

Basic Terms – Recirculating Water Chillers

Use this helpful glossary to learn more about some of the most commonly used chiller terms. Whether you are looking to learn the basics of what a chiller is or if you are aiming to understand more complicated terms, this glossary can help you. If you would like to know more about chillers, and you don't see it on our web site, please contact us at Production Engineering to learn more. We will be happy to assist you.

Air-Cooled

Refers to a chiller system that uses the ambient air surrounding the condensing unit to cool and condense the refrigerant back into a liquid.

BTU

BRITISH THERMAL UNIT (BTU) is a unit of measure often used to describe chiller capacity. A single btu is the amount of energy required to raise one pound of water one degree F.

Central Chiller

A central chiller is referred to as any chiller used to cool several processes. The chiller can be either water or air cooled, and have a stationary or portable configuration.

Chiller

A water chiller is a refrigeration apparatus that produces cold water or water/glycol mix, to cool industrial process equipment or provide comfort cooling for buildings. A water chiller uses the evaporation of a refrigerant to cool the fluid through a heat exchanger. The fluid through a piping system or circuit to reach the process equipment.

Compressor

A compressor in a refrigeration circuit compresses cool low pressure refrigerant gas to hot high pressure refrigerant gas that is then condensed back into a liquid to be used again.

Glycol

Glycol is added to the water in a chill water system to protect from freezing. Glycol is available as Ethylene Glycol or Propylene Glycol and can either be purchased with or without rust inhibitors. The freezing point of the fluid is dependent upon the concentration of the glycol. The higher the concentration of glycol the lower the freezing point, but as the concentration goes higher the heat transfer properties are reduced. This will reduce chiller capacity.

Hot Gas Bypass

Hot Gas Bypass is a valve that bypasses a portion of the hot gas leaving the refrigeration compressor. This bypassed gas does not enter the condenser and is reintroduced into the circuit after the expansion valve and before the evaporator. This practice is used for low load applications and can also be used to assist in low ambient conditions.

Industrial Chiller

Industrial chillers often refer to chillers used for process cooling versus comfort cooling applications. The heat loads and leaving fluid temperatures may be different in process cooling applications than those found in comfort cooling applications. Some components, system pumps, and fluid volumes requirements will be different.

Low Ambient Kit Chiller

Modification allows for proper chiller operation in low ambient conditions. The modifications will vary depending on the type of chiller, refrigerant used, the actual temperatures involved, leaving fluid temperature, and fluid being cooled.

Low Temp (LT) Chiller

Low temperature chillers can vary depending on manufacturer. LT chillers are designed to operate below 40F leaving fluid temperature.

Medical Chiller

Refers to a chiller or chiller system that is used in the medical industry. Typical applications included MRI and LINEAR ACCELERATORS, and PET SCANNERS. Due to the critical nature of these applications Medical Chillers are generally equipped with Automatic City Switch Over, Air Compressors, Refrigerated Air Driers, and various other alarms to help insure patient comfort.

Portable Chiller

Portable chillers are mounted on castors and capable of easy relocation within your production facility.

Refrigerant

A refrigerant is any substance used to cool the water in a chiller through a heat exchanger or evaporator. The substance typically has a low boiling temperature and includes Freon and ammonia.

Refrigeration Unit or Refrigeration Circuit

A refrigeration unit includes all the components needed to evaporate and condense a refrigerant.

Reservoir

A reservoir is required for most all process cooling applications. A good “rule of thumb” for sizing a reservoir for process cooling would be to allow for at least 6 gallons of fluid per ton of chiller capacity. Larger volumes may be required depending on the variation of the heat load.

Reverse Flow

Reverse Flow is a portable water chiller without a tank. It is used in open loop cooling applications where an external tank or trough is used. This tank or trough must gravity feed into the chiller pump which sends water through the chiller and filter, back to the process or back to the tank or trough.

Standard Flow

Standard Flow: is a portable water chiller with a tank. They are used in closed loop cooling applications where all of the water pumped from the chiller returns to the machines under pressure generated by the chiller pump.

Tank

See Reservoir.

Water Cooled

Water cooled chillers absorb heat from process water and transfer it to a separate water source such as a cooling tower, river, pond, etc. They are generally used for large capacity applications, where the heat generated by an air-cooled water chiller creates a problem. They are also considered when a cooling tower is already in place, or where the customer requires optimum efficiency of power consumption. Water cooled chillers require condenser water treatment to eliminate mineral buildup. Mineral deposits create poor heat transfer situations that reduce the efficiency of the unit.