

## 11. Warranty

OAKTON warrants this pump to be free from significant deviations in material and workmanship for a period of one year from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the warranted time period, please return—freight prepaid—and correction will be made without charge. OAKTON alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

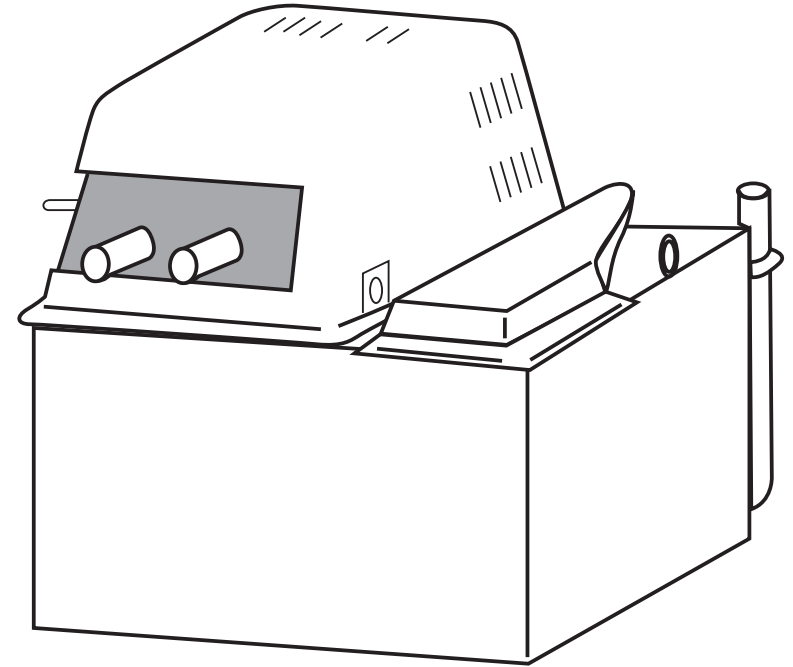
## 12. Return of items

Authorization must be obtained from our Customer Service Department before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. We will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorized returns.

NOTE: We reserve the right to make improvements in design, construction, and appearance of products without notice.

## OPERATING INSTRUCTIONS

# Aspirator Pump



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**OAKTON**<sup>®</sup>

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## Table of Contents

1. <b>Introduction</b> .....	4
2. <b>Before Operating</b> .....	5
3. <b>Operating Principle</b> .....	6
4. <b>Assembly</b> .....	7
5. <b>Operation</b> .....	8
6. <b>Parts</b> .....	9
7. <b>Precautions</b> .....	10
8. <b>Troubleshooting</b> .....	11
9. <b>Specifications</b> .....	11
10. <b>Accessories</b> .....	11
11. <b>Warranty</b> .....	12
12. <b>Return of Items</b> .....	12

