



Model 2500 Pump Out Station

Electric Powered 25 GPM Double Diaphragm Pump

Installation and Operations Manual

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**The Pump Is Factory Wired For
120V/15A/1ph/60hz Electric Power**
See Lenze SM Vector-Frequency Inverter Operating Instructions



DANGER! Hazard of Electrical Shock. Capacitors retain charge for approximately 180 seconds after power is removed. Allow at least 3 minutes for discharge of residual charge before touching the drive.



COMPONENT SPECIFICATIONS & DIMENSIONS

ENCLOSURE 161-B-1366:

- Stainless
- Modular 4 Part Assembly For Added Strength, Easy Assembly and Access
- On/Off and Hour Meter Installed



PUMP Model 2500:

Performance

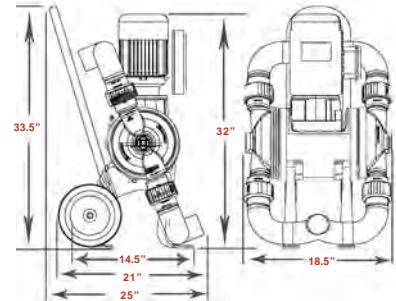
- Max Volume - 25 gpm / 94.6 lpm / 5.68 m³hr.
- Suction Lift to 25 ft / 7.62 meters
- Self Prime Suction Lift to 12 ft / 3.657 meters
- Discharge Head to 25 ft / 7.62 meters

Construction

- Polypropylene Pump Body
- Inlet & Discharge Ports - 1.5" MNPT Polypropylene
- 3/4hp/.55kw; 60hz; tefc
- Check Valves - Viton Enclosed In Clear PVC
- Stainless Steel Hardware and Support Stand



Discharge



Inlet

OPTIONS :

Deck Fitting Rack - Order No. 160-B-1363

- Electropolished Stainless
- Holds up to 4 deck fittings
- Mounts on any surface including right side of enclosure.



Hose Rack - Order No. 160-A-2876

- 304 Stainless
- Holds Up To 75 ft of Hose
- Mounts on any surface including left side of enclosure.



Pump Out Hose Assembly - Order No. 261-25-150 & 261-50-150

- Flexible Smooth Bore 1 1/2" Hose
- 90° Ball Valve, Clear Sight Glass, Female Quick Clamp Adapter
- Complete Set Of Clamp-In Deck Adapters



Hose Stands - Order Nos. 260-HS and 260-284

- White Powder Coated Aluminum
- Holds Up To 100 ft of 1 1/2" Hose
- 260-HS Basic Hose Stand
- 260-285 Hose Stand with Start/Stop Switches
(Requires Special Relay Control Added To 2500 when stand is located over 30 ft from pump)



INSTALLATION GUIDELINES

Step 1: Locate Pump

- Plan the discharge and suction plumbing and how it will connect to the pump either through the cut out in the lower corner of the Back/Right Side Panel or by bringing it up under the enclosure.
- Do not install the plumbing yet.
- Plan the orientation of the enclosure, the position of the front panel and the hose rack.
- Secure the pump to the deck.

Step 2: Install The Bottom Mounting Frame

- Orient the Bottom Mounting Frame. The frame is a square but there are extra tapped holes on one side of the frame for installing the plastic cover for the cut out in the Back/Right Side Panel. Orient this side to where you want the back panel to be.
- Secure the Bottom Mounting Frame to the deck.

Top Cover



Step 3: Install Plumbing

- The pump comes with 1 1/2" Male NPT on both the discharge and suction ports.
- You can install rigid or flexible pipe.
- Never use smaller than 1 1/2" ID hose or pipe.
- By loosening the v-clamps on the port "T"s, they can be rotated to orient the port as required.

Discharge Plumbing

- It will connect to the pump either through the cut out in the lower corner of the Back/Right Side Panel or by bringing it up under the enclosure.
- Minimize back pressure by using sweep elbows.

