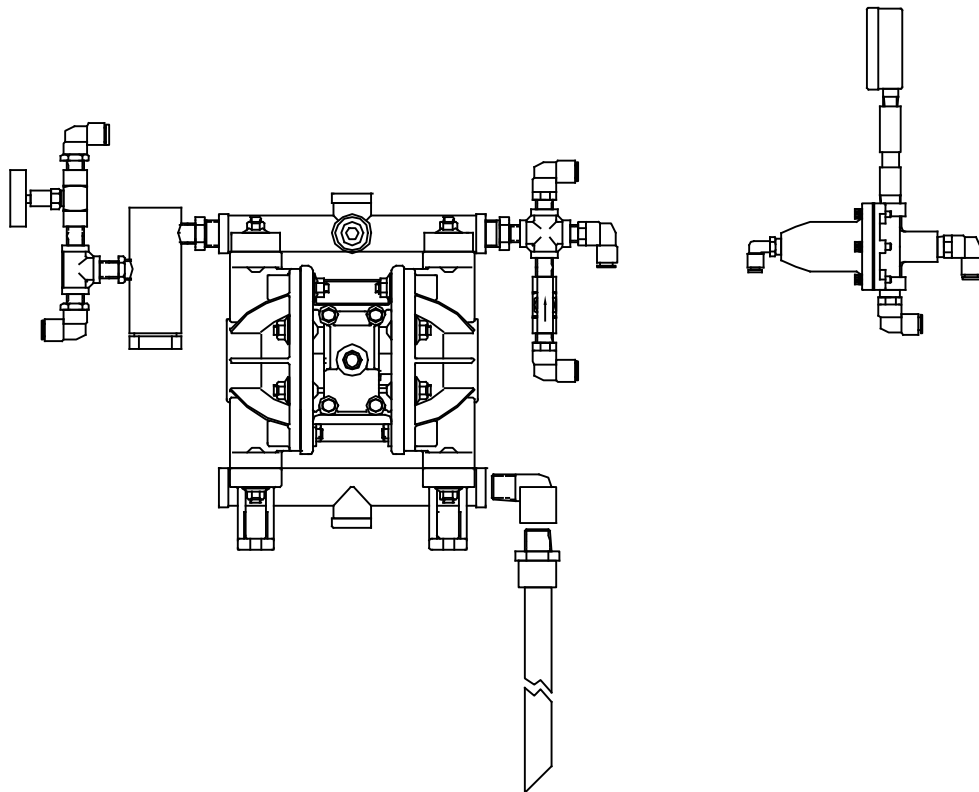




The Next Level of Technology

■ innovation ■ service ■ reliability

1:1 DIAPHRAGM PUMP KIT SERVICE MANUAL



IMPORTANT ! - READ ALL INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT

It is the customer's responsibility to have all operators and service personnel read and understand this information. Contact your ITW Dynatec customer service representative for additional copies.

NOTICE! Please be sure to include the serial number of your application system each time you order replacement parts and/or supplies. This will enable us to send you the correct items that you need.

ITW Dynatec Service Parts Direct Dial: 1-800-538-9540
ITW Dynatec Technical Service Direct Dial: 1-800-654-6711

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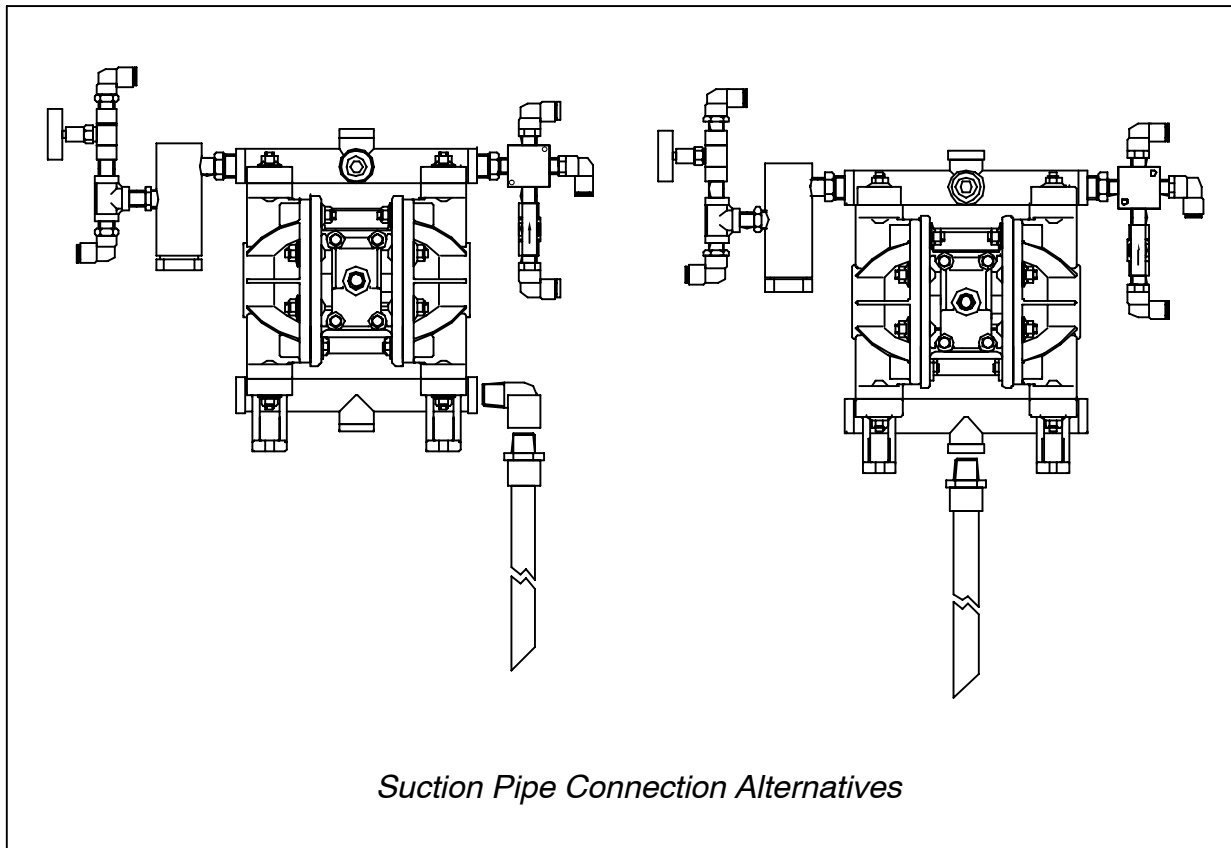
Overview

The ITW Dynatec 1:1 diaphragm pump fluid delivery systems are designed for use with mono or co-polymer synthetic resin adhesives with viscosities to 1000 centipoise. Higher viscosity materials may be usable, but would have to be determined on a case-by-case basis. Fluid application pressures for this system may range from 0 to 80 psi (0 to 5.5 bar). Contact your ITW Dynatec representative for assistance if your adhesive application requirements do not meet the above criteria.

Installation

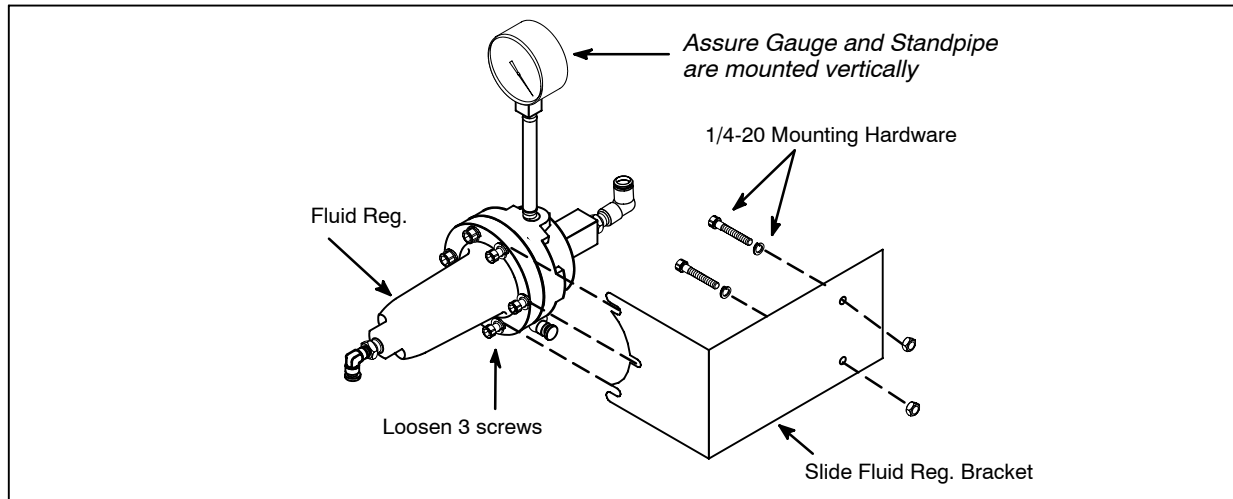
The pump and filter portion on the fluid delivery system is designed to sit on the top of the glue reservoir (typically a 5 gallon pail or 55 gallon drum).

1. The pump pick-up tube is a ½" PVC pipe that should be cut to length, approximately 2 inches shorter than the depth of the glue reservoir.
2. The bottom end of the pipe should be cut on a 45-degree angle to avoid the potential blockage of glue flow into the tube.



3. The threaded end of the pipe should be used as is or in conjunction with the supplied 90° elbow for assembly into the suction side (bottom) of the pump. Use thread sealant on all joints.
4. Mount the Fluid Regulator (PN 108433) to its bracket (PN 108480) by loosening three of the 10-24x1.00 screws on the Fluid Regulator. Slide the Bracket on the Fluid Regula-

tor by aligning the slots in the Bracket with the 10-24 screws in the Fluid Regulator. Tighten the 10-24 screws to a torque of 65 to 75 inch pounds to prevent glue leakage. Use the supplied 1/4-28x3/4" screws to mount the bracket/ regulator to a flat surface.



5. Install all fluid and air tube connections as appropriate. These connections are illustrated in the diagrams on the following pages.

NOTE: It is important that the “double daisy chain” glue manifold supply lines be installed as shown in the diagram on page 1 when more than one manifold is used in your system. This configuration assures consistent glue pressure throughout the system.

6. The needle valve on the Return Line Assembly should be completely tightened (turn clock-wise) then turned counter-clockwise 1/4 turn or until a slow drip is observed from the outlet of the return manifold (see drawing). This will allow the pressure in the manifold(s) to dissipate when the machine is shut down. Having the needle valve open too much will siphon pressure from the glue applicators during machine operation.

7. The needle valve on the output side of the pump should be closed (see drawing) during normal operation. This forces all of the pump output to the fluid regulator and ultimately to the manifolds.

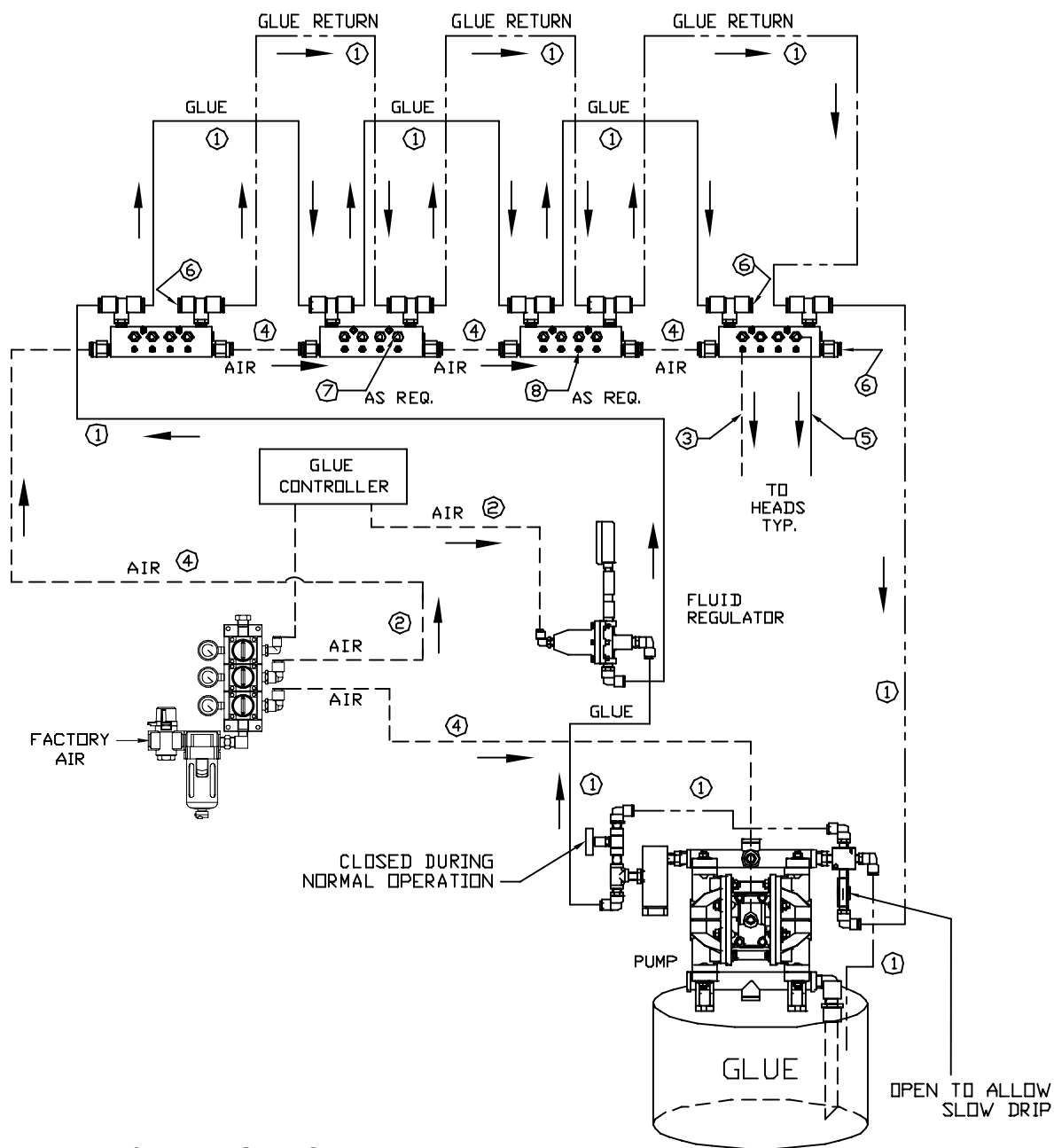
8. Air tree regulator setting should be as follows:

Pump Pressure: 90 psi

Transducer Pressure: 90 psi

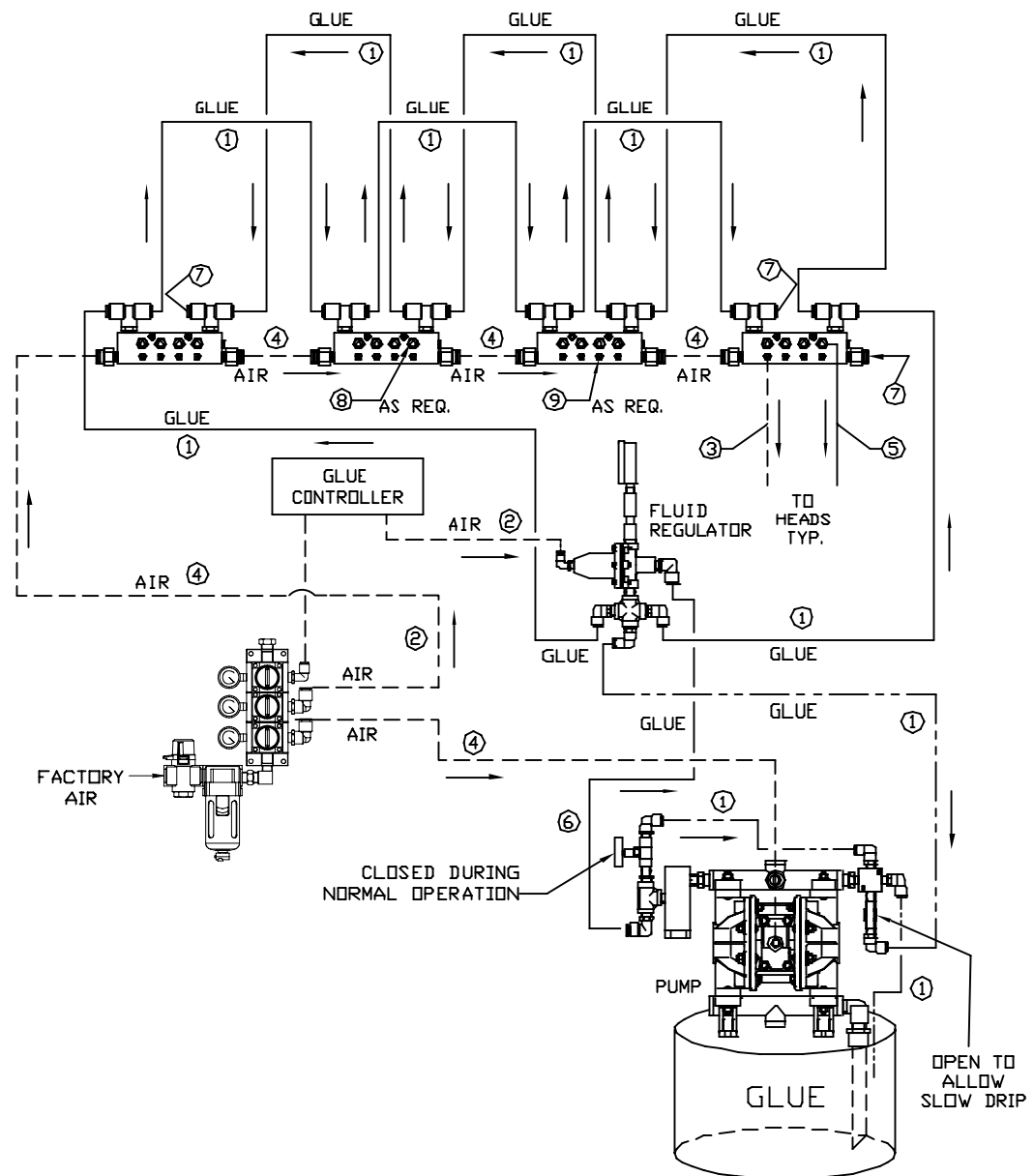
Air Manifold Pressure*: As required by pneumatic glue applicators (see applicator manual)