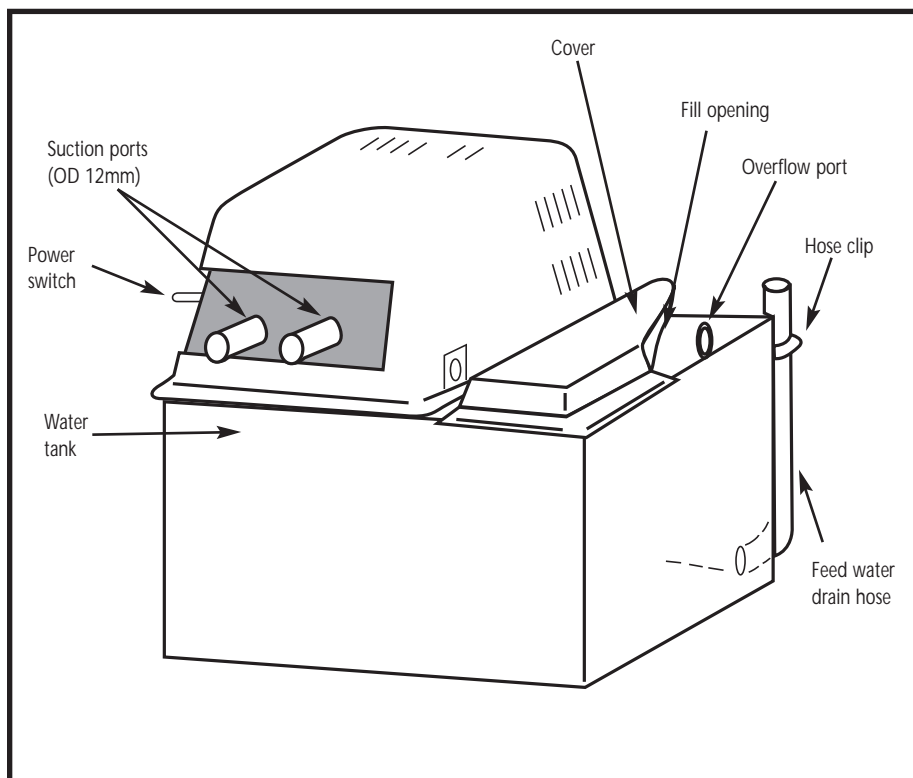
## 1. Introduction

Your new OAKTON aspirator pump delivers 12 to 14 liters/min at each of its two ports (12 mm OD). A unique recirculation system lifts water from an independent 10 liter reservoir tank and generates a pulseless vacuum to 29"Hg (74 cm).

Special two-compartment design greatly reduces motor noise and allows easy access to the water tank when using ice or an immersion cooler to maintain the high vacuum. The system operates on the same principle as a water-tap aspirator, but does not have to be located near a sink or water supply since the water is circulated internally.

The two suction ports operate independently, allowing the aspirator to be used with two separate systems. You can increase free air capacity for use with a single system by joining the ports with a Y-connector and vacuum tubing.

Figure 1: External view of pump



## 2. Before Operating

### Unpacking

Unpack carefully and check to make sure all parts are included with the unit (see figure 1).

### Filling the aspirator

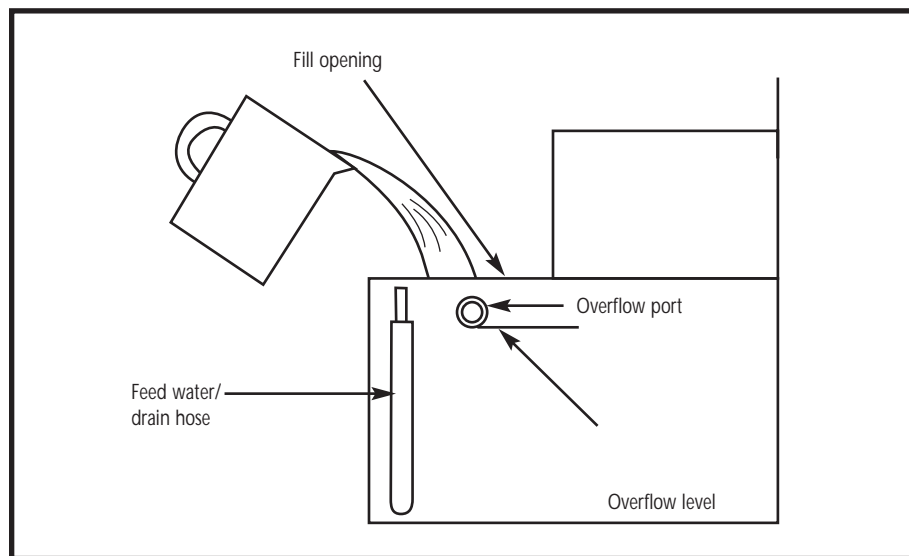
Remove the cover of the aspirator and pour water into the tank through the fill opening to the level of the overflow port. (See figure 2).

### Cooling the water temperature

If you are using the aspirator without a running water hookup, cool the internally circulating water by inserting ice or an immersion cooler through the fill opening. Cooling the circulating water will prevent loss of suction force caused by a rise in the water temperature (see Operating Principle section and figure 3, which shows the relation between the temperature of the circulating water and the maximum attainable vacuum).

**NOTE:** You need to use a running water hookup for use with organic solvents. Connect the feed water/drain hose to a tap and supply water at approximately 1L/min. Firmly connect the overflow port to a sink or drain with appropriate tubing, kept as short as possible, to drain excess water.