Suction Plumbing

- If installing the pump out hose on the enclosure:
 1. Install Front/ Left Side Panel.
 2. If ordered, install the hose rack on the right side.
 3. Orient the suction port to the back.
 4. Connect pump out hose to the pump thru the cut out in Back/Right Side Panel.

- If installing the pump out hose at a remote location or more than one location:
 1. Install an 1 1/2" suction line connecting all locations to the pump inlet.
 2. It will connect to the pump either through the cut out in the lower corner of the Back/Right Side Panel or by bringing it up under the enclosure.
 3. If ordered, install the hose stand and hydrant at each remote station.

Step 4: Install All Wiring Per Wiring Diagram

- Install Start/Stop and Hour Meter To Front Panel. They should already be wired to the controller.
- If ordered wire remote Start Stop stations to auxiliary control panel.

Step 5: Test The Pump Out Using Available Water

Step 6: Install Back/Right Side Panel and The Cover

- Cut holes in the black cover used for the plumbing cut out in back panel to accommodate the plumbing and any electrical connections.

PLUMBING A DIAPHRAGM PUMP

Warning! DO NOT SHUT OFF DISCHARGE WHEN THE PUMP IS RUNNING BECAUSE the Edson Model 2500 pump is a positive displacement pump, it 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 INSTALL THE PUMP WHERE THE DISCHARGE LINE WILL BE CLOSED WHILE THE PUMP IS RUNNING UNLESS AN AUTOMATIC HIGH AMP OR HIGH PRESSURE 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 CAN NOT BE TRAPPED IN THE DISCHARGE PLUMBING
BECAUSE trapped air will severely 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 PUMPOUT APPLICATION.
The Edson Model 2500 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 a is dry line suction lift 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



ELECTRICAL INSTALLATION GUIDELINES



DANGER! HAZARD OF ELECTRICAL SHOCK.

THE INVERTER CAPASITORS HOLD A CHARGE FOR APPROXIMATELY 180 SECONDS AFTER POWER IS TURNED OFF OR THE UNIT IS UNPLUGGED. ALLOW AT LEAST 3 MIN. FOR DISCHARGE OF THE RESIDUAL CHARGE BEFORE OPENING THE DRIVE.

READ THE ENCLOSED INVERTER MANUAL SAFTEY SECTION BEFORE CONNECTING ELECTRICAL POWER TO THE PUMP

Caution

All Electrical Connections Must Be Installed By a Licensed Electrician In Accordance With Local Codes

- The Model 2500 drive is a combination of a Lenza Frequency Drive wired for **110V/ 1 Phase** input rated atFLA Draw of**13.5 amps** and inverter grade 3/4 hp, 3 ph, 208-230/460v, tefc motor.
- The Lenza Vector-Frequency Inverter is a programable AC Speed Control. The standard unit is factory wired for 120V/1 Phase Input. The Output from the VFD is 230V/ 3 Phase. Other VFDs can be used to meet any power input requirement but this section of the manual only applies to 120V/1 Phase Input. Contact Edson Customer Service if there is any question regarding the unit shipped.
- The inverter has been prograded and wired so that when the momentary start switch on the front of the enclosure is pressed the pump will run for 10 minutes and then shut off automatically
- The Enclosure 161-B-1366 comes with an Hour Meter and Momentary Start/Stop on the front panel. Shipped from the Edson factory the hour meter is installed on the front of the enclosure and the stop/start switch is wired to the inverter terminal strip.
 1. The cable must be secured to the inside of the enclosure using the cable tie provided.
 2. The stop/start switch must be installed to the front panel.
 3. The black and red wires with the spade connectors must be attached to the back of 12V DC Hour Meter. Red wire to the Positive (+) Terminal and Black wire to the Negative (-) Terminal.
- If remote hose stands with start/stop switches are used with this pump station and if they are installed more than 30 ft away from the VFD then an auxiliary relay in a nema 4X box must be installed on the pump unit. The remote start/stop are wired to the relay and the relay is wired to the VFD. See wiring diagram on page 6.



