Edson Electric Powered Double Diaphragm
Order No.s 25020 25030 25040 25050 25060

Installation and Operations Manual

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Order No. 25060

The 25060 Shown Above Was Assembled With A 30 to 1 Ratio Gear Reducer, An Optional 3/4HP Motor And The Optional Wheels and Handle.

The Ratio of The Gear Reducer Defines The Order No. Of Your Pump:

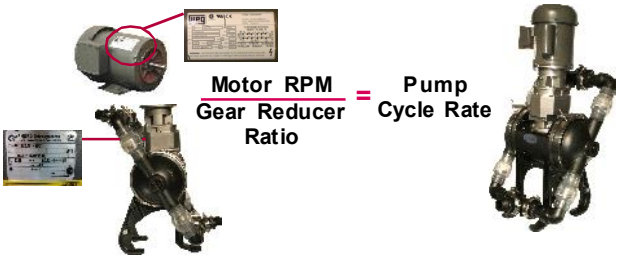
30 to 1 Order No. 25060
34 to 1 Order No. 25050
43 to 1 Order No. 25040
60 to 1 Order No. 25030
83 to 1 Order No. 25020

Circle The Order No. That Applies To Your Pump

146 Duchaine Blvd., New Bedford, MA 02745-1292 Tel. 508-995-9711 Fax 508-995-5021 E-Mail pumps@edsonintl.com

PUMP CONFIGURATION & DIMENSIONS

- **The 25060 25040 25040 25030 25020** pumps can be purchased with a number of optional motors. The version of the pump and the rpm of the motor ordered with the pump determines the performance you should expect. The ratio specified on the legend plate of the pump gear reducer and the rpm specified on the motor legend will inform you of the pump cycle rate per minute. The cycle rate and the back pressure caused by the head conditions of the application determine the diaphragm pump's output.



Example: The Order No. for your pump is 2560. It is built with a 30 to 1 gear reducer. The motor ordered with your pump is Order No. 161-A-1432 a 3/4hp/12VDC/1800RPM Motor. The cycle rate is 1800 divided by 30 = 60 cycles per minute.

Pump Order No. and Gear Reduction

Typical Motor RPMs	25060	25050	25040	25030	25020
	30	34	43	60	83
1150	38.3	33.8	26.7	19.2	13.9
1425	47.5	41.9	33.1	23.8	17.2
1725	57.5	50.7	40.1	28.7	20.8
1745	58	51.3	40.6	29.1	21
1800	60	52.9	41.8	30	21.7
2850				47.5	34.3
3450				57.5	41.5

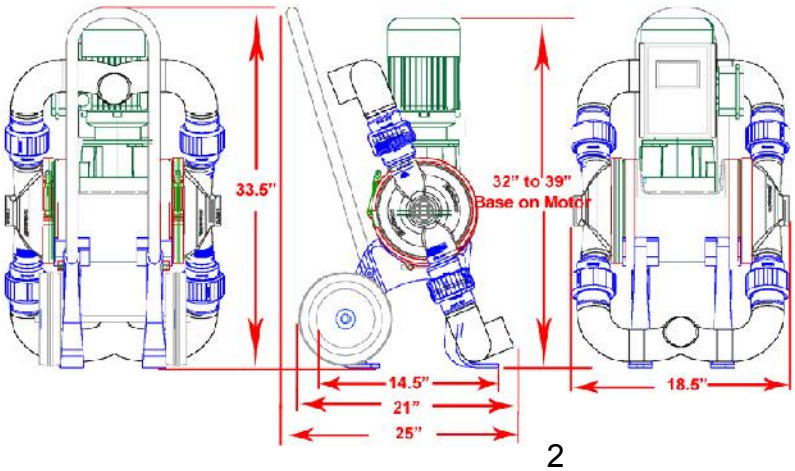
Pump Cycle Rates Per Minute

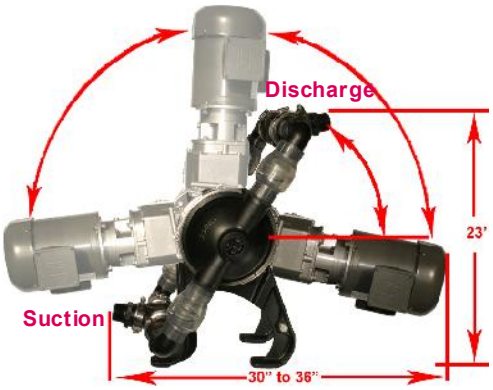
- **161-G-2500-WH** is the order number for the optional Handle & Wheels for a 2500 pump.

