EDSON Pump Division

290-10-2210 VACUUM PUMPING SYSTEM

Installation and Operations Manual

Index

Includes Order No.:

290-10-2210P - Pump Unit is built with wheels for portability.

290-10-1HP - A Hose Stand and Pump Out Hose Assembly is included with the pump unit.

Option Order No.**231-A-2324CV** - The pump unit is built with a Constant Vacuum Option.

Option Order No.**161-G-1000** - External Float Switch

Attention
Wiring Diagram Located Inside
Control Panel Door

IMPORTANT

Before Operating Pump Station

Air Pump - Fill Oil Reservoir With Biodegradable Hydraulic Oil (Mobil EAL 224H)or 10W30 or 10W40 High Detergent Oil Before Starting System. Failure to Do So Will Cause Damage to The Model 06 Air Pump. See Page 3 For Instructions.

Install Suction Plumbing - The Check Valve & Ball Valve May hHave Been Removed for Shipping. See Page 2 Componet 7.

Install Wheels If Needed - The Wheels Were Removed for Shipping. See Page 3 For Instructions On Reinstalling The Wheels and Castor.

Eletrical Power - The unit was built to operate on 120 Volt Single Phase 60HZ Electrical Power . It should be pluged into or wired directly to a dedicated 20 amp circut.

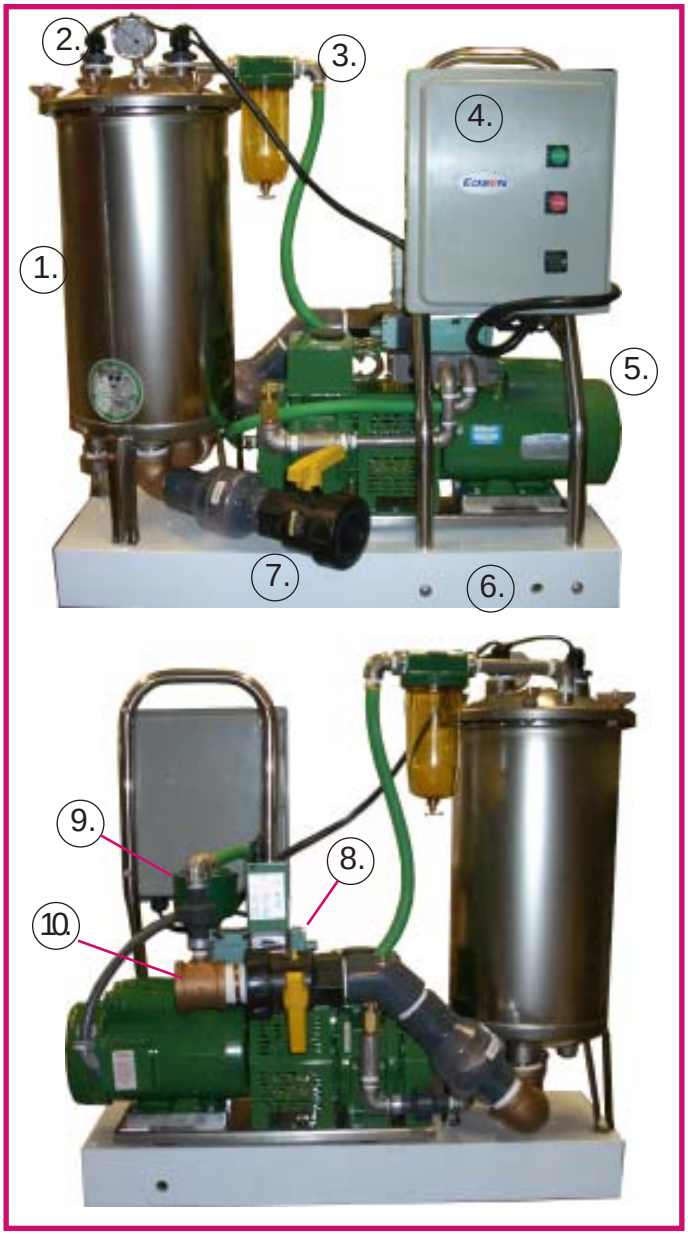
Check Level Sensor Sensitivity - The Power Source May Change The Resistance Of The Level Sensors. Check them Before Pumping Liquid. See Page 7 For Instructions.

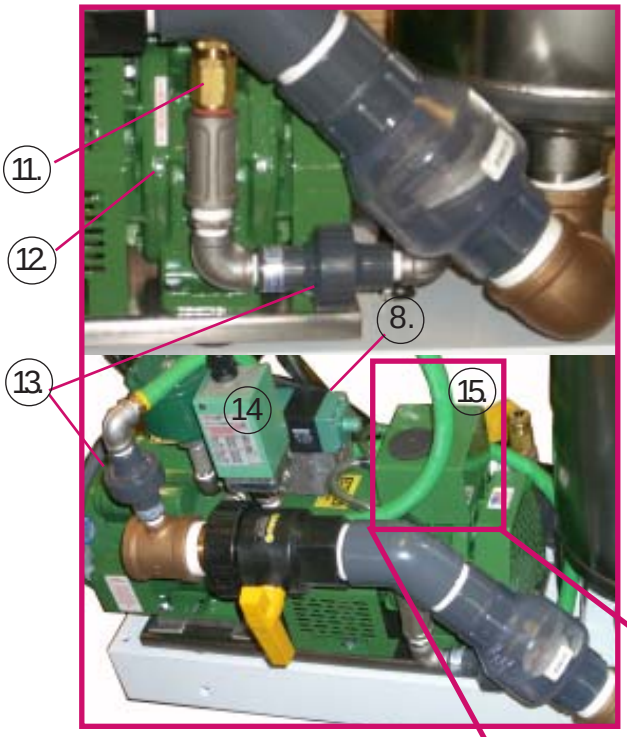
SYSTEM SERIAL #

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

Major Components

1.) 10 Gallon Steel Tank
2.) Vacuum/Pressure Gauge
3.) Primary Trap
4.) Nema 4X Control Panel Shown With Start/Stop & Optional Constant Vacuum Selector Switch
5.) Motor 1hp/1ph/110v/60hz/tefc
6.) Mounting Frame
7.) Tank Inlet
8.) 4 Way Valve
9.) Air Filter
10.) Tank Discharge
11.) Pressure Regulator
12.) Air Pump
13.) Air Pump Check Valve
14.) Constant Vacuum Switch (Optional)
15.) Oil Reservoir





IMPORTANT

Fill Air Pump Oil Reservoir With Biodegradable Hydraulic Oil (Mobil EAL 224H) or 10W30 or 10W40 High Detergent Oil Before Starting System.

Failure to Do So Will Cause Damage to The Model 03 Air Pump.
Fill Location - Oil Reservoir - Remove Fill Cap - Capacity 1 Qt.

