CXVB Evaporative Condenser

TABLE OF CONTENTS

The CXVB delivers efficient performance in an easy-to-maintain package. BAC's Advanced Coil and Combined Flow Technology provides maximum capacity at the lowest refrigerant charge available in the industry by incorporating fill media into the traditional evaporative condenser. In addition, CXVB models are designed to mount directly on existing support steel of both crossflow and counterflow units, making them a direct replacement option for almost any existing model.

TriArmor® Corrosion Protection System

EVERTOUGH™ CONSTRUCTION

IBC Compliant

BAC's CXVB:
Maximum Capacity at Lowest Charge

75 to 1,287 R-717 Tons in a Single Unit

- Lowest Refrigerant Charge Per Ton
- Fewest Piping Connections
- Layout Flexibility
- Shake Table Tested to S_{DS} of 2.40g
- Easy Maintenance

iar® International Institute of Ammonia Refrigeration

RETA Education · Efficiency · Development®

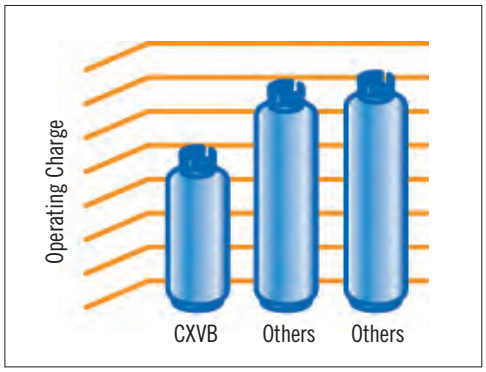
U.S. Green Building Council Member®

IARW International Association of Refrigerated Warehouses

CXVB Benefits

Technology – Leadership

- Patented Combined Flow Technology provides the highest capacity at the lowest refrigerant charge in the industry
- Air and water flow in a parallel path, therefore eliminating scale-producing "hot spots" on the coil
- Increased heat rejection occurs as the water flows over the fill, therefore lowering spray water temperatures
- Meets wind and seismic requirements of the International Building Code through shake table testing. Rated to withstand a seismic event up to 2.40g and windloads up to 167 psf.
- Premium efficient motors are standard and ready for VFD's now or later



Operating Charge

Installation Efficiency

- Combined Flow Technology lowers installation and operating costs
  - Significantly lower refrigerant charge
  - Fewer coil connections and valves
  - Lower weights mean support steel can be reduced
  - Less overall piping connections and fewer supports
- Pre-assembled platform package reduces installation time (option)
- Single point wiring simplifies field installation (option)


Easily Accessible Spray Water Distribution

Service – Maintenance

- Oversized doors for access to the internal walkway
- Spacious interior provides easy access to the basin, drift eliminators, coils, and drive system
- Extended lubrication lines, internal walkway, and ladder (standard)
- A water distribution system that makes service of the nozzles, spray branches, and headers possible without the need for tools
- Motor davit system to facilitate motor removal (option)