161-A-1613
Remote Start Stop

260-284 Hose Stand

- The Lenze Control Panel has been programmed and wired so that when the momentary start switch on the front of the enclosure is pressed the pump will run for 10 minutes and then shut off automatically. Below is the program sequence for the Lenza VFD. Please refer to the supplied Lenza SMV Frequency Inverter - Operating Instructions for more details.

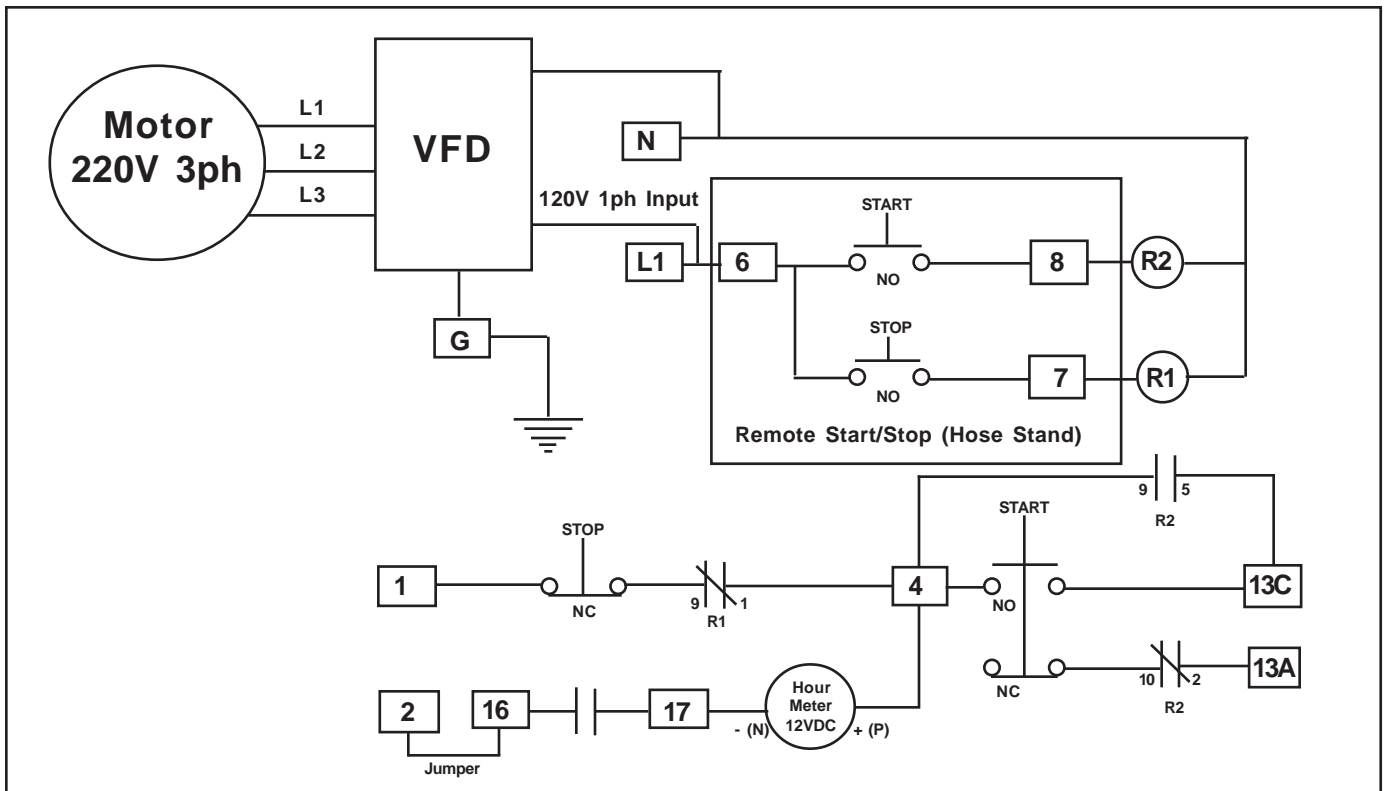
As supplied with parameter P100 set on 4, the green start button on the face of the controller is inactive.

