

1" PERFORMANCE PLUS METALLIC MAINTENANCE MANUAL

CHECK VALVE AND O-RING MAINTENANCE

1. Flush and neutralize the pump to be certain all corrosives or hazardous materials are removed prior to any maintenance. This procedure should always be followed when returning pumps for factory service also.
2. Remove nuts (18) and washers (12) and (9) from bolts (16) in both the discharge and suction manifolds. Suction check valve seats and check balls (26, 27) are located inside of the bottom of the outer chamber (28). Gently remove and inspect for excessive wear, pitting or other signs of degradation. Inspect valve seat and manifold o-rings (38). Replace if necessary. Discharge check valves are located inside of the bottom of the discharge manifolds (32). Repeat procedure for inspection of discharge check valves and o-rings. When re-assembling, the check ball should fit within the ball cavity of the chamber and discharge manifold. Assemble the valve seats into position with the curved portion facing the ball. Lightly tighten fasteners. Tighten all external fasteners to final torque requirement after pump is completely assembled.

NOTE: When using pumps built with PTFE o-rings always replace with new PTFE o-rings, since the original o-rings may not reseal the pump.

DIAPHRAGM AND PILOT SLEEVE ASSEMBLY MAINTENANCE

4. To inspect diaphragms remove nuts (18) and washers (12) and (9) from bolts (16) and remove washers (12) from bolts (3) from the outer pumping chambers (28). If replacement is necessary due to abrasion or rupture unscrew the outer diaphragm plates (29). Models that are built with PTFE elastomers will have a PTFE overlay (30) that faces the outer pumping chamber and a back-up diaphragm (31) on the air side of pump. Pumps without PTFE will contain only the back-up diaphragms.
5. If there has been a diaphragm rupture and corrosive or viscous fluid has entered the air side of pump the complete air system should be inspected. After removing diaphragms and inner diaphragm plate (33), the pilot sleeve assembly (14, 40, 42, 45-47) and diaphragm rod assembly (13, 15) may be removed by removing the retaining plates (41) and push the entire unit out through the bore in the intermediate (34). Diaphragm rod assembly must be unscrewed to remove pilot sleeve.
NOTE: To aid in reassembly use a non-synthetic, petroleum based lubricating grease without EP additives. Carleton-Stuart MagnaLube G is recommended.
6. Clean or replace any components that have excessive wear, dirt build-up, or chemical attack. Lube all components prior to reassembling. Reassemble pilot sleeve spacers, o-rings and lip seals (40) within bore of intermediate. Make sure that the open side of the lip seals is facing outward toward the diaphragms. Also make sure that the end pilot spacers (14) are at the end on either side of the pilot sleeve assembly and all inner spacers (47) are separated by o-rings. Next carefully insert the diaphragm rod assembly with pilot sleeve inside the assembly in the bore. Reattach retaining plates. Do not over tighten self-tapping screws (24).

7. Take one diaphragm and with the curved side of the inner diaphragm plate facing the diaphragm assemble onto outer diaphragm plate stud and then screw assembly into diaphragm rod. Push diaphragm rod to the opposite side of the intermediate and add the opposite diaphragm assembly. **Tighten the outer diaphragm plates to 165 in-lbs (18,64 NM) of torque.**
8. Position outer diaphragm chambers onto intermediate making sure that witness lines are matching.
NOTE: If air valve has been removed, proper orientation of air system with fluid chambers must be observed. The bottom of the intermediate has the smaller hook shaped air passage slot on the air valve mounting face and the outer chamber check ball cavity should be pointing downward.
9. Replace all external fasteners and tighten to final torque requirement after pump is completely assembled.
10. Position the manifolds making sure of the proper orientation in relation to the air valve for your application. Also make sure that the manifold o-rings do not shift from their grooves during reassembly. Tighten all external fasteners to final torque requirement after pump is completely assembled.

EXTERNAL FASTENER TORQUE REQUIREMENTS

NOTE: When reassembling loosely tighten all external fasteners adjusting and aligning and gradually, in an alternating fashion, tighten to torque requirements listed below.

AIR VALVE CAP SCREWS 40 in-lbs (4,52 NM)

MANIFOLD BOLTS, 80-90 in-lbs (9,04-10,17 NM)

OUTER CHAMBER CAP SCREWS, 75-85 in-lbs (8,48-9,61 NM)

Note: Always torque the chamber bolts prior to the manifold bolts.