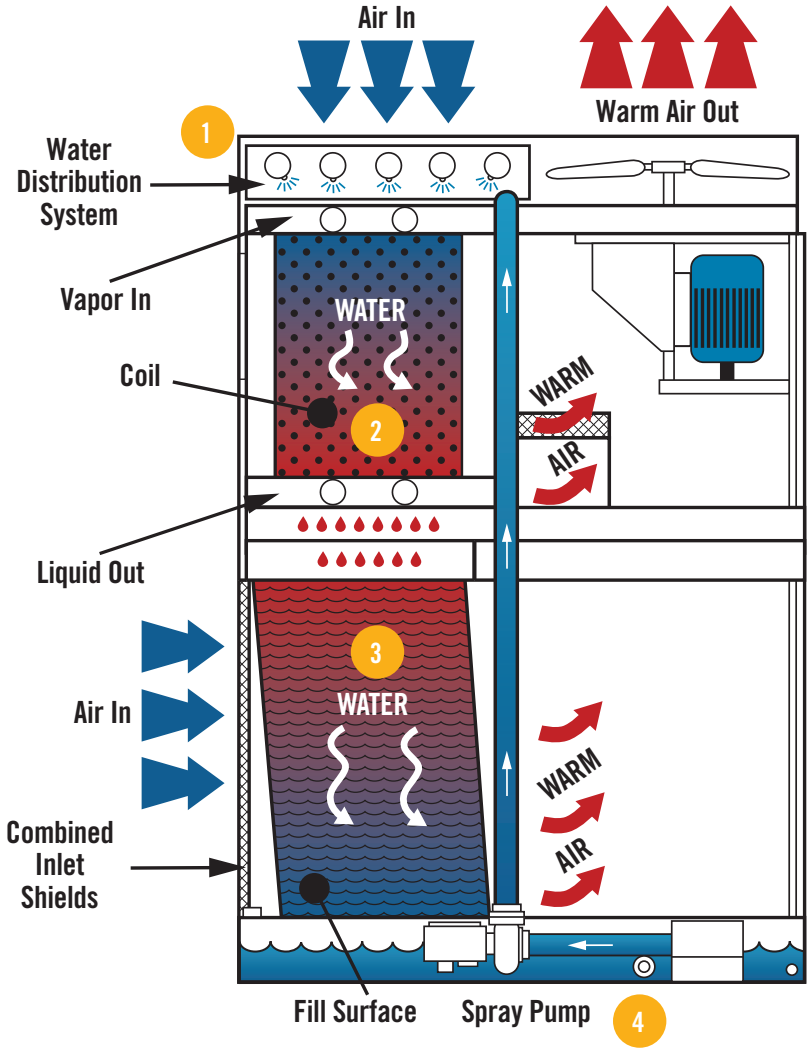

Pre-Assembled Platforms

Industrial Grade Construction

- Materials of construction
  - Mill galvanized (G-235) steel construction (standard)
  - TriArmor® Corrosion Protection System encapsulates the hygienic basin with three barriers of protection (option)
- Fully welded, not bolted, stainless steel basins (option)
- All coils are fabricated to ASME B31.5 standards

Application of TriArmor® Corrosion Protection System

Patented Combined Flow Technology



1. Water is sprayed in parallel with the fresh ambient air flowing over the outside of the condensing coil. Parallel air and water paths minimize scale-producing dry spots that may be found on the bottom of the tubes in other, conventional condensers.
2. The condensing coil rejects heat through both evaporative cooling using the fresh air stream and, more significantly, through sensible cooling of the pre-cooled recirculating spray water. Reducing this evaporative cooling component from the coil section helps to minimize the propensity to form scale on the coil surface.
3. The recirculating spray water falls from the coil to the fill surface section where it is cooled by a second fresh air stream using evaporative heat transfer.
4. Water is pumped over the condensing coil at a rate greater than 10 USGPM/ft^2 of coil plan area to ensure continuous wetting of the primary heat transfer surface, which enhances heat transfer efficiency and minimizes scale formation.

CXVB Construction Details

1 Heavy-Duty Construction

- G-235 (Z700 metric) mill galvanized steel panels
- Meets seismic and wind requirements for International Building Code
- Shake table tested and verified with seismic ratings up to 2.40g and windload ratings up to 167 psf

2 BALTIDRIVE® Power Train

- Premium efficient/inverter duty fan motors are standard
- 5-year motor and drive warranty
- Corrosion resistant cast aluminum sheaves
- Heavy-duty bearings, with minimum L_{10} 80,000 hours
- Extended lubrication lines with grease fittings are standard
- Premium quality, solid-backed, multi-groove belt

3 Low HP Axial Fans

- High efficiency
- Quiet operation
- Corrosion resistant

4 Water Distribution System

- Visible and accessible during operation
- Overlapping spray patterns ensure proper water coverage
- Large orifice, non-clog, 360 Spray Nozzles

5 Coil Section (NOT SHOWN)

- Continuous serpentine, steel tubing
- Hot-dip galvanized after fabrication (HDGAF)
- Maximum allowable working pressure is 300 psig (2,068 kPa)
- Fabricated per ASME B31.5 standards
- Orders shipping into Canada are supplied with a CRN

6 BACross® Fill with Integral Drift Eliminators (NOT SHOWN)

- High efficiency heat transfer surface
- Recyclable Polyvinyl chloride (PVC)
- Impervious to rot, decay, and biological attack
- Flame spread rating of 5 per ASTM E84
- Elevated off the basin

