

## EASY INSTALLATION GUIDE

### Installations That May Cause Operation Problems

#### Suction Piping:

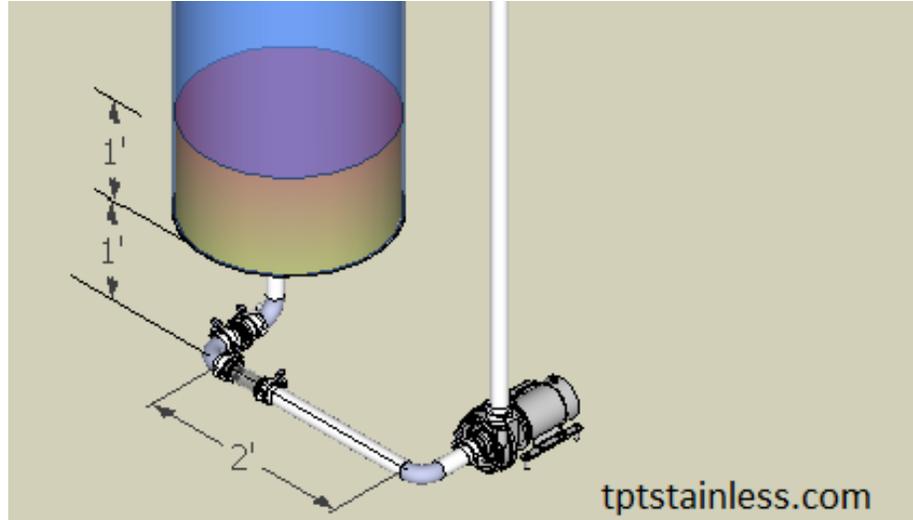
The greatest amount of attention should be devoted to the suction piping

##### ❖ **NPSH (Net Positive Suction Head):**

Net Positive Suction Head is an important element in the proper selection of a centrifugal pump.

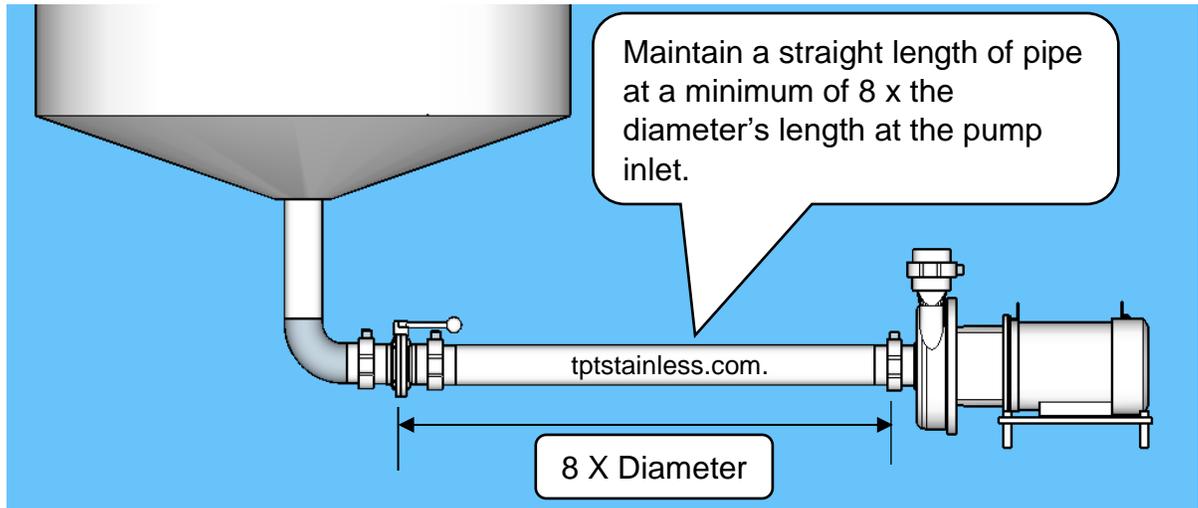
The NPSH required is the head of the liquid required at the pump suction nozzle above the vapor pressure of the liquid at that point.

Net Positive Suction Head is directly related to the problematic phenomenon known as cavitation. Liquid cavitation has a deleterious effect on a pump's internal parts and as a result reduces the pump's efficiency and performance.