* Air Manifold pressure only applies to pneumatic glue applicators or pneumatically controlled shutter devices



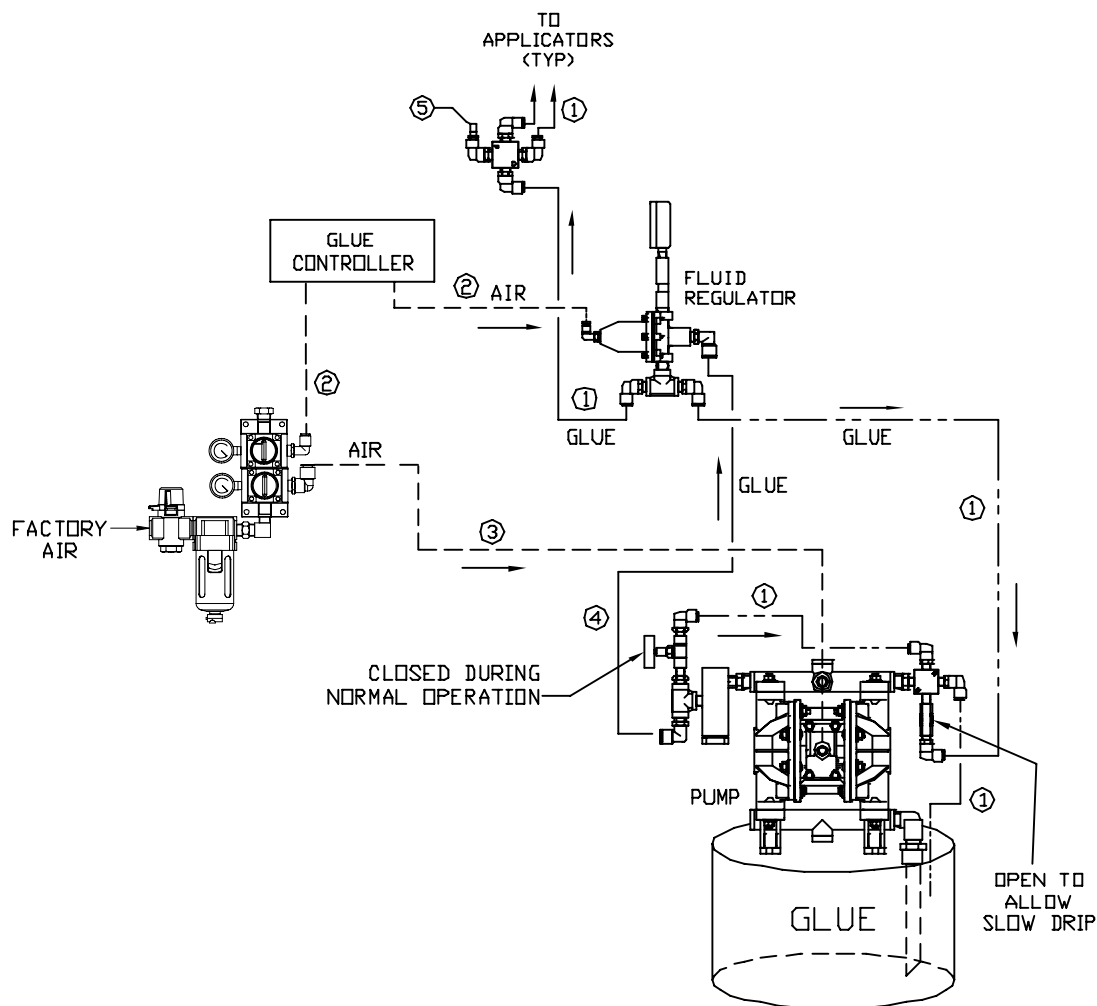
Multiple Manifold Air/ Glue Connections Diagram

Item No.	Part Number	Description
1	775-003	Tubing, 3/8" Nylon (Fluid)
2	775-005	Tubing, 1/4" Poly (Air)
3	775-041	Tubing, 1/8" Poly (Air)
4	775-006	Tubing, 3/8" Poly (Air)
5	775-010	Tubing, 1/4" Nylon (Fluid)
6	N06505	Plug, 3/8" Tube
7	N06506	Plug, 1/4" Tube
8	105844	Plug, 1/8" Tube



High Flow, Multiple Manifold Air/ Glue Connections Diagram

Item No.	Part Number	Description
1	775-003	Tubing, 3/8" Nylon (Fluid)
2	775-005	Tubing, 1/4" Poly (Air)
3	775-041	Tubing, 1/8" Poly (Air)
4	775-006	Tubing, 3/8" Poly (Air)
5	775-010	Tubing, 1/4" Nylon (Fluid)
6	105763	Tubing, 1/2" Nylon (Fluid)
7	N06505	Plug, 3/8" Tube
8	N06506	Plug, 1/4" Tube
9	105844	Plug, 1/8" Tube



Single Manifold Air/ Glue Connections Diagram

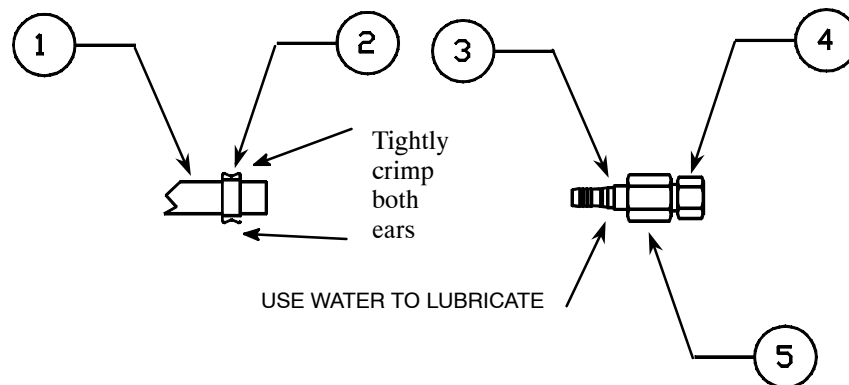
Item No.	Part Number	Description
1	775-003	Tubing, 3/8" Nylon (Fluid)
2	775-005	Tubing, 1/4" Poly (Air)
3	775-006	Tubing, 3/8" Poly (Air)
4	105763	Tubing, 1/2" Nylon (Fluid)
5	N06505	Plug, 3/8" Tube

9. Remove any nozzles from the applicators or fully open stroke adjustment on applicator (zero-cavity nozzles).
10. Use the Pattern Control Unit to purge each applicator for about 30 seconds. This is done to force out any dirt or other contaminants that may have entered the fluid delivery system during installation.
11. Discontinue the channel purge on the Pattern Control Unit and use a clean, damp rag to clean any glue from the applicator.
12. Properly attach nozzles and position all glue applicators. The system is now ready to operate.

Hydraulic Fitting Assembly

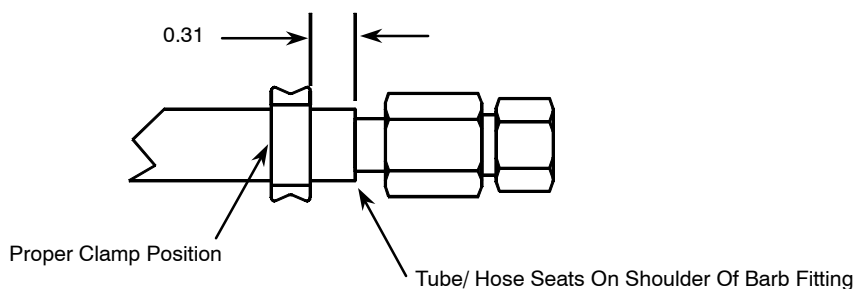
Certain systems will require special hydraulic fittings for proper connection to glue applicators. Clear 3/8" nylon tubing or 1/4" hydraulic hose and fittings are provided in kit form for on-site assembly. This allows the cutting of the tube/ hose to lengths appropriate for your installation. The following procedure should be used to correctly assemble the connector fittings to the tube/ hose:

1. Cut the end of the 3/8" Nylon Tubing or 1/4" hydraulic hose so it is straight and square.
2. Place the Clamp over the end of the tube/ hose.
3. Slide the Barb Fitting into the Nut.
4. Tighten the Plug into the Nut.



Item	Description
1	3/8" Tube/ 1/4" Hose
2	Clamp
3	Barb
4	Plug
5	Hose Nut

5. Lubricate the end of the Barb Fitting with water to ease its assembly into the tube/ hose.
6. Push the tube/ hose and clamp over the barb fitting until the end of the tube/ hose butts against the shoulder of the Barb Fitting.



7. Position the Clamp 5/16" (8mm) back from the end of the tube/ hose.
8. Tighten the clamp as tightly as possible around the tube/ hose using an Oetiker Crimp Tool (107571).
Note: Completely crimp both "ears" of the clamp.
9. Remove the plug from the nut.
10. Repeat steps #1 through #9 for installation of each set of hose connection fittings.

Changing the Adhesive Reservoir

The following procedure should be followed when changing the glue reservoir (i.e. 5 gallon pail, 55 gallon drum, etc.). The same basic procedure is used if the existing reservoir is continually re-filled, however the reservoir should be thoroughly cleaned at least once each week to inhibit the buildup of dried glue on the inner walls of the reservoir.

1. Remove the pump assembly, inclusive of the pickup tube, from the old glue reservoir.
2. Use a clean, wet rag to wipe the built-up adhesive from the outside walls of the pickup tube.
3. Place the pump assembly, inclusive of pickup tube, in the new adhesive reservoir.
4. Open the needle valve (turn counter-clockwise) on the output side of the pump. This will allow the glue flow to bypass the fluid regulator and manifold tubing and instead circulate back into the adhesive reservoir.
5. Let the pump operate for a few minutes to allow all air that has entered the pick-up tube to work its way out of the pump.
6. Close the needle valve (turn clockwise) on the output side of the pump.
7. Assure the needle valve on the return line assembly is open $\frac{1}{4}$ turn from the completely closed position to allow a slow drip back into the adhesive reservoir.

The system is now ready to operate.

Routine Maintenance

The following procedures should be performed on a regular basis to help ensure the proper operation of the fluid delivery system.

Once Each Week (or as appropriate)

1. Filter Screen: Wash the filter screen (stainless steel version) with warm (not hot) water. Inspect for splitting, corrosion or clogging in the mesh material. Replace filter screens as necessary. The bag filter element (plastic version) is meant to be disposable.

NOTE: The filter assembly (107577) is designed with the Cap Nut (551-119) down. This is done so any debris that accumulates in the filter body is flushed from the system when the Cap Nut is removed. Inverting the Filter Body (551-117) so the Cap Nut is on the top is not recommended.

2. Purge Unused Applicators: Purge for approximately one minute each applicator that has not been used during the week. This helps ensure that the adhesive does not thicken inside the nozzle and impede operation when the applicator is required for use.
3. Reused Adhesive Reservoir: Wash a reused adhesive reservoir with warm (not hot) water until all dried adhesive has been removed. Completely dry the container prior to filling with new adhesive. Follow the directions under “Changing the Adhesive Reservoir” prior to placing the system into operation.

Once Each Month

1. Remove the fluid delivery system from its adhesive reservoir.
2. Clean the reservoir if it is to be reused.
3. Place warm water in a clean reservoir and flush the entire adhesive supply system, including the applicators, until clean water flows through the system.
4. Remove any water from the reservoir.
5. Recharge the system with fresh glue.

Once Each Quarter (3 months) or Upon Changing Adhesive Products

1. Perform the monthly water flush.
2. Mix a 10% vinegar/ water solution (2 quarts vinegar in 5 gallons of water) using distilled white vinegar.
3. Completely flush the system with this solution and purge each applicator with at least a quart of water (remove nozzle or open needle stroke to speed this process).
4. Remove any remaining vinegar from the reservoir.
5. Completely flush the system and applicators with warm water once again to remove the vinegar.

6. Remove any water from the reservoir.

7. Recharge the system with fresh glue.

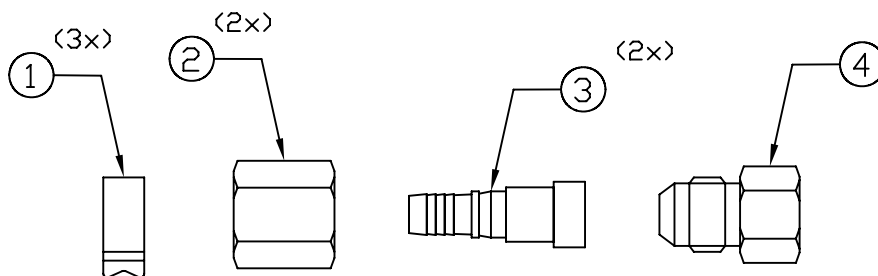
Once Per Year

Fluid Regulator: Take the Fluid Regulator (PN 108434) apart and thoroughly clean. Check for corrosion or wear of internal parts. Replace items as necessary.

Parts and Repair Information

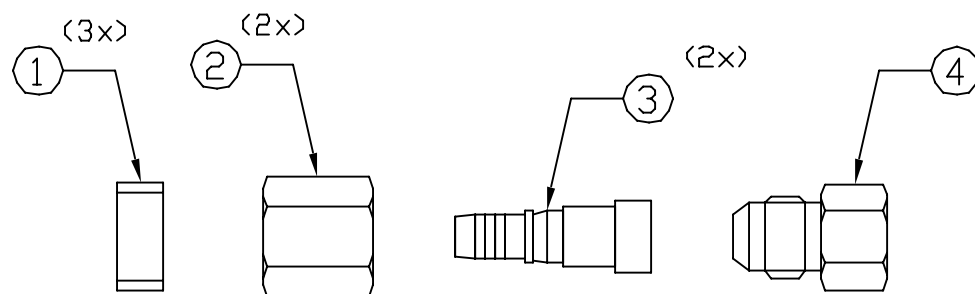
Part Number	Description
107571	Oetiker Crimp Tool
108525	Seat Service Kit for PN 108437 Diaphragm Pump (4 required per pump)
108526	Fluid Section Service Kit for PN 108437 Diaphragm Pump
108527	Air Motor Service Kit for PN 108437 Diaphragm Pump
108532	Service Kit for PN 108433 Fluid Regulator
551-118	Filter Screen, 100 mesh, stainless steel
551-112	Filter Screen, 50 mesh, stainless steel (supplied with PN 107577)
113877	Bag Filter Element, 200 micron (70 mesh)

5/16 JIC x 1/4" Hose Connector Kit - 108091



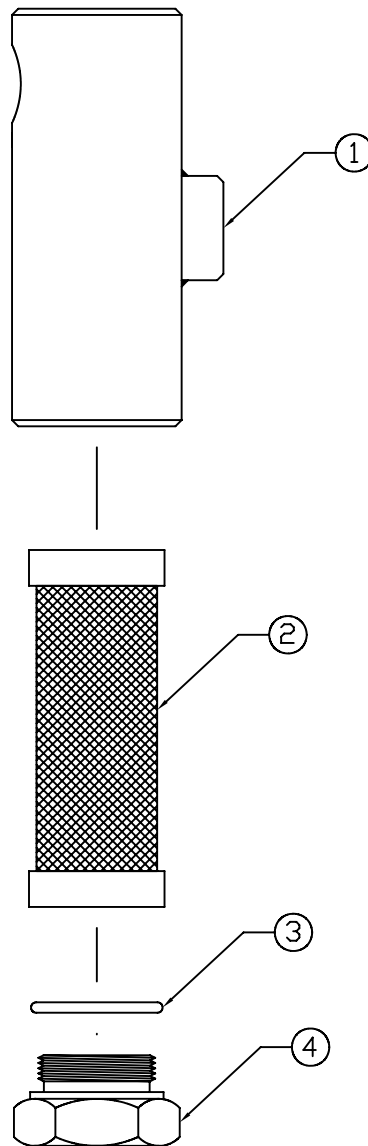
Item No.	Part Number	Description	Qty.
1	107567	Clamp, 1/4 Hose	3
2	107568	Nut, Hose Adapter	2
3	108082	Stem Fitting, 5/16 JIC x 1/4" Hose	2
4	107570	Plug, 5/16 JIC Hose	1

5/16 JIC x 3/8" Tube Connector Kit - 108619



Item No.	Part Number	Description	Qty.
1	108620	Clamp, 3/8 Tube	3
2	107568	Nut, Hose Adapter	2
3	108082	Stem Fitting, 5/16 JIC x 1/4" Hose	2
4	107570	Plug, 5/16 JIC Hose	1