7 Combined Inlet Shields

- Corrosion resistant
- UV-resistant finish
- Maintenance free
- Reduces sunlight and algae growth

8 Basin

- Sloped basin for easy cleaning
- Suction strainer with anti-vortex hood

9 Recirculating Spray Water Pump

- Close coupled, bronze fitted centrifugal pump
- Totally enclosed fan cooled (TEFC) motor
- Bleed line with metering valve installed from pump discharge to overflow

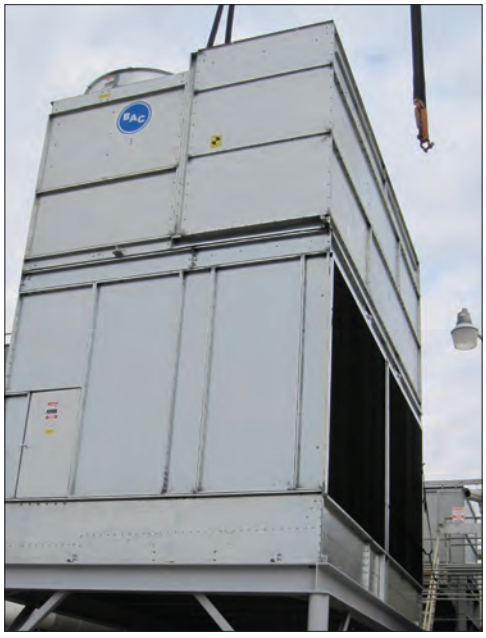
10 Hinged Access Doors

- Inward swinging door on each end wall
- Opening to a standard internal walkway and internal ladder

CXVB
Custom Features & Options

Materials of Construction

Determining the appropriate material of construction for a project depends on several factors, including water quality, climate and environmental conditions, availability of time and manpower for maintenance, unit lifetime requirements, and budget. BAC provides the widest variety of material of construction options in the industry and has the ability to provide a solution to meet all conditions and budgets. Options such as the TriArmor® Corrosion Protection System and EVERTOUGH™ Construction provide superior corrosion resistance and durability at a tremendous value.



Standard Construction Installation

STANDARD CONSTRUCTION

G-235 mill galvanized steel is the heaviest commercially available galvanized steel, universally recognized for its strength and corrosion resistance. To assure long life, G-235 mill galvanized steel panels and structural members are used as the standard material of construction. The standard construction has been seismically verified by shake table testing in an independent laboratory up to an S_{DS} of 2.40g and can withstand wind loads of up to 167 psf, proving its construction is designed for extreme durability. With proper maintenance and water treatment, G-235 galvanized steel will provide an excellent service life under the operating conditions normally encountered in refrigeration applications.

Customer Valued

TRIARMOR® CORROSION PROTECTION SYSTEM (OPTION)

The TriArmor® Corrosion Protection System consists of heavy gauge G-235 mill galvanized steel panels fully encapsulated by a thermosetting hybrid polymer and further protected by a polyurethane barrier applied to all submerged surfaces of the cold water basin. The triple layers of protection form a completely seamless cold water basin for the most leak resistant and durable basin in the industry. Other components within the basin, such as the strainer and submerged structural supports, will be constructed of Stainless Steel. The TriArmor® Corrosion Protection System was specifically designed for evaporative cooling applications and released in 2006 after a decade of extensive R&D and field testing. To date, there are thousands of successful installations in North America. Every basin is leak tested at the factory and warranted against leaks and corrosion for five years.

Application of TriArmor® Corrosion Protection System

EVERTOUGH™ CONSTRUCTION (OPTION)

EVERTOUGH™ Construction combines the most corrosion resistant materials to provide the best value in corrosion protection for most water chemistries. EVERTOUGH™ Construction is backed by a comprehensive 5-year warranty which covers ALL components from the fan to the cold water basin, from louver to louver, including the motor (excluding the coil).

The following materials are used in EVERTOUGH™ Construction:

- The basin is constructed with the TriArmor® Corrosion Protection System. The basin is leak tested at the factory and warranted against leaks and corrosion for 5 years.
- Designated steel components above the basin are constructed of heavy-gauge G-235 galvanized steel and further protected with a thermosetting hybrid polymer.
- The distribution system is non-corrosive Schedule 40 PVC.
- Other components within the basin, such as the strainer and submerged structural supports, will be constructed of stainless steel.

