Configurations

There are three main configurations of factory assembled evaporative cooling products: crossflow, counterflow and combined crossflow.

Unit Configurations

Crossflow

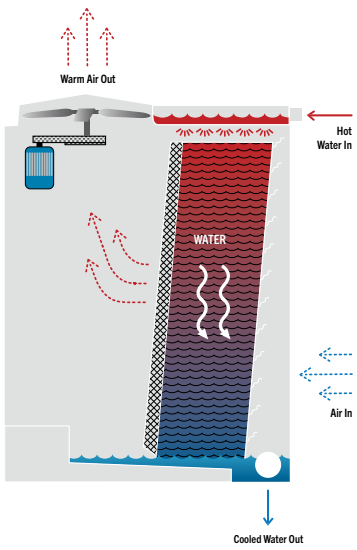
In crossflow cooling products, the water flows vertically down the wet deck or coil as the air flows horizontally across it.

Counterflow

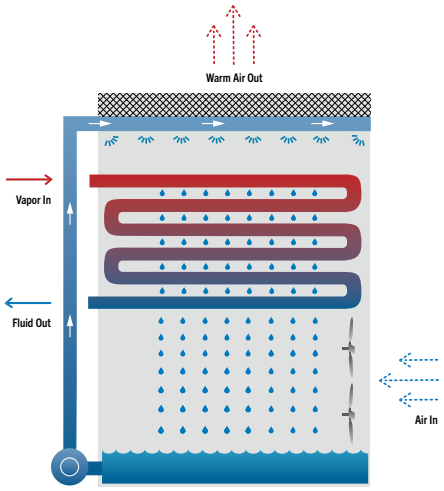
In counterflow cooling products the water flows vertically down as the air flows vertically up it.

Combined Crossflow

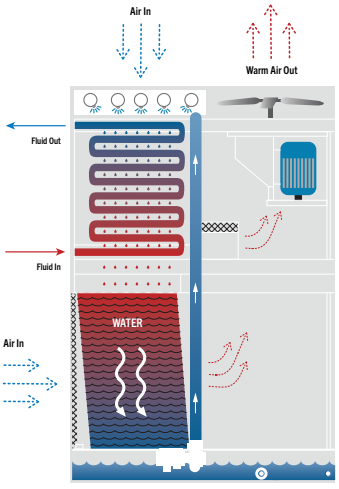
Combined crossflow products use both a heat exchange coil and wet deck surface for heat transfer. The addition of the wet deck surface to the traditional design reduces evaporation in the coil section, reducing the potential for scaling and fouling. BAC's combined crossflow units utilize parallel flow of air and spray water over the coil, and crossflow air/water flow through the wet deck surface. In parallel flow, air and water flow over the coil in the same direction. The process fluid travels from the bottom to the top of the coil, increasing efficiency by bringing the coldest spray water and air in contact with the process fluid at its coldest temperature.



Crossflow



Counterflow



Combined Crossflow

NOTE:
See pages B1, C1, D1, and E1 for specific product configurations.

Water Distribution Systems

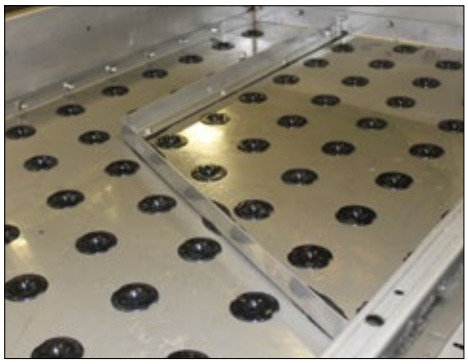
Evaporative cooling products employ either gravity distribution or pressurized spray systems to distribute water over the wet deck surface.

Gravity Distribution Systems

Gravity distribution systems, installed on BAC's crossflow cooling towers, feature hot water basins mounted on top of the tower above the wet deck. A series of metering orifices in the floor of each hot water basin distribute the water as a function of the depth of the water in the basin. Gravity distribution systems generally require minimal pump head, can be inspected while the unit is in operation and are easy to access for routine maintenance and service.

Pressurized Spray Distribution Systems

Pressurized spray distribution systems, installed on counterflow cooling towers, closed circuit cooling towers, and evaporative condensers, feature a series of PVC branches or pipes fitted with spray nozzles mounted inside the tower above the fill. These systems typically require 2 to 7 psig water pressure at the water inlet and require the unit to be out of service for inspection and maintenance.