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Optional Equipment

1.) 290-10-2210P Pump Unit Ordered With Wheels
2.) 290-10-1HP Pump Unit Ordered With Pump Out Hose & Hose Stand
3.) 231-A-2324CV Pump Unit Ordered With Constant Vacuum Option
4.) 161-G-1000 Pump Unit Ordered With External Float Switch

① 

② 

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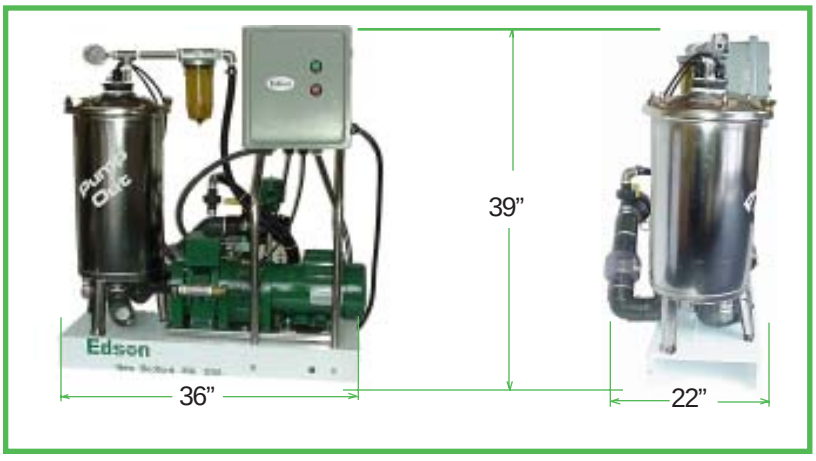
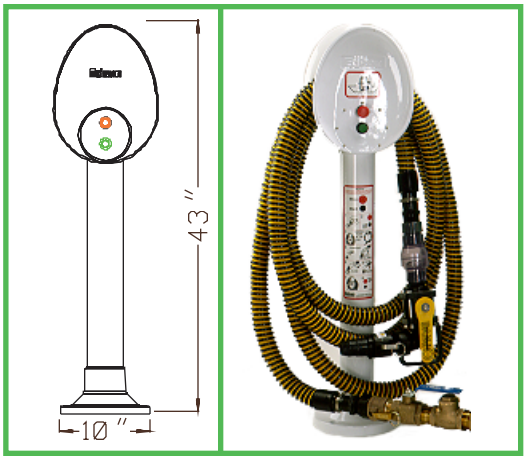
5.) 270BR-150 Bronze Pump Out Hydrant 1 1/2”
6.) 270PC-150 PVC Pump Out Hydrant 1 1/2”

⑤ 

⑥ 

Dimensions





Installation - Setup

1.Air Pump - Fill Oil Reservoir **CAUTION**

Fill Air Pump Oil Reservoir With Biodegradable Hydraulic Oil (Mobil EAL 224H) or 10W30 or 10W40 High Detergent Oil Before Starting System.

Failure to Do So Will Cause Damage to The Model 06 Air Pump.
Remove Fill Cap - Fill To Just Below Wick Port - Capacity Approx. 2 Qt.

2.Install Suction Plumbing - The Suction Check Valve & Ball Valve Were Removed for Shipping. Re-Install Valves.

Make sure check hinge is up.

Hinge Must Be UP

3.Install Wheels If Needed - The Wheels Were Removed for Shipping. Re-Install Wheels If Needed To Move Pump Station Around.

Bolts onto the frame under the tank.

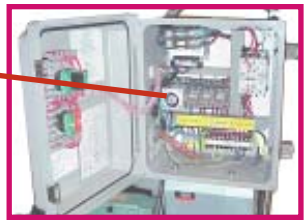
Unbolt retaining washer from one side of axle. Remove one wheel and washer. Slide axle through the holes in frame under the motor & reassemble.

4.If Hard Wireing Power To The Pump Station - The unit was designed to operate on 120v/1ph/60hz power supplied by a 20 amp dedicated circut. Wiring Diagram is inside control panel.

Connect power to wire leads provided inside motor junction box.

5.Set Run Timer - The pump unit is equipped with a programmable timer. It is set at the factory for a 5 minute run time with the dial set some where between 1 and 5 minutes. If longer run time is required see wiring diagram on setting longer times.

Relay Timer



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WARNING

This pumping unit is wired for use with grounded 110V/1ph/60hz/20amp electric service. Failure to power this unit with the specified electric service will result in damage to the pump and potential bodily injury, loss of life and property damage from electrical shock and fire.

CAUTION

Fill Oil Reservoir

Use A Biodegradable Hydraulic Oil (Mobil EAL 224H) or High Detergent 10W-30/40 Motor Oil Not Using Oil or Using the wrong oil or dirty oil can cause loss of vacuum or pump failure.

ATTENTION

All Plumbing Fittings Must Be Air Tight. Install With Thread Sealant.

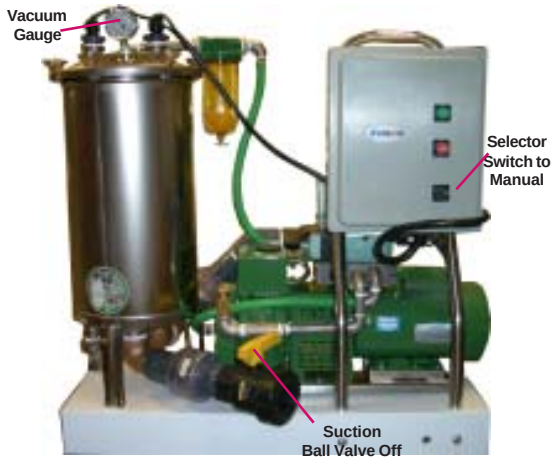
IMPORTANT (Constant Vacuum Option Only)

A Pump Unit With The Constant Vacuum Option Comes Wired For Hand Start (Hand) Operation and Constant Vacuum (Auto) Operation. The Selector Switch On Front Panel Lets You Chose The Mode Of Operation. For Initial Setup & Testing Chose Hand Start (HAND) Operation Mode and Follow The Guidelines. After Setup and Testing Switch To Auto and Read Constant Vacuum Operation Page 12

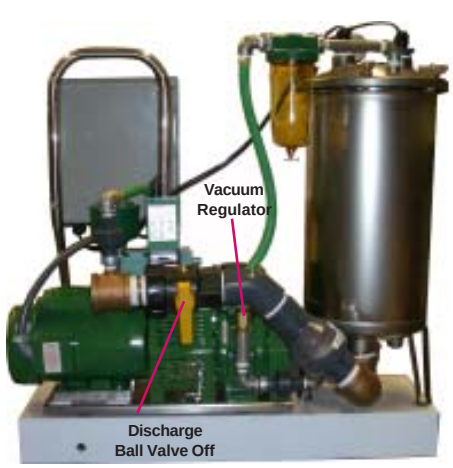
1. Inspect and Setup the Pump Unit

- Fill Oil Reservoir with A Biodegradable Hydraulic Oil (Mobil EAL 224H) or Any High Detergent 10W-30 or 10W-40 Motor Oil.
- Visually Check Factory Supplied Plumbing To Tank and Close Both Inlet and Discharge Ball Valves
- Test Run Pump Unit : Plug unit into appropriate outlet. If equipped with constant vacuum option, turn selector switch to “HAND” and push Start. With inlet ball valve closed the unit should run in vacuum and the gauge should stablilize at 15 hg. Pump unit should run for 5 minutes before automatically shutting off.

See Hand Start Operation pg.5 For Timer Settings and Testing and pg 7 For Vacuum/Pressure Regulator Settings



Suction Inlet Side 2” FNPT



Discharge Side 2” FNPT

- General Operation Guidelines pages 5-9
- Marine Pump Out Installations Pages 9-11
- Constant Vacuum Installations see Pages 12-13
- External Float Switch Installation see Pages 12-13

Hand Start Operation:

WARNING

Do Not Open Control Panel Cover With Unit Plugged In. Unplug Unit Before Opening Control Panel. With The Unit Plugged In To A Power Outlet, There Are Live Wires Inside The Console.

CAUTION

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

MPORTANT (Constant Vacuum Option Only)

The Pump Unit 290-10-2210 Constant Vacuum Comes Wired For Standard (Manual) Operation and Constant Vacuum (Auto) Operation. The Selector Switch On Front Panel Lets You Chose The Mode Of Operation. For Initial Setup Chose Manual Operation Mode and Follow The Guidelines. After Setup and Testing Switch To Auto and Read Constant Vacuum Operation Page

IMPORTANT

1HP Motor Operating On 120 Volt Is Rated At Full Load AMPS of 12.5

Electrical:

1. Wiring Diagram Is Inside Control Panel Door

- An appropriate cord and plug is wired to control panel. Unit is factory wired for Single Phase, 120Volt, 60 HZ electrical power.
- Insure all components, main control panel and any remote start/stop stations are properly grounded.
- Insure all connections to the enclosure are water tight and installed with appropriate strain relief.