EVERTOUGH™ Construction Installation

THERMOSETTING HYBRID POLYMER (OPTION)

A thermosetting hybrid polymer, used to extend equipment life, is applied to select G-235 mill galvanized steel components of the unit. The polymerized coating is baked onto the G-235 mill galvanized steel and creates a barrier to the already corrosion resistant galvanized steel. The thermosetting hybrid polymer has been tested to withstand 6,000 hours in a 5% salt spray without blistering, chipping, or losing adhesion.

STAINLESS STEEL (OPTION)

Several stainless steel material of construction options are available.

- **WELDED STAINLESS STEEL BASIN**
  All steel panels and structural members of the basin are constructed from stainless steel. Seams between panels inside the basin are welded, providing an advantage over bolted stainless steel basins for minimizing susceptibility to leaks at basin seams. The basin is leak tested at the factory and welded seams are provided with a 5-year, leak-proof warranty.
- **ALL STAINLESS STEEL CONSTRUCTION**
  Steel panels and structural elements are constructed of stainless steel. Seams between panels inside the basin are welded. The basin is leak tested at the factory and welded seams are provided with a 5-year leak-proof warranty.


Welded Stainless Steel Basin

CXVB
Custom Features & Options

Coil Configurations.

BAC offers a large selection of coil configuration options to fulfill any thermal and pressure drop requirements.

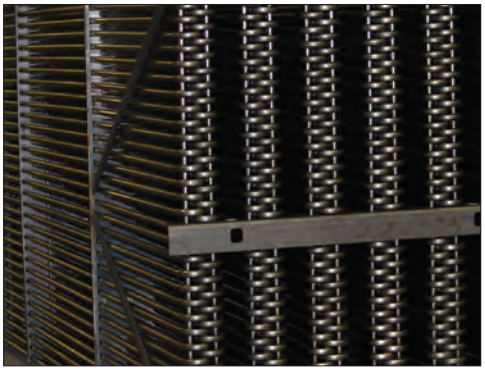
STANDARD SERPENTINE COIL

The standard coil is constructed of continuous lengths of all prime surface steel. The coil is hot-dip galvanized after fabrication (HDGAF) to apply a thick, zinc corrosion barrier over the entire exterior surface of the coil. The coil is designed for low pressure drop with sloping tubes for free drainage of fluid. Each coil has a maximum allowable working pressure of 300 psig (2,068 kPa) and is fabricated per ASME B31.5 standards to ensure the highest quality and integrity.

Standard Serpentine Coil

STAINLESS STEEL COIL (OPTION)

Coils are available in stainless steel for specialized applications. The coil is designed for low pressure drop with sloping tubes for free drainage of fluid. Each coil has a maximum allowable working pressure of 300 psig (2,068 kPa) and is fabricated per ASME B31.5 standards to ensure the highest quality and integrity.



Stainless Steel Coil

ASME U DESIGNATOR COIL (OPTION)

BAC offers coils that are certified in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII, Division I. ASME U designated coils are available for projects requiring ASME certified pressure vessels and involve 3rd party inspection and certification. Standard ASME U designated coils are rated at 340 psig (2,344 kPa) maximum allowable working pressure, and they are pneumatically tested at 375 psig (2,586 kPa).

NOTE: A Canadian Registration Number (CRN) is required for all pressure vessels over 15 psig entering Canada. The CRN identifies that the design of a boiler, pressure vessel, or fitting has been accepted and registered for use in Canada. CRN is available for all BAC Dual and TriCoil configurations shipping into Canada.