AIR VALVE MAINTENANCE

11. To evaluate air valve components, remove the four cap screws (11), washers, (25, 10) and nuts (17) from the air valve body (7). The shuttle plate (5) and shuttle (6) may be inspected by removing them from their location in the slot in the back of the air valve. Inspect for scratches or surface irregularities. Replace if necessary. Remove the plug (1) at the bottom of the air valve. Next push the air valve spool (2) out of the air valve body. Gently reach in and pull lip seals (43) out of inside bore of the air valve body. Check for cracks, splitting or scratches. Clean components if replacement is not necessary. Inspect plug o-ring (44) for any damage and replace if necessary and reposition o-ring into groove in air valve body.
NOTE: Make sure that the open sides of the two lip seals face each other when reassembling air valve. Lube all components with suggested maintenance grease as an aid in reassembly.
12. Reinsert air valve spool inside of air valve body. Place shuttle on middle rib of air valve spool through the square slot in back of air valve. Lubricate side of plate that faces the shuttle and reposition valve plate over shuttle. Press the valve plug into air valve body, chamfered end first.
13. Check that gasket (4) is not cracked. If damaged replace.
14. After gasket is pressed back into position align air valve onto intermediate and reinsert the four cap screws with lock washer and flat washers. Apply 40 in-lbs (4,52 NM) of torque to fasteners.

SPECIFICATIONS

CAPACITY:

Adjustable 0-41 GPM (155,8 LPM)

MAXIMUM TEMP:

Metallic models – 200° F (93° C)

MAXIMUM AIR PRESSURE:

120 psi (8,2 bar)

MINIMUM AIR PRESSURE:

20 psi (1,3 bar)

DRY LIFT:

Models with PTFE balls – 10 feet (3 meters)

Other models – 15 feet (4,5 meters)

WEIGHT:

Aluminum models – 23 pounds (10,5 kg)

Stainless Steel models – 45 pounds (20,4 kg)

MAXIMUM SOLIDS:

1/4" (6,2 mm) Ball Check Valve

AIR SUPPLY:

Inlet – 1/4" NPT Female (BSP compatible)

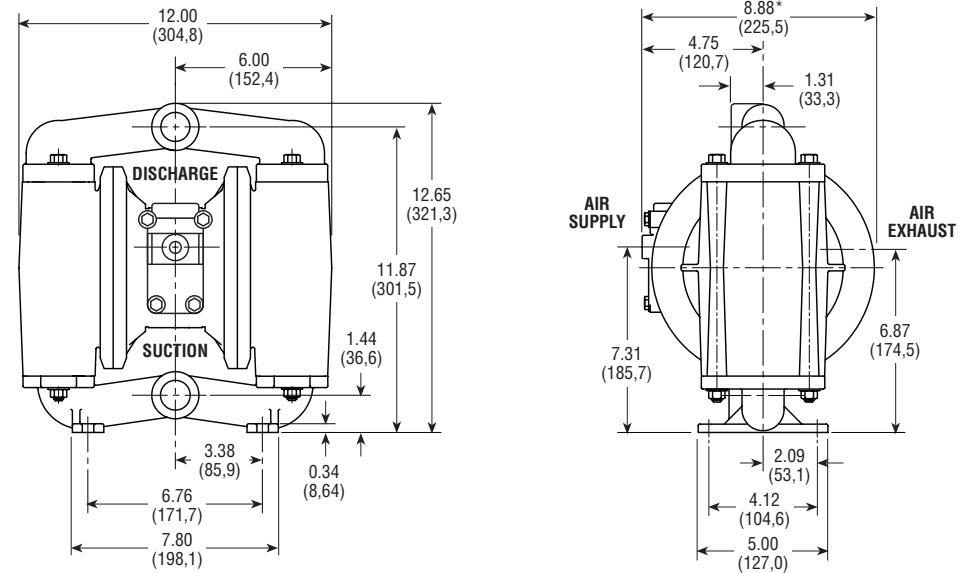
Outlet – 3/8" NPT Female

FLUID INLET/DISCHARGE:

Metallic models – 1" NPT

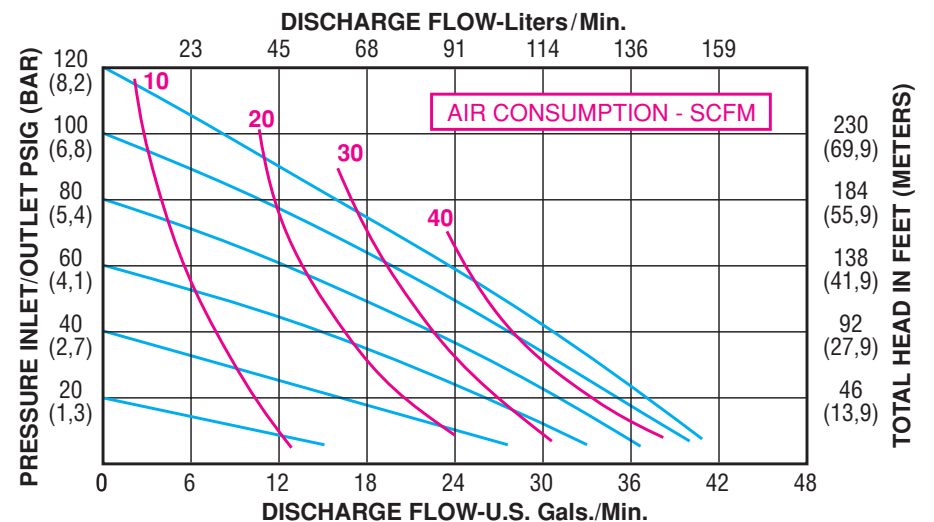
DIMENSIONS

Dimensions in inches and (mm)

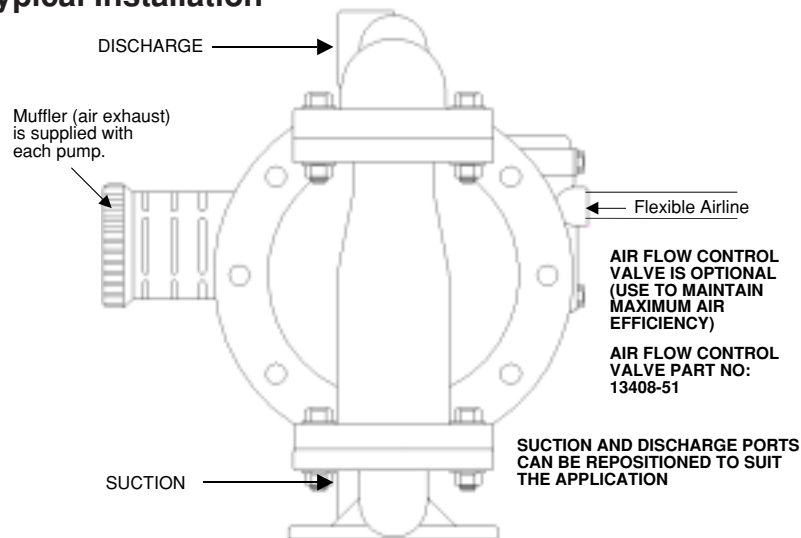


PERFORMANCE CURVE

(Based on water-flooded suction)