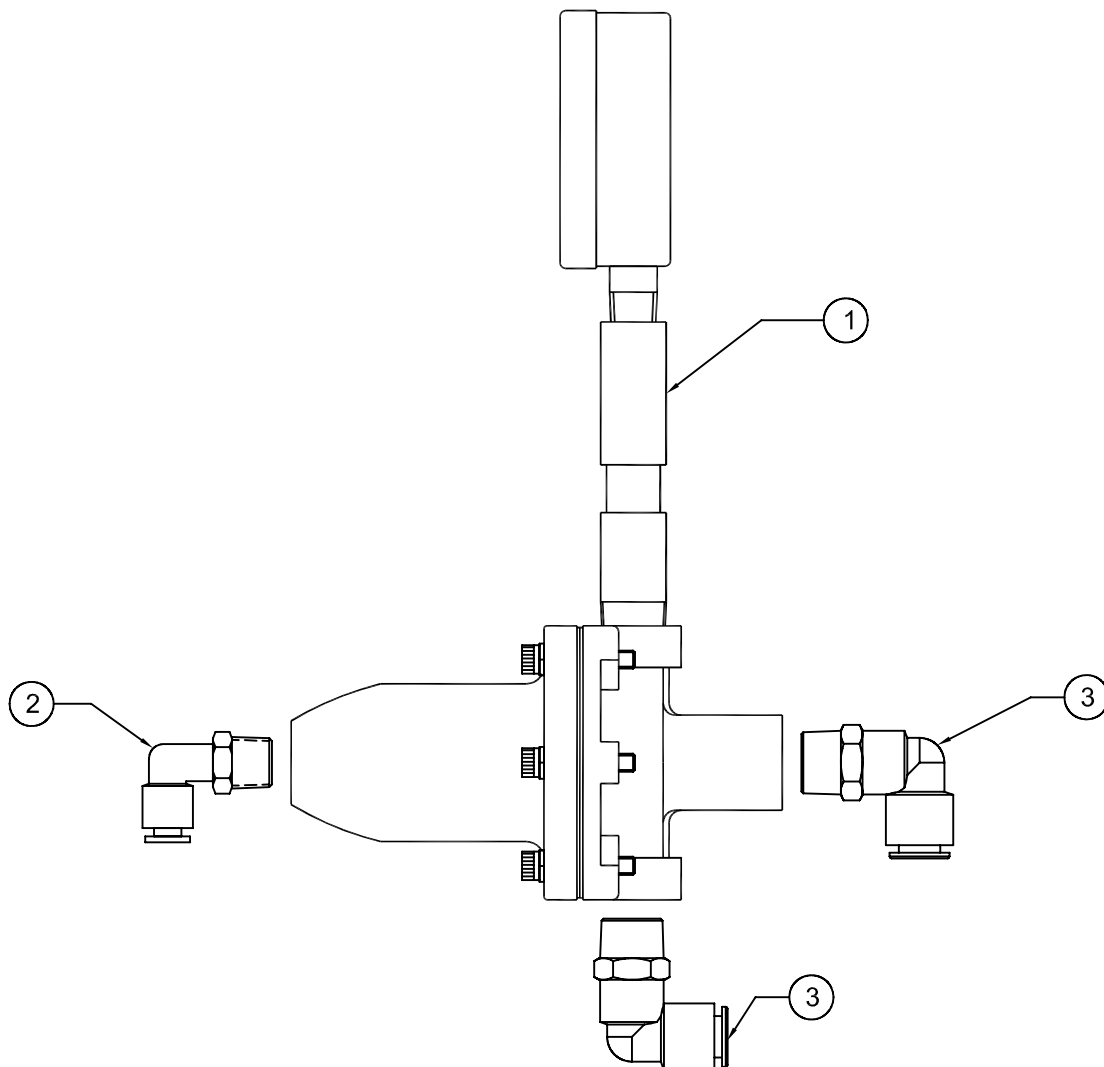
Cold Glue Filter Assembly - 107577



Item No.	Part Number	Description	Qty.
1	551-117	Filter Body	1
2	* 551-112	Filter Screen, 50 mesh	1
3	551-120	O-ring	1
4	551-119	Cap, Filter Body, SST	1

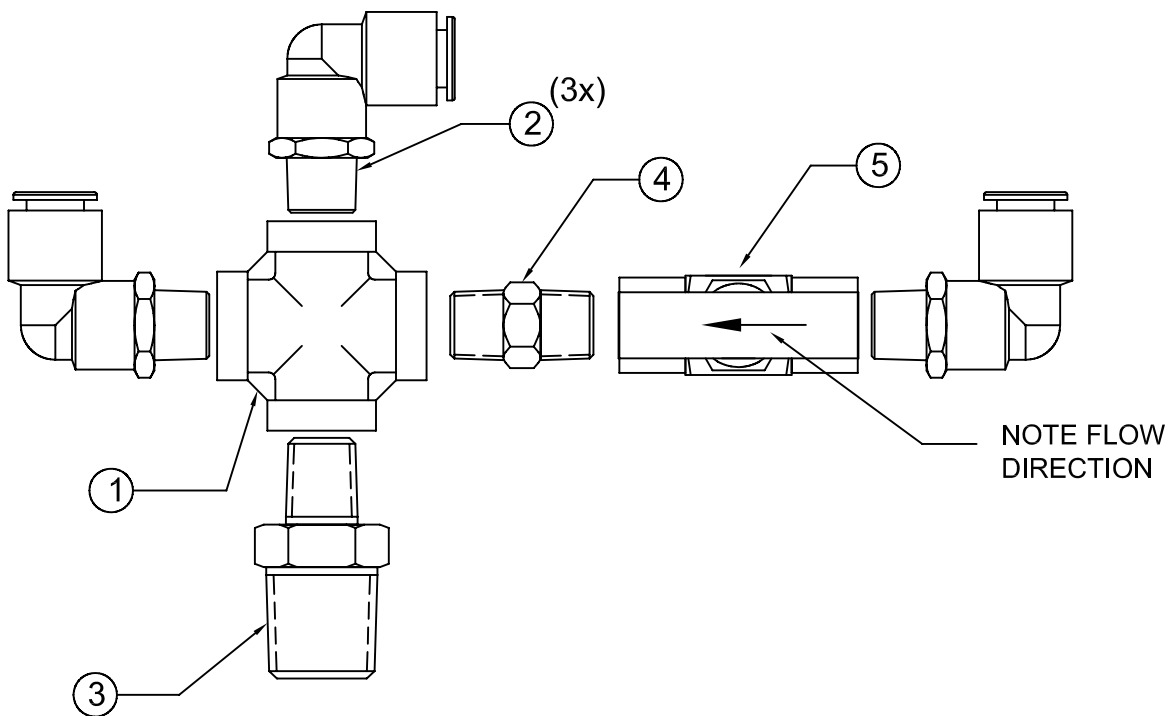
*Note: Filter Screen, 100 mesh (551-118) is available as a replacement part.

Fluid Regulator Assembly - 108434



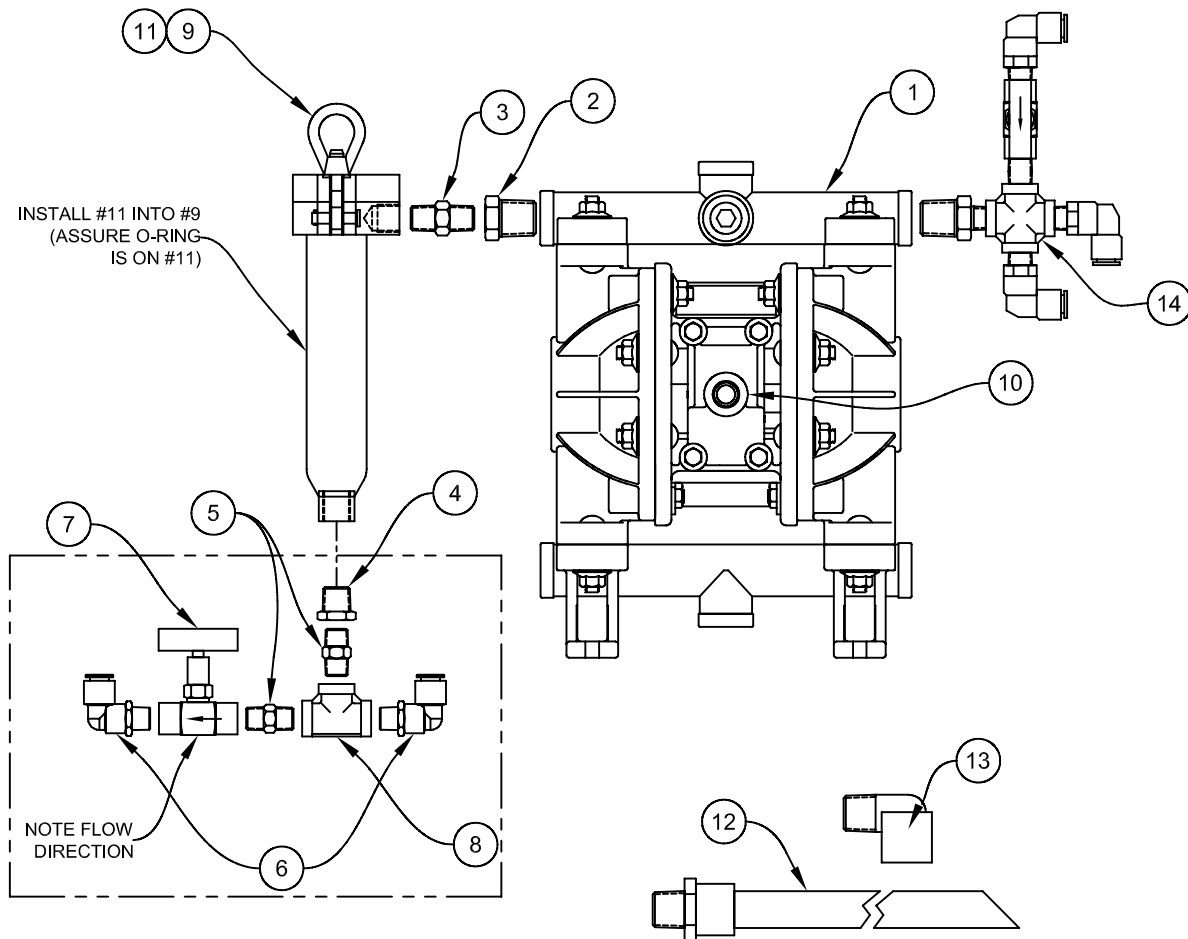
Item No.	Part Number	Description	Qty.
1	108433	Fluid Regulator	1
2	N06412	Fitting, Elbow, 1/4 NPT x 1/4 Tube	1
3	N06501	Fitting, 90°, 3/8 NPT x 3/8 Tube	2

1:1 Diaphragm Pump, Return Manifold Assembly - 108435



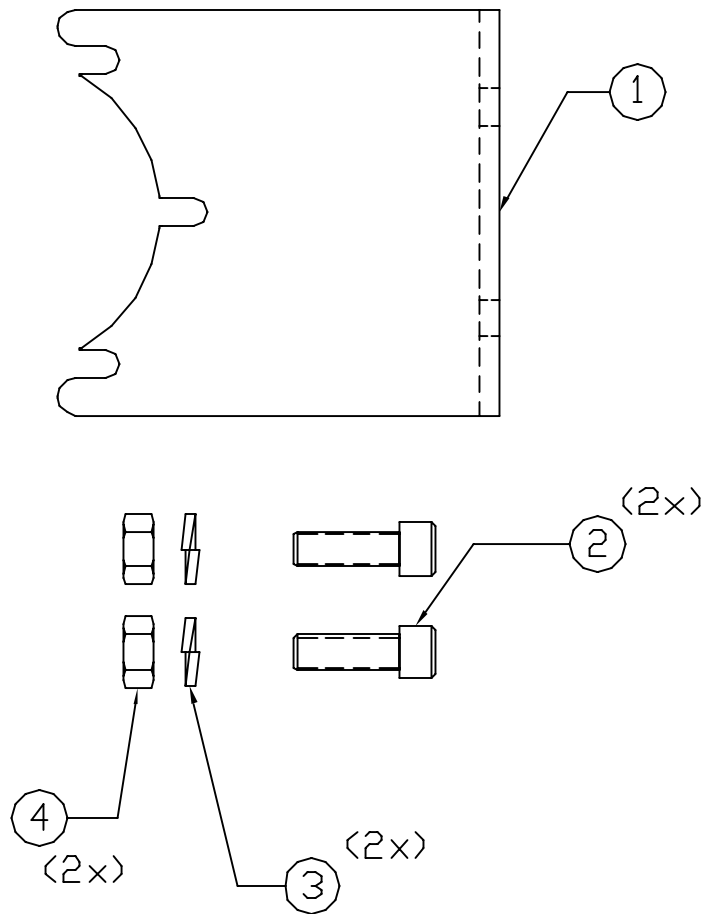
Item No.	Part Number	Description	Qty.
1	108482	Cross, Female, 1/4 NPT, SST	1
2	N06502	Fitting, 90°, 1/4 NPT x 3/8 Tube	3
3	108441	Plug, 1/2 To 1/4 NPT	1
4	108106	Nipple, Hex, 1/4 NPT, SST	1
5	108069	Needle Valve, 1/4 NPT, SST	1

1:1 Diaphragm Pump Assembly With Bypass - 108442



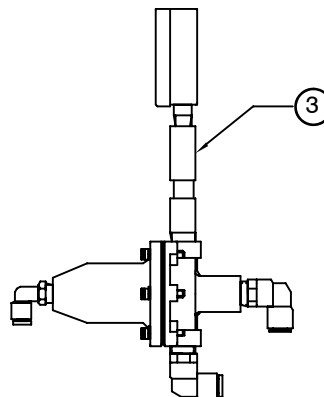
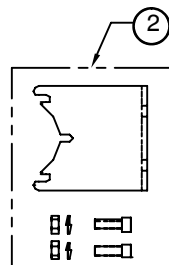
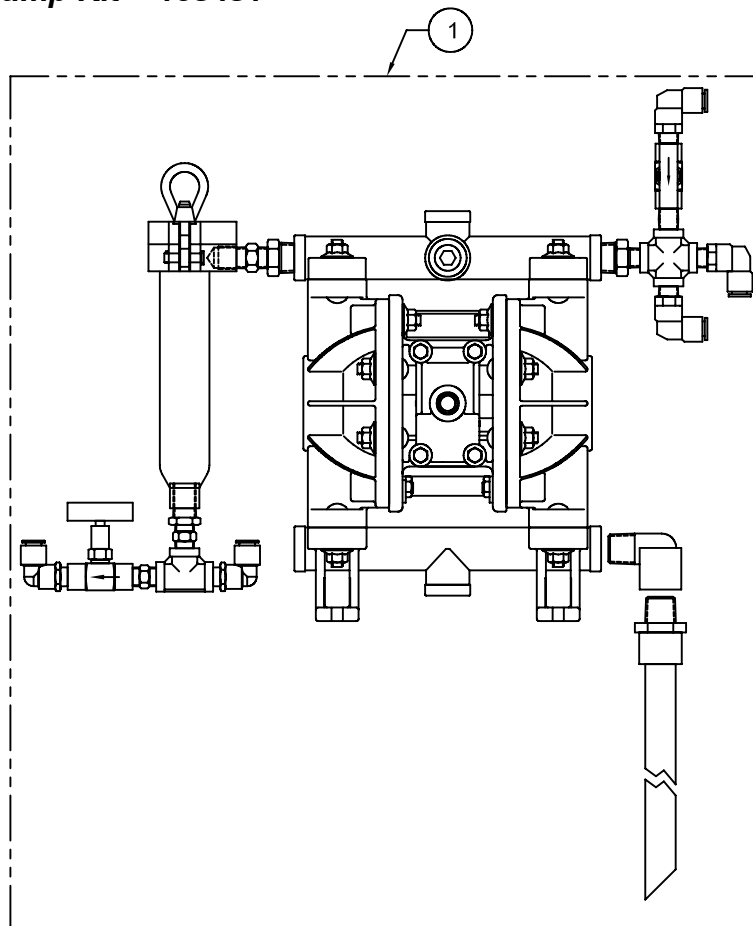
Item No.	Part Number	Description	Qty.
1	108680	Diaphragm Pump, 1:1	1
2	108438	Reducer, 1/2 To 3/8 NPT, SST	1
3	108103	Nipple, Hex, 3/8 NPT, SST	1
4	108072	Reducer, 3/8 To 1/4 NPT, SST	1
5	108106	Nipple, Hex, 1/4 NPT, SST	2
6	N06502	Fitting, 90°, 1/4 NPT x 3/8 Tube	2
7	108069	Needle Valve, 1/4 NPT, SST	1
8	108271	Tee, Female, 1/4 NPT, SST	1
9	113876	Filter Bag Assembly, SST	1
10	N06434	Fitting, 1/4 NPT x 3/8 Tube	1
11	113877	Bag Filter, 200 micron	1
12	108440	Suction Pipe Assembly, 36"	1
13	108439	Street Elbow, 1/2 NPT, SST	1
14	108435	Return Manifold Assembly	1