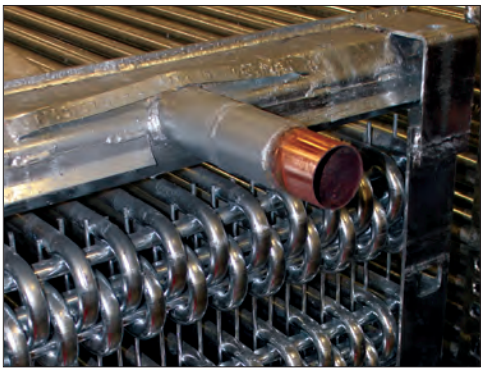
MULTIPLE CIRCUIT COILS/AUXILIARY COOLING CIRCUIT (OPTION)

Split coil configurations are available to allow separate process fluid or refrigerant loops through the same unit. Separate loops may be needed for multiple applications requiring different temperature processes or multiple types of process fluids or refrigerants. Multiple refrigerant circuit coils are generally required on halocarbon refrigerant systems, where it is common practice to maintain individual compressor systems. The quantity of circuits, capacity per circuit, and desired connection size and type should be specified when requesting this option.

Multiple Circuit Coil

COPPER SWEAT FITTINGS (OPTION)

Factory installed copper sweat fittings are available to simplify field piping.


Copper Sweat Fittings

Drive System Options

The fan drive system provides the cooling air necessary to reject unwanted heat from the system to the atmosphere. All BAC drive systems use premium efficient cooling tower duty motors and include BAC's comprehensive 5-year motor and drive warranty. Cooling tower duty motors are specially designed for the harsh environment inside an evaporative condenser and have permanently lubricated bearings, drastically decreasing the maintenance requirement of the motor. BAC belt drive systems are the most durable and maintenance friendly drive systems on the market, including single nut adjustment for belt tensioning to make belt tensioning simple.

CXVB
Custom Features & Options

STANDARD BALTIDRIVE® POWER TRAIN

The BALTIDRIVE® Power Train utilizes special corrosion resistant materials of construction and state-of-the-art technology to ensure ease of maintenance and reliable year-round performance. This BAC engineered drive system consists of a specially designed powerband and two cast aluminum sheaves located at minimal shaft centerline distances to maximize belt life. When compared to a gear drive system, this specially engineered belt drive system provides many advantages. The BALTIDRIVE® Power Train requires only periodic inspection of components and belt tensioning, which is simple with a single nut adjustment and requires less downtime. Only fan bearing lubrication is required for routine maintenance. Belt drive systems also have the added advantage of being suitable for variable frequency drive (VFD) applications without requiring expensive optional accessories.

BALTIDRIVE® Power Train

EXTENDED LUBRICATION LINES

Extended lubrication lines are also provided with the BALTIDRIVE® Power Train for lubrication of the fan shaft bearings. Fittings are located on the exterior casing panel next to the access door.

Extended Lubrication Lines with Grease Fittings Located by the Access Door

Customer Valued

INDEPENDENT FAN OPERATION (OPTION)

Models CXVB-x-0809-x, CXVB-x-0812-x, CXVB-x-1212-x are provided with one motor driving two fans as standard. The CXVB-x-0818-x and CXVB-x-1218-x are provided with two fan motors driving three fans as standard. The independent fan option consists of one fan motor and drive assembly for each fan to allow independent operation, adding an additional step of fan cycling and capacity control. This option ensures redundancy for the fan and motor system.

BALTIGUARD™ FAN SYSTEM (OPTION)

The BALTIGUARD™ Fan System consists of two standard single-speed fan motor and drive assemblies. One drive assembly is sized for full speed and load, and the other is sized for approximately 2/3 speed and consumes only 1/3 the design horsepower. This configuration provides the reserve capability of a standby motor in the event of failure. As a minimum, approximately 70% capacity will be available from the low horsepower motor (pony), even on a design wet-bulb day. Controls and wiring are the same as those required for a two-speed, two-winding motor. Redundant motors are available by increasing the size of the standby fan motor of the BALTIGUARD™ Fan System to the size of the main motor. This provides 100% motor redundancy and the greatest level of reliability.