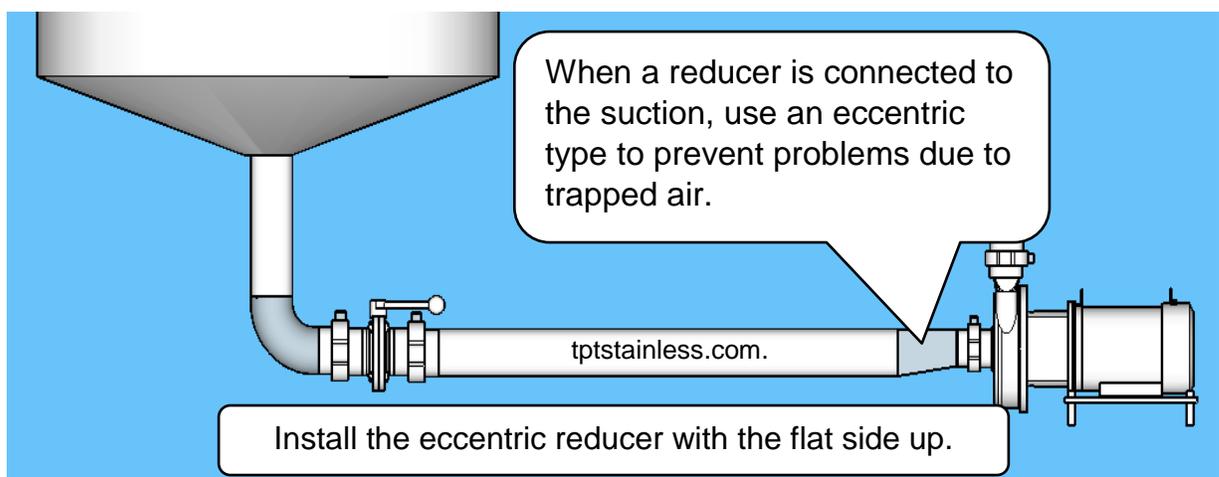


- ❖ **Suction restriction:** DO NOT install any system throttling valves or similar devices to control the flow rate in the supply. Any system **throttling** valves or similar devices to control flow rate must be installed in the discharge line. Restriction in the supply line may cause cavitation and pump damage

- ❖ **Suction distance:** It is recommended that the straight horizontal pipe run is kept to a minimum



- ❖ **Suction reduction:** The suction pipe should never be smaller than the suction nozzle of the pump and in most cases should be at least one size larger. In this case, an eccentric reducer must be used in the suction pump.



❖ **Suction size:**

- The suction pipe should be as short and as direct as possible
- The suction pipe should be sized for a low velocity, typically 3-6 ft/s

**Example:**

Flow: 60 GPM

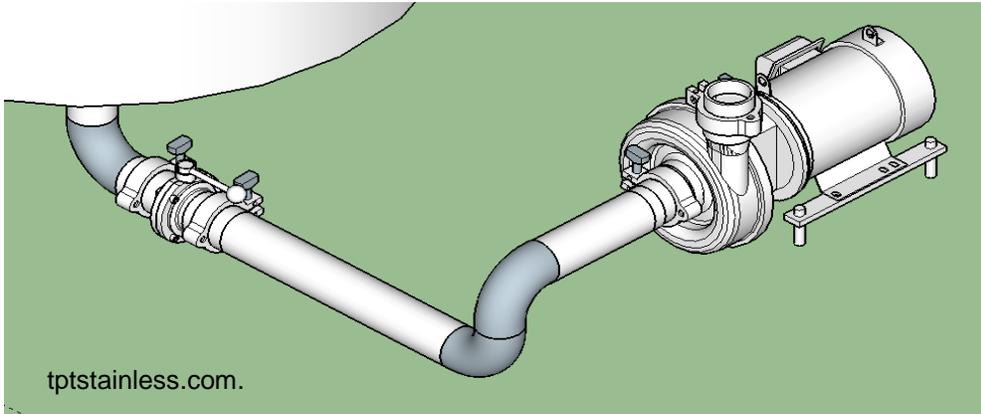
Suction tube size	Suction Velocity foot/sec. @ 60 GPM
1.5"	13
2"	6
2 ½"	4

❖ **Suction Strainers:** The purpose of a suction strainer is to act as a particulate strainer or filter ahead of the pump. This prevents large particles from entering the pump. However, the addition of a strainer in the suction line of a centrifugal pump increases the losses in the suction line, thereby decreasing the NPSH available to the pump. Pumps forced to operate under insufficient NPSH conditions frequently cavitate and vibrate. If a pump operates under these conditions, there will probably be insufficient lubrication at the seal faces. High friction and cavitation, or vibration, at the seal faces can lead to early seal failure. Therefore, the use of a suction strainer is neither mandatory nor recommended. If use of the strainer in suction cannot be avoided, consider the following:

- ✓ The suction pipe should never be smaller than the suction nozzle of the pump and in most cases should be at least one size larger. In this case, an eccentric reducer must be used in the suction pump.
- ✓ Suction pipes should be as short and as straight as possible.
- ✓ The strainer must have an open area at least four times the area of the suction pipe
- ✓ The strainer screen size must be 20 mesh or less.
- ✓ It is important that the strainer screen be checked and cleaned regularly.