Bracket Assembly For Fluid Regulator - 108480



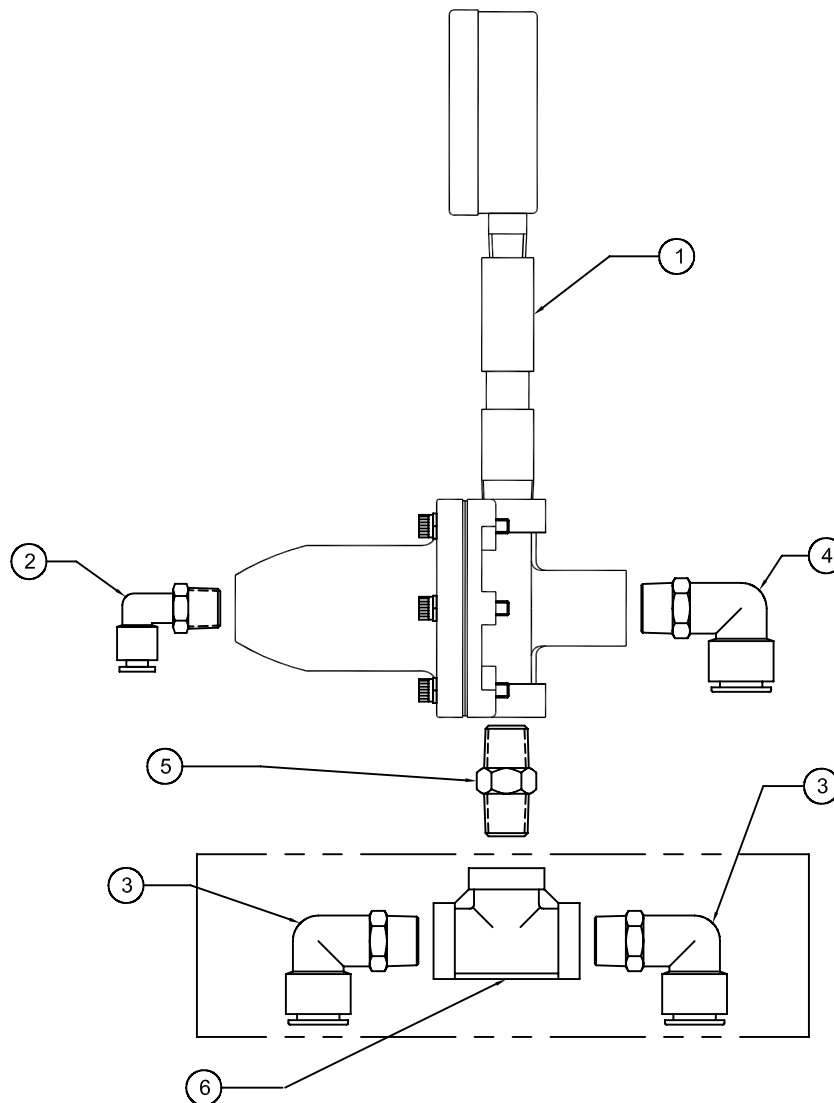
Item No.	Part Number	Description	Qty.
1	108479	Fluid Regulator Bracket	1
2	107543	1/4-28 x 3/4 SHC Screw	2
3	078C011	1/4 Split Lock Washer	2
4	078D031	1/4-28 Hex Nut	2

1:1 Diaphragm Pump Kit - 108481



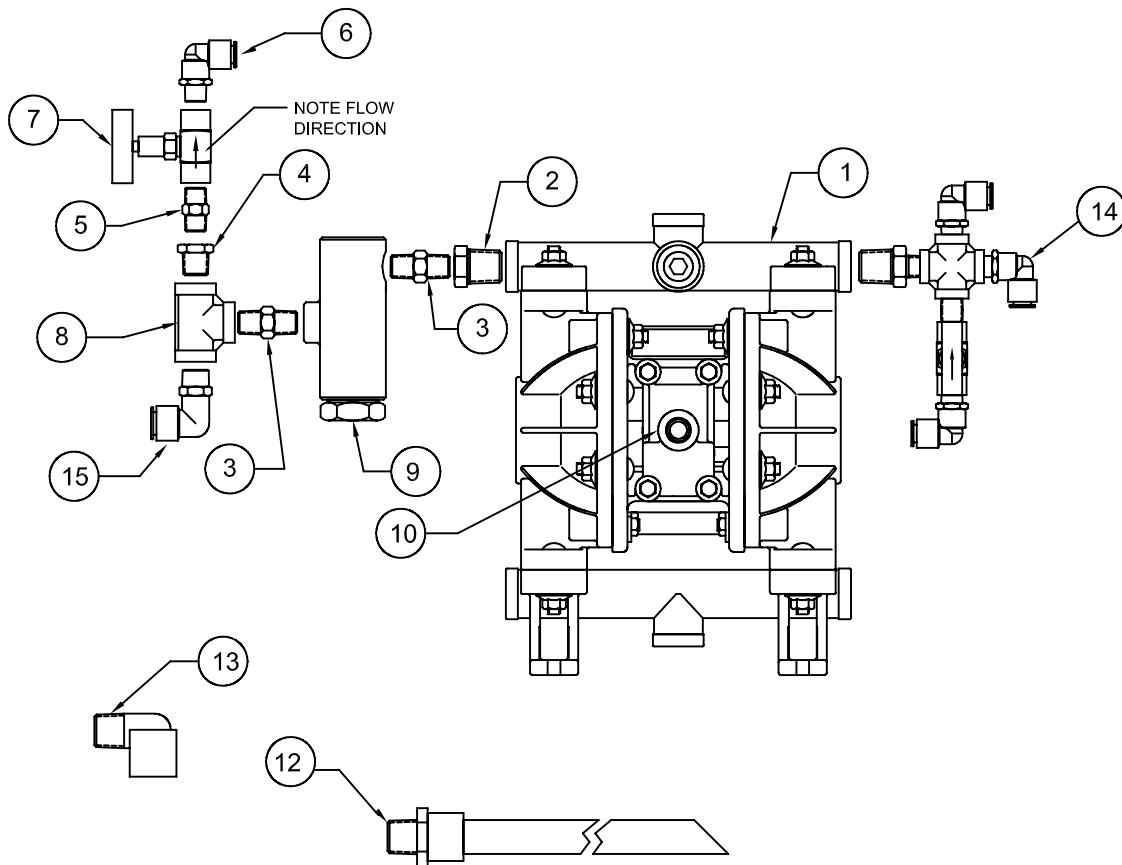
Item No.	Part Number	Description	Qty.
1	108442	Pump Assembly with Bypass, 1:1	1
2	108480	Bracket Assembly, Fluid Regulator	1
3	108434	Fluid Regulator Assembly, 75 PSI	1

Fluid Regulator Assembly, 75 PSI, with Bypass - 108600



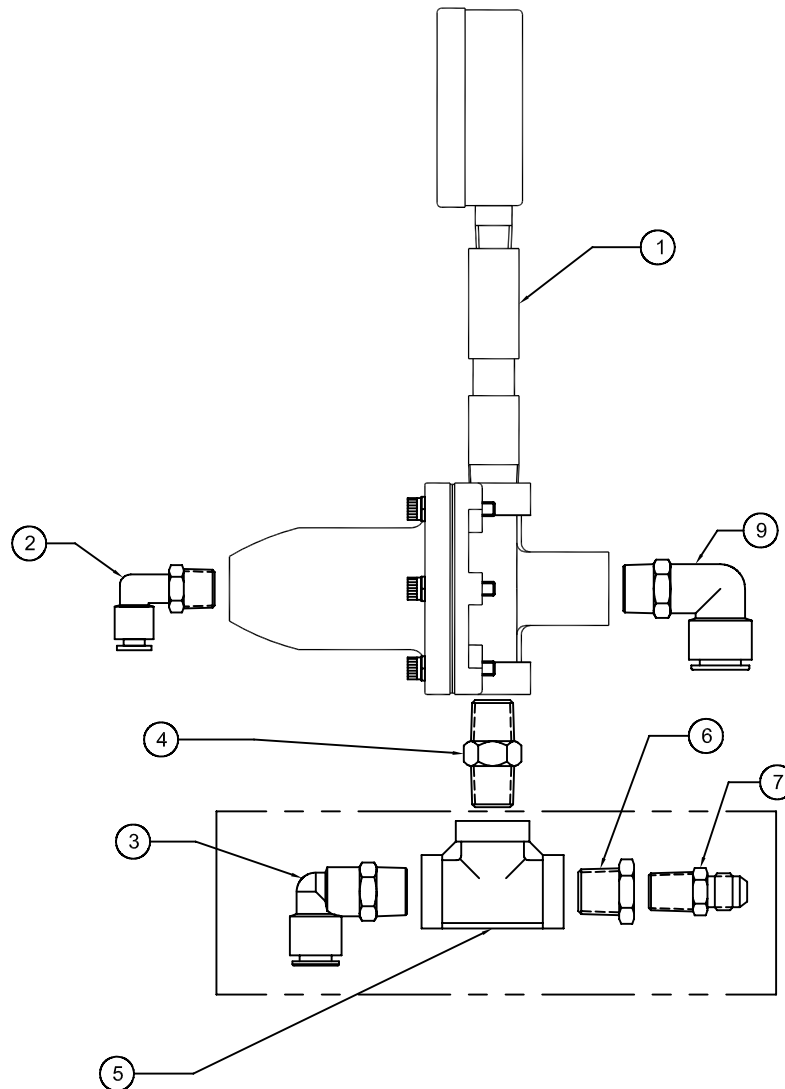
Item No.	Part Number	Description	Qty.
1	108433	Fluid Regulator, Raw	1
2	N06412	Fitting, Elbow, 1/4 NPT x 1/4 Tube	1
3	N06501	Fitting, 90°, 3/8 NPT x 3/8 Tube	2
4	108598	Fitting, 90°, 3/8 NPT x 1/2 Tube	1
5	108103	Nipple, Hex, 3/8 NPT, SST	1
6	108599	Tee, Female, 3/8 NPT, SST	1

1:1 High Flow Diaphragm Pump Assembly - 108601



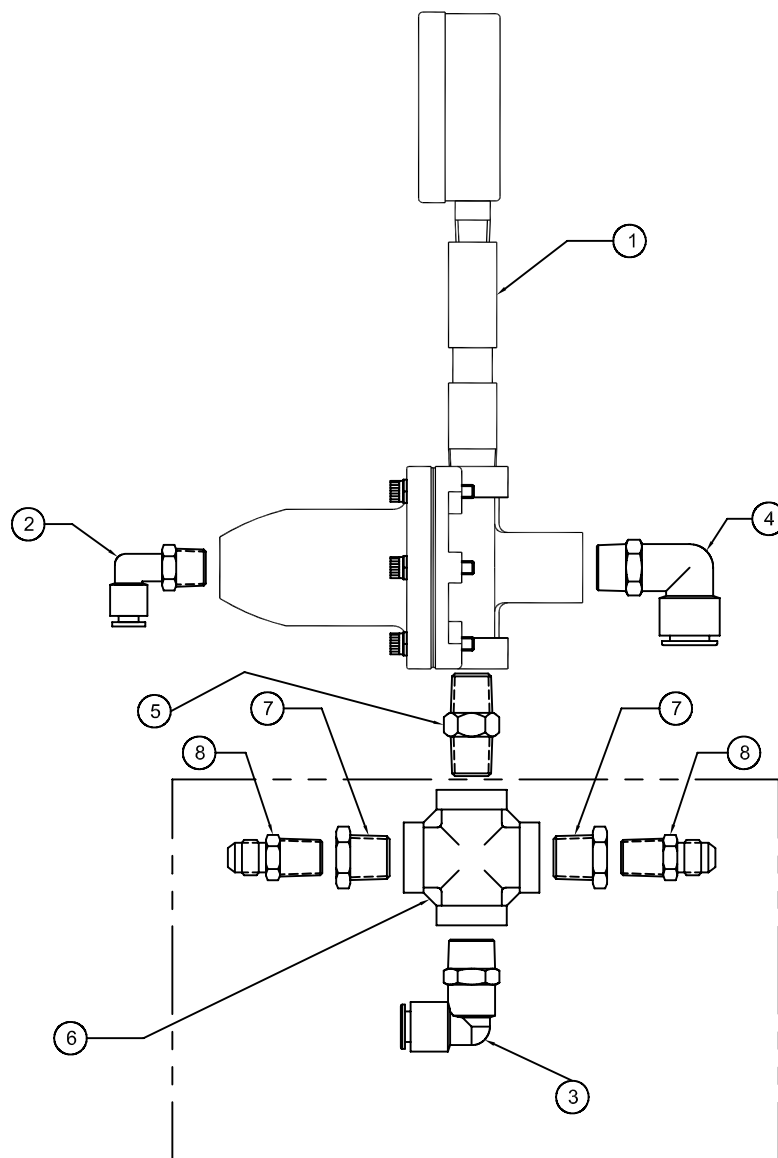
Item No.	Part Number	Description	Qty.
1	108680	Diaphragm Pump, 1:1	1
2	108438	Reducer, 1/2 To 3/8 NPT, SST	1
3	108103	Nipple, Hex, 3/8 NPT, SST	2
4	108072	Reducer, 3/8 To 1/4 NPT, SST	1
5	108106	Nipple, Hex, 1/4 NPT, SST	1
6	N06502	Fitting, 90°, 1/4 NPT x 3/8 Tube	1
7	108069	Needle Valve, 1/4 NPT, SST	1
8	108599	Tee, Female, 3/8 NPT, SST	1
9	107577	Filter Assembly, SST	1
10	N06434	Fitting, 1/4 NPT x 3/8 Tube	1
11			
12	108440	Suction Pipe Assembly, 36"	1
13	108439	Street Elbow, 1/2 NPT, SST	1
14	108435	Return Manifold Assembly	1
15	108598	Fitting, 90°, 1/2 Tube x 3/8 NPT	1

Fluid Regulator Assembly - 108725



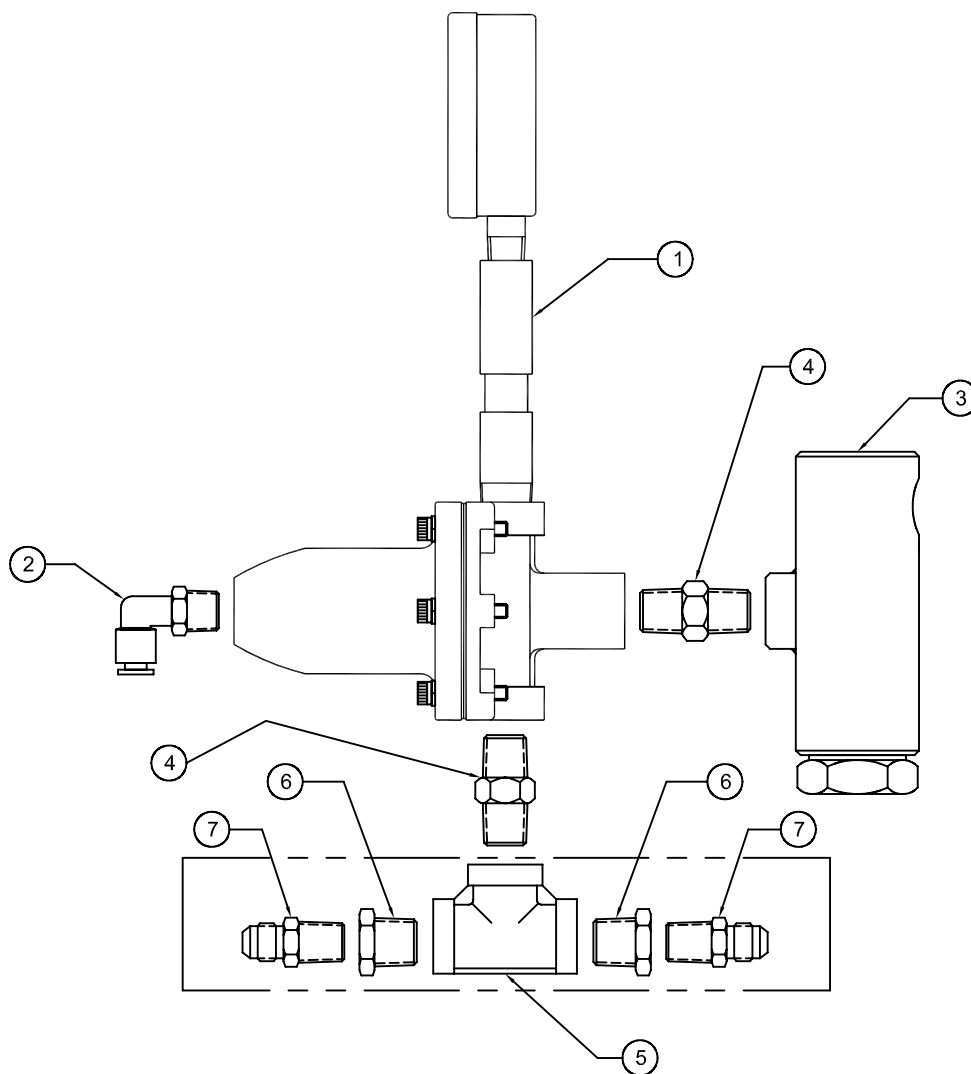
Item No.	Part Number	Description	Qty.
1	108433	Fluid Regulator Assembly	1
2	N06412	Fitting, Elbow, 1/4 NPT x 1/4 Tube	1
3	N06501	Fitting, 90°, 3/8 NPT x 3/8 Tube	1
4	108103	Nipple, Hex, 3/8 NPT, SST	1
5	108599	Tee, Female, 3/8 NPT, SST	1
6	108072	Reducer, 3/8 NPT x 1/4, SST	1
7	108070	Nipple, 1/4 NPT x 5/16 JIC, SST	1
9	108598	Fitting, 90°, 3/8 NPT x 1/2 Tube	1