2. Check and/or Set Timer:

- Motor Timer acts as a self-monitoring Shut-Off for the motor. It It is usually factory set for 5 min. See wiring diagram for settings.

3. Units can be operated with remote start/stop station(s): See wiring diagram Inside

Pump Unit Dry Test:

1. Plug Unit In:

- Power is now present on the motor contact and the transformer.

2. Set Selector Switch to Manual (Auto For Constant Vac) and Push Start

- The 4way valve is controlled through relays that are controlled by two level sensors. With no liquid in the tank the 4way valve should be in the vacuum position and the tank is being depressurized.
- With the tank check valves in place and the ball valves open, vacuum should be felt on the inlet port of the tank but the tank gauge will read zero.
- Close the inlet ball valve and watch the pressure/vacuum gauge. The gauge should record vacuum (Hg) . Open the inlet ball valve and the gauge should drop back to zero.

3. With Motor Running Depress The 4Way Valve Manual Button

- 4way valve is now manually positioned so the tank is pressurized
- With the discharge ball valves closed, tank gauge will read 10psi.
- Open the discharge ball valve and watch the pressure/vacuum gauge drop back to 0.

4. Press Stop Switch :

- Motor stops and 4way valve turn off.

Pump Unit Wet Test:

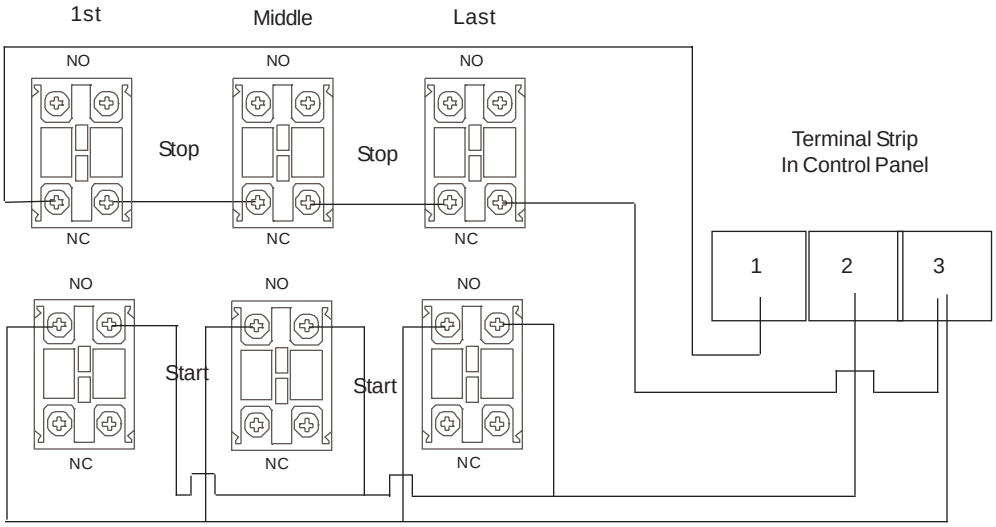
1. Press The Start Button :

- The pump unit comes on in vacuum mode.
- Put the suction hose into clean water and suck water into the tank.
- When both the low and the high sensor sense liquid, the 4way valve is turned on and the tank builds pressure and forces the water in the tank out. Pg 18
- When the bottom sensor no longer senses water the 4way valve turns off and the vacuum side of the air pump starts to depressurize the tank again.
- This cycle will continue until the TM1 timer times out or the red stop switch is pushed.

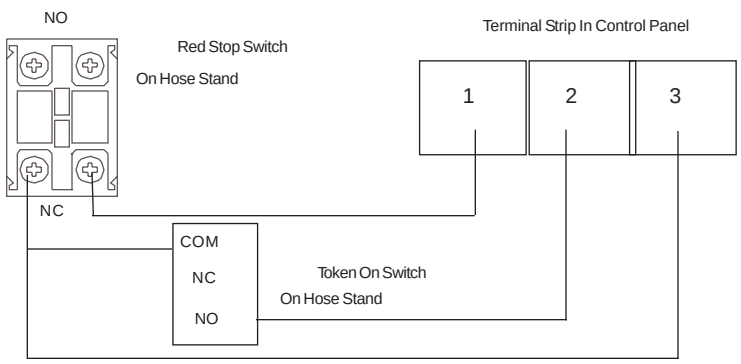
Electrical:

See Wiring Diagram Is Inside Panel Cover For Installing Remote Start Stop

Multiple Remote Start Stop Stations



260-Token-Optional Token Operated Hose Stand Switch

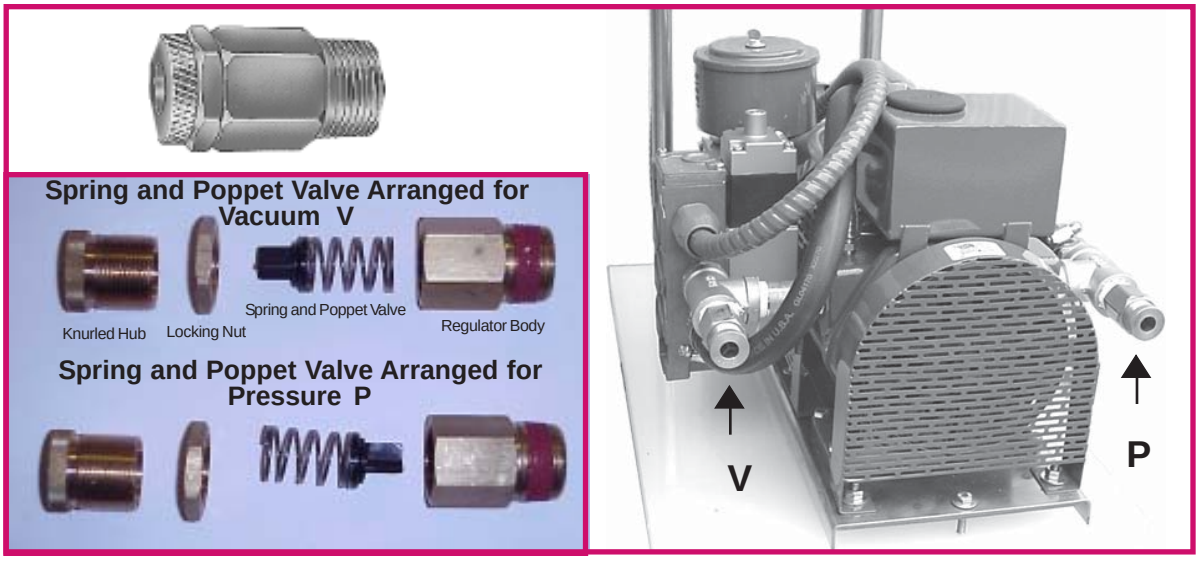


Setting Vacuum/Pressure Regulators:

WARNING

The Regulators Are Used To Prevent The Air Pump From Over Heating Due To Running At Excessive Pressures. Maximum Run Settings For The Air Pump Are 20" Hg Vacuum and 10 PSI Pressure.

1. With the tank empty, check regulator settings
   - Regulators have been factory set at 20" hg vacuum for systems equipped with constant vacuum and 10 psi pressure.
   - Close both the inlet and discharge ball valves. Run the unit in vacuum for 2 to 3 minutes and record the gauge reading. Then run the vacuum unit in the pressure mode for 2 to 3 minutes and record the gauge reading.



