



*Closed Loop Cooling Systems*

## *Why Use a Closed Loop Cooling System?*

Closed loop coolers are used extensively to cool water in a closed system where it is important to eliminate the scaling, corrosion and sludge formation that can occur with open type cooling towers.

Scaling is a major problem in the water cooling jackets of industrial equipment such as compressors, welding machines, plastic molding machines, etc. By using a closed loop cooler, the water is cooled inside a coil and does not come in contact with the recirculated spray water or air flowing through the unit, clean cool water is delivered back to the water jackets or heat exchangers and down time due to scaling and sludge formation is eliminated.

## *Types of Flair Coolers*

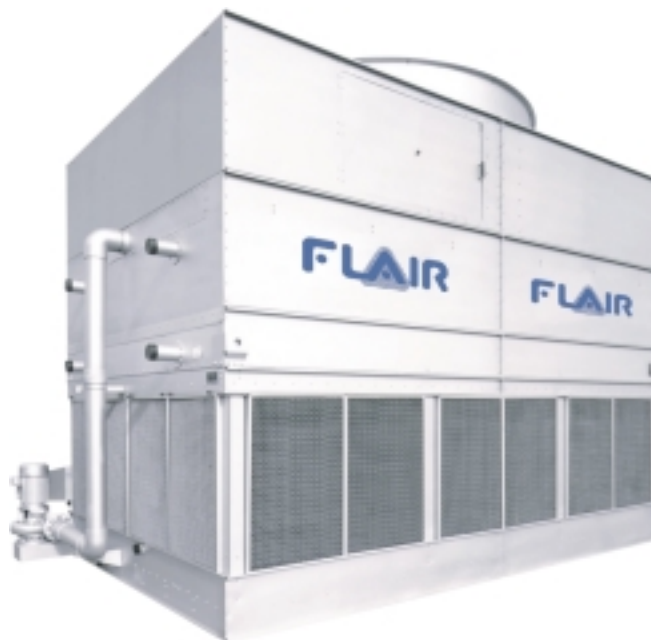
Flair closed loop cooling systems are designed especially for use with water cooled equipment or processes.

Flair closed loop cooling systems incorporate features necessary to keep machinery or process cooling circuits clean and performing at their peak efficiency.

Closed Loop Fluid Cooler



Closed Loop Evaporative Cooler



# How the Flair Evaporative Cooling Systems Work

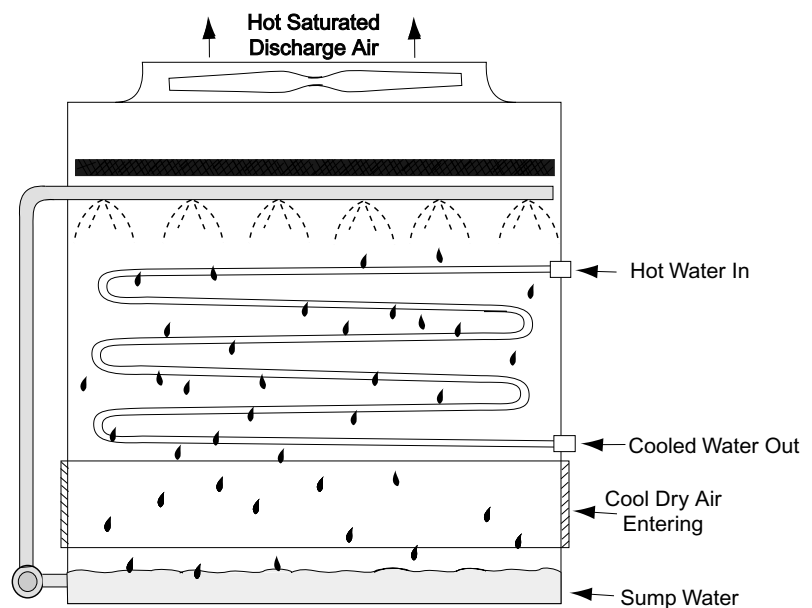
## What is a Closed Loop System

Two types of closed loop cooling systems are described here. The Evaporative Cooler and Fluid Cooler. They are both commonly used to cool air compressors. Both coolers use heat exchangers with a water and glycol mixture circulating through the air compressor cooling jackets to cool the compressor.

Air compressors generate heat based on size and operation, this heat must be removed to maintain peak operating conditions. The Evaporative Cooler uses an air and water mist heat exchanger to evaporate off heat from the glycol and water coolant supply coming out of the air compressor cooling jackets. The Fluid Cooler uses an air cooled heat exchanger. Both coolers allow the compressor's cooling systems to remain free of contaminants caused by other cooling methods. The glycol coolant is used to prevent corrosion and scaling and also aids in preventing winter freezing.