Fluid Regulator Assembly - 109498



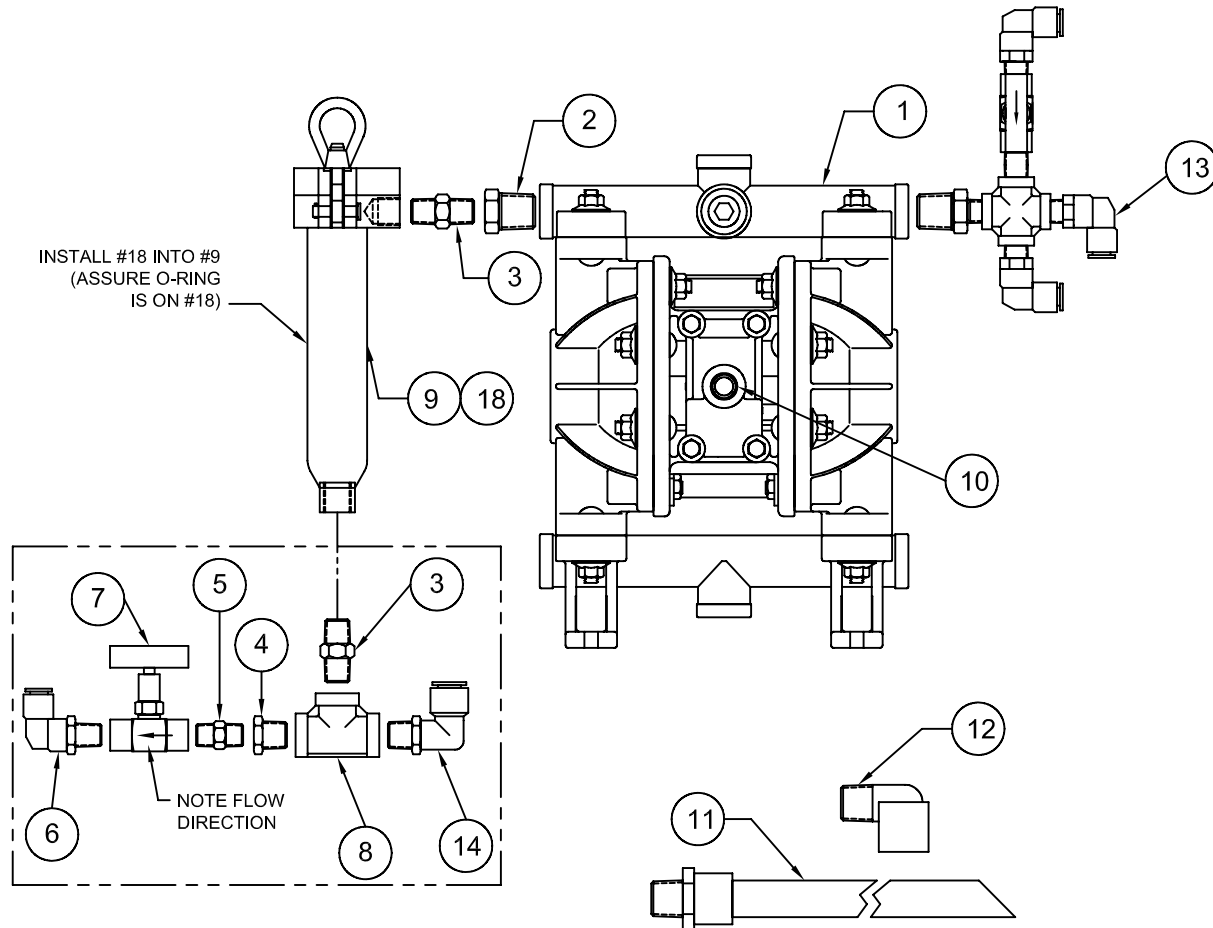
Item No.	Part Number	Description	Qty.
1	108433	Fluid Regulator Assembly	1
2	N06412	Fitting, Elbow, 1/4 NPT x 1/4 Tube	1
3	N06501	Fitting, 90°, 3/8 NPT x 3/8 Tube	1
4	108598	Fitting, 90°, 3/8 NPT x 1/2 Tube	1
5	108103	Nipple Hex, 3/8 NPT, SST	1
6	108616	Cross, Female, 3/8 NPT, SST	1
7	108072	Reducer, 3/8 NPT x 1/4, SST	2
8	108070	Nipple, 1/4 NPT x 5/16 JIC, SST	2

Fluid Filter/Regulator Assembly - 111690



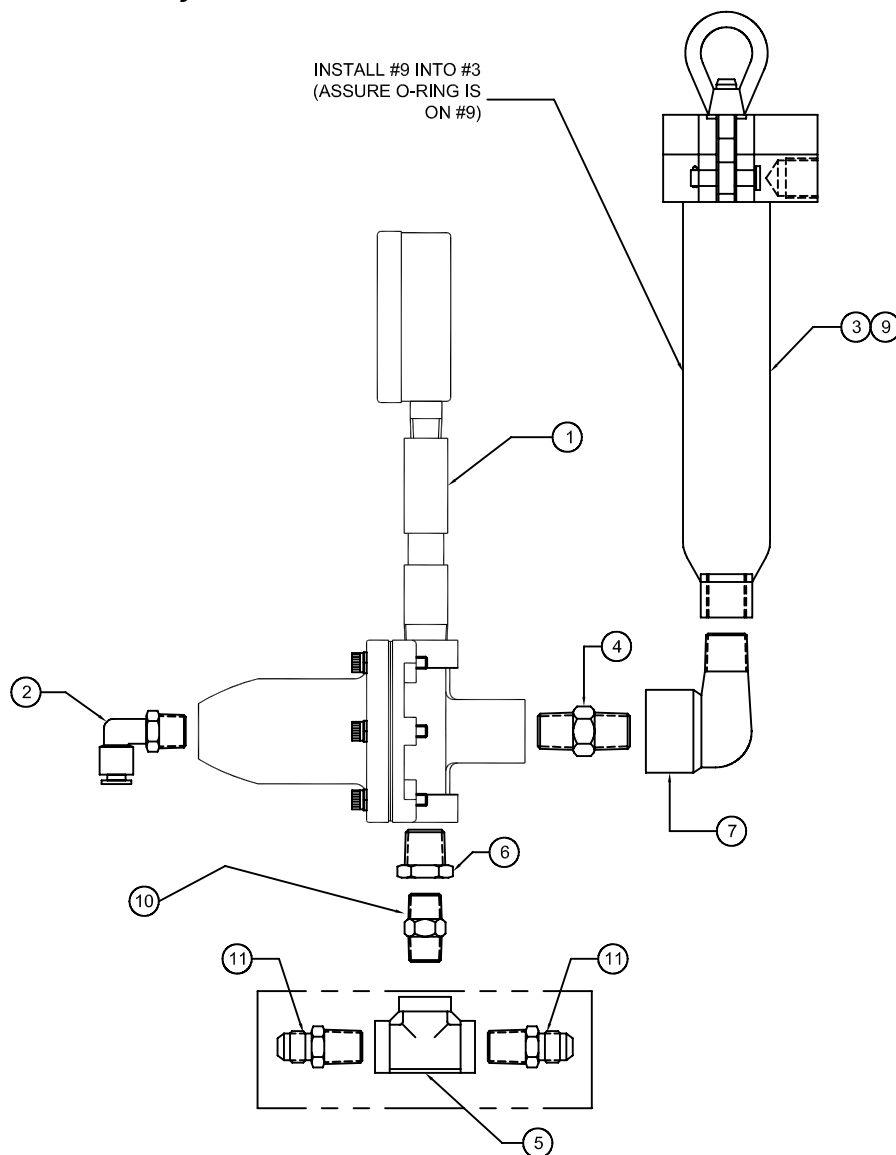
Item No.	Part Number	Description	Qty.
1	108433	Fluid Regulator	1
2	N06412	Fitting, Elbow, 1/4 NPT x 1/4 Tube	1
3	107577	Filter Assembly, SST	1
4	108103	Nipple Hex, 3/8 NPT, SST	2
5	108599	Tee, Female, 3/8 NPT, SST	1
6	108072	Reducer, 3/8 NPT x 1/4, SST	2
7	108070	Nipple, 1/4 NPT x 5/16 JIC, SST	2

1:1 Diaphragm Pump Assembly - 113878



Item No.	Part Number	Description	Qty.
1	108680	Diaphragm Pump, 1:1	1
2	108438	Reducer, 1/2 To 3/8 NPT, SST	1
3	108103	Nipple, Hex, 3/8 NPT, SST	2
4	108072	Reducer, 3/8 To 1/4 NPT, SST	1
5	108106	Nipple, Hex, 1/4 NPT, SST	1
6	N06502	Fitting, 90°, 1/4 NPT x 3/8 Tube	1
7	108069	Needle Valve, 1/4 NPT, SST	1
8	108599	Tee, Female, 3/8 NPT, SST	1
9	113876	Filter Assembly, SST	1
10	N06434	Fitting, 1/4 NPT x 3/8 Tube	1
11	108440	Suction Pipe Assembly, 36"	1
12	108439	Street Elbow, 1/2 NPT, SST	1
13	108435	Return Manifold Assembly	1
14	108598	Fitting, 90°, 1/2 Tube x 3/8 NPT	1
18	113877	Filter Bag, 200 Micron	1

Bag Filter/Regulator Assembly - 115139



Item No.	Part Number	Description	Qty.
1	108433	Fluid Regulator	1
2	N06412	Fitting, Elbow, 1/4 NPT x 1/4 Tube	1
3	113876	Filter Body, Bag	1
4	108103	Nipple Hex, 3/8 NPT, SST	1
5	108271	Tee, Union, 1/4 NPT, SST	1
6	108072	Reducer, 3/8 NPT x 1/4, SST	1
7	108076	Street Elbow, 3/8 NPT, SST	1
8			
9	113877	Bag Filter, 200 micron	1
10	108106	Nipple, Hex, 1/4 NPT, SST	1
11	108070	Nipple, 1/4NPT x 5/16 JIC, SST	2

ITW Dynatec
An Illinois Tool Works Company



Adhesive Application Solutions

OPERATOR'S MANUAL

650762-X

INCLUDE MANUALS: 66605X-X 1/2" Diaphragm Pump (pn 97999-99)

RELEASED: 9-20-97

REVISED: 1-19-05

(REV. F)

650762-X

SPECIAL 1/2" DIAPHRAGM PUMP

(Single - Piece Polypropylene Manifolds & Modified Pilot Rod)

GENERAL DESCRIPTION

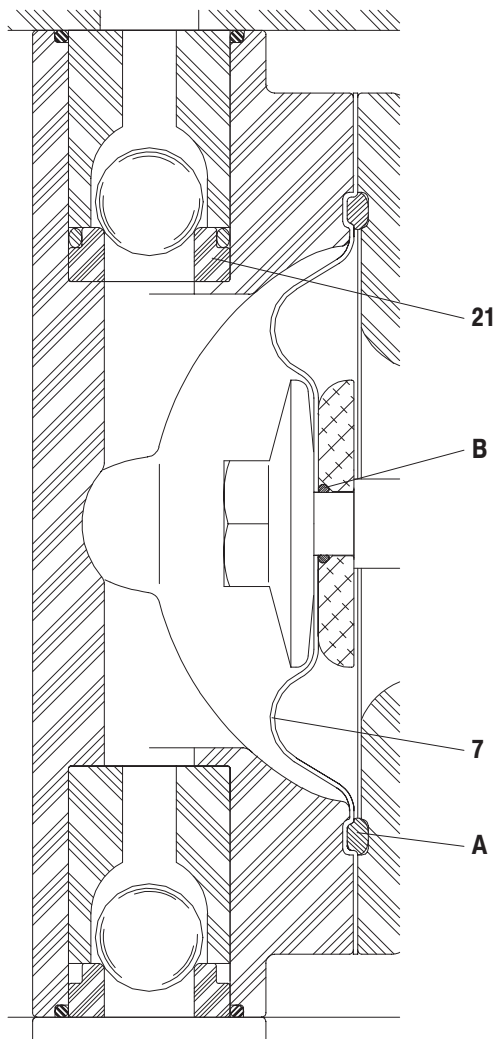
The 650762-X special 1/2" diaphragm pumps are similar to 66605J-XXX diaphragm pumps, a Polypropylene pump with single piece manifolds. A 66605X-X Operator's Manual (pn 97999-99) is to be used for General Information, Installation, Operation and Maintenance.

The special models and their standard model counterparts are shown in the chart at right. Refer to the standard 66605X-X Operator's Manual for Service Kits and other information. Follow the standard parts list with the exception of the items listed below.

MODEL CHART

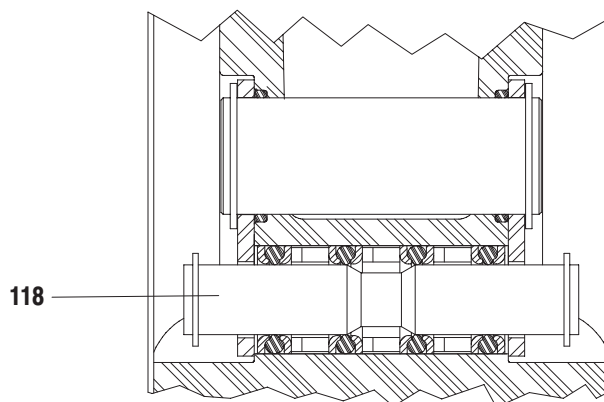
SPECIAL MODEL	STANDARD MODEL
650762	66605J-2A4
650762-2EB	66605J-2EB
650762-348	66605J-348
650762-3A8	66605J-3A8
650762-3EB	66605J-3EB
650762-3EB-3	66605J-3EB

NOTE: The 650762-X models use a modified pilot rod to shorten the pump stroke and further reduce pulse. For part differences, refer to the chart below.



650762-X SERIES SPECIAL DIAPHRAGM PUMPS

Models	"7" Diaphragm (2)	"21" Seat (4)	"118" Pilot Rod	"A" "O" Ring (2)	"B" "O" Ring (2) (1/16" x 9/16" o.d.)
650762	93111	-----	93088-4	93869	Y325-13
650762-2EB	-----	-----	93088-4	-----	-----
650762-348	-----	-----	93088-4	-----	-----
650762-3A8	-----	-----	93088-4	-----	-----
650762-3EB	-----	-----	93088-4	-----	-----
650762-3EB-3	-----	93098-10	93088-3	-----	-----



PN 97999-756

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Adhesive Application Solutions

OPERATOR'S MANUAL

INCLUDING: OPERATION, INSTALLATION & MAINTENANCE

66605X-X

RELEASED: 4-15-87
REVISED: 5-28-10
(REV. AR)

1/2" DIAPHRAGM PUMP 1:1 RATIO (NON-METALLIC)



**READ THIS MANUAL CAREFULLY BEFORE INSTALLING,
OPERATING OR SERVICING THIS EQUIPMENT.**

It is the responsibility of the employer to place this information in the hands of the operator. Keep for future reference.

SERVICE KITS

Refer to Model Description Chart to match the pump material options.
637140-XX for fluid section repair (see page 4).
637141 for air section repair (see page 6).

PUMP DATA

Models	.....	see Model Description Chart for "-XXX".
Pump Type	.....	Non-Metallic Air Operated Double Diaphragm
Material	.....	see Model Description Chart.
Weight	Polypropylene	7.2 (3.3 kgs)
	Groundable Acetal	8.8 (4.0 kgs)
	Kynar® PVDF	9.5 (4.3 kgs)
Maximum Air Inlet Pressure	.....	100 p.s.i.g. (6.9 bar)
Maximum Material Inlet Pressure	.....	10 p.s.i.g. (0.69 bar)
Maximum Outlet Pressure	.....	100 p.s.i.g. (6.9 bar)
Air Consumption	.....	1 c.f.m. / gallon (approx.)
Maximum Flow Rate	(Ball)	13 g.p.m. (49.2 l.p.m.)
	(Duckbill)	10 g.p.m. (37.9 l.p.m.)
Maximum Particle Size	(Ball)	3/32" dia. (2.4 mm)
	(Duckbill)	Fibers
Maximum Temperature Limits		
	E.P.R.	-60° to 280° F (-51° to 138° C)
	Groundable Acetal	10° to 180° F (-12° to 82° C)
	Hytrel®	-20° to 150° F (-29° to 66° C)
	Neoprene	0° to 200° F (-18° to 93° C)
	Nitrile	10° to 180° F (-12° to 82° C)
	Polypropylene	35° to 175° F (2° to 79° C)
	Polyurethane	10° to 150° F (-12° to 66° C)
	Kynar PVDF	10° to 200° F (-12° to 93° C)
	Santoprene®	-40° to 225° F (-40° to 107° C)
	PTFE	40° to 225° F (4° to 107° C)
	Viton®	-40° to 350° F (-40° to 177° C)
Groundable	.....	666056-X and 66605H-X models only
Dimensional Data	.....	see page 8
Noise Level @ 70 p.s.i., 60 c.p.m.	.....	71.1 db(A)

* The pump sound pressure levels published here have been updated to an Equivalent Continuous Sound Level (L_{Aeq}) to meet the intent of ANSI S1.13-1971, CAGI-PNEUROP S5.1 using four microphone locations.

NOTICE: All possible options are shown in the chart however certain combinations may not be recommended, consult a representative or the factory if you have questions concerning availability.