BAC MOTOR & DRIVE 5 YEAR WARRANTY

BALTIGUARD PLUS™ FAN SYSTEM (OPTION)

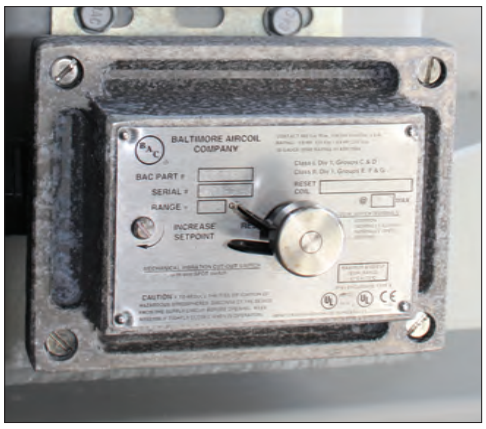
The BALTIGUARD PLUS™ Fan System builds on the advantages of the BALTIGUARD™ Fan System by adding a variable frequency drive (VFD) to either the pony or the main motor, depending on system requirements. This offers the benefits of additional capacity control and energy savings, along with the redundancy offered by the BALTIGUARD™ Fan System. Alternatively, a VFD can be added to both the pony and main motor for complete capacity control and redundancy under any load.

BALTIGUARD PLUS™ Fan System Used for VFD Applications

Customer Valued

VIBRATION CUTOUT SWITCH (OPTION)

A factory mounted vibration cutout switch is available to effectively protect against rotating equipment failure. BAC can provide either a mechanical or solid-state electronic vibration cutout switch in a NEMA 4 enclosure to ensure reliable protection. Additional contacts can be provided on either switch type to activate an alarm. Remote reset capability is also available on either switch type.



Vibration Cutout Switch

Basin

The spray water collects in the basin which is pumped back over the condensing coil. During operation, the CXVB basin eliminates any stagnant water zones, which are susceptible to biological growth.

STANDARD MECHANICAL WATER LEVEL CONTROL

Mechanical make-up valves must operate continuously in the moist and turbulent environment within evaporative cooling equipment. Due to this environment, the operation of the valve must be simple and the valve must be durable. BAC's high quality mechanical water level control assembly is standard with all units and has been specially designed to provide the most reliable operation while being easy to maintain. This accessory is omitted for remote sump applications.

CXVB
Custom Features & Options

ELECTRIC WATER LEVEL CONTROL (OPTION)

BAC's Electric Water Level Control (EWLC) is a state-of-the-art, conductivity actuated, probe type liquid level control. The hermetically sealed EWLC is engineered and manufactured specifically for use in evaporative cooling systems and is equipped with an error code LED to indicate status, including when the water and/or probes are dirty. The EWLC option replaces the standard mechanical make-up valve, and includes a slow closing, solenoid activated valve in the make-up water line to minimize water hammer. EWLC is recommended when more precise water level control is required and in areas that experience sub-freezing conditions.

Electric Water Level Control (EWLC)

BASIN HEATERS (OPTION)

Evaporative cooling equipment exposed to below freezing ambient temperatures require protection to prevent freezing of the water in the basin when the unit is idle. Factory-installed electric immersion heaters, which maintain 40°F (4.4°C) water temperature, are a simple and inexpensive way of providing such protection.

HEATER kW DATA

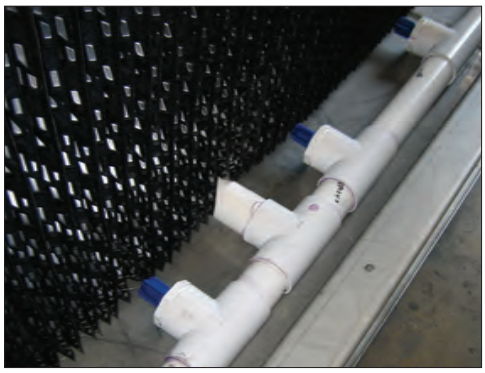
Model Number	0°F (-17.8°C) Ambient Heaters		-20°F (-28.9°C) Ambient Heaters	
	Number of Heaters	kW per Heater	Number of Heaters	kW per Heater
CXVB-x-0806	1	4	1	6
CXVB-x-0809	1	6	1	8
CXVB-x-0812	1	8	1	12
CXVB-x-0818	1	12	1	18
CXVB-x-1212	1	12	1	16
CXVB-x-1218	1	16	1	24

NOTE: This table is based on 460V/3 phase/60 Hz power.

Basin Heater

BASIN SWEEPER PIPING (OPTION)

Basin sweeper piping is an effective method of reducing sediment that may collect in the basin. A complete piping system, including nozzles, is provided in the basin to connect to side stream filtration equipment (provided by others). For more information on filtration systems, consult "Filtration Guide" found on **page J241**.