2. Reset regulators per the following instructions:
   - **To Adjust Pressure Regulator 1. Max pressure 10 psi**

     Step 1 Close inlet and discharge ball valve.
     Step 2 Run unit in the pressure mode. Record pressure reading, turn system off.
     Step 3 Loosen locking nut counter clockwise.
     Step 4 If pressure setting is too low, turn knurled hub clockwise to increase pressure at which valve opens. If pressure is to high, turn hub counter clockwise.
     Step 5 Tighten locking nut. Turn on system.

     Repeat steps 2-5 until pressure is set.

   - **To Adjust Vacuum Regulator 2. Max Vacuum 20 hg**

     Step 1 Close inlet and discharge ball valve.
     Step 2 Run Vacuum unit in the vacuum mode. Record vacuum reading, turn system off.
     Step 3 Loosen locking nut counter clockwise.
     Step 4 If vacuum setting is too low, turn knurled hub clockwise to increase pressure at which valve opens. If vacuum is to high, turn hub counter clockwise.
     Step 5 Tighten locking nut. Turn on system.

     Repeat steps 2-5 until vacuum is set.

For Good Pumping Operation

1. Level sensors calibrated properly.
2. All electrical components operating properly.
3. Tank inlet and discharge check valves sealing properly.
4. Pressure and vacuum relief valve set properly
5. Suction and discharge plumbing air tight.

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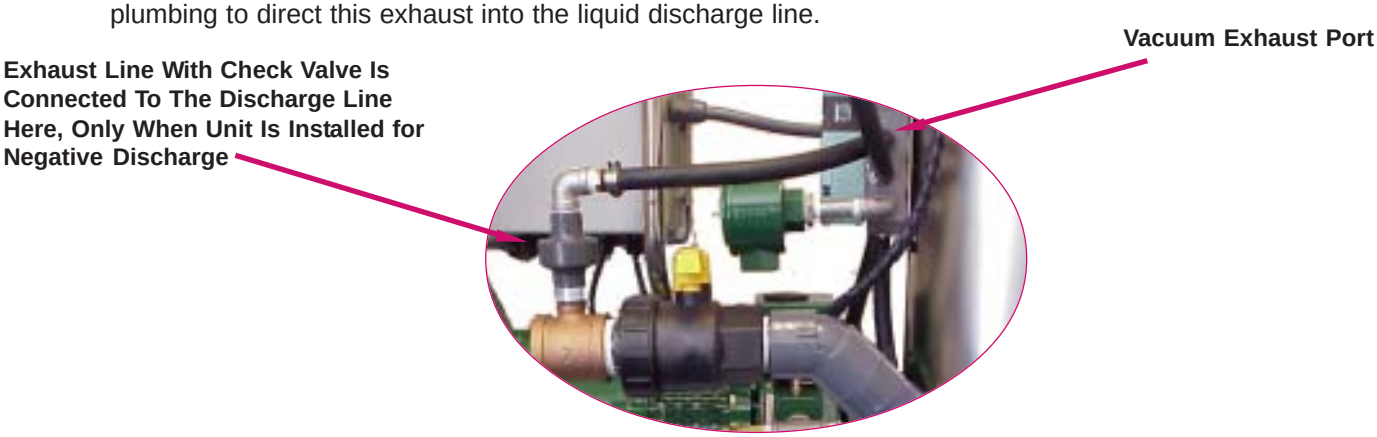
Vacuum Exhaust Plumbing (Optional)

1. When the pump unit is in the vacuum mode the pressure side of the air pump is being exhausted through one of the ports on the output side of the 4way valve. The liquid being pumped may smell or have characteristics that should not be discharged direct to atmosphere. Also because the air pump is an oil protected vane type a small amount of oil is being discharged with the exhaust air. For these reasons this pump unit is equipped with plumbing to direct this exhaust into the liquid discharge line.

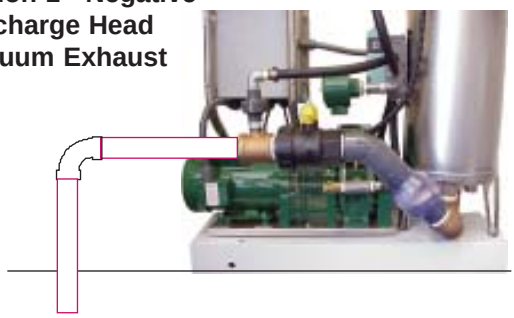


IMPORTANT

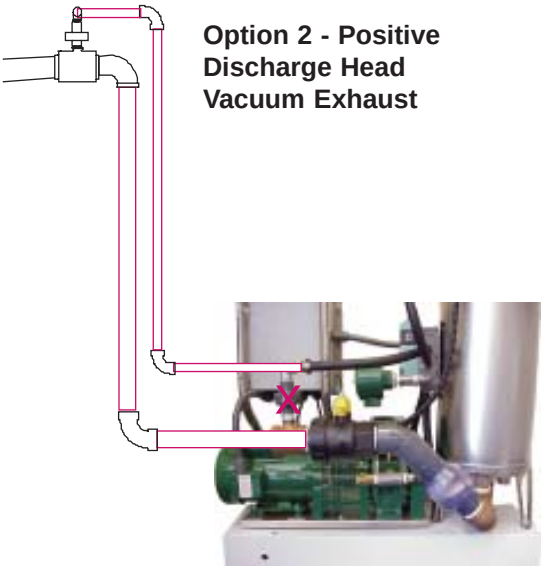
Never Use Factory Setup With A Positive Discharge Head

2. The pump unit is shipped from the factory with the vacuum exhaust plumbing installed on the discharge line.
3. For final installation the following options apply:
   - If the pump unit is being installed with a negative discharge head - Use the factory installed set up.
   - If the pump unit is being installed with a positive discharge head - The vacuum exhaust air line and check valve must be repositioned and tied into the discharge line at a point where the pumped liquid begins to gravity drain. 1/2" ID hose or pipe is recommended.
   - If neither of the above options are feasible and odor is an issue, the remaining options are to extend the vacuum exhaust air port to some place were the smell is not bothersome or to filter the exhaust air to remove the odor.

Option 1 - Negative Discharge Head Vacuum Exhaust



Option 2 - Positive Discharge Head Vacuum Exhaust



General Installation Guidelines

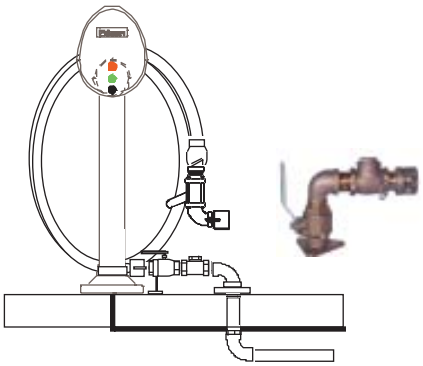
- Stationary pump units should be installed under cover, protected from the weather.
- Install the pump unit in accordance with the performance specification.
- Suction line locations can be 1000s of feet from tank and pump unit but remote start/stop stations that operate on 24 volt power should not be installed more than 300 feet from the pump unit.
- Bolt the pump unit to a secure surface.
- Install for Maintenance - Install the pump in a manner that allows easy access for inspection & maintenance..
- In order to avoid cloging the discharge line should always be the same size or larger than the suction line when pumping liquids with suspended solids.
- All hose and pipe used should be rated for 29” hg vacuum and 25 psi pressure.

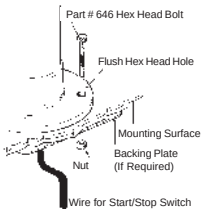
Suction Inlet Side 1 1/2” or 2”NPT

Discharge Side 2” NPT Only

Pump Out Installation Guidelines

- Position the hose stand and hydrant so that the hose assembly can easily reach the boats to be pumped.
- Support hydrant with a plumbing hanger if necessary.
- Use the aluminum mounting bolts to secure the hose stand. If they can not be used, use appropriate substitutes. Aluminum is recommended.
- Secure hydrant to surface with appropriate hardware.





