

1 1/2" MODELS 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 the elbow to outer pumping chamber band clamps (35). 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 o-rings (24). Replace if necessary. Discharge check valves are located inside of the bottom of the discharge elbows (32). Repeat procedure for inspection of discharge check valves.
- 2A. **METAL PUMPS:** To inspect the check valves, remove the carriage bolts (17) from elbow/manifold sections (21, 23). Repeat procedure above. There are no manifold o-rings in the metallic pumps.
3. To inspect the manifold o-rings remove the manifold band clamps from each manifold assembly. Inspect and replace o-rings if necessary. Then reassemble, lightly tighten fasteners. Tighten all external fasteners to final torque requirement after pump is completely assembled. The check ball should fit into the curved portion of the valve seat and be facing upward when reinserted into the valve seat location.

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

DIAPHRAGM AND PILOT SLEEVE ASSEMBLY MAINTENANCE

4. To inspect diaphragms remove the band clamps (16) from the outer pumping chambers. If replacement is necessary due to abrasion or rupture unscrew the outer diaphragm plates (29). Models that are built with Teflon elastomers will have a Teflon overlay (30) that faces the outer pumping chamber (28) and a back-up diaphragm (31) on the air side of pump. Pumps without Teflon 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, inner diaphragm plate (33), and flat washer (47) the pilot sleeve assembly (13, 14, 15, 42, 45, 48) and diaphragm rod assembly (34, 49) may be removed by removing the retaining plates (46) (you may only need to remove one retaining plate) and pushing the entire unit out through the bore in the intermediate (41). 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 (14) 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 (45) are at the end on either side of the pilot sleeve assembly and all inner spacers (48) 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 overtighten self-tapping screws (38).

7. 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 opposite side of intermediate and add the opposite diaphragm assembly. Tighten the outer diaphragm plates to 372 in-lbs (42,04 NM) of torque. Assemble the outer chamber and band clamps first on the side where the diaphragm has been inverted. Next reach under the opposite diaphragm assembly and pull diaphragm rod to opposite side (a large flat screw driver may be used as an aid in this process) and assemble remaining outer chamber and band clamp. When positioning outer diaphragm chambers onto intermediate make 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 top of the intermediate has a single vertical air passage slot on the air valve mounting face while the outer chamber check ball cavity should be pointing downward.

NOTE: When positioning band clamps use soapy water or a compatible lubricating spray on the inside of band clamps to aid assembly. Tap with a mallet on the outside of clamp to help position the clamp while tightening the fasteners. The band clamp fasteners are stainless steel. To prevent galling always apply an anti-seize compound to the thread. Tighten all external fasteners to final torque requirement after pump is completely assembled.

8. Position the reassembled manifolds making sure of the proper orientation in relation to the air valve for your application. Also make sure that the valve seat o-rings do not shift from their grooves during reassembly. Flat washers should be placed under the head of each cap screw and nut. Tighten all external fasteners to final torque requirement after pump is completely assembled.
- 8A. **METAL PUMPS:** Position manifold/elbow sections making sure that the valve seat o-rings do not shift from their grooves. Tighten fasteners on bolts loosely.

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.

BAND CLAMPS (Outer Chamber - all versions), 20.8 ft-lbs (28,25 NM)

BAND CLAMPS (Manifolds & Elbow), 80 in-lbs (9,04 NM)

METAL PUMPS (Elbow to Chamber Bolts), 37 ft-lbs (50,17 NM)

AIR VALVE MAINTENANCE

9. To evaluate air valve components, remove the four cap screws (11), washers, (8, 10) and nuts from the air valve body (7). The valve 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. To remove the plug (1) at the bottom of the air valve, point the bottom of the air valve safely away from people, direct compressed air through one of the lower holes in the back of the air valve body and the plug will shoot out. 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 reinsert in o-ring groove.
- NOTE: Make sure that the open side of the two lip seals face each other when reassembling air valve. Lube all components with suggested maintenance grease as an aid in reassembly.**

10. 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. If using original valve plate lubricate side of plate that was facing the shuttle (or if new valve plate is used lubricate the lapped and polished side of plate) and place the lubricated side next to the shuttle in the slot. Press valve plug into air valve body, chamfered end first.
11. Check that gaskets (3, 4) are not cracked. If damaged replace.
12. After gaskets are pressed back into position align air valve onto intermediate and reinsert the four cap screws with lock washer and flat washers. Apply 60 in-lbs (6,78 NM) of torque to fasteners.