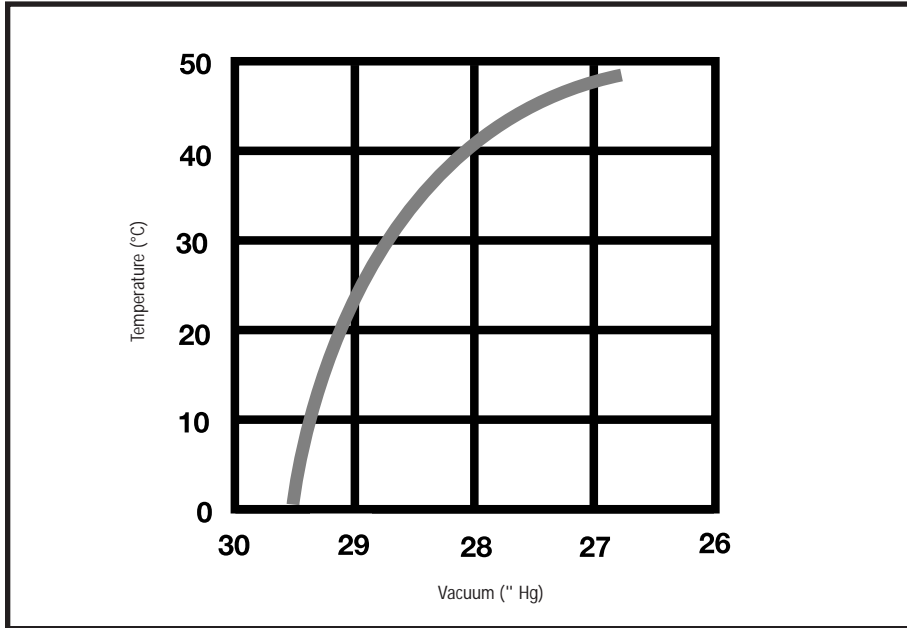
Figure 2: Filling the aspirator



### 3. Operating principle

The OAKTON Aspirator pump, like other water-tap aspirators, operates on the Bernoulli effect. A fast-moving stream of water passes a port in the line; that motion creates a pressure drop down to the vapor pressure of water at that temperature (0.67" at room temperature). Since vapor pressure is inversely proportional to water temperature, you increase the pressure by lowering that temperature. See figure 3 for a graphic representation of this principle.

Figure 3: Vapor pressure curve



### 4. Assembly

#### Without a regulator

Connect suction ports to your system or systems using vacuum tubing. If you are depressurizing only one system, you can obtain maximum suction by connecting the system to the aspirator with a Y-connector (see figure 4).

If the second suction port is left open, air will be pulled in and mixed with the circulating water, lowering the vacuum. However, it is not necessary to cover the second port while operating the system.

#### With optional vacuum regulator:

Connect the vacuum regulator to one of the two suction ports by means of the attached nut (see figure 5). Then connect the vacuum regulator nipple to your system using a vacuum hose. Contact your OAKTON distributor to order an optional vacuum regulator.

Figure 4: Using a Y-connector

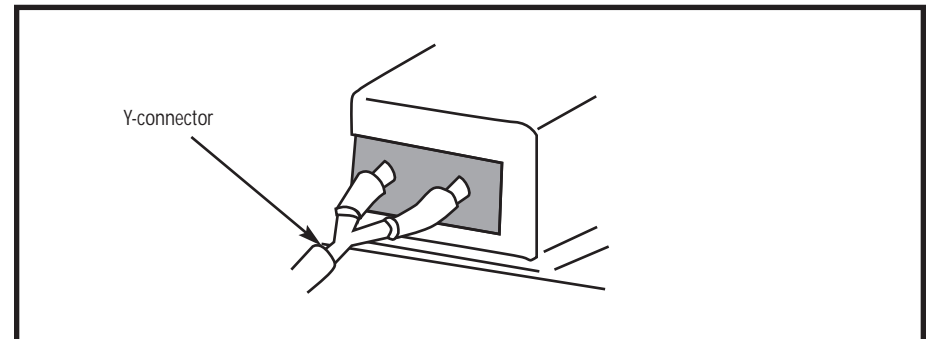
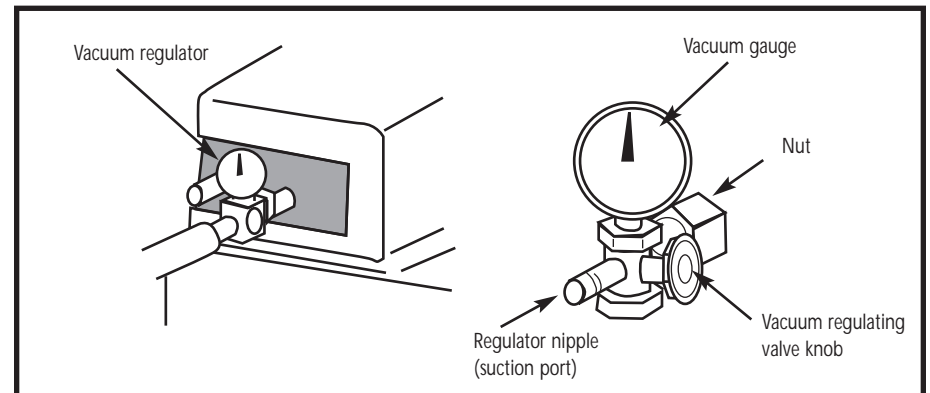