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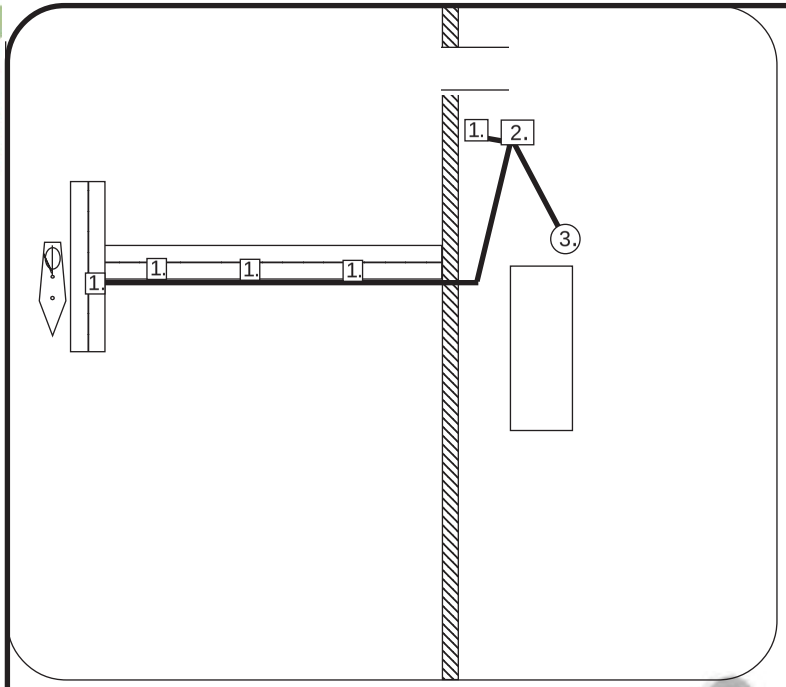


Distances

a. 1.
c. 2.
b. d. 3.

Legend
Elevation:
a. 20'
b. -2'
Horizontal:
c.1000'
d. 200'

All dimensions are approximate.
Should **not** be used for Contractor estimating.

290-10-1HP
Shown With Optional Hydrant 270BR-150

2. Edson Vacuum Pump Unit

1. Pump Out Hose & Stand with Hydrant

Electrical Line
2" ID Sewer Line
1 1/2" ID Sewer Line
2" ID Sewer Line

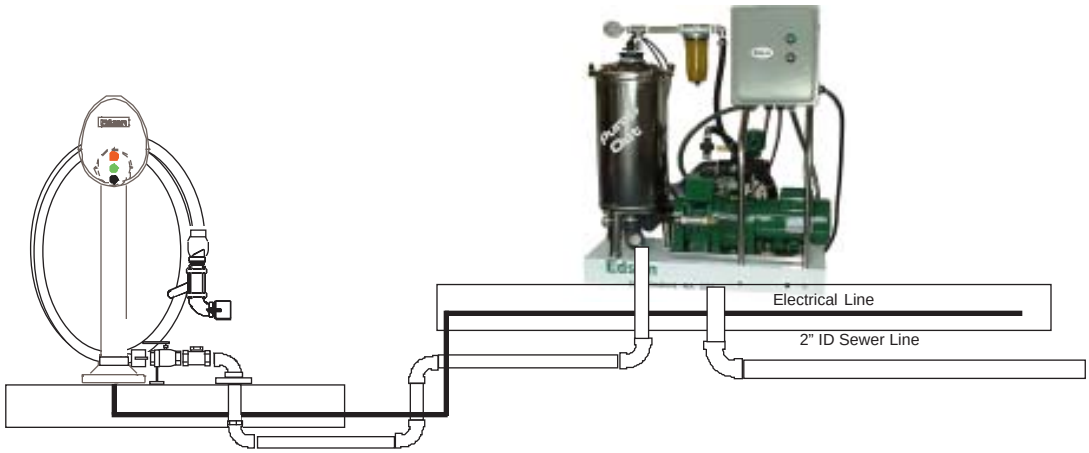
Holding Tank Waste Deck Fill with Pump Out Adapter Attached

3. To Sewer

Edson INTERNATIONAL
146 Duchaine Blvd.
New Bedford, MA 02745
Tel:508-995-9711 Fax:508-995-5021

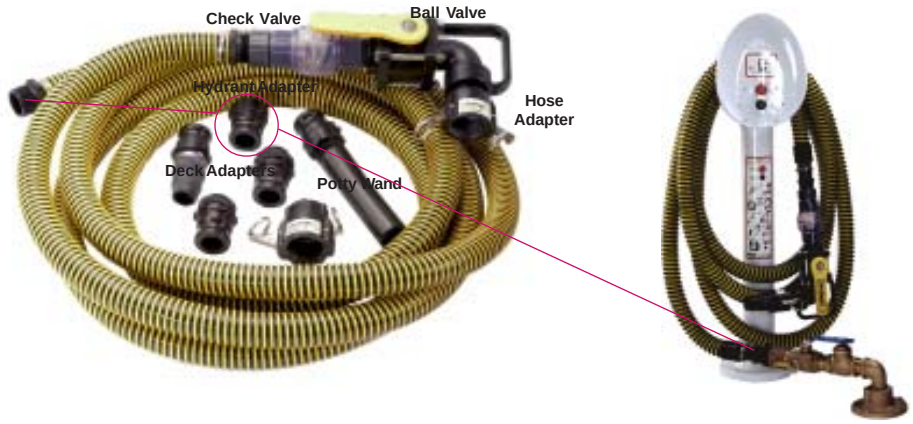
290-10-1HP Pump Out

- Suction plumbing between hydrants and suction inlet of pump unit should be 1½" or 2" ID.
- Discharge plumbing between pump unit and sewage disposal site should be 2"ID.
- Use only wide radius 90^{O} elbows, sewer sweep fitting and sewer wyes in lieu of tees.
- Follow all standard plumbing practices for waste line installations.
- Install for Maintenance - Install the pumbing in a manner that allows easy access for inspection & maintenance.
- Connect plumbing to the tank using unions or easily removed couplings.



6. Pump Out Hose Assembly.

- **Use Pipe Sealant On All Threads When Assembling Hose Components.**
- Hose adapter is a female cam lock fitting. It is screwed into the Ball Valve to provide a secure air tight connection to a boat waste deck adapter.
- 90^{0} Ball Valve keeps the hose from dripping when connected and disconnected from waste deck fittings.
- Check Valve/Sight Glass allows visual confirmation of flow and also prevents back flushing.
- Pump Out Nozzle is a flexible adapter for use when the threaded waste deck adapters can not be used. It is clamped onto the Hose Adapter on the suction end of the hose and then held into the boat waste deck fitting.
- Deck Adapters are threaded waste deck fitting adapters. They are screwed into a boat waste deck fitting so the Hose Adapter can be clamped in place.
- Potty Wand is a nozzle extension for use when pumping out portable toilets.
- Hydrant Adapter is used to convert the thread on the end of the hose to male quick clamp for use with hydrants.