U.S. Patent Number 5232352

SPECIFICATIONS

CAPACITY:

Adjustable 0-95 GPM (569 LPM)

MAXIMUM TEMP:

PVDF models - 200°F (93°C)

Other Non-Metallic -150°F (66°C)

Metallic - 200°F (93°C)

MAXIMUM AIR PRESSURE:

100 psi (6,8 bars)

MINIMUM AIR PRESSURE:

30 psi (2,7 bars)

DRY LIFT CAPACITY

@ 100 psi (6,8 bars):

Models with Teflon balls - 10 feet

(3 meters)

Other Models - 15 feet (4,5 meters)

WEIGHT:

PVDF models - 59 pounds (27 kg)

Other Non-Metallic - 53 pounds (24 kg)

Stainless Steel - 113 pounds (51 kg)

Aluminum - 55 pounds (24 kg)

MAXIMUM SOLIDS:

1/4" (6,4 mm)

AIR SUPPLY:

Inlet - 3/4" NPT Female (BSP compatible)

Outlet - 3/4" NPT Female

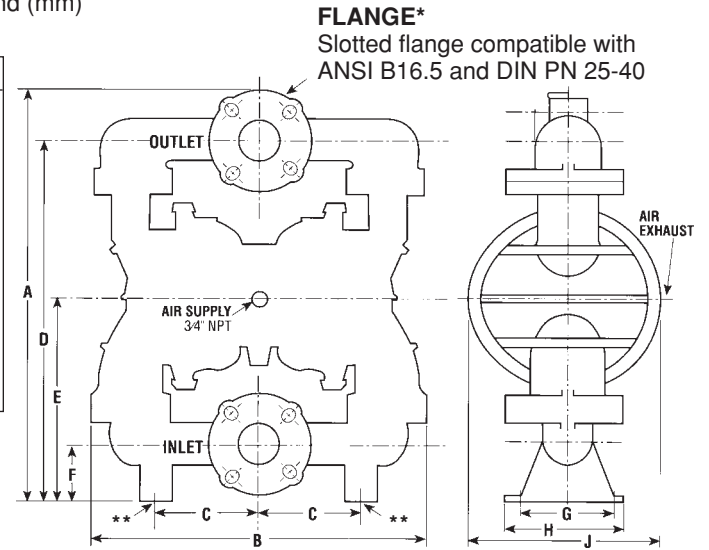
FLUID INLET/DISCHARGE:

1-1/2" ANSI Flange (DIN compatible)

DIMENSIONS

Dimensions in inches and (mm)

	Plastic	Metallic
A	21.12 (536.5)	20.5 (520)
B	20.34 (516.6)	19.5 (495)
C	4.67 (118.6)	4.66 (118)
D	18.25 (463.6)	18.0 (457)
E	11.47 (291.4)	10.62 (270)
F	3.12 (79.2)	3.19 (81)
G	7.06 (179.2)	5.0 (127)
H	8.06 (204.8)	6.0 (152)
J	11.88 (302.0)	10.9 (278)



FLANGE*

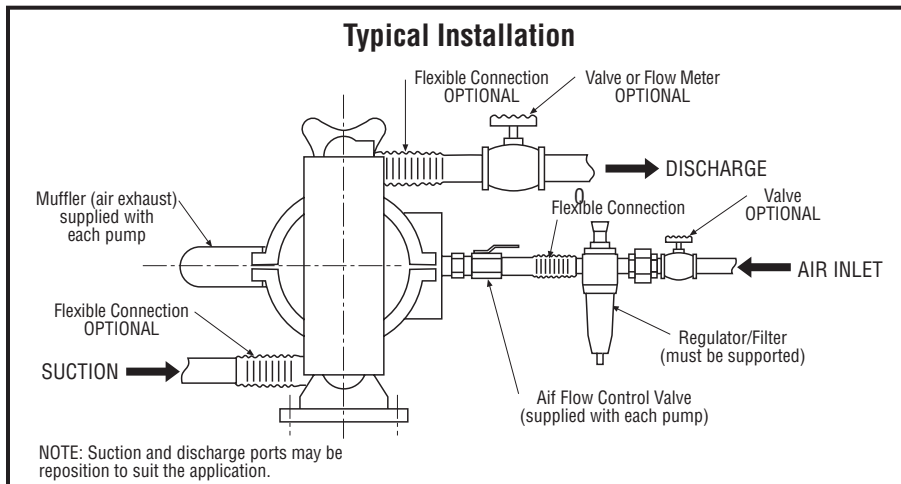
Slotted flange compatible with ANSI B16.5 and DIN PN 25-40

ANSI Flange: 5/8" Dia. on 3-7/8" B.C.

* Flange mounting requires four (4) bolts: 1/2" x 4"

** Slotted mounting holes four (4): .56 (14) wide x .75 (19) long

DO NOT USE AIR LINE LUBRICATION



PERFORMANCE CURVE

(Based on water-flooded suction)