- **Dimensions:** Shown below are the dimension drawings of a 2500 series pump. The first 3 are for the standard pump orientation. However because of the way the pump is built the pump drive and mounting assembly can be rotated forward or backwards on the support legs. Also the the pump bases assembly that includes the suction and discharge plumbing can be rotated on the pump frame. Rotating either or both assemblies you will change the pump dimensions as shown by the 4th drawing.

  Caution: Rotating the pump frame and drive assembly requires that the pump frame support legs be bolted down or the pump will tip due to the overhung weight of the motor.

  Caution: Do not rotate the pump bases and plumbing beyond horizontal or the flapper check valves will not work and the pump will not pump.





PUMP SPECIFICATIONS & PERFORMANCE

- **PUMP PERFORMANCE :**
  - Max Volume - 25 gpm / 94.6 lpm / 5.68 m^3hr.
  - Suction Lift to 25 ft /7.62 meters
  - Dry Prime Suction Lift to 12 ft / 3.657 meters
  - Discharge Head to 25 ft / 7.62 meters

- **PUMP CONSTRUCTION:**
  - 2 Polypropylene Pump Bodies.
  - Inlet & Discharge Ports - 1.5" MNPT Polypropylene
  - Diaphragm - Viton
  - Valve Assembly - Viton, Flapper Type
  - Optional Stainless Handle and 8" Wheels

- **Models 25060 25050 25040 25030 25020 Pumps Built With Choice Of Fixed Speed Reducers and Motors:**
  - Motors - .75hp/.55kw; Any Voltage; Any Phase; Any Hertz; TEFC or Xp With 56C Frames.
  - Gear Reducers - 5 Different Gear Reducers Available For Matching Pump Performance To The Application.

- **Volume Performance:** The following chart provides an estimate of the volume out put of an Edson 2500 Electric Powered Double Diaphragm Pump operating at 4 different cycle rates. This chart was created by measuring the output volume under 25 different specific combinations of suction pressure (inches of mercury, Hg) and discharge pressure (pounds per square inch, PSI) for each cycle rate. On the chart these pressure settings are equated to suction and discharge head in both feet and meters.

Results In Gallon Per Minute
1 Gallon Per Min. = 3.785 Liters Per Min. = .2271 Cubic Meters Per Hour

60 Cycles / Min.		Discharge Head	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
		0	2.2 psi	4.4 psi	8.7 psi	10.8 psi
Suction Head	0	25.0 gpm	21.4 gpm	20.0 gpm	16.7 gpm	12.5 gpm
5 ft / 1.52 m	4.5 hg	25.0 gpm	21.4 gpm	20.0 gpm	16.7 gpm	12.5 gpm
10 ft / 3.04 m	9.1 hg	21.4 gpm	16.7 gpm	14.3 gpm	11.5 gpm	11.1 gpm
20 ft / 6.09 m	18.2 hg	18.8 gpm	16.7 gpm	12.5 gpm	10.7 gpm	10.3 gpm
25 ft / 7.62 m	22.7 hg	15.0 gpm	14.3 gpm	11.5 gpm	10.7 gpm	10.0 gpm