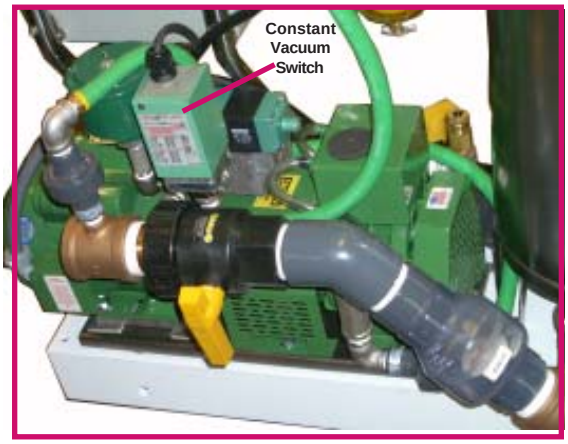


A Good Constant Vacuum Setup Depends On An Air Tight Suction Line

Dry Run Test

1. Turn The Selector Switch On the Control Panel To "Auto" . Red and Green Start/Stop No Longer Operates

- With all the suction lines closed off pump unit should build vacuum to 20 hg and then shut off.
- The vacuum switch differential is set at a high of 20 hg and a low of 15 hg .
- When a suction line is opened and the vacuum pressure drops to 15 hg the pump unit will start and continue to run until the vacuum again reaches 20 hg.
- Close the open suction line to insure shut off at 20 hg.
- If unit continues to run and vacuum never reaches 20 hg, close tank suction ball valve. If unit shuts off at 20 hg, the indication is that there is an air leak in the suction line. Trace and repair the leak.
- Turn selector switch To Off. Motor stops.



Wet Run Test

1. Turn Selector Switch To "Auto" .

- With all the suction lines closed off the pump unit should build vacuum to 20 hg and then shut off.
- Using a suction line and clean water open the ball valve and suck water. The pump unit should fill the transfer cell and when full the 4way valve should come on and the tank will be pressurized and empty the tank. It will continue to cycle until the ball valve is closed.
- When the ball valve is closed the unit will build vacuum to 20 hg and then shut off.
- Whenever the line pressure drops to 15 hg the pump will come on automatically and build vacuum to 20 hg before shutting off.

Optional Operations:

1. Should a suction plumbing leak occur so the unit doesn't shut off :

- Switch pump unit to manual mode and use the start-stop buttons until the leak is repaired.

2. A flashing amber light is provided to visually indicate when the pump is running.

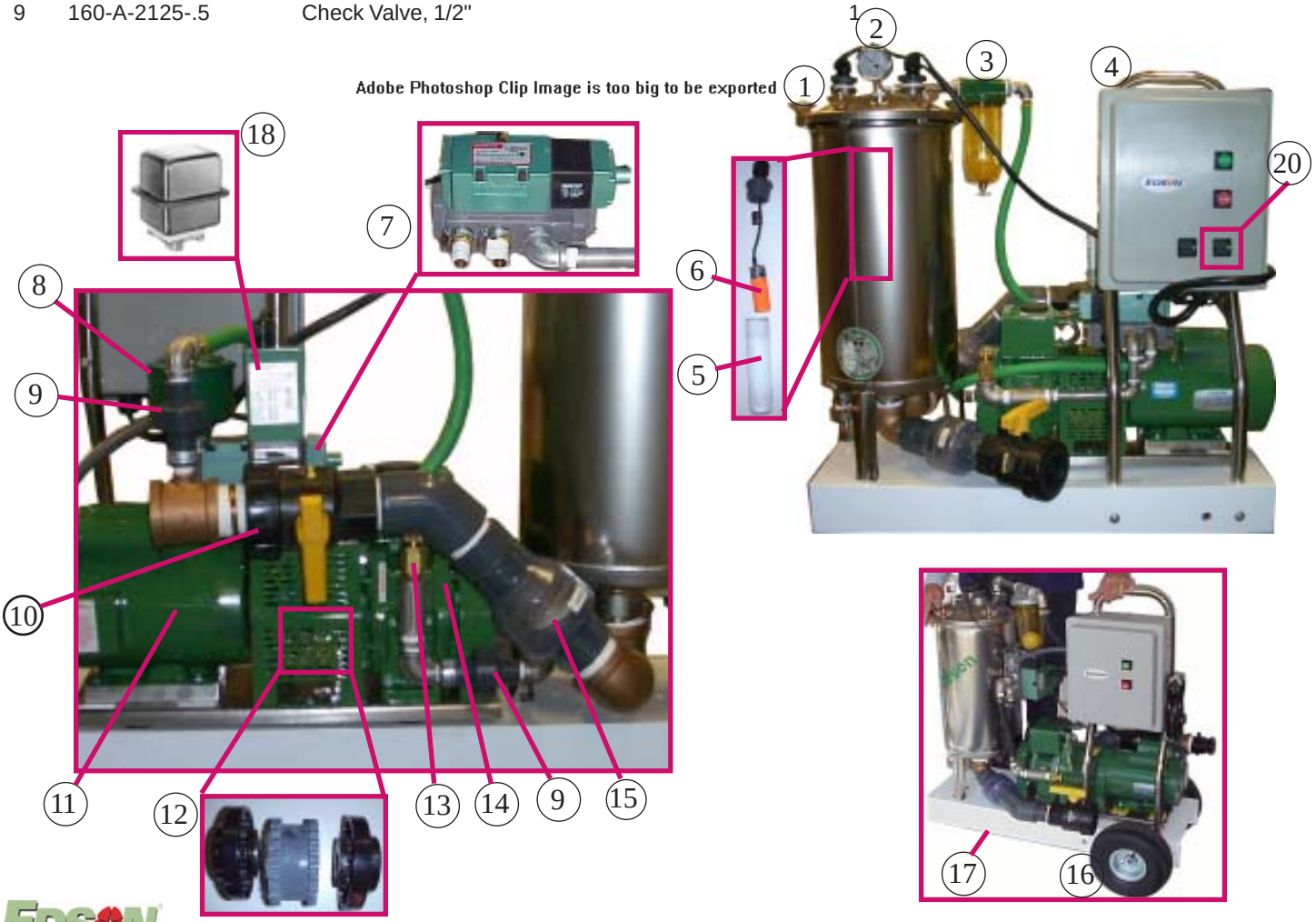
- Whenever the pump motor is operating the light will be on. The light is to be wired to the motor contact with the motor feed voltage. (typically the T1 and T2 on the contact)

Parts List - Pump Unit

Key #	Part #	Description	Qty
1	160-A-2276	10 Gallon Stainless Tank	1
2	161-A-1824	Pressure/Vacuum Gauge	1
3	160-A-2025	Trap, 1" NPT Poly Trap w/Ball	1
4	161-A-2325 or 2598	Electric Control Panel 2Hp 1Ph 120V	1
5a.	160-A-2432-A	Proximity Sensor Tube - 7" Long	1
5b.	160-A-2432	Proximity Sensor Tube - 19.5" Long	1
6	161-A-2413	Proximity Sensor	2
7	161-A-2073	Valve, 4 Way	1
8	161-A-2071FILTR	Filter, Cartridge Type, 1/2" NPT for #3 Pump	1
9	160-A-2125-.5	Check Valve, 1/2"	1
10	264-200	2" Ball Valve	2
11	161-A-2071-Motor	1 Hp Single Phase Motor Only	1
12	161-A-2071-Coupling	LoveJoy Drive Coupling (3 Pcs.)	1
13	161-A-2013	Pressure/Vacuum Regulator	2
14	161-A-2071-Pump	Air Pump Only	1
15	269CL-200V	Check Valve/Sight Glass - 2" - Viton Gasket	2

Options

Portable			
16	160-A-2371	Wheel	2
17	160-A-2370	Castor Wheel, Swivel (Under Frame)	1
Constant Vacuum			
18	161-A-2378-A	Vacuum Switch	1
19	161-A-2378-B	Vacuum Switch Transducer (Not Shown)	1
20	161-A-	Selector Switch 3 Position (Manual - OFF - Auto)	1
21	161-A-2386	Light Flashing W/ Stainless Base (Not Shown)	1
9	160-A-2125-.5	Check Valve, 1/2"	1