Gravity Distribution System Hot Water Basin

Pressurized Spray Distribution

Maximum Entering Water Temperature

Typical HVAC conditions call for an entering water temperature of approximately 95°F (35.0°C). All BAC open cooling towers are capable of withstanding temperatures of at least 120°F (48.9°C) with standard fill materials. For applications where the entering water temperature exceeds 120°F (48.9°C) alternate fill materials are available and may be required for your project.

All BAC closed circuit cooling towers and adiabatic products are capable of withstanding entering fluid temperatures as high as 180°F (82.2°C), and the HXV is capable of withstanding even higher temperatures due to the added dry coil technology.

Fan Types

The flow of air through most factory assembled cooling equipment is provided by one or more mechanically driven fans. The fan(s) may be axial, centrifugal, or an EC Fan System, each type having its own distinct advantages.

Axial Fan(s)

Units with axial fans require approximately half the fan motor horsepower of comparably sized centrifugal fan units, offering significant energy savings. The flow of air through most factory assembled is provided by one or more mechanically driven fans. Axial fan units require approximately half the fan motor horsepower of comparably sized centrifugal fan units, offering significant energy savings.

Axial Fans

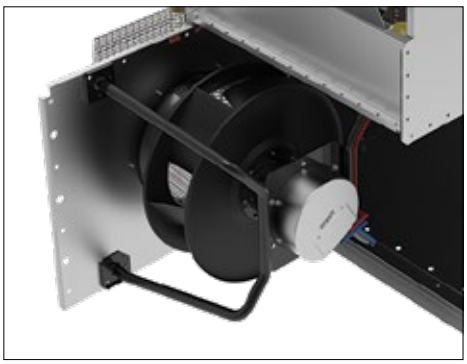
Centrifugal Fan(s)

Units with centrifugal fans are capable of overcoming reasonable amounts of external static pressure (≤ 0.5" or 12.7 mm of H_2O), making them suitable for both indoor and outdoor installations. Centrifugal fans are also inherently quieter than axial fans, although the difference is minimal and can often be overcome through the application of optional low sound fans and/or sound attenuation on axial fan units.

Centrifugal Fans

EC Fan System

EC Fan Systems are direct-drive and are designed for lowest maintenance and high reliability with no belts or gears to maintain. There are also built in controls with no VFDs required. High static capability for indoor ducted applications.



EC Fan System

NOTE:

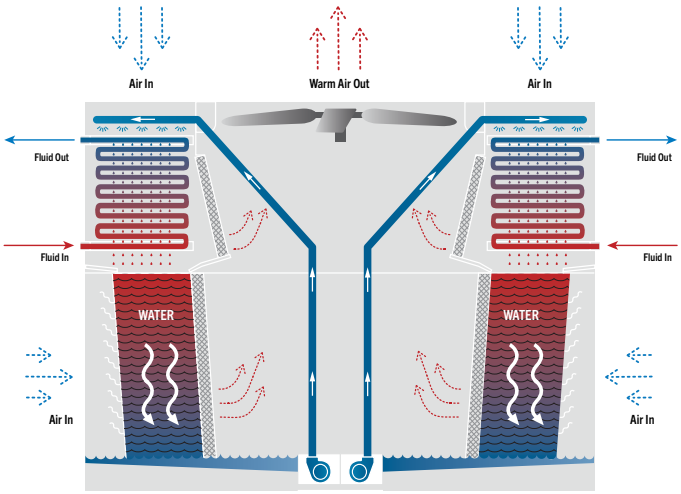
See **pages B1, C1, D1, and E1** for specific product configurations. For more information on sound see "Fundamentals of Sound" on **page J27**.

Fan Configurations

There are two main fan configurations, induced draft and forced draft. For induced draft products, the fan is at the air discharge while for forced draft products the fan is at the air intake.

Induced Draft

The rotating air handling components of induced draft equipment are mounted in the top deck of the unit, minimizing the impact of fan noise on near-by neighbors and providing maximum protection from fan icing with units operating in sub-freezing conditions. The air being drawn through the unit hereby discharges over the inducing fan. The use of corrosion resistant materials ensures long life and minimizes maintenance requirements for the air handling components.



Forced Draft

Rotating air-handling components are located on the air inlet face at the base of forced draft equipment whereby fresh air is blown through the unit. This base fan position facilitates easy access for routine maintenance and service. Additionally, location of these components in the dry entering air stream extends component life by isolating them from the corrosive saturated discharge air.