40 Cycles / Min.		Discharge Head	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
		0	2.2 psi	4.4 psi	8.7 psi	10.8 psi
Suction Head	0	15.8 gpm	12.5 gpm	11.5 gpm	10.0 gpm	9.4 gpm
5 ft / 1.52 m	4.5 hg	15.0 gpm	12.5 gpm	11.5 gpm	10.0 gpm	9.4 gpm
10 ft / 3.04 m	9.1 hg	13.6 gpm	11.5 gpm	10.3 gpm	8.8 gpm	8.8 gpm
20 ft / 6.09 m	18.2 hg	12.5 gpm	11.1 gpm	9.4 gpm	6.3 gpm	5.0 gpm
25 ft / 7.62 m	22.7 hg	10.0 gpm	9.4 gpm	6.0 gpm	5.0 gpm	4.4 gpm

30 Cycles / Min.		Discharge Head	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
		0	2.2 psi	4.4 psi	8.7 psi	10.8 psi
Suction Head	0	12.0 gpm	10.7 gpm	10.0 gpm	8.3 gpm	7.9 gpm
5 ft / 1.52 m	4.5 hg	10.7 gpm	10.7 gpm	7.5 gpm	5.6 gpm	5.0 gpm
10 ft / 3.04 m	9.1 hg	10.0 gpm	8.8 gpm	6.7 gpm	5.0 gpm	4.5 gpm
20 ft / 6.09 m	18.2 hg	8.3 gpm	7.1 gpm	5.0 gpm	4.2 gpm	3.8 gpm
25 ft / 7.62 m	22.7 hg	7.1 gpm	6.0 gpm	4.3 gpm	3.8 gpm	3.5 gpm

20 Cycles / Min.		Discharge Head	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
		0	2.2 psi	4.4 psi	8.7 psi	10.8 psi
Suction Head	0	6.3 gpm	6.0 gpm	4.7 gpm	4.3 gpm	4.1 gpm
5 ft / 1.52 m	4.5 hg	6.0 gpm	4.7 gpm	4.1 gpm	3.3 gpm	3.0 gpm
10 ft / 3.04 m	9.1 hg	6.0 gpm	4.1 gpm	3.5 gpm	3.0 gpm	2.9 gpm
20 ft / 6.09 m	18.2 hg	5.0 gpm	3.3 gpm	3.0 gpm	2.6 gpm	2.4 gpm
25 ft / 7.62 m	22.7 hg	4.4 gpm	3.0 gpm	2.3 gpm	2.1 gpm	1.9 gpm

PARTS LIST

25060 25050 25040 25030 25020 P umps

Pump Drive Components

1 Motor — Check Legend Plate For Specifications. Qty 1
Following is a partial list of replacement motors:

60 Hertz Totally Enclosed Fan Cooled Motors

Order No.	Description
161-A-161	3/4Hp 115/208-230V 60Hz 1745Rpm 1Ph TEFC Motor
161-A-1429	3/4Hp 208-230/460V 60Hz 1745Rpm 3Ph TEFC Motor

12 Volt Totally Enclosed Fan Cooled Motors

Order No.	Description
161-A-1432	3/4Hp 12 Volt DC 1800Rpm TEFC Motor
161-A-1433	3/4Hp 24 Volt DC 1800Rpm TEFC Motor

Explosion Proof Motors

Order No.	Description
161-A-1430	3/4Hp 115/208-230V 60Hz 1725Rpm 1Ph Explosion Proof Mtr
161-A-1431	3/4Hp 208-230/460V 60Hz 1725Rpm 3Ph Explosion Proof Mtr
161-A-1500	3/4Hp 115/208-230V 50Hz 2850Rpm 1Ph Explosion Proof Mtr
161-A-1557	3/4Hp 208-230/460V 50Hz 1425Rpm 3Ph Explosion Proof Mtr

50 Hertz Totally Enclosed Fan Cooled Motors

Order No.	Description
161-A-1501	3/4Hp 115/208-230V 50Hz 2850Rpm 1Ph TEFC Motor
161-A-1558	3/4Hp 115/208-230V 50Hz 1425Rpm 1Ph TEFC Motor
161-A-1559	3/4Hp 208-230/460V50Hz 2850Rpm 3Ph TEFC Motor
161-A-1560	3/4hp 208-230/460V50hz 1425Rpm 3Ph TEFC Motor