VFD Program:

Parameter	Description	Setting	Explanation
P100	Start Control Source	4	Allows Start w/ momentary NO Switch btw Term. 4-13A
P108	Motor Overload	65%	Setting calc. by motor FLA/SMV output current
P111	Stop Method	2	Drive Ramps to Zero Speed not Coast
P121	TB13A Input Function	24	Activate Sequencer Segment 1
P122	TB13B Input Function	8	Control Select-Allows Switch btw Keypad/Term. Start/Stop
P123	TB13C Input Function	11	Start ForwardAllows NO momentary Switch Start
P140	Relay Output Run	1	Hour Meter Energized
P700	Sequencer Mode	1	Enable Timer Transition mode
P706	Sequencer Action	1	Sequencer Action After Start/Stop-Restarts @ Seg. Begin.
P707	Sequencer # Cycles	1	Single Cycle Scan
P708	Sequencer Scaling	2	Sequencer Timer Set in Minutes
P710	Sequencer Freq Setpt	60	Sets Sequencer Speed = 60 Hz (1725 RPM)
P711	Seq. Accel/Decel	2	Sets Sequencer Accel/ Decel = 2 Seconds
P712	Time in Current Seg.	10	Set the time executing the segment = 10 Minutes
P795	End Segment	1	SMV Stops after execution of segment

Wiring Diagram:

- Wiring 1 Stop Switch Red Momentary Switch With NC Contact wired between TB 1&4.
- Wiring 2 Start Switch Green Momentary Switch With 2 sets of Contacts, 1 NO Contact wired between TB 13C&4, and 1 NC Contact wired between TB 13A&4
- Wiring 3 Hour Meter Jumper wired between TB 2&16. TB17 wired to the Negative (-) terminal of the 12 VDC hour meter and TB 4 wired to the Positive (+) terminal of the hour meter



PUMPING OUT A BOAT

1. Make Sure Hydrant Ball Valve Is Open & Hose 90° Ball Valve is Closed.

2. Prepare The Waste Deck Fitting On the Boat.

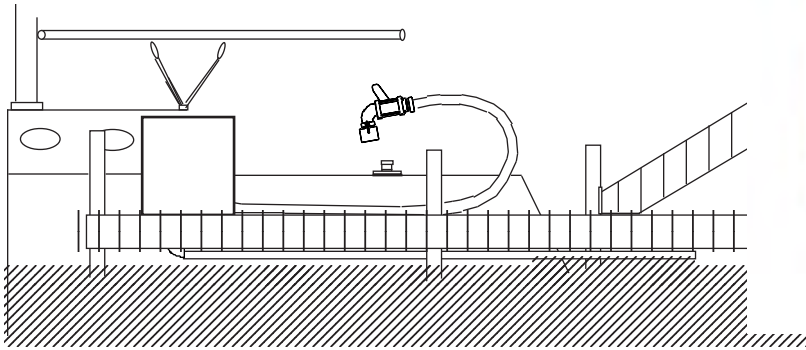
- Remove the cap from the deck fitting.
- Screw in a deck adapter, 1 1/2" or 1 1/4".
- If neither fit, clamp the universal nozzle to the hose.
- If pumping out a portable holding tank or bucket, clamp the potty wand to the hose.

3. Turn On The Pump Out System.

- Push the green start button

4. Connecting The Hose To The Boat

- Unwind the hose all the way from the hose rack.
- Clamp the hose to the deck adapter or hold the universal nozzle in the deck fitting.