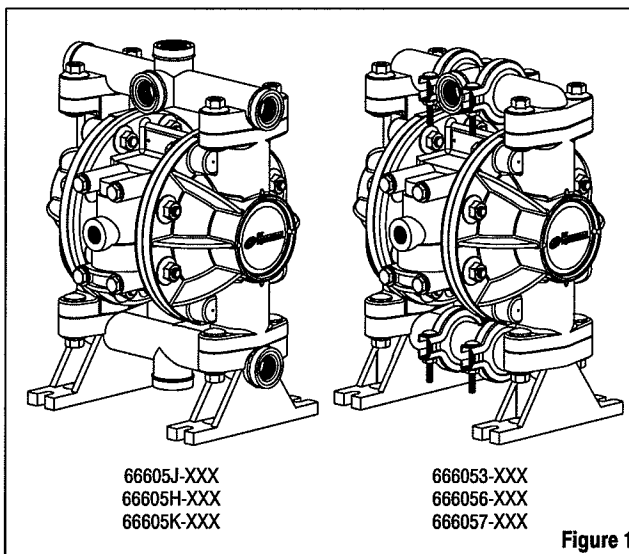


Figure 1

MODEL DESCRIPTION CHART

66605 X - X X X - 04	
Fluid Caps & Manifold Material	
3 - Piece Manifold	Single Piece Manifold
3 - Polypropylene	J - Polypropylene
6 - Groundable Acetal	H - Groundable Acetal
7 - Pure Kynar	K - Pure Kynar
Seat Material	
0 - (Duck Bill)	4 - Kynar PVDF
2 - Stainless Steel	6 - Acetal
3 - Polypropylene	
Ball Material	
1 - Neoprene	(*) Duckbill models
2 - Nitrile	8 - Polyurethane
3 - Viton	A - Stainless Steel
4 - PTFE	C - Neoprene (*)
5 - E.P.R.	D - Nitrile (*)
	E - Santoprene
Diaphragm Material	
1 - Neoprene	5 - E.P.R.
2 - Nitrile	8 - Polyurethane
3 - Viton	9 - Hytrel
4 - PTFE / Santoprene	B - Santoprene
Cone Check Flow	
04 - Top Discharge	
FLUID SECTION SERVICE KIT SELECTION	
EXAMPLE: MODEL # 666053-321	66605X - X X X
Fluid Section Service Kit # 637140-21	637140 - ☒ ☒ ☐
	Ball ☐ Diaphragm ☐

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OPERATING AND SAFETY PRECAUTIONS

READ, UNDERSTAND AND FOLLOW THIS INFORMATION TO AVOID INJURY AND PROPERTY DAMAGE.



EXCESSIVE AIR PRESSURE
STATIC SPARK



HAZARDOUS MATERIALS
HAZARDOUS PRESSURE

⚠ WARNING **EXCESSIVE AIR PRESSURE.** Can cause personal injury, pump damage or property damage.

- Do not exceed the maximum inlet air pressure as stated on the pump model plate.
- Be sure material hoses and other components are able to withstand fluid pressures developed by this pump. Check all hoses for damage or wear. Be certain dispensing device is clean and in proper working condition.

⚠ WARNING **STATIC SPARK.** Can cause explosion resulting in severe injury or death. Ground pump and pumping system.

- Sparks can ignite flammable material and vapors.
- The pumping system and object being sprayed must be grounded when it is pumping, flushing, recirculating or spraying flammable materials such as paints, solvents, lacquers, etc. or used in a location where surrounding atmosphere is conducive to spontaneous combustion. Ground the dispensing valve or device, containers, hoses and any object to which material is being pumped.
- 666056-XXX and 66605H-XXX Groundable Acetal pumps: Use the pump grounding screw provided. Connect a 12 ga. (minimum) wire (kit is included) to a good earth ground source.
- Secure pump, connections and all contact points to avoid vibration and generation of contact or static spark.
- Consult local building codes and electrical codes for specific grounding requirements.
- After grounding, periodically verify continuity of electrical path to ground. Test with an ohmmeter from each component (e.g., hoses, pump, clamps, container, spray gun, etc.) to ground to insure continuity. Ohmmeter should show 0.1 ohms or less.
- Submerge the outlet hose end, dispensing valve or device in the material being dispensed if possible. (Avoid free streaming of material being dispensed.)
- Use hoses incorporating a static wire.
- Use proper ventilation.
- Keep inflammables away from heat, open flames and sparks.
- Keep containers closed when not in use.

⚠ WARNING **Pump exhaust may contain contaminants.** Can cause severe injury. Pipe exhaust away from work area and personnel.

- In the event of a diaphragm rupture material can be forced out of the air exhaust muffler.
- Pipe the exhaust to a safe remote location when pumping hazardous or inflammable materials.
- Use a grounded 3/8" minimum i.d. hose between the pump and the muffler.

⚠ WARNING **HAZARDOUS PRESSURE.** Can result in serious injury or property damage. Do not service or clean pump, hoses or dispensing valve while the system is pressurized.

- Disconnect air supply line and relieve pressure from the system by opening dispensing valve or device and / or carefully and slowly loosening and removing outlet hose or piping from pump.

⚠ WARNING **HAZARDOUS MATERIALS.** Can cause serious injury or property damage. Do not attempt to return a pump to the factory or service center that contains hazardous material. Safe handling practices must comply with local and national laws and safety code requirements.

- Obtain Material Safety Data Sheets on all materials from the supplier for proper handling instructions.

⚠ CAUTION Verify the chemical compatibility of the pump wetted parts and the substance being pumped, flushed or recirculated. Chemical compatibility may change with temperature and concentration of the chemical(s) within the substances being pumped, flushed or circulated. For specific fluid compatibility, consult the chemical manufacturer.

⚠ CAUTION Maximum temperatures are based on mechanical stress only. Certain chemicals will significantly reduce maximum safe operating temperature. Consult the chemical manufacturer for chemical compatibility and temperature limits. Refer to Pump Data on page 1 of this manual.

⚠ CAUTION Be certain all operators of this equipment have been trained for safe working practices, understand it's limitations, and wear safety goggles / equipment when required.

⚠ CAUTION Do not use the pump for the structural support of the piping system. Be certain the system components are properly supported to prevent stress on the pump parts.

- Suction and discharge connections should be flexible connections (such as hose), not rigid piped, and should be compatible with the substance being pumped.

⚠ CAUTION Prevent unnecessary damage to the pump. Do not allow pump to operate when out of material for long periods of time.

- Disconnect air line from pump when system sits idle for long periods of time.

⚠ CAUTION Use only genuine ARO replacement parts to assure compatible pressure rating and longest service life.

NOTICE Install the pump in the vertical position. The pump may not prime properly if the balls do not check by gravity upon start-up.

NOTICE Re-torque all fasteners before operation. Creep of housing and gasket materials may cause fasteners to loosen. Re-torque all fasteners to insure against fluid or air leakage.

NOTICE Replacement warning labels are available upon request: "Static Spark" pn \ 93616-1, "Diaphragm Rupture" pn \ 93122.

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

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

NOTICE = Important installation, operation or maintenance information.

GENERAL DESCRIPTION

The ARO diaphragm pump offers high volume delivery even at low air pressure and a broad range of material compatibility options available. Refer to the model and option chart. ARO pumps feature stall resistant design, modular air motor / fluid sections.

Air operated double diaphragm pumps utilize a pressure differential in the air chambers to alternately create suction and positive fluid pressure in the fluid chambers. Ball checks insure a positive flow of fluid.

Pump cycling will begin as air pressure is applied and it will continue to pump and keep up with the demand. It will build and maintain line pressure and will stop cycling once maximum line pressure is reached (dispensing device closed) and will resume pumping as needed.

Models 666056-X and 66605H-X: The Acetal material used in these pumps contains stainless steel fibers. It's conductivity allows it to be connected to a suitable ground. A ground screw and ground wire kit is provided for this.

AIR AND LUBE REQUIREMENTS

⚠ WARNING **EXCESSIVE AIR PRESSURE. Can cause pump damage, personal injury or property damage.**

- A filter capable of filtering out particles larger than 50 microns should be used on the air supply. There is no lubrication required other than the "O" ring lubricant which is applied during assembly or repair.
- If lubricated air is present, make sure that it is compatible with the "O" rings and seals in the air motor section of the pump.

OPERATING INSTRUCTIONS

- Always flush the pump with a solvent compatible with the material being pumped if the material being pumped is subject to "setting up" when not in use for a period of time.
- Disconnect the air supply from the pump if it is to be inactive for a few hours.
- The outlet material volume is governed not only by the air supply but also by the material supply available at the inlet. The material supply tubing should not be too small or restrictive. Be sure not to use hose which might collapse.
- When the diaphragm pump is used in a forced-feed (flooded inlet) situation, it is recommended that a "Check Valve" be installed at the air inlet.
- Secure the diaphragm pump legs to a suitable surface to insure against damage by vibration.

MAINTENANCE

Refer to the part views and descriptions as provided on page 4 through 7 for parts identification and Service Kit information.

- Certain ARO "Smart Parts" are indicated which should be available for fast repair and reduction of down time.
- Service kits are available to service two separate diaphragm pump functions: 1. AIR SECTION, 2. FLUID SECTION. The Fluid Section is divided further to match typical active MATERIAL OPTIONS.
- Provide a clean work surface to protect sensitive internal moving parts from contamination from dirt and foreign matter during service disassembly and reassembly.
- Keep good records of service activity and include pump in preventive maintenance program.

DUCKBILL CHECK VALVES (OPTIONAL)

Pump models with the suffix (-0CX or -0DX) come equipped with duckbill type checks. Standard duckbill pumps are shipped with the material inlet in the top and the material outlet on the bottom manifold. To change the direction of flow, disassemble the pump as instructed in the FLUID SECTION and reassemble as described below. A pump that was factory built with balls and seats can be retro-fitted with duckbill type check valves by purchasing the necessary parts and installing them as shown.

Reassembly:

The duckbills may be installed in either direction to produce flow from top to bottom of the pump or from bottom to top of the pump. In either case, **all of the (42) duckbills must point in the same direction.**

Flow from Top to Bottom: (see page 5)

1. With (15) fluid caps installed, stand the pump upside down.
2. Place (21) insert into (42) duckbill and slide (41) sleeve over (42) duckbill.
3. Slide the complete check assembly into the fluid cap bore with the (21) insert end first. [Duckbills (42) point up.]
4. Position (19) "O" ring over (41) sleeve.
5. Attach (35) manifold feet / (36) swivel assembly to the fluid caps.
6. Turn pump over to right side up position.
7. Assemble duckbill check as in step #1.
8. Slide the complete check assembly into the fluid cap bore with the (41) sleeve end first. [Duckbill is pointing down toward fluid cap cavity.]
9. Position (19) "O" ring around (21) insert.
10. Attach (34) manifold / (36) swivel assembly to fluid cap.

Flow from Bottom to Top: (Inlet Bottom - Outlet Top)

To reverse flow direction, slide check valve assemblies into the (15) fluid caps backwards from what is indicated in steps #2 and #7. In step #2, the (42) duckbills will be pointing down and in step #7, they will be pointing up.

PARTS LIST / 66605X-X FLUID SECTION

☆ 637140-XX Fluid Section Service Kits include: Balls (see "BALL OPTIONS", refer to -XX in chart below), Diaphragms (see "DIAPHRAGM OPTIONS", refer to -XX in chart below), plus "O" ring items: 2, 19, 20, 33 and 93706-1 Key-Lube grease (page 6).

SEAT OPTIONS				BALL OPTIONS			
ITEM "21"				ITEM "22" (3/4" dia.) (Service Kit -XX)			
-XX	Seat	Qty	[Mtl]	-XX	Ball	Qty	[Mtl]
-2XX	93409-1	(4)	[SS]	-X1X	93100-1	(4)	[N]
-3XX	93098-1	(4)	[P]	-X2X	93100-2	(4)	[B]
-34X / -3AX	93098-10	(4)	[P]	-X3X	93100-3	(4)	[V]
-4XX	93098-4	(4)	[PK]	-X4X	93100-4	(4)	[T]
-6XX	93098-3	(4)	[D]	-X5X	93100-5	(4)	[E]
-0XX	93115-1	(4)	[P]	-X8X	93100-8	(4)	[U]

MATERIAL CODE

[B] = Nitrile
 [D] = Acetal
 [E] = E.P.R.
 [F] = Fluoraz
 [GA] = Groundable Acetal
 [GFN] = Glass Filled Nylon
 [H] = Hytrel
 [N] = Neoprene
 [P] = Polypropylene
 [PK] = Pure Kynar
 [Sp] = Santoprene
 [SS] = Stainless Steel
 [T] = PTFE
 [U] = Polyurethane
 [V] = Viton

DIAPHRAGM OPTIONS							
66605X-XXX	☆ Service Kits	"7" / "8"		"19"	"20"	"33" *	
	-XX = (Ball or Duckbill) -XX = (Diaphragm)	Diaphragm (2)	[Mtl]	"O" Ring (4) 1-5/16" o.d.	"O" Ring (2) 1-1/8" o.d.	"O" Ring (4) 1-3/16" o.d.	[Mtl]
-XX1	637140-X1	93113	[N]	Y325-122	Y325-119	Y325-120	[B]
-XX2	637140-X2	93465-G	[B]	Y325-122	Y325-119	Y325-120	[B]
-XX3	637140-X3	93581-3	[V]	Y327-122	Y327-119	Y327-120	[V]
66605J-XXX	637140-X4	93111 / 93465	[T/Sp]	93265	Y328-119	94749	[T]
66605H-XXX	637140-X4	93111 / 93465	[T/Sp]	93764	93933	95129	[F]
66605K-XXX	637140-X4	93111 / 93465	[T/Sp]	93265	Y328-119	94749	[T]
-XX5	637140-X5	93760	[E]	93763	93761	93762	[E]
-XX8	637140-X8	93112	[U]	93119	93117	93118	[U]
-XX9	637140-X9	93465-9	[H]	Y325-122	Y325-119	Y325-120	[B]
-XXB	637140-XB	93465	[Sp]	93763	93761	93762	[E]
-0X1	637140-C1, D1	93113	[N]	Y325-122	Not Req'd	Y325-120	[B]
-0X2	637140-C2, D2	93465-G	[B]	Y325-122	Not Req'd	Y325-120	[B]
-0X4	637140-C4, D4	93111 / 93465	[T/Sp]	Y325-122	Not Req'd	94749	[T]
-0X8	637140-C8, D8	93112	[U]	93119	Not Req'd	93118	[U]
-0XB	637140-CB, DB	93465	[Sp]	Y325-122	Not Req'd	Y325-120	[B]

■ Not shown

■ Quantity = 22

☆ Item "33" "O" rings are not used on models 66605J-XXX, 66605K-XXX and 66605L-XXX.

WETTED COMMON PARTS														
			Polypropylene				Groundable Acetal				Pure Kynar			
			66605J-XXX		66605L-XXX		66605G-XXX		66605H-XXX		66605I-XXX		66605K-XXX	
Item	Description (size)	Qty	Part No.	Mtl	Part No.	Mtl	Part No.	Mtl	Part No.	Mtl	Part No.	Mtl	Part No.	Mtl
□ 1	Rod	(1)	93084	[SS]	93084	[SS]	93084	[SS]	93084	[SS]	93084	[SS]	93084	[SS]
2	“O” Ring (3/32” x 5/8” o.d.)	(1)	Y325-111	[B]	Y325-111	[B]	Y325-111	[B]	Y325-111	[B]	Y325-111	[B]	Y325-111	[B]
5	Washer (2” o.d.)	(2)	94645	[GFN]	94645	[GFN]	94645	[GFN]	94645	[GFN]	94645	[GFN]	94645	[GFN]
□ 6	Diaphragm Nut (5/16” - 18)	(2)	93103-1	[P]	93103-1	[P]	93103-3	[D]	93103-3	[D]	93103-4	[PK]	93103-4	[PK]
15	Fluid Cap (includes 26 & 124)	(2)	93105-1	[P]	93105-1	[P]	93105-11	[GA]	93105-11	[GA]	93105-9	[PK]	93105-9	[PK]
26	Bolt (5/16” - 18 x 1-1/2”)	(8)	93109	[SS]	93109	[SS]	93109	[SS]	93109	[SS]	93109	[SS]	93109	[SS]
29	Nut (5/16” - 18)	(2)	-----	---	-----	---	Y12-5-S	[SS]	Y12-5-S	[SS]	-----	---	-----	---
34	Manifold, Outlet (top)	(2)	93102-1	[P]	-----	---	93102-6	[GA]	-----	---	93102-4	[PK]	-----	---
□ 35	Manifold, Foot (bottom)	(2)	93106-1	[P]	-----	---	93106-6	[GA]	-----	---	93106-4	[PK]	-----	---
□ 36	Swivel	(2)	93101-1	[P]	-----	---	93101-6	[GA]	-----	---	93101-4	[PK]	-----	---
□ 37	Clamp	(8)	93099	[SS]	-----	---	93099	[SS]	-----	---	93099	[SS]	-----	---
38	Bolt (#10 - 24 x 1-1/2”)	(8)	Y84-303-T	[SS]	-----	---	Y84-303-T	[SS]	-----	---	Y84-303-T	[SS]	-----	---
39	Nut (#10 - 24)	(8)	Y22-10-S	[SS]	-----	---	Y22-10-S	[SS]	-----	---	Y22-10-S	[SS]	-----	---
41a	Ball Cage	(4)	93097-1	[P]	93097-1	[P]	93097-3	[D]	93097-3	[D]	93097-4	[PK]	93097-4	[PK]
41b	Sleeve (models 66605X-QXX)	(4)	93120-1	[P]	93120-1	[P]	-----	---	-----	---	-----	---	-----	---
43	Ground Strap	(1)	-----	---	-----	---	92956-1	[SS]	92956-1	[SS]	-----	---	-----	---
■ 57	Ground Kit Assembly	(1)	-----	---	-----	---	66885-1	---	66885-1	---	-----	---	-----	---
60	Manifold, Inlet (bottom)	(1)	-----	---	93802-1	[P]	-----	---	93802-2	[GA]	-----	---	93802-3	[PK]
61	Manifold, Outlet (top)	(1)	-----	---	93801-1	[P]	-----	---	93801-2	[GA]	-----	---	93801-3	[PK]
62	Flange Nut (5/16” - 18)	(24)	93886	[SS]	93886	[SS]	93886 (##)	[SS]	93886 (##)	[SS]	93886	[SS]	93886	[SS]
63	Plug (1/2 - 14 N.P.T.)	(6)	-----	---	93897-1	[P]	-----	---	93897-2	[D]	-----	---	93897-3	[PK]

□ "Smart Parts", keep these items on hand in addition to the service kits for fast repair and reduction of down time.