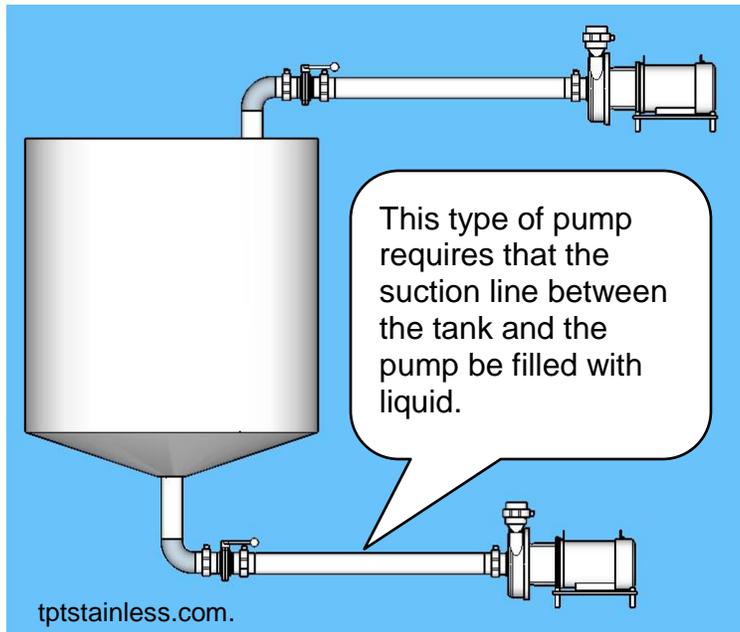
❖ **Elbows on the suction:**

An elbow or series of elbows close to the suction of a centrifugal pump can have a serious effect on its performance.



❖ **Priming:**

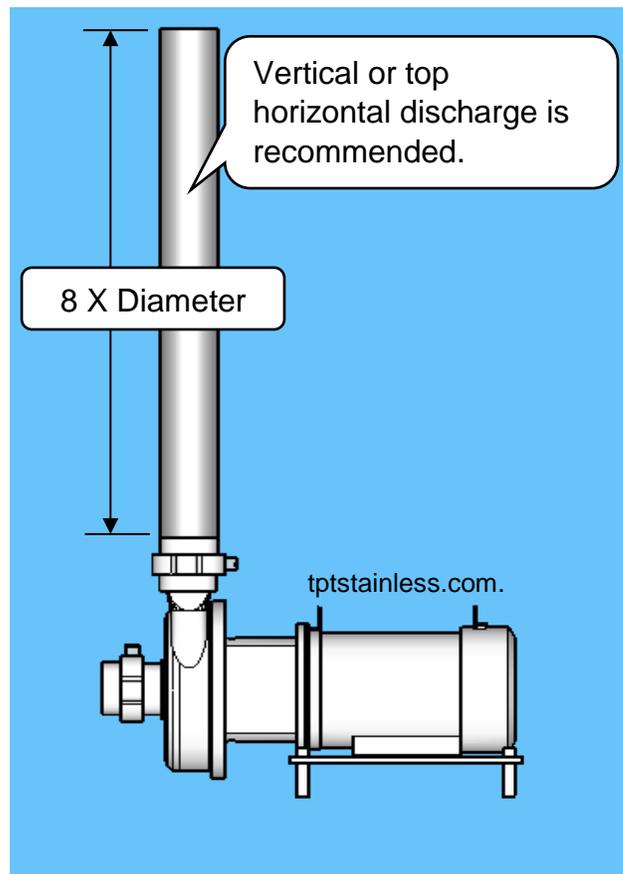
This pump is not self-priming



- ❖ **Water hammer:** Water hammer in the system can damage the pump and other system components. Water hammer often occurs when valves in the system are suddenly closed, causing lines to move violently with a loud noise. One way to eliminate water hammer is to slow down the actuation speed of the valve.
- ❖ **Freezing:** Do not expose the pump to freezing temperatures with liquid in the casing. Frozen liquid in the casing will damage pump. Drain the casing before exposing it to freezing temperatures.

### Discharge Piping:

- The suction pipe should be as short and as direct as possible
- For vertical discharge you can use a concentric reducer



*The owner's manual will give you all the information you need.*