Figure 5: Using a vacuum regulator

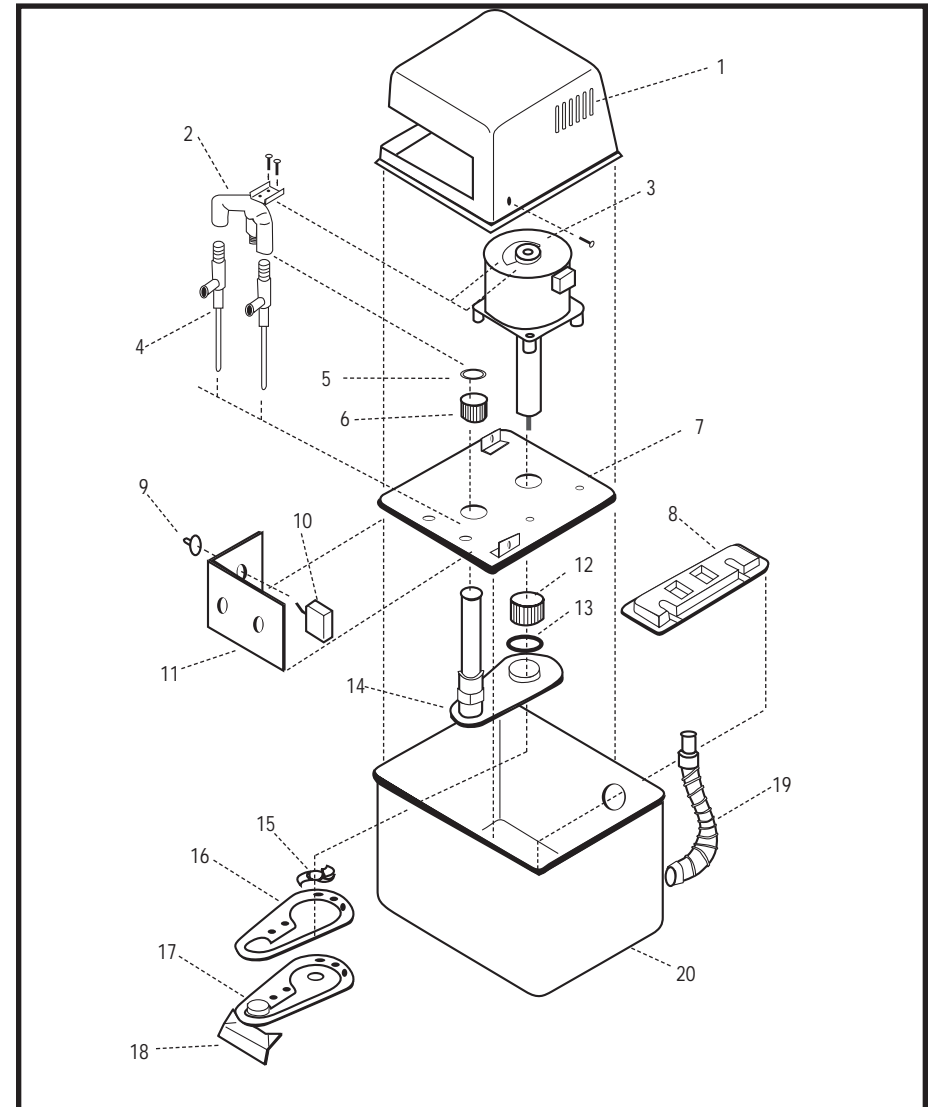


## 5. Operation

1. Follow instructions in "Assembly" section on page 7.
2. Turn power switch to "ON" to begin operation and create the vacuum.
3. If you are using an optional vacuum regulator, set the desired degree of vacuum by slowly turning the control knob while reading the gauge.
4. After operating, release the vacuum in the system by turning off the vacuum regulating control knob, or by removing the vacuum tubing from the suction ports.  
**NOTE:** if you do not release the vacuum before turning off your aspirator, water will backflow into the vacuum tubes and corrode the float ball.
5. Switch power to "OFF".
6. Turn off tap water if necessary. A metal aspirator with a backflow prevention valve is provided, but if the system is left in a decompressed condition, a gradual backflow will result.
7. If water tank is to be drained, release the feed water/drain hose from the hose clip and connect it with a sink or drain.