Basin Sweeper Piping

LOW AND HIGH LEVEL ALARM FLOAT SWITCHES (OPTION)

Low and high level alarm float switches are available to provide added control to your equipment operation. Level alarms can alert operators to an abnormal operating condition to ensure the highest system efficiency with minimal water usage.

Water Distribution System

STANDARD SPRAY WATER PUMP

The CXVB water distribution system comes standard with an integral spray water pump sized to distribute the recirculating water over the coil, maximizing capacity. The patented BAC 360 Spray Nozzles are non-clog, ensure even flow over the coil area, and are simple to remove for maintenance. Parallel flow of air and spray water allow for inspection and access to the top of the coils during operation.

Standard Spray Water Pump

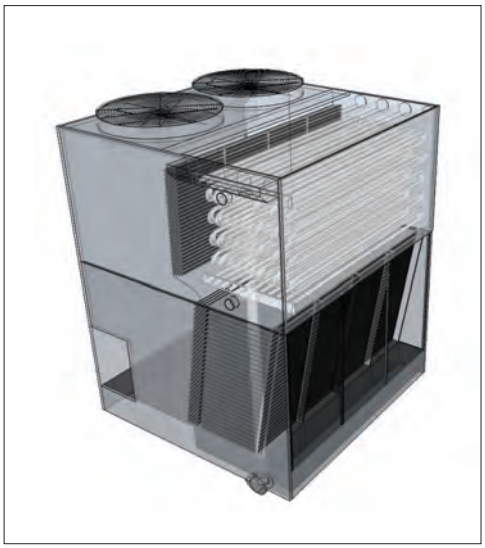
REDUNDANT PUMPS (OPTION)

An optional secondary spray pump is available. A manual valve will be supplied at each pump discharge to allow for manual switch-over for continued equipment operation until maintenance can be performed.

CXVB
Custom Features & Options

Fill

BACross® Fill, BAC's patented crossflow hanging fill, was developed after years of extensive research. BACross® Fill is made of PVC and is optimized to provide the highest thermal capacity. PVC is virtually impervious to rot, decay, and biological attack. The fill is elevated above the basin floor to facilitate cleaning and maintenance. The integral eliminators effectively strip entrained moisture from the leaving air stream with minimum pressure drop to prevent water loss with negligible impact on efficiency.



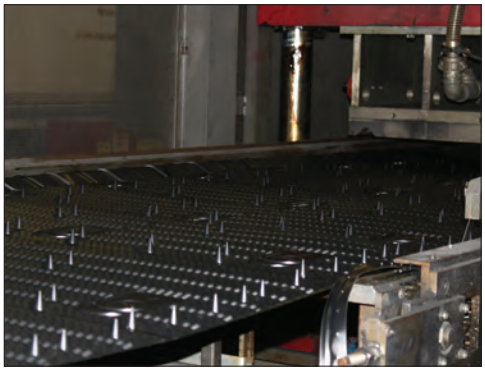
BAC's Combined Flow Technology

STANDARD FILL

Standard fill can be used in applications with spray water temperature up to 130°F (54.4°C). The fill and drift eliminators are formed from self-extinguishing PVC having a flame spread rating of 5 per ASTM E84.

HIGH TEMPERATURE FILL (OPTION)

An optional high temperature fill material is available which increases the maximum allowable spray water temperature to 140°F (60°C). The online selection program automatically determines if high temperature fill is necessary based on the design requirements.



BACross® Fill Manufacturing

Shipping and Rigging

BAC units are factory-assembled to ensure uniform quality with minimum field assembly. Each unit has been designed with rigging and assembly in mind and includes features to minimize the number of tools required and installation time.

KNOCKDOWN UNITS (OPTION)

Knockdown units are available for jobs where access to the condenser location is limited by elevators, doorways, or similar obstacles, where lifting methods impose very strict weight limits, or where the shipping cost of a fully assembled unit is excessive. All materials of construction and design features are the same as those of a factory assembled unit. Welded stainless steel basins and TriArmor® Corrosion Protection System basins are excluded from knockdown due to the need for in-plant assembly.