## How Flair Evaporative Coolers Work

Coolant is heated as it is pumped through the machinery or process cooling jackets and on to the high efficiency air to liquid heat exchanger coil located inside the Flair Closed Loop Evaporative Cooler. The coolant flows through this heat exchanger to be cooled by a combination of ambient air and water spray which results in evaporation and cools the glycol solution passing through the coil. The coolant is then recirculated to the machine or process for reuse.



A fan provides the required air flow while a small centrifugal pump recirculates water from the sump, located at the bottom of the Flair cooler, through the water distribution nozzles. The spray, air flow and evaporation of the water reduces the temperature of the coolant to as low as 5°F above the wet bulb temperature.

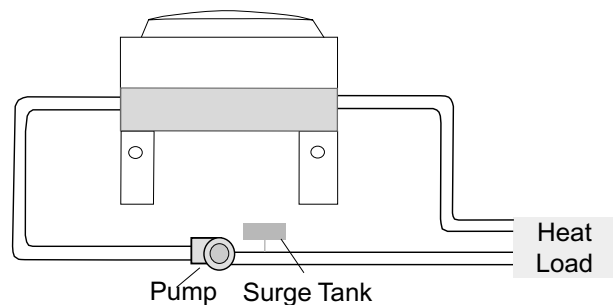
To minimize scale formation, a small quantity of water is bled-off the sump. Fresh make-up water is used to replenish the water which was evaporated and bled-off.

# How the Flair Fluid Cooling Systems Work

## How Flair Fluid Coolers Work

Coolant is heated as it is pumped through the machinery or process cooling jackets and on to the high efficiency air to liquid heat exchanger coil located inside the Flair Closed Loop Fluid Cooler. The coolant flows through this heat exchanger to be cooled by ambient air which is being drawn across the finned tube coil by the fan. The coolant, usually cooled to 10°F above ambient air temperature, exits the cooler and flows back to the machine or process.

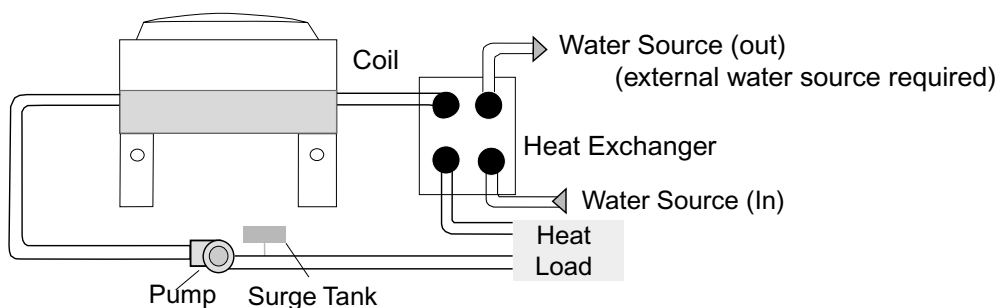
This cooler requires no additional piping for cooling water. This reduces or eliminates expensive water and sewer costs. This also eliminates the dirt build-up and bacterial growth caused by various types of water sources.



## How Flair Optional Trim Coolers Work

When high ambient temperatures result in coolant temperatures which are too warm for proper cooling, an auxiliary trim cooler may be added to the system to reduce the coolant temperature to acceptable levels.

An automatic trim cooler water valve maintains the coolant at the desired temperature and minimizes water consumption. This valve stops trim water consumption when the ambient temperature falls and eliminates the need for trim cooling.



# *Benefits of Flair Closed Loop Cooling System*

## *Benefits of Flair Cooling Systems*

- ★ Reduce or eliminate water and sewer costs
- ★ Eliminate dirt build-up and fouling of heat exchangers and other cooling surfaces
- ★ Eliminate algae and bacterial growth common on open style cooling towers
- ★ Maximize freeze protection during cold weather operation
- ★ Comply with environmental regulations
- ★ Provide the lowest possible operating costs

## *Technical Data*

Sizing of all cooling systems requires that many variables be taken into consideration. We recommend that you consult a factory representative for accurate sizing and application information.

## *Typical Applications*

Air Compressors  
Hydraulic Units  
Engines  
Die Casting Machines  
Quench Tanks  
Welding Machines  
Furnaces  
Plastic Molding Machines

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