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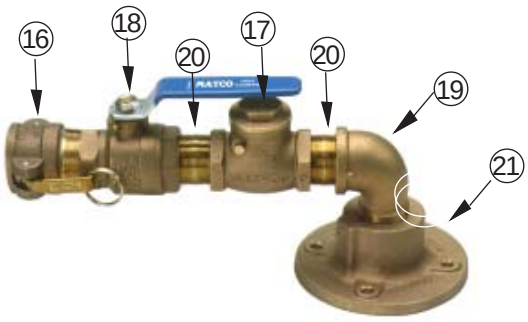
Parts List - Hose Stand and Hose Assembly

No.	Qty.	Part #	Description
Hose Stand 260-284			
1	4	646-7Hex	Hex Head Aluminum Bolts
2	1	161-A-1705	Momentary Mushroom Switch Red
3	1	161-A-1704	Momentary Switch Green
4	1	161-A-1693-2	Pump-Out Instruction Sign
5	1	1610-A-1693-3	Pump-Out Logo Sign
Hose Assembly 261-25-150			
6	25ft	262-25-150	Hose
7	1	269CL-150	Clear Swing Check Valve
8	1	264-90-150	90 Degree Ball Valve 1.5"
9	1	152FM-150NY	Quick Clamp Adapter 1 1/2” FQC X MNPT
10	1	273-150	1 1/2” Deck Adapter
11	1	273-125	1 1/4” Deck Adapter
12	1	272QC-150	QC Pump Out Nozzle
13	1	274-150	Potty Wand
14	1	158MF-150NY	Adapter, Male Quick Clamp X Female NPT 1 1/2”
15	1	151FF-150NY	Adapter, Female Quick Clamp X Female NPT 1 1/2”
Bronze Hydrant 270BR-150			
16	1	152MF-150BR	Adapter, Quick Clamp Female QC X MNPT 1 1/2” Bronze
17	1	269BR-150	Valve, Swing Check Bronze
18	1	264-150BR	Valve, Ball Full Port 1 1/2" Bronze
19	1	160-A-1711	Elbow , 90 Street 1 1/2" Bronze
20	2	160-A-1708-150	Nipple, Close 1 1/2" Brass (Qty 2)
21	1	160-B-468	Flange, Size 0 Bronze Tapped 1 1/2" FNPT Both Ends
Plastic Hydrant 270PC-150			
22	1	152MF-150NY	Adapter, Quick Clamp Female QC X MNPT 1 1/2”
23	1	269CL-150	Valve, Swing Check Bronze
24	1	264-150	Valve, Ball Full Port 1 1/2"
25	1	153OP-150NY	Quick Clamp Plug 1 1/2” (Not Shown)

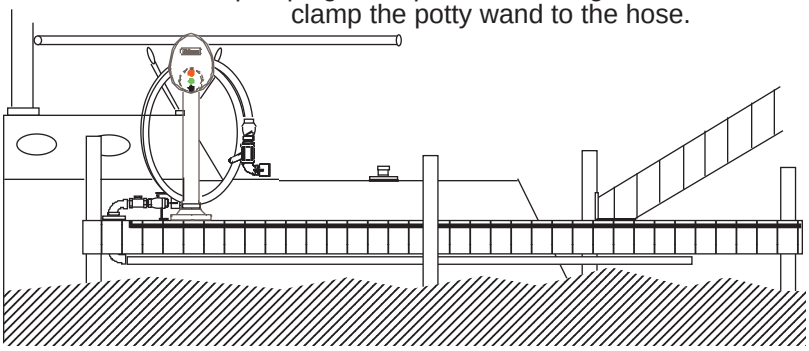


How To Pump Out

1. Make Sure Hydrant Ball Valve Is Open & Hose 90⁰ 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 pump out nozzle to the hose.
- If pumping out a portable holding tank or bucket, clamp the potty wand to the hose.

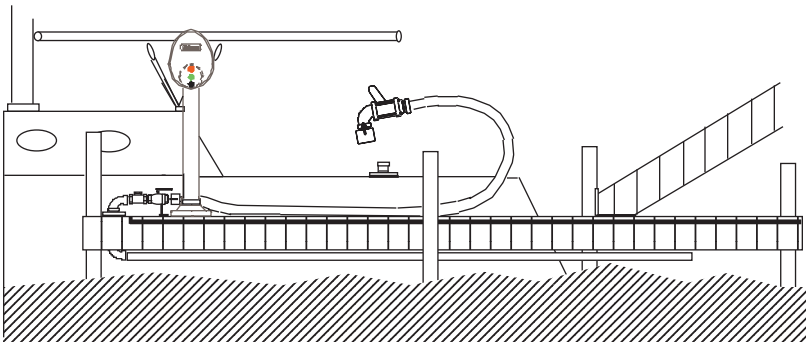


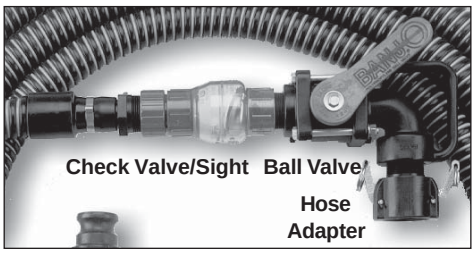
3. Turn On The Pump Out System. **(Not Required for Constant Vacuum Operation)**

- Push the green start button

4. Connecting The Hose To The Boat

- Unwind the hose all the way from the hose stand.
- Clamp the hose to the deck adapter or hold the pump out 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 for 10 sec.
- Lift the hose and close the ball valve.
- Push the Red Stop Button. **(Not Required for Constant Vacuum Operation)**

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.

Maintenance

Caution

Turn System Off At Main Power Source When Doing Any Maintenance That Requires Undoing Or Opening Parts Of Vacuum Unit.
Failure To Lock Out Power Could Result In Injury.

Maintenance Schedule:

1. Daily When In Use:

- **Check Valves-** Each Edson unit is equipped with two clear 2" check valves. (Some Applications require BRONZE CHECK VALVES). The check valves are designed to operate automatically, opening and closing when the unit switches from vacuum to pressure mode. If the unit is not pumping properly or pumping is taking longer than normal, the intake and outlet check valve should be checked to see if any debris is keeping it from opening or closing completely.
  If a check valve is clogged, it may be removed for cleaning or you can try the following:
  1. Close the ball valves.
  2. Start the pump and let pressure build.
  3. Open the Inlet ball valve quickly flushing the inlet check valve.
  4. When the tank is full close the inlet ball valve and let pressure build in the tank.
  5. Open the discharge ball valve to flush the discharge check valve.
- **Moisture Traps-** The Edson unit is equipped with a clear bowl moisture trap installed on the tank to pump line. It is there to remove oil and moisture from the air line when the unit is in vacuum mode. It also acts as a vacuum shut-off if the unit fails to switch from vacuum to pressure. This clear bowl trap should be checked periodically for moisture and drained accordingly. If it is filled with liquid the vacuum pump should be flushed.

2. As required:

- Check oil level. Refill when low. Use biodegradable hydraulic oil or 10W-30 or 10W-40 oil.
- Drain and clean secondary trap.
- Do pressure test. Page 9

3. Semi Annually:

- **Clean Regulators:** Take each regulator apart and wipe clean. Reassemble and adjust per instructions. Page 10
- **Check Air Filter-** Replace as required. Order # 161-A-1629-A. The air filter is found inside the canister. It is a cartridge filter that removes particles from ambient air when the vacuum unit is in the pressure mode.
- **Flush Air Pump -** Flush the system at least once a year (twice a year if used regularly) or if the pump gets a significant amount of water sucked into it.

Air Pump Flushing

Performed for regular maintenance and in cases of liquid being sucked into the pump *(See Trouble Shooting / Condition 3 pg.18)* or if vacuum pump does not turn freely by hand.