## 6. Parts

Figure 6: Parts diagram



- |                            |                       |                               |
|----------------------------|-----------------------|-------------------------------|
| 1. Cover (motor)           | 8. Cover (tank)       | 15. Propeller                 |
| 2. Connecting pipe         | 9. Rubber cap         | 16. Gasket                    |
| 3. Motor                   | 10. Power switch      | 17. Casing pump, bottom cover |
| 4. Aspirator tube          | 11. Panel             | 18. Plate                     |
| 5. O-ring (105)            | 12. Nut, under        | 19. Hose                      |
| 6. Nut, upper to aspirator | 13. O-ring (113)      | 20. Bath                      |
| 7. Chassis                 | 14. Casing pump cover |                               |

## 7. Precautions

1. Whenever possible, supply running water by means of the feed water/drain hose and the overflow port.
2. If you are using organic solvents, you must supply running water. Upon completion of operation, drain the water in the tank.

Following are examples of organic solvents which require this sort of special care

- Hexane
- Aluminum Chloride
- Butadiene Chloride
- Methylene Chloride
- Ketone (all kinds)
- Phosphorus Trichloride
- Carbon Tetrachloride
- Trichloroethylene
- Naphthalene
- Carbon Disulfide
- Hydrazine
- Hydiodic Acid
- Resorcind
- Ethyl Ether
- Acetic Acid Chloride
- Propylene Chloride
- Chlorosulfonic Acid
- Ethyl Acetate
- Diacetone
- Cyclohexanol
- Toluene
- Propylene Dichloride
- Tetrachloroethylene
- Methyl Ethyl Ketone
- Idoform
- Nitrobenzene
- Chloroform Acetone
- Methylene Bromide Chloride
- Benzene Chloride
- Chlorobenzyl Chloride
- Polyvinyl Acetate
- Alcohol
- Methyl Bromide
- Decalin
- Calcium Disulfide
- Benzene
- Methylene Chloride
- Tricresyl Phosphate

3. If running water cannot be supplied, change the tank water as often as is necessary for its frequency of use.
4. RINSE THOROUGHLY the Aspirator (part #4) after each use.
5. Clean and empty the water in your tank regularly, since solvents build up on the sides of your tank and interfere with the vacuum. The more aggressive the solvent, the more frequently the water must be changed.

## 8. Specifications

**Air suction rate:** 12 to 14 L/min per port (12 mm OD)

**Maximum attainable vacuum:** 29.5" Hg (75 cm Hg)

NOTE: The maximum vacuum attainable corresponds to the vapor pressure of water at your operating temperature (see "Operating Principle" on page 6)

**Circulating pump:** Self-priming, 80W; polypropylene and stainless steel SS304

**Water tank:** 10 L; Polypropylene or stainless steel (depending on model)

**Wetted parts:** chrome-plated brass fittings, PVC internal piping, polypropylene and 304 SS circulating pump, brass venturi

**Hose barb size:** 3/8"

**Overall dimensions:** 14.4"W x 9.6"D x 14.4"H (360 W x 240 D x 360 H mm)

**Power:** 115 VAC, 2.8A, 50/60 Hz, or 220 VAC, 1.1A, 50/60 Hz (depending on model)

**Net weight:**

Polypropylene tank: 20 lbs (9 kg)

Stainless steel tank: 27 lbs (12.3 kg)

## 9. Optional accessories

**Vacuum regulator**

Provides fine control over vacuum produced (does not interfere with vacuum capability). Features a regulating gauge that reads from 0 to 76 cm Hg. Connecting hose and mounting hardware included.

**Dolly**

For easy mobility of unit. Four-caster design. Shipping weight 10 lbs.

**Contact your OAKTON distributor for information.**

## 10. Troubleshooting

**Vacuum Problems:**

Insufficient vacuum is usually due to leakage or contamination. A system must be completely clean and free from leaks to operate efficiently.

Each aspirator tube has a float ball that may stick in one position. Tapping on the aspirator float may release the float ball.

Be sure to check all vacuum connections. If you find that your trouble is within the aspirator tube and can not be dislodged, replacement tubes are available. Contact your OAKTON distributor for information.