PARTS LIST / 66605X-X FLUID SECTION

COLOR CODE		
Material	Diaphragm Color	Ball Color
Acetal	N/A	Orange
Nitrile	Red (-)	Red (+)
E.P.R.	Blue (-)	Blue (+)
Hydrel	Cream	N/A
Neoprene	Green (-)	Green (+)
Santoprene	Tan	Tan
PTFE	White	White
Polyurethane	Clear	Red
Viton	Yellow (-)	Yellow (+)
	(-) Stripe	(+) Dot

FOR THE
AIR MOTOR SECTION
SEE PAGES 6 & 7

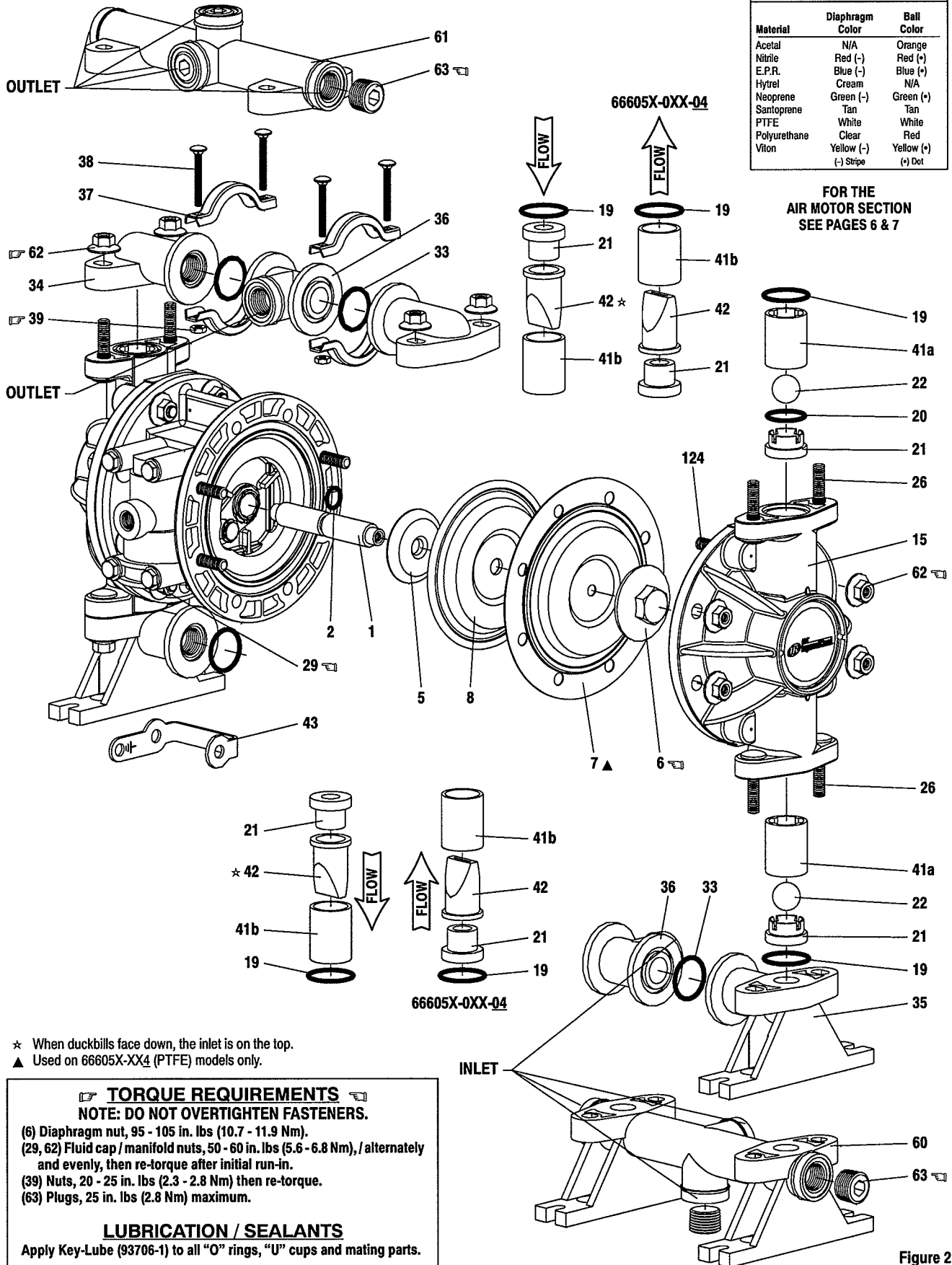


Figure 2

PARTS LIST / 66605X-X AIR MOTOR SECTION

✓ Indicates parts included in 637141 Air Section Repair Kit.

AIR SECTION PARTS

Item	Description (size)	Qty	Part No.	[Mtl]
101	Motor Body	(1)	93091	[P]
✓ 102	"O" Ring (3/32" x 1" o.d.)	(2)	Y325-117	[B]
□ 103	Sleeve	(1)	93087	[Bz]
□ 104	Snap Ring (13/16")	(2)	37285	[C]
111	Spool	(1)	93085	[D]
118	Pilot Rod	(1)	93088	[C]
✓ 119	"O" Ring (1/8" x 3/4" o.d.)	(4)	93075	[U]
□ 120	Spacer	(3)	115959	[Z]
✓ 122	Snap Ring (1/2")	(2)	77802	[C]
124	Stud (5/16" - 18 x 1-17/32") (see page 5)	(8)	93249	[SS]
129	Muffler Assembly	(1)	66972	[P]
129☆	Exhaust Cover (see note 2)		93092	[PS]
✓ 130	Gasket	(1)	93107	[SY]
131	Bolt (5/16" - 18 x 1-1/4")	(8)	93095	[SS]
✓ 132	Gasket (see note 1)	(1)	93339-1	[B]

Item	Description (size)	Qty	Part No.	[Mtl]
133	Washer (9/32" i.d.)	(4)	93096	[SS]
134	Bolt (1/4" - 20 x 5")	(4)	Y6-419-T	[SS]
135	Valve Block	(1)	93090	[P]
136	Plug	(1)	93086	[D]
✓ 137	"O" Ring (3/32" x 1-1/2" o.d.)	(1)	Y325-125	[B]
✓ 138	Packing, "U" Cup (1/8" x 1" o.d.)	(1)	94395	[U]
✓ 139	Packing, "U" Cup (1/8" x 1.427" o.d.)	(1)	96383	[B]
✓ 140	Valve Insert	(1)	93276	[CK]
✓ 141	Valve Plate	(1)	93275	[CK]
142	Washer	(2)	116038	[Z]
143	Plate	(2)	93089	[SS]
201	Muffler (see note 2)		93110	[C]
✓	Key-Lube "O" Ring Lubricant		93706-1	
	10 Pack of Key-Lube		637175	

DIAPHRAGM PUMP SERVICE

GENERAL SERVICE NOTES:

- Inspect and replace old parts with new parts as necessary. Look for deep scratches on metallic surfaces, and nicks or cuts in "O" rings.
 - 7/16" wrench, 1/2" wrench, 7/16" socket, 1/2" socket, torque wrench (measuring inch pounds), "O" ring pick.

FLUID SECTION DISASSEMBLY

- Remove (34) top manifold / (36) swivel assembly.
Note: Manifold options involve single piece manifolds (60 / 61) or three piece swivel type manifolds with clamps.
- Remove (41) ball cages, (22) balls, (19 and 20) "O" rings and (21) seats. Note: If cages are difficult to remove at this step, it may be helpful to proceed through step 5 and remove them once they are accessible from the inside of the fluid cap.
- Remove (35) bottom manifolds / (36) swivel assembly.
- Remove (19) "O" rings, (21) seats and (22) balls.
- Remove (15) fluid caps.
- Remove (6) diaphragm nut, (8) [(7) PTFE models only] diaphragm(s) and (5) diaphragm washer from (1) diaphragm connecting rod.
- Remove (1) connecting rod from air motor.
- Carefully remove remaining (6) diaphragm nut, (8) [(7) PTFE models] diaphragm and (5) diaphragm washer from (1) connecting rod. Do not mar surface of connecting rod.
- Remove (2) "O" ring from connecting rod.
- Remove (37) clamps from top and bottom manifold / swivel assemblies.
- Remove (33) "O" rings from (36) swivels.

Note 1: Part no. 93339-1 one-piece gasket replaces the following parts (not shown) in models manufactured prior to October 1988, Y325-10 (4), Y325-12, 93093, 93094, Y325-8.

Note 2: The (129☆) exhaust cover and (201) muffler were standard until 9/92. They are available separately for service or piped exhaust applications.

Note 3: A major valve service assembly is available separately which includes items: 111, 132, 135 - 141. Order part no. 66362.

MATERIAL CODE

[B] = Nitrile	[D] = Acetal	[SY] = Syn-Seal
[Bz] = Bronze	[P] = Polypropylene	[U] = Polyurethane
[C] = Carbon Steel	[PS] = Polyester	[Z] = Zinc
[CK] = Ceramic	[SS] = Stainless Steel	

FLUID SECTION REASSEMBLY

- Reassemble in reverse order.
- Lubricate (1) connecting rod and (2) "O" ring with Key-Lube or equivalent "O" ring lubricant.
- Install (5) diaphragm washers with i.d. chamfer toward diaphragm.
- When replacing PTFE diaphragms, install the 93465 Santoprene diaphragm behind the PTFE diaphragm.
- When installing (41) cage, ball guides must line up with notches in (21) seat to prevent damage.
- Before installing (35), (34) manifolds, (19) "O" ring should be properly seated on the o.d. of (41) ball cage.
- Before tightening (39) nut and (38) carriage bolts on (36) swivels, attach the manifold / swivel assembly to the fluid caps. Rotate (36) swivel to desired position and tighten each of the nuts approximately 8 - 9 turns, then finish tightening (29) nuts.

PARTS LIST / 66605X-X AIR MOTOR SECTION

TORQUE REQUIREMENTS

NOTE: DO NOT OVERTIGHTEN FASTENERS.

(134) Torque to 15 - 20 in. lbs (1.7 - 2.3 Nm), wait 10 minutes, then re-torque to 15 - 20 in. lbs (1.7 - 2.3 Nm).

LUBRICATION / SEALANTS

Apply Key-Lube (93706-1) to all "O" rings, "U" cups and mating parts.

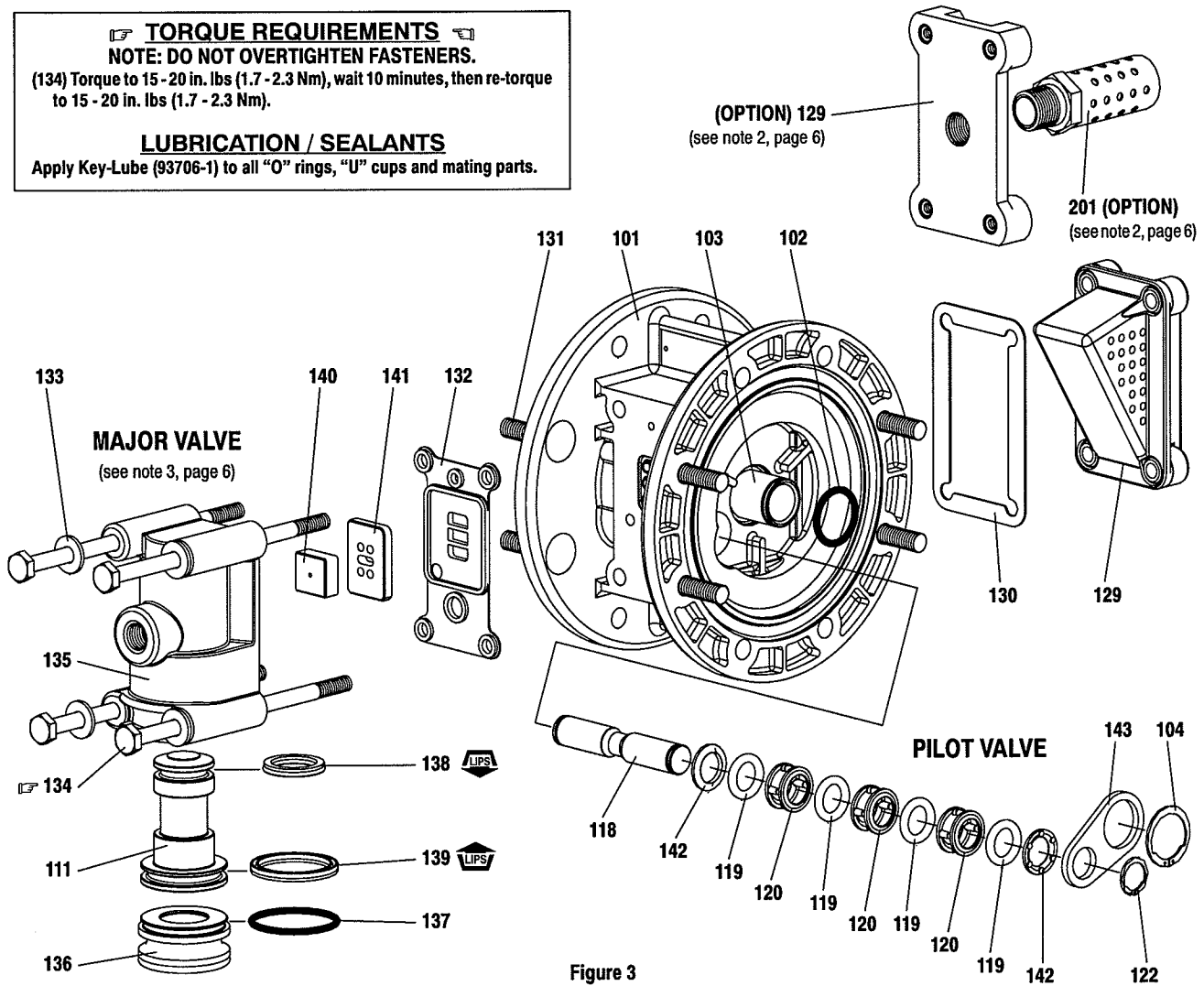


Figure 3

AIR MOTOR SECTION SERVICE

Service is divided into two parts - 1. Pilot Valve, 2. Major Valve.

- Air Motor Section Service is continued from Fluid Section repair.

PILOT VALVE DISASSEMBLY

1. Remove (122) and (104) snap rings.
2. Remove (143) plates.
3. Remove (103) sleeve and (102) "O" rings.
4. Remove (118) piston, (142) washers, (119) "O" rings and (120) spacers from (101) center body.

PILOT VALVE REASSEMBLY

1. Assemble (119) "O" rings, (120) spacers and (142) washers on (118) pilot rod.
2. Insert the stack into the (101) body. Sleeve (103) may be used to assist pressing stack into body.
3. Install (103) sleeve and (102) "O" rings into (101) body.
4. Install (143) plates and (122) and (104) snap rings.

MAJOR VALVE DISASSEMBLY

1. Remove (129) exhaust cover and (130) gasket.
2. Pull (135) valve block assembly from (101) body.
3. Remove (134) bolts, (133) washers and (132) gasket from (135) valve block.
4. Remove (141) valve plate and (140) valve insert.
5. Remove (136) plug and (111) spool.

MAJOR VALVE REASSEMBLY

1. Install new (139) and (138) "U" cups on (111) spool - **LIPS MUST FACE EACH OTHER.**
2. Insert (111) spool into (135) valve block.
3. Install (137) "O" ring on (136) plug, insert plug into (135) valve block.
4. Install (140) valve insert and (141) valve plate into (135) valve block. Note: After 9/92, parts (140, 141) are white (ceramic), the dished side of the (140) valve insert should be against the shiny face of (141) valve plate for best performance.
5. Replace (132) gasket and install valve block assembly on (101) body.

TROUBLE SHOOTING

Product discharged from air exhaust.

- Check for diaphragm rupture.
- Check tightness of (6) diaphragm nut.

Air Bubbles in Product Discharge.

- Check connections of suction plumbing.
- Check band clamps on intake manifold.
- Check "O" rings between intake manifold and fluid caps.
- Check tightness of (6) diaphragm nut.

Pump blows air out main exhaust when stalled on either stroke.

- Check "U" cups on (111) spool in major valve.
- Check (141) valve plate and (140) insert for wear.
- Check (103) sleeve and (2) "O" ring on diaphragm connecting rod.
- Check (119) "O" rings on (118) piston for wear.

Low output volume.