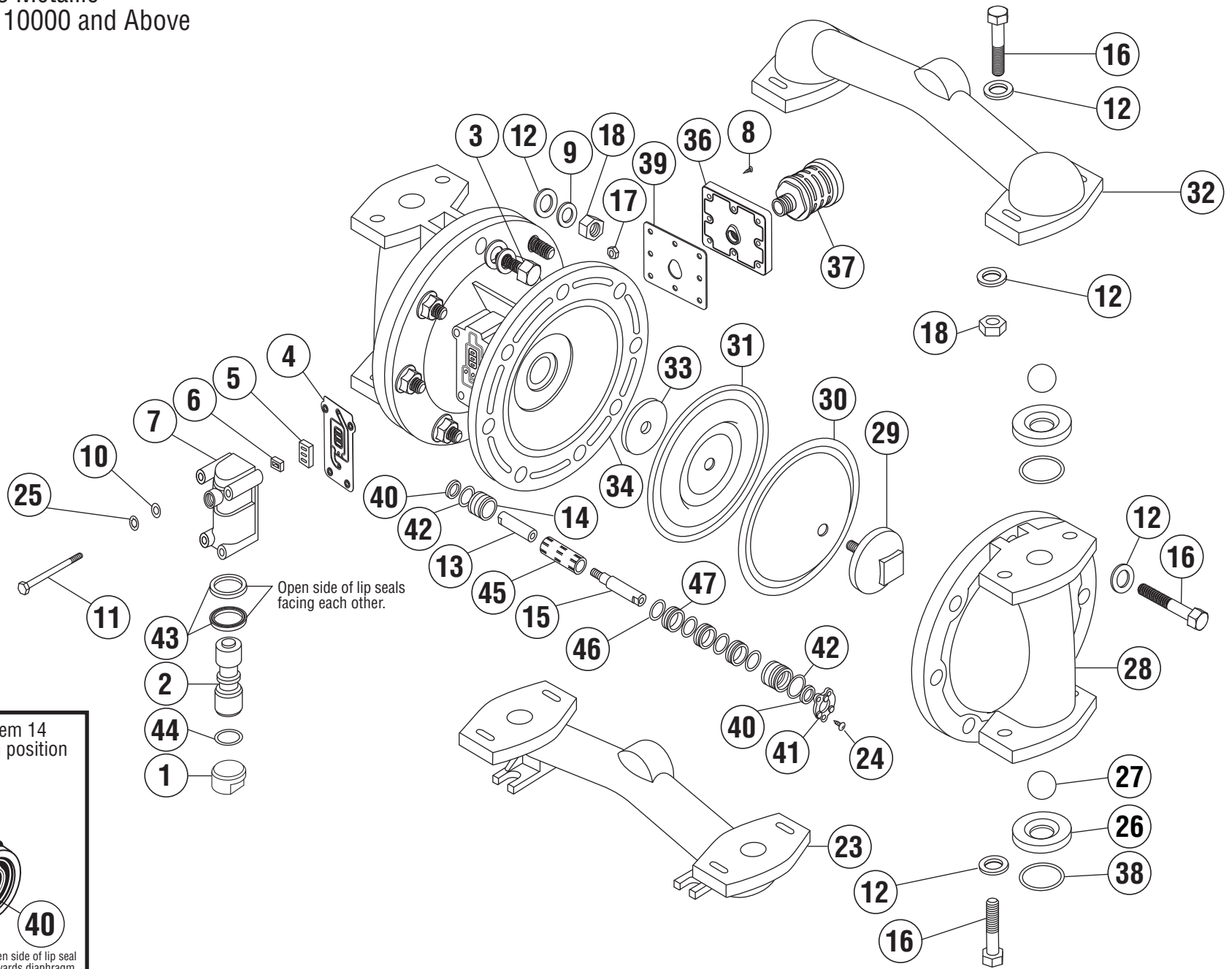
Typical Installation



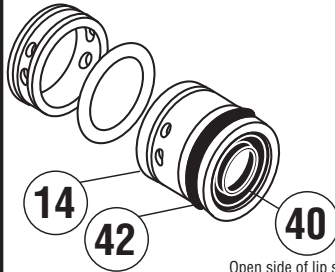
DO NOT USE AIR LINE LUBRICATION

1" MODEL

Performance Plus Metallic
Serial Numbers 110000 and Above



Enlarged view of item 14
with items 42 & 48 in position



Open side of lip seal
towards diaphragm

1" PERFORMANCE PLUS METALLIC MODELS

JANUARY 2008

ITEM	DESCRIPTION	QTY PER PUMP	MODELS	PART NO.	MATERIAL
1	AIR VALVE END PLUG	1	ALL MODELS	11703-60	POLYPRO
2	AIR VALVE SPOOL	1	ALL MODELS	10480-31	ACETAL
3	BOLT (3/8" X 1-1/2")	4	ALL MODELS	12534-26	SS
4	AIR VALVE GASKET	1	ALL MODELS	12116-19	NITRILE
5	SHUTTLE PLATE	1	ALL MODELS	10416-77	CERAMIC
6	SHUTTLE	1	ALL MODELS	10415-00	SPECIAL
7	AIR VALVE BODY	1	ALL MODELS	11614-60	POLYPRO
8	SLT WSHD (#8 X 1") SCREW	8	ALL MODELS	12525-26	SS
9	SPLIT LOCK WASHER	16	ALL MODELS	12316-26	SS
10	FLAT WASHER	4	ALL MODELS	12300-26	SS
11	CAP SCREW (1/4" X 5")	4	ALL MODELS	12512-26	SS
12	FLAT WASHER (0.875OD)	44	ALL MODELS	12314-26	SS
13	DIAPHRAGM ROD (Short)	1	ALL MODELS	*	SS
14	END SPACER (Pilot Sleeve)	2	ALL MODELS	10204-40	POLYPRO
15	DIAPHRAGM ROD (Long)	1	ALL MODELS	*	SS
16	BOLT (3/8" X 2")	20	ALL MODELS	12545-26	SS
17	HEX NUT (1/4" - 20)	4	ALL MODELS	12600-26	SS
18	HEX NUT (3/8" - 16)	20	ALL MODELS	12602-26	SS
23	SUCTION MANIFOLD (NPT)	1	A -PUMPS	10526-20	AL
	SUCTION MANIFOLD (BSP)		S -PUMPS	10526-26	SS
			A -PUMPS	10527-20	AL
			S -PUMPS	10527-26	SS
24	SELF TAP SCREW (#6 X 1/2")	6	ALL MODELS	12510-26	SS
25	LOCK WASHER	4	ALL MODELS	12350-26	SS
26	VALVE SEAT	4	AB,AE AT,AV S -PUMPS	10901-57 10901-47 10901-26	POLYPRO NYLON SS
27	BALL	4	AB, SB AT, SP AE, SE AV, SV	11002-11 11002-45 11002-23 11002-13	GEOLAST PTFE SANTO VITON
	STAINLESS STEEL	OPT	ALL MODELS	11002-26	SS
28	OUTER CHAMBER	2	A -PUMPS S -PUMPS	10721-20 10721-26	AL SS
29	OUTER DIAPHRAGM PLATE	2	A -PUMPS S -PUMPS	11207-20 11207-26	AL SS