5. Open The Ball Valve Slowly & Pump Out.

- When the holding tank is empty close the ball valve.
- Pump water through your toilet into the holding tank.
- Pump out again. This procedure rinses the entire system and helps to prevent odor
- Close the ball valve & disconnect the hose

6. Flush the Hose.

- Put the hose into water & open the ball valve long enough to flush the hose and plumbing.
- Lift the hose and close the ball valve.
- Push the Red Stop Button.

7. Clean Up.

- Curl the hose onto the hose stand.
- Secure the boat deck fitting.
- Rinse the deck and pump out with water
- Wash your hands.

PUMP OUT HOSE

261 Pump Out Hose Assembly

Standard Length Assemblies

261-25-150 25 ft

261-50-150 50 ft

Special Length Assemblies -5 ft. to 100 ft.

Parts List for 261-25-150 25 ft Assembly

262-25-150	Pump Out Hose Only w/1 1/2" MNPT
151FF-150NY	Quick Clamp Adapter FE QC x FNPT
152FM-150NY	Quick Clamp Adapter FE QC x MNPT
158MF-150NY	Quick Clamp Adapter MA QC x FNPT
264-90-150	Ball Valve - 1-1/2" 90 Degree
269CL-150	Check Valve/Sight Glass - 1 1/2"
272QC-150-SG	Suction Nozzle w/Splash Guard
273-125	Deck Fill Adapter - 1-1/4"
273-150	Deck Fill Adapter - 1-1/2"
274-150	Potty Wand



261-25-150

Hose Assembly Components



152FM-150NY



264-90-150



269CL-150



262-25-150
OR
262-25-150
or Any Length



158MF-150NY



151FF-150NY

Deck Adapters



273-125



273-150



272QC-150 SG



274-150



Hose Handler



Hose Stand

PUMP PART LIST

Model 2500 Pump

Pump Drive Components

1	161-A-2808	3/4 HP - 3 Phase Gearmotor Qty 1
2	160-A-2816	14/3 Power Supply Cord, 8 ft long Qty 1 <small>(Not Shown. Supplied Only With Inverter Set Up for 110V 1 Phase Input)</small>
3	161-A-2810	Inverter 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	160-A-1475-150V	Gasket 1 1/2" Viton Qty 4
13	266-150	Nipple Close X 1 1/2", Sch 80 PVC Qty 4
14	160-A-1653V	Check Valve, Swing, Clear 1 1/2", Viton Qty 4
15	160-G-297	Flange Adapter With Elbow Qty 4
16	161-A-2245	O-Ring 2" X 1.75" X .125" Viton Qty 2
17	161-A-2245	Pump Base Plug Qty 2

Suction & Discharge Port Components

18	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



161-B-1366-304 Pump Enclosure

160-A-1421-A	Vinyl Sign - Edson, New Bedford, MA	1
160-A-1421-C	Vinyl Sign, GREEN - HoldingTank	1
160-A-2871	Access Panel Cover, 10" x 9" x 1/8"	1
160-A-2873	Cable, 18 gauge 5 Conductor	1
161-A-2390	Hour Meter, 24 Volt	1
161-A-2865	Dual Start/Stop Switch	1



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 for pump out installations life expectancy should be about 650 hrs for extreme head conditions and 1200 hrs for low to moderate 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. Compare the volume, the cycle speed and the head conditions of your test with the volume on the Volume Chart on page 12. 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 assemblies.
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 valves.

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.

PERFORMANCE CHARTS

- Max Volume - 25 gpm / 94.6 lpm / 5.68 m³hr.
- 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

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

60 Cycles / Min.		Discharge Head				
		0	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
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				
		0	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
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				
		0	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
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				
		0	5 ft / 1.52 m	10 ft / 3.04 m	20 ft / 6.09 m	25 ft / 7.62 m
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

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 Assembly. 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, run the pump to center the piston in the fully withdrawn position back into the pump frame.



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. 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.