

Condensate pumps are found in a number of applications and are used to collect and then move excess condensate to a suitable drain location. The majority of condensate pumps are installed in residential and commercial properties or used in restaurant applications. (With Mini-Split applications starting to gain acceptance in the North American market, look for a future MARS Tech to learn about condensate pumps for those specialized applications.)

Some of the more common applications for condensate pumps;

- Central Air-conditioning
- Condensing Gas Furnace
- Ice Machines
- Beverage Machines
- Drinking Fountains
- Whole House Humidifiers
- Mini-Split Units
- Refrigeration
- Condensing Gas Boilers

The most common condensate pumps fall into the following categories;

- | | |
|----------------------------------|----------------------------------|
| Medium Reservoir Pumps - | Low Profile Pumps - |
| • 1/2 gallon reservoir | • 1/3 gallon reservoir |
| • 15' or 20' lift | • 20' lift |
| • 120 volt and 230 volt versions | • 120 volt and 230 volt versions |

The basic operation of a condensate pumps is as follows;

- A condensate drain line is piped to one of the inlets on the condensate pump.
- Condensate flows through the drain line and into the reservoir on the pump.
- A float switch is located in the reservoir and once the condensate reaches a preset level in the reservoir the float switch is actuated and the pump motor is turned on.
- The pump moves the condensate through a check valve which is connected to condensate line.
- The condensate is then pumped through the condensate line to a suitable drain location.

This process is repeated as often as needed depending on the amount of condensate being produced and drained to the condensate pump. Condensate pumps in this range are typically of centrifugal design. This means they use an impeller which is connected to the motor shaft. The pump motor spins the impeller pumping the condensate liquid through tubing connected to the pump to a drain location.

Key features for pumps are as follows;

Check Valve-

The check valve is designed to prevent “back flow” of condensate that was pumped to a drain location. Two primary types of check valves are used- check ball or silicone “duck bill”. The check ball design is considered less reliable and more prone to clogs.

Mounting –

Most pumps have a side mount bracket or integrated mounts that are molded into the pump housing. The external side mount brackets that are not integrated do require some assembly and some parts can potentially be lost. Some pumps also include rubber mounting feet that help with stability of the pump and reduce the transmission of noise.

Housing –

Look for a pump that has a drip proof housing. Many of the pumps have a flat housing on top of the motor with air cooling slots. The problem with this design is that whatever dirt and water happen to land on the pump housing also have the potential to be drawn into the motor since the cool air intake for some pumps is also on top of the motor housing.

Safety Switch –

A safety switch is optional on some pumps and is connected to the float in the pump reservoir. Should the pump fail or clog the higher than normal condensate level in the pump reservoir will actuate the safety switch. The safety switch is typically wired into the low voltage control system of a HVAC unit and will turn the system off until the issue with the pump is corrected. This reduces the possibility of water damage for the property owner.

Float –

The most reliable floats are made of solid plastic. Some floats that have been used are a porous foam material which can degrade and collect organic matter. Once this happens the float is no longer a float. The best design for a solid plastic float is to have a stand-off molded into the bottom of the housing so the float will not stick to any debris in the bottom of the reservoir.

Application –

In a typical application you will need to pump the condensate to a Suitable drain location.

The amount of condensate produced by a piece of equipment varies. A high efficiency gas furnace may produce a small amount per heating cycle compared to the amount produced by a coil during a cooling cycle. A humidifier or ice machine may produce a significant amount of liquid that will need to be handled by the condensate pump.

One of the primary goals when installing a condensate pump is to make sure you install and properly sized the condensate pump for the application. You need to know the amount of condensate produced by the equipment you are working with and then determine how high you will need to move the condensate to reach a suitable drain.

How do you determine what pump to use?

All pumps are rated for Lift and GPH.

What is lift?

Lift is how high a condensate pump can pump. Most pumps are rated at either 15 or 20 feet of lift.

What is GPH?

GPH is an abbreviation for Gallons Per Hour and determines how much condensate the pump can pump per hour.

Power source

Determine what power source is available and the voltage. Remember pumps are available in 115 VAC and 230 VAC.

The tricky part is making sure you check how much condensate the pump will move at a given height or lift.

Most manufacturers rate their pumps capability in a chart that shows GPH at 5 foot lift increments.

For example;

Performance - Gallons per hour @ height in feet

Model No.	1	5	10	15	20
XXXXX	125	96	74	70	43

This chart shows that the manufacturer has rated this pump at 125 GPH at 1 foot of lift. It also shows that at 20 ft. of lift the pump can now only move 43 GPH.

Every pump experiences reduced GPH capacity the higher it needs to pump. Don't make the mistake of picking a pump that isn't capable of getting the job done!

The majority of pumps are rated to handle condensate temperatures up to about 130 degrees F. Some “Steam Humidifiers” and “Condensing Gas Boilers” can generate condensate that exceeds the 130 degree F limits. So you will need to use a pump that is rated for these higher temperatures.