2 Gear Reducer — 1 of 4 Check Legend Plate For Specifications. Qty 1

Order No.	Description *(All Gear Reducers Include part no. 3, a 161-A-1810-B Coupling.)*
161-A-2984	Gear Reducer 30:1 C-Face Flange Mount For Pump 2560
161-A-2985	Gear Reducer 34:1 C-Face Flange Mount For Pump 2560
161-A-2986	Gear Reducer 43:1 C-Face Flange Mount For Pump 2540
161-A-2987	Gear Reducer 60:1 C-Face Flange Mount For Pump 2530
161-A-2988	Gear Reducer 83:1 C-Face Flange Mount For Pump 2520

3	161-A-1810-B	Reducer To Motor Coupling Qty 1
4	161-C-810	Motor Mount Qty 1
5	161-G-2814	Eccentric Qty 1
6	161-C-805	Piston Qty 1

Pump Head Components

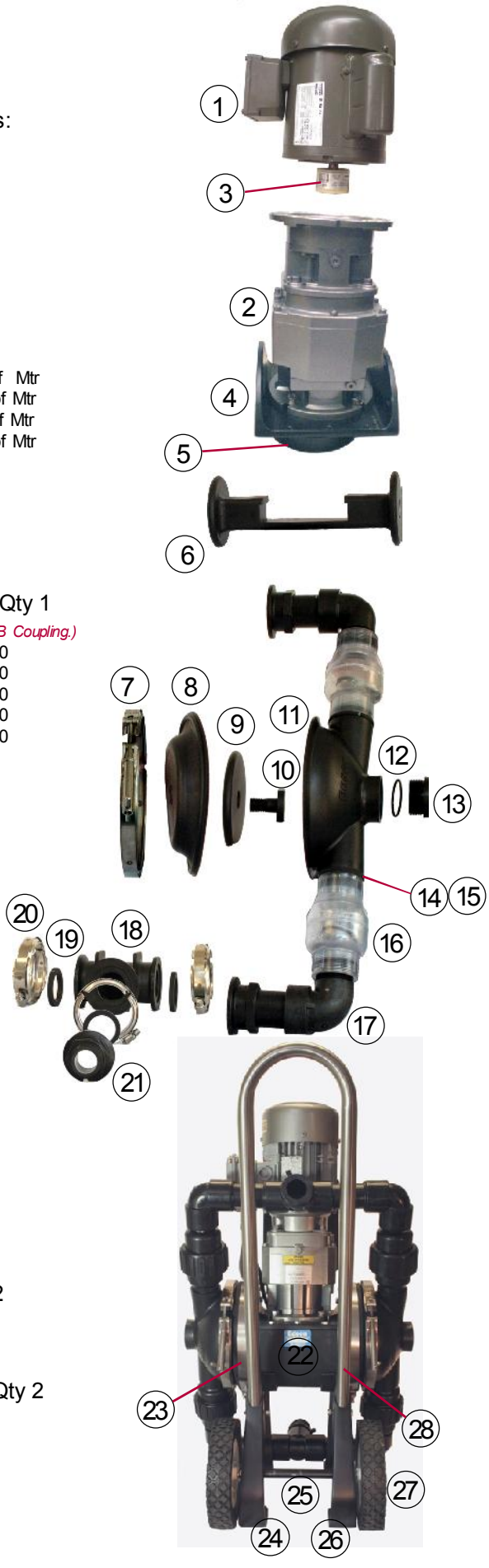
7	160-B-1278	V-Clamp for Pump Base Qty 2
8	113V-2500	Diaphragm, Viton Qty 2
9	161-A-2813	Lower Standard Qty 2
10	161-A-2815	Standard Bolt Qty 2
11	161-D-361	Pump Base, Poly Qty 2
12	161-A-2245	O-Ring 2” X 1.75” X .125” Viton Qty 2
13	161-A-2245	Pump Base Plug Qty 2
14	266-150	Nipple Close X 1 1/2”, Sch 80 PVC Qty 4
15	160-A-1475-150V	Gasket 1 1/2” Viton Qty 4
16	160-A-1653V	Check Valve, Swing, Clear 1 1/2”, Viton Qty 4
17	160-G-297	Flange Adapter With Elbow Qty 4

