

Dry Cleaning Chiller Installation

Installing A Bypass Loop

Purpose:

1. To provide a continuously circulating water flow through the chiller coil, tank and piping system. This is necessary to maintain the reservoir at the cold temperature setting. **The system should be balanced so that the flow through the bypass loop while maintaining sufficient flow to the process.**
2. To establish the minimum operating pressure of the cooling water supply to the process machine. This is a result of setting the continuous flow at maximum. This also establishes a **high pressure supply** to the process machine and a **low pressure return** to the chiller for good circulation through the process machine heat exchangers. The differential pressure between the supply and return should be a minimum of 20 psi.
3. To allow the chiller refrigeration to cycle on and off freely, and independently of external demands for flow and temperature.

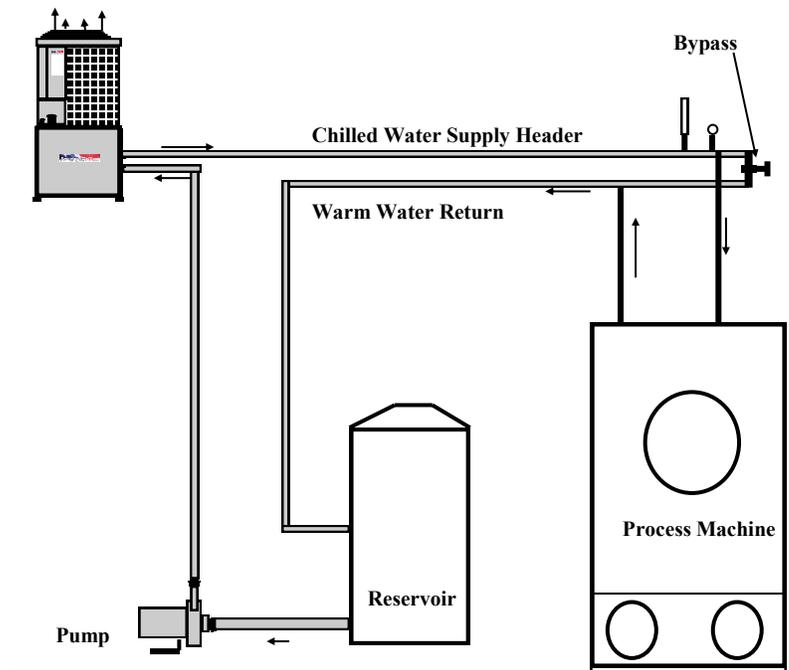
Where To Put The Bypass:

The bypass valve must be located at the end of the line, with the process machine connections between the bypass and the pump.

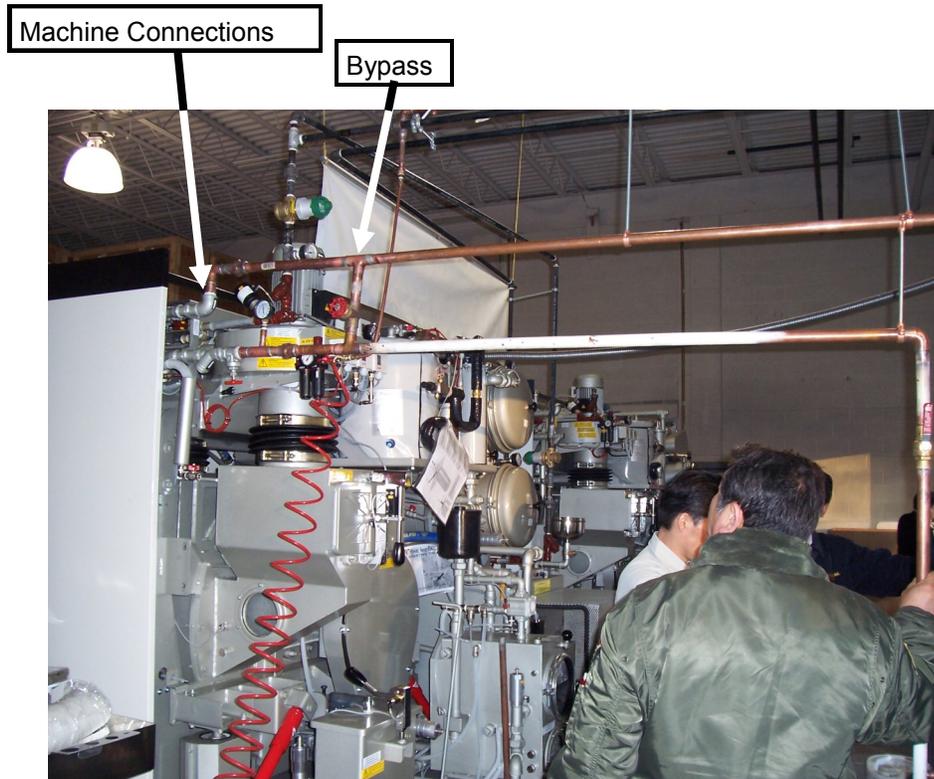
The illustration below shows a modular chiller system with the process (dry cleaning) machine correctly connected to the piping **between the pump and the bypass**.

The pressure to the process machine (s) will be the same every inch in the line between the bypass and the pump. Two machines can be connected and their supply pressure will be the same.

The picture shows the bypass **before the process machine connections** and the pressure will be lower to the machine when the bypass is open. The drop in pressure will **increase** as the bypass is opened and set for optimum flow to the chiller. **The process machine heat exchangers very likely will starve for cooling as a result.**



This photo clearly shows the **wrong way** to connect the bypass. The natural tendency of the operator when the process machine alarms due to lack of cold water is to **close the bypass to force more pressure and flow to the process machine heat exchangers.**



Starving the Chiller:

The process machine will get more pressure and flow as a result of closing the bypass - But what happens to the chiller?

The chiller will starve for flow causing the water temperature to be very cold coming out of the chiller **but at a reduced flow that will cause the loop temperature to swing wildly between cold and hot!** The purpose of the flowing loop has been defeated and the chiller can not maintain the reservoir and loop temperature at an even temperature. The temperature fluctuations of the water supply can be 30 to 40 degrees or more.

Bypass Line Size:

The piping connections on the chiller are the correct size for the supply and return header lines based on sound engineering principles of flow, pressure drops, and fluid velocity. Reducing the line size from the recommended causes higher velocities, higher pressure drops, reduced supply pressure to the process machine, and fluctuations in the supply temperature.