- Check air supply.
- Check for plugged outlet hose.
- For the pump to prime itself, it must be mounted in the vertical position so that the balls will check by gravity.
- Check for pump cavitation - suction pipe should be 1/2" min. or larger if high viscosity fluids are being pumped. Suction hose must be non-collapsible type, capable of pulling a high vacuum.
- Check all joints on intake manifolds and suction connections. These must be airtight.
- Check for sticking or improperly seating check valves.
- If pump cycles at a high rate or runs erratically, check (119) piston "O" rings for wear.

DIMENSIONAL DATA

Dimensions shown are for reference only, they are shown in inches and millimeters (mm).

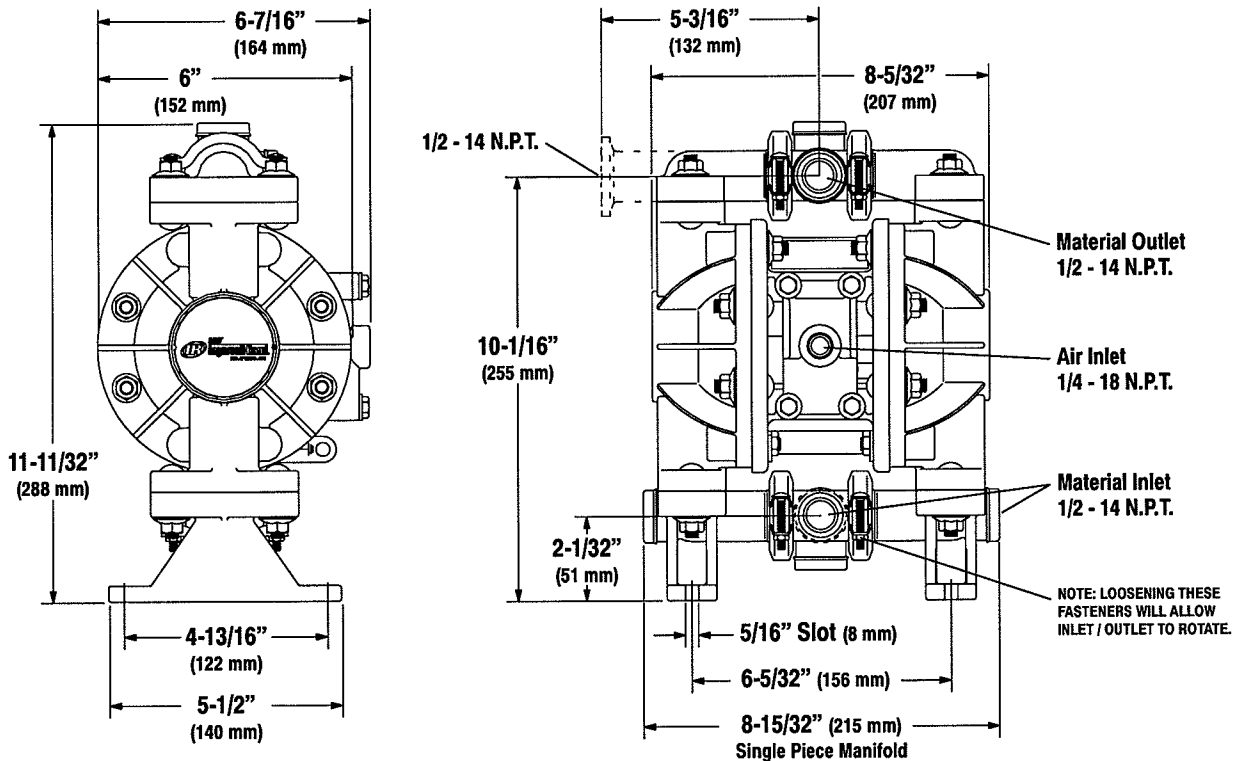
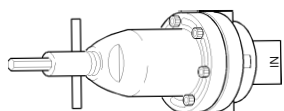


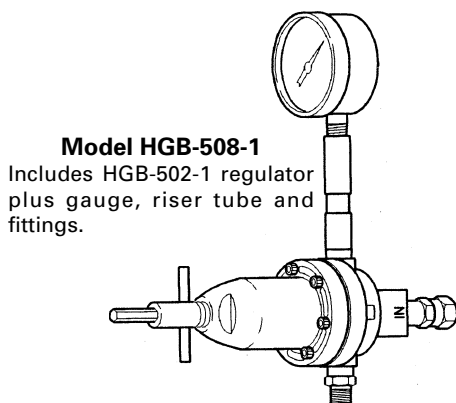
Figure 4

HGB Fluid Regulators

Important: Before using this equipment, read all safety precautions and instructions. Keep for future use.



Model HGB-502-1
 Regulator Assembly
 Only



Model HGB-508-1

Includes HGB-502-1 regulator plus gauge, riser tube and fittings.

SPECIFICATIONS:

Height: 5" (excluding adjusting key)
 Width: 2-7/8"
 Wetted parts: Stainless steel/nylon

Inlet Pressure		Regulated Outlet Press.	Max. Fluid Flow	Connections
Max.	Min.			
175 psi	50 psi	10-75 psi	8 gal/min.	3/8" NPT(F)

Maximum temperature 180°F.

INSTALLATION

The HGB regulator is provided with two side outlet ports and one bottom inlet port, all 3/8" NPT(F). The regulator may be installed either vertically or horizontally for flexibility of installation. In either case, riser and gauge should be mounted vertically. The HGB-508 includes gauge, riser tube and fittings factory installed.

Since the gauge operates on air trapped in the riser, a rise is always necessary. Any leaks in riser or gauge connections will permit this trapped air to escape thus allowing paint to get into the gauge causing damage.

CAUTION

It is recommended that at initial installation the material supply line should not be flushed through the regulator because pipe compound, chips, scale, etc., may lodge in the regulator valve assembly.

See "ACCESSORIES" section for connections for riser, gauge, adapter and ball valves.

OPERATION

Fluid pressure adjustment is done with a removable key (1). Insert large end of key into top of regulator. Turn clockwise to increase fluid pressure, counterclockwise to decrease fluid pressure.

Fluid pressure adjustment can also be accomplished remotely with air control:

1. Turn adjusting key (1) fully counterclockwise turning the regulator off.
2. Remove adjusting key (1).
3. Install a 1/4" NPT(M) fitting H-2008 for air hose connection.
4. Use a regulated air supply to adjust fluid pressure regulator.

PREVENTIVE MAINTENANCE

Periodic cleaning of regulator with a solvent compatible with the material being used is recommended.

To clean material from the regulated material line and the regulator, these steps should be followed:

1. Relieve supply line pressure.
2. Using the small end of the adjusting key (1), engage the regulator and screw it down tight. This holds the valve off its seat. Also, the key may be used in this position to prevent waste from entering the regulator when spray booth is cleaned.
3. Blow material back through the regulated line by introducing air pressure into the line down stream from the regulator. With spray gun attached, this can be done by loosening air cap ring on gun, holding cloth over air cap and pulling trigger. This forces air in a reverse path through spray gun and air forces material back through regulated material line.

4. Periodically clean exterior of regulator with solvent soaked cloth.

PARTS REPLACEMENT

The HGB regulator may be serviced without removing it from the line.

Note

Relieve line pressure before servicing regulator.

Remove six socket head cap screws (2) with a 5/32" hex key. The small end of the adjusting key (1) may be used for this purpose.

To Replace Diaphragm:

1. The diaphragm socket (B) has an arrow  stamped on top. Curl the edge of the diaphragm up where the arrows point.
2. Slip the diaphragm assembly out from under the valve stem nut (C) so the nut is released from the socket (B).
3. Remove nut (A) and pull off diaphragms (7). Install 2 new diaphragms over threaded end of the socket (B). Convex sides of each diaphragm must be toward threaded end.
4. Apply retaining compound to male threads as shown and install nut (A).
5. Install diaphragm into body by again curling the edges of the diaphragms.
6. Slip socket (B) under valve stem nut (C).
7. Reassemble regulator body. Tighten all six cap screws evenly to 65 to 75 in./lbs. torque.

To Replace Valve Assembly:

1. Valve assembly (9) can be removed from the body with a 3/4" socket wrench.
2. Install new valve assembly. Tighten valve assembly to 20 to 25 in./lbs. torque.

TROUBLESHOOTING

CONDITION	CAUSE	CORRECTION
Regulated pressure creep.	Improper seating of valve stem on seat. Diaphragm leaking. Damaged valve seat.	Be sure stem and seat are not damaged, worn or dirty. Replace. Replace seat and stem.
Regulated pressure drop.	Restriction in main material line or at valve inlet. Damaged diaphragm.	Remove restriction. Replace.
Fluid leakage from under bonnet.	Loose cap screws (2). Damaged diaphragm.	Tighten all six cap screws evenly to 65 to 75 in./lbs. torque. Replace.

SAFETY PRECAUTIONS

This manual contains information that is important for you to know and understand. This information relates to **USER SAFETY** and **PREVENTING EQUIPMENT PROBLEMS**. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

WARNING

Important safety information – A hazard that may cause serious injury or loss of life.

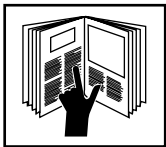
CAUTION

Important information that tells how to prevent damage to equipment, or how to avoid a situation that may cause minor injury.

Note

Information that you should pay special attention to.

Read the following warnings before using this equipment.



READ THE MANUAL

Before operating finishing equipment, read and understand all safety, operation and maintenance information provided in the operation manual.



WEAR SAFETY GLASSES

Failure to wear safety glasses with side shields could result in serious eye injury or blindness.



DE-ENERGIZE, DEPRESSURIZE, DISCONNECT AND LOCK OUT ALL POWER SOURCES DURING MAINTENANCE

Failure to De-energize, disconnect and lock out all power supplies before performing equipment maintenance could cause serious injury or death.



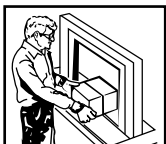
OPERATOR TRAINING

All personnel must be trained before operating finishing equipment.



EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture, malfunction, or start unexpectedly and result in serious injury.



KEEP EQUIPMENT GUARDS IN PLACE

Do not operate the equipment if the safety devices have been removed.



HIGH PRESSURE CONSIDERATION

High pressure can cause serious injury. Relieve all pressure before servicing. Spray from the spray gun, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury.



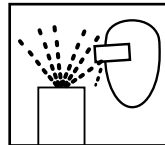
PRESSURE RELIEF PROCEDURE

Always follow the pressure relief procedure in the equipment instruction manual.



ELECTRIC SHOCK/GROUNDING

Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.



PROJECTILE HAZARD

You may be injured by venting liquids or gases that are released under pressure, or flying debris.



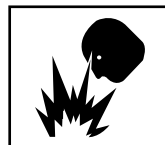
INSPECT THE EQUIPMENT DAILY

Inspect the equipment for worn or broken parts on a daily basis. Do not operate the equipment if you are uncertain about its condition.



NEVER MODIFY THE EQUIPMENT

Do not modify the equipment unless the manufacturer provides written approval.

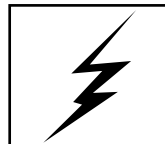


FIRE AND EXPLOSION HAZARD

Improper equipment grounding, poor ventilation, open flame or sparks can cause hazardous conditions and result in fire or explosion and serious injury.



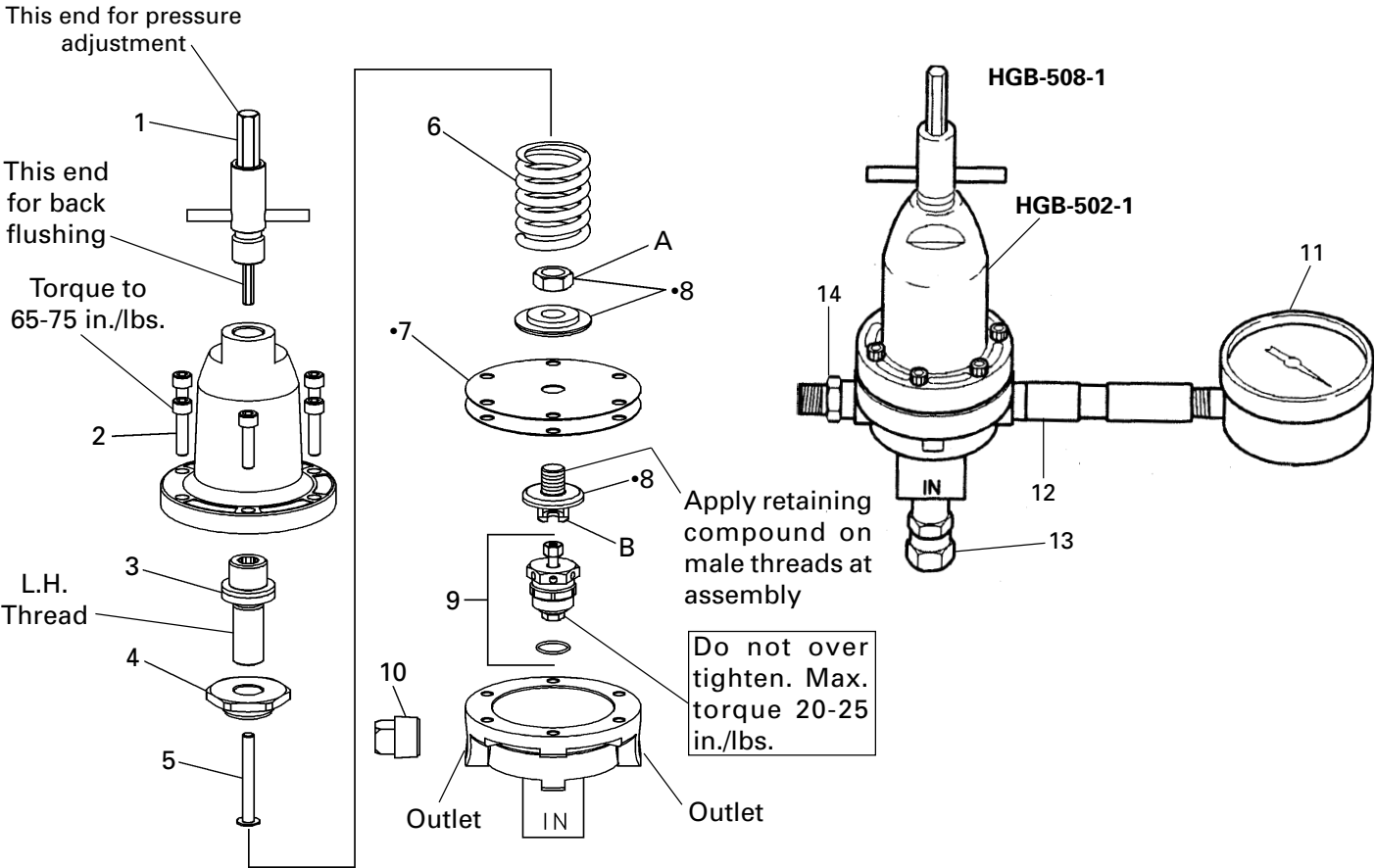
KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY



STATIC CHARGE

Fluid may develop a static charge that must be dissipated through proper grounding of the equipment, objects to be sprayed and all other electrically conductive objects in the dispensing area. Improper grounding or sparks can cause a hazardous condition and result in fire, explosion or electric shock and other serious injury.

**FOR FURTHER SAFETY INFORMATION REGARDING BINKS AND DEVILBISS EQUIPMENT,
SEE THE GENERAL EQUIPMENT SAFETY BOOKLET (77-5300).**



Parts List

Ref. No.	Replacement Part No.	Description	Individual Parts Req.
1	HGB-404	Adjusting Key	1
2	SSF-3167-K6	Cap Screw (Kit of 6)	6
3	HGB-408	Adjusting Screw Assembly	1
4	HGB-7	Adjusting Nut	1
5	HGB-403	Pin Assembly	1
6	HGB-13	Spring	1
+7	HGB-16-K10	Diaphragm Kit, Nylon II (Kit of 10)	2
•8	KK-4216	Diaphragm Hardware Kit	1
9	KGB-406-4-K	Valve Assembly Kit	1

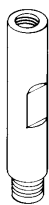
Ref. No.	Replacement Part No.	Description	Individual Parts Req.
*10		S/S Plug, 3/8" NPT(M)	1
11	GA-333	Gauge (0-100#)	1
12	HGB-14	Riser Tube, Stainless Steel	1
13	PLH-6SN-6TSS	Swivel Fitting, S.S.	1
14	PLH-6-6T-SS	Fitting, Stainless Steel	1

- All kits contain parts shown plus retaining compound for use at assembly.
- + Kit contains 10 diaphragms. Only 2 are used in regulator. Diaphragms are only available in kit form.
- * Purchase locally.

ACCESSORIES

HGB-14 Riser Tube

3/8" NPT(M) x 1/4" NPT(F) Stainless Steel, 3-1/2" for elevated mounting of gauge

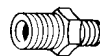


GA-333 Air Pressure 0-100 PSI Gauge

1/4" NPT(M), 2" diameter, requires riser tube.



H-2008 Adapter



1/4" NPS(M) x 1/4" NPT(M) for adapting regulator to remote air control.

VA-527 Ball Valve S/S



3/8" NPS(M) x 3/8" NPT(M)

WARRANTY

This product is covered by DeVilbiss' 1 Year Limited Warranty.

DeVilbiss Worldwide Sales and Service Listing: www.devilbiss.com

ITW Industrial Finishing

DeVilbiss has authorized distributors throughout the world. For technical assistance or the distributor nearest you, see listing below.

U.S./Canada Technical Service Office:

195 Internationale Blvd., Glendale Heights, IL 60139
Toll-Free Telephone: 1-888-992-4657 (U.S.A. and Canada only)
Toll-Free Fax: 1-800-368-8401

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