Suction & Discharge Port Components

8	160-A-2836	Flange Tee 2" Qty 2
19	160-A-1475-150V	Gasket 1 1/2” Viton Qty 6
20	160-A-2450	V-Clamp for Flange Fittings Qty 6
21	160-A-2835	Flange Adapter 2" Flange x 1-1/2" MNPT Qty 2

Mounting Frame Assembly

22	160-C-804	Pump Frame PVC Schedule 120 Qty 1
23	160-A-2897	Stainless Clamp 8.61 - 9.19 Clamping Range Qty 2
24	161-D-390-R	Pump Leg - RIGHT Qty 1
25	161-A-2902	Leg Connecting Rod Qty 1
26	161-D-390-L	Pump Leg - LEFT Qty 1
27	161-A-166	Wheel Qty 2
28	161-A-2903	Handle, 28.3" for Model 2500, Stainless

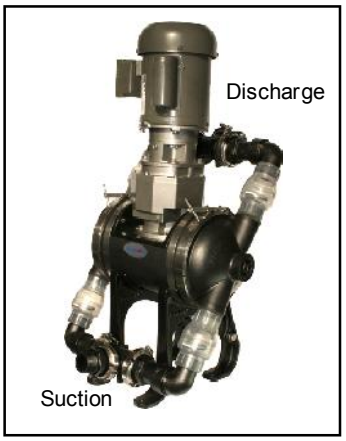


PLUMBING A DIAPHRAGM PUMP

Warning! DO NOT SHUT OFF DISCHARGE WHEN THE PUMP IS RUNNING.
BECAUSE Edson Model 2500 pumps are positive displacement pumps, they will continue to try to pump liquid through a closed line. The pressure created will cause damage to the pump.

FOR THE SAME REASON.

DO NOT PLACE THE PUMP IN A SITUATION WERE THE DISCHARGE LINE WILL BE CLOSED WHILE THE PUMP IS RUNNING unless an automatic high amp or high pressure shut-off switch is used.



- USE ONLY NON COLLAPSING HOSE AND/OR PIPE ON THE SUCTION AND THE DISCHARGE OF THE PUMP.

- WHEN PUMPING LIQUIDS WITH SUSPENDED SOLIDS, THE DISCHARGE PLUMBING CAN BE THE SAME SIZE OR LARGER BUT NEVER SMALLER THAN THE SUCTION.
  BECAUSE a smaller discharge line increases the possibility of clogging.

- WHENEVER POSSIBLE INSTALL THE PUMP AND DISCHARGE PLUMBING SO AIR CANNOT BE TRAPPED IN THE DISCHARGE PLUMBING.
  BECAUSE trapped air will severly restrict flow and require more work from the pump resulting in early diaphragm failure. Install pump and plumbing so any air introduced into the plumbing will not be trapped but flow naturally through liquid and out of the system.

- TAKE APPROPRIATE PRECAUTIONS WHEN INSTALLING THE PUMP BELOW THE LIQUID BEING TRANSFERED.
  BECAUSE installing the pump on a positive suction head, the force of gravity will cause the liquid to flow right through a diaphragm pump even when it is not running. There is no internal shut off in a check valved diaphragm pump to stop the siphone effect of a positive suction head.

- DRY START SELF PRIMING IS REQUIRED FOR A PUMP OUT APPLICATION.
  The Edson 2500 pumps will develop a dry start vacuum equal to 10.5 hg. After the pump chambers are full (primed) the suction lift will increase to 23 hg. You can maintain a primed pump chamber and the 23 hg by installing optional high suction lift plumbing. This plumbing keeps the pump chambers primed even when the suction line runs dry. The result is dry line suction lifts to depths greater than 20ft.
  The self priming feature depends on:
  1. An airtight suction line.
  2. The flapper check valves sealing properly. Solids trapped under the check valves will prevent self priming. This can occur when the pump is used in sewage or sump pump out applications. Flushing with water will generally clear out the solid matter.