1. If the air pump is creating vacuum, disconnect the oil feed line from the reservoir an use it to suck 1/2 cup of kerosene into the air pump. If it is not working unscrew the pressure regulator and pour the kerosene into the pump.
2. Replace the regulator and let the pump sit for 10 minutes. Run unit in the pressure mode for about 15 sec.. If the pump will not run let the kerosene sit for two hours. Try and turn the pump by hand. If it still will not turn, wait one day. If after one day the pump will not turn over, the pump must be rebuilt or replaced.
3. If the pump runs, make sure the oil reservoir is full and run the pump so oil enters the pump unit.

Air Pump Maintenance & Rebuilding

The main replaceable parts are vanes (four per pump), bearings (two per pump) and seals (two per pump)
See for Pump "Operating Instructions" manual for detailed instructions on rebuilding the pump.
Service kits are available for mechanically inclined owners and operators. We also offer a factory exchange program and a factory repair program.

Trouble Shooting

Condition 1. No Vacuum At The Hose or Pipe Inlet.

Isolating The Problem: If Constant Vacuum Option Is Installed Switch to Hand Start Mode.

Step 1 - Check motor. Push green start button on pump unit.

1. Motor is not running. See Electrical & Trace Problem.
2. Motor is running, but there is low or 0 vacuum reading on the pressure gauge. Proceed to Step 2

Step 2 - Check for tank pressure leak. Close inlet and discharge ball valves on the tank.

1. Vacuum gauge still reads 0. See Condition 2.
2. Vacuum gauge builds vacuum to regulator preset. Proceed to Step 3

Step 3 - Isolate vacuum leak. With unit running in vacuum and open discharge ball valve.

1. Vacuum gauge drops. See Check Valves, Pg. 17.
2. Vacuum gauge holds vacuum to regulator preset. Proceed to Step 4

Step 4 - Open suction ball valve.

1. Vacuum gauge drops. Check for break in suction line. Check Suction Plumbing
2. Vacuum gauge holds vacuum to regulator preset but no vacuum at end of inlet plumbing. Check for blockage in suction line.

Condition 2. Air pump is running but vacuum/ pressure gauge reads 0 or very low with inlet and discharge ball valves closed.

Problem is isolated to vacuum pump unit. (Keep Ball Valves Closed)

1. Check air pump. Run pump unit in pressure mode and check for vacuum at air filter inlet. If no vacuum at air filter, remove filter cartridge and flush air pump. See pg.17. If ok.....
2. Check for air leaks in air pump assembly plumbing. If found tighten or replace fitting or hose. If ok.....
3. Check regulators. See Pg.7. If ok.....
4. Check 4 way electric valve. Remove exhaust and tank hose from output side of valve. Run unit in vacuum and pressure mode. Is valve switching positions? Is pressure and vacuum strong. If no, call Edson for replacement. If ok.....

Condition 3. The Trap Is Filled With Water.

This usually means that the sensors or the 4 way electrical valve failed to switch the air pump from vacuum to pressure. In case the trap failed to prevent water from being sucked into the air pump and 4 way valve.

1. Unscrew and empty trap bowl. Put it back and run pump in pressure mode to clear pump and air line of any water. Flush air pump See page 17
2. Test unit to identify cause of failure to switch from vacuum to pressure. Page 5
    a. One of the sensors is not working or needs calibration Pg. 19.
    b. A relay not working.
    c. 4 way valve malfunction due to mechanical or electrical problem.

Sensor Installation and Sensitivity Adjustments:

The 290-10-2210 vacuum pumping unit operates with two sensors. These sensors are mounted in the polypropylene tubes under the tank cover.
Due to varying line voltages or replacement, a field adjustment may be required to operate the unit effectively.

When installing a new sensor the sensitivity needs to be “dialed In”. A very small screw driver is required to turn the sensitivity screw.

TOP SENSOR

1. After the sensor has been connected to the unit, place it in the appropriate tube, turn the pump unit on.
2. A red indicator light should illuminate on the sensor. (If it doesn’t come on, turn the screw counter clockwise until it turns on and follow below.)
3. Using the screw driver, turn the sensitivity screw clockwise until the light turns off.
4. Turn the screw counterclockwise just until the light turns on.
5. Place the end of the tube in the open palm of your hand. The indicator light should go off.
6. Adjust the screw counterclockwise until the light comes back on, be sure to count the number of turns required to turn the light on while positioned on your palm.
7. Turn the screw clockwise half the turns counted in the previous step.
8 Test the adjustment by slowly moving your palm toward the tube end and about 1/4” **before** you touch the end of the tube the light should go off.

BOTTOM SENSOR

Repeat the above steps 1-7.
8. Adjust the sensor counterclockwise until your palm has to be pressed against the tube end to make the light go off.

Note: Be sure the sensor is in the bottom of the tube when checking the indicator light. Any space or liquid between the sensor and the tube will defeat the adjustments.

Troubleshooting Adjustments.

Unit will not go back to vacuum	Turn the lower sensor screw CCW 1/4 turn, repeat as needed
Pump draws excessive liquid into site glass basin	Re-adjust the top sensor.
Pump rapidly cycles between vacuum and pressure	Turn lower sensor CW 1/4 turn (repeat if needed)

Sensitivity Screw

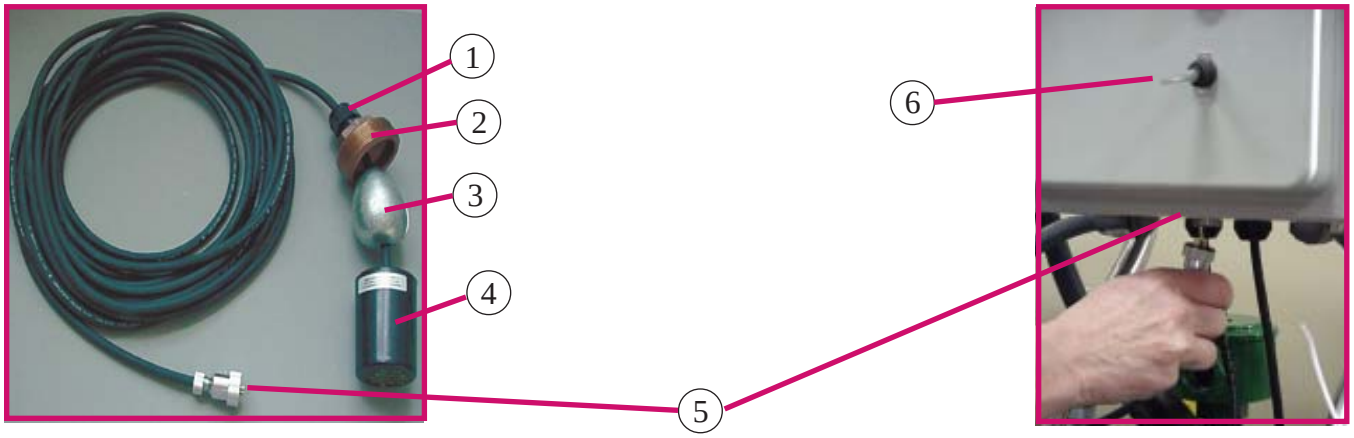
Indicator Light

External Float As Stop Switch:

Operation

Filling a tank or a drum this NC float switch will shut off the vacuum unit when the float goes horizontal. The control panel is modified with a switch and a external watertight terminal for connecting and activating the float switch.

- Put the float switch into a drum or tank. Adjust the height of the float and weight using the wire strain relief mounted on top of the 2” tank plug.
- Turn on the Float On/Off Switch.
- When the float switch goes horizontal the motor will turn off.



Parts List

1	160-A-2197	Electrical, Strain Relief 1/2”	1
2	160-A-2055	Bushing, Reducer, 2” X 1/2”, Bronze	1
3	160-A-2075	Weight, Float	1
4	160-A-2219	Float Switch, Normally Closed	1
5	161-A-2437	Electrical Plug Connector, Four Pin	1
6		Electrical Switch, 2 Position	1