Sound Options

Recognition of the importance of sound reduction is growing and can be a very important design criterion for any project. BAC maintains the widest selection of sound mitigating options in the market place and can provide the most cost effective option to meet any requirement.

STANDARD FAN

The fan provided for all CXVB Evaporative Condensers is selected to optimize low sound levels and maximize thermal performance.

Standard Fan

LOW SOUND FAN (OPTION)

The Low Sound Fan option reduces sound up to 8 dBA. Adding a high solidity fan decreases fan speeds, which proportionally decreases sound levels.

WHISPER QUIET FAN (OPTION)

For the most extreme sound limitations, BAC's Whisper Quiet Fan reduces sound up to 14 dBA.

SOUND ATTENUATION (OPTION)

Factory designed, tested, and rated sound attenuation options are available for both the air intake and discharge. Consult your local BAC Representative regarding available options.

Low Sound Fan

Customer Valued

SINGLE SIDE AIR INTAKE

Single-side air intake units can be placed close to solid walls, reducing the size of enclosures and allowing for more profitable use of premium space. Also, the panel opposite the air intake, called the blankoff panel, is inherently quiet. Positioning the blankoff panel towards the sound sensitive direction insulates sensitive areas from higher sound levels.

CXVB
Custom Features & Options

Air Intake Options

In an evaporative condenser, airborne debris can be entrained in the water through the unit's air intake. The CXVB has several options for air intake accessories that prevent debris from entering the system and maintain even unobstructed flow through the unit. Reducing the amount of debris that enters the unit lowers maintenance requirements and helps to maintain thermal efficiency.

COMBINED INLET SHIELDS

The Combined Inlet Shields' (CIS) bent flow path blocks sunlight from the basin and fill section and acts as a screen to prevent debris from entering the unit. These benefits result in a significant reduction in algae growth, debris accumulation, and scale build-up. CIS are constructed from corrosion and UV-resistant PVC and are installed in easy to handle sections that are separate from the fill section to facilitate removal, inspection, and replacement. The use of CIS results in lower maintenance costs and ease of maintenance over the life of the unit.

Customer Valued

SUNSCREENS (OPTION)

The corrosion resistant SunScreens are mounted above the spray distribution system and help to smooth the airflow into the coils for optimum thermal performance. They also prevent strong winds from carrying spray water out of the unit, and block sunlight in locations previously susceptible to algae growth. SunScreens are constructed in easy to handle sections to facilitate removal, inspection, and replacement.

Single Side Air intake

Combined Inlet Shields

Access Options

BAC provides a broad offering of access options. Our evaporative equipment is designed to be easily maintained for sustaining capacity over a longer life. All BAC platforms and ladders are OSHA compliant to ensure personnel safety and code compliance.

INTERNAL WALKWAY

An internal walkway is provided, allowing access to the spacious plenum area for maintenance and inspection of the basin, make-up, fill, and drive system.

Internal Walkway

INTERNAL LADDER

For access to the motor and drive assemblies on single air intake models, a movable internal ladder is provided on the CXVB.

MOTOR REMOVAL SYSTEM (OPTION)

The removal system includes davit arm(s) and access panels on the side opposite of the air inlet face, facilitating motor replacement.

Motor Removal System

EXTERNAL PLATFORM (OPTION)

Every external platform is preassembled and pre-fitted at the factory to ensure that every component will fit and function exactly as described. The platform will ship secured in the basin and attach quickly in the field with minimum fasteners. Platforms, ladders, and safety cages can be added at the time of order or as an aftermarket item. Safety gates are available for all handrail openings. All components are designed to meet OSHA requirements.

ACCESS DOOR PLATFORM AND LADDER PACKAGES (OPTION)

An access door platform is available to allow access to the unit when installed on elevated supports. This option allows for safe access to the unit, as well as a working platform to stage tools for maintenance.

External Platform

Customer Valued

INTERNAL SERVICE PLATFORM AND LADDER PACKAGES (OPTION FOR TWO PIECE UNITS)

For access to the motor and drive assemblies, an internal ladder and upper service platform with handrails is available on larger units. Safety gates are available for all handrail openings, and all components are designed to meet OSHA requirements.

NOTE: Platforms, ladders, handrails, safety gates, and safety cages can be added at the time of order or as an aftermarket item.