PUMP MAINTENANCE

Overview:

Except for general cleaning and the as needed replacement of the diaphragms, check valves and O rings, there is no scheduled maintenance program for this pump.

The replacement of the diaphragms, valve assemblies and O rings are going to be determined based on the demands of the particular installation.

Determining those demands and the pumps performance can be evaluated by inspection and testing on a regular basis.

- Life expectancy is directly related to head conditions, run time and diaphragm material. The higher the suction and discharge pressures the shorter the life.

- The 2500 diaphragm is made of Viton. Dynamic testing shows that life expectancy for the Viton diaphragm should be between 650 hrs under extreme head conditions and 1200 hrs under low to moderate head conditions.

Testing:

- **Vacuum/Pressure Gauge Test - Tests the performance of the pump using an Edson Vacuum/Pressure Test Gauge. Order No. 276-150**
  1. By holding or clamping the gauge into the suction and discharge plumbing you can read the actual vacuum and pressure forces created by the installation.

- **Volume Test - Testing overall performance of the pump installation.**
  1. Use a container with a known capacity of at least 2 gallons.
  2. Empty the container using the suction side of the pump or fill it from the discharge. When using the fill test make sure the pump is fully primed before filling the container.
  3. Use a watch to record the time it takes. Repeat the test at least twice.
  4. Establish GPM rate. Example: It took 10 seconds to empty a 2 gallon container. The GPM rate is 12 Gallons Per Minute.(60 seconds divided by 10 seconds times 2 gal.)
  5. Record the cycle speed of the pump. Know the head conditions of your test and compare the results of your test with the volume of the appropriate Volume Chart on the pump specification sheet. Every installation is different so use the charts as a guideline.

- **Manual Test - Testing the pump valves and valve seats without the use of a gauge.**
  1. Remove all fittings from the inlet and discharge of the pump.
  2. Turn on the pump.
  3. Put your hand over the inlet. If the discharge valve is working properly, you should feel a very strong pulsing suction. If you do not feel any suction, do the same thing again and listen for air being sucked in around the diaphragm. If you hear air movement, inspect for loose clamps or worn diaphragm. Tighten and replace as required.
     If you hear no air movement, inspect the valve assembly. Clean or replace the valve assembly.
  4. Press your hand over the discharge. If the inlet valve is sealing properly, the pressure of the pump should push your hand away. If it does not and the air is forced out the inlet chamber, inspect the valve assembly. Clean or replace the valve

Edson Diaphragm and Check Valves:

Over time these parts wear and need to be replaced. The ability to easily and quickly replace these parts is one of the major advantages of an Edson pump. These parts are available as individual items.

Order No.	Description	Qty Per Pump
113V-2500	Viton Diaphragm	2
160-A-1653V	Check Valve, Swing, Clear 1 1/2", Viton	4

See the next pages for guidelines in changing these parts.

Changing The Diaphragms Of The Model 2500

Rule 1. Change only one side at a time.

Step 1. Remove the 2" Flange V Clamps and Gaskets on the suction and discharge Tee only on the side of the diaphragm being changed.

Step 2. Remove the Pump Base V Clamp by unscrewing the Tee Handle all the way

Step 3. Remove the Pump Base and Valves Assemby. Lay out all these parts for reassembly.

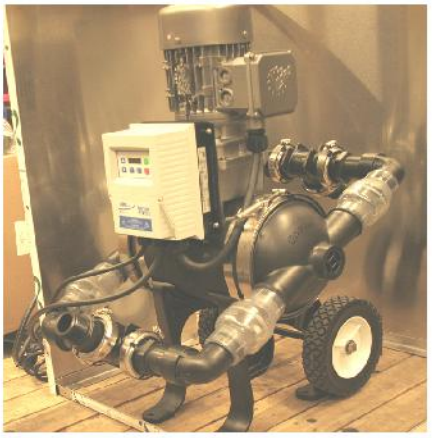
Step 4. Use a 1/2" drive or a crescent wrench to unscrew the diaphragm retaining nut, lower standard and diaphragm from the piston.

