



# FXV Closed Circuit Cooling Towers

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# FXV Benefits

## > Low Environmental Impact

### ▶ ENERGY EFFICIENT