30	OVERLAY	2	AT,SP	11406-59	PTFE

ITEM	DESCRIPTION	QTY PER PUMP	MODELS	PART NO.	MATERIAL
31	DIAPHRAGM	2	AB, SB AE,SE,AT,SP AV, SV	10605-19 10605-23 10605-13	GEOLAST SANTO VITON
32	DISCHARGE MANIFOLD (NPT)	1	A -PUMPS	10529-20	AL
	DISCHARGE MANIFOLD (BSP)		S -PUMPS	10529-26	SS
			A -PUMPS	10530-20	AL
			S -PUMPS	10530-26	SS
33	INNER DIAPHRAGM PLT	2	ALL MODELS	11104-25	PS
34	INTERMEDIATE	1	ALL MODELS	11522-60	POLYPRO
36	MUFFLER PLATE	1	ALL MODELS	13111-60	POLYPRO
37	EXTERNAL MUFFLER	1	ALL MODELS	13007-00	SPECIAL
38	O-RING (Valve Seat)	4	AB,SB AT,SP AE,SE AV, SV	11910-11 11910-17 11910-15 11910-13	NITRILE-N PTFE EPDM VITON
39	GASKET (Muffler Plate)	1	ALL MODELS	12117-19	NITRILE
40	LIP SEAL (Diaphragm Rod)	2	ALL MODELS	12000-76	NITRILE
41	RETAINING PLATE	2	ALL MODELS	12708-40	POLYPRO
42	O-RING (End Spacer)	2	ALL MODELS	11923-11	NITRILE
43	AIR VALVE LIP SEAL	2	ALL MODELS	12003-76	NITRILE
44	O-RING (Valve End Plug)	1	ALL MODELS	11913-11	NITRILE
45	PILOT SLEEVE	1	ALL MODELS	10105-31	ACETAL
46	O-RING (Pilot Sleeve)	4	ALL MODELS	11920-16	URETHANE
47	INNER SPACER (Pilot Sleeve)	3	ALL MODELS	10203-40	POLYPRO

*** NOTE: DIAPHRAGM ROD AVAILABLE ONLY AS AN ASSEMBLY.**

DIAPHRAGM ROD ASSEMBLY Items 13 & 15	1	ALL MODELS	32000-00	SS
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OPTIONAL ASSEMBLIES AVAILABLE

AIR VALVE ASSEMBLY Items 1,2,4,5,6,7,43,44	1	ALL MODELS	42000-60	POLYPRO
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PILOT SLEEVE ASSEMBLY. Items 14,40,42,45,46,47	1	ALL MODELS	41000-00	VARIOUS
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REPAIR KITS - WET END				
Includes items 26, 27, 31, 38 & (30 - Used in pumps built w/ PTFE)				
To order a wet end repair kit, add "KIT" to the pump model. e.g. AB-10 KIT				

NOTES:

1. PS = PLATED STEEL, SS = STAINLESS STEEL.