Rule 2. Before installing the new diaphragm, move the piston so it is fully withdrawn back into the pump frame. Removing the fan cover and rotating the fan by hand is the best way.

Step 5. Use a little teflon grease to hold the gaskets in place while you align the Pump Base & Valves Assembly. Hold the Pump Base tight to the diaphragm with your body while you fit and tighten the large pump base V Clamp. Make sure the Pump base, the diaphragm and the pump frame are aligned before tightening the V Clamp. Re-install the 2" Flange V Clamps on the suction and discharge Tee before starting to change the other diaphragm.

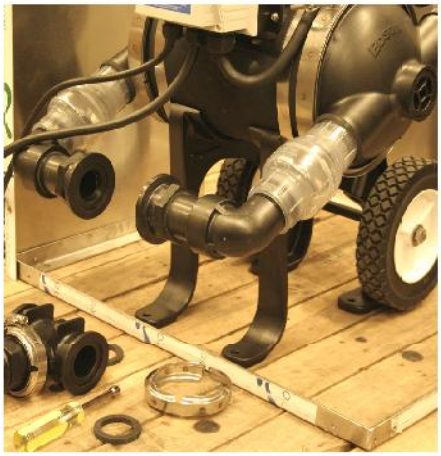
Changing A Check Valve

Rule 1. **If changing both suction and discharge check valve(s), complete the suction side before beginning the discharge side.**



Step 1. Loosen both pump base v-clamps (do not remove) and rotate the suction, discharge and base assembly until the suction port is clear of the front support legs. Tighten the v-clamps.

Step 2. Remove the suction flange tee and washers by removing the 2" flange v-clamps. You may have to spread the tee and elbow flanges on one side of the tee and then the other while working the flange tee and washers free.

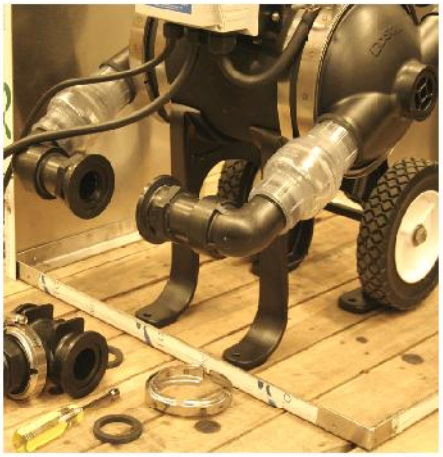


Step 3. Unscrew the check valve-flange elbow assembly(ies) from the pump base(s). If the sealing washer and 1 1/2" close nipple remains in the pump base, leave it. If it comes off with the check valve, it and the flange elbow must be removed from the check valve being replaced. They will be used with the new check valve.

Changing A Check Valve

Rule 2. **Orient the check valve so the suction flapper opens towards the pump base. When installed on the discharge side, it must be oriented so the flapper opens away from the pump base.**

Step 4. Screw the check valve, sealing washer and 1 1/2" close nipple into the pump base after coating the close nipple threads with a light coating of a non-petroleum based, teflon grease. By hand, tighten the valve to the pump base until the sealing washer is pressed tight between the two surfaces. Using a pipe wrench if necessary, continue to screw in the new valve until the flapper hinge is at the top.



Step 5. Using sealing paste on the threads of the flange elbow, screw it into the check valve. Screw it in until it is aligned with the opposing assembly. Use the flange tee to check the alignment and then go ahead and change the opposing check valve if necessary following the same procedures

Step 6. Install the flange tee and sealing washers, then install and tighten the flange tee v-clamps.
If required follow the same procedures to change the discharge check valves.
When completed loosen the pump base v-clamps and rotate the suction and discharge and base assemblies to their original position and make sure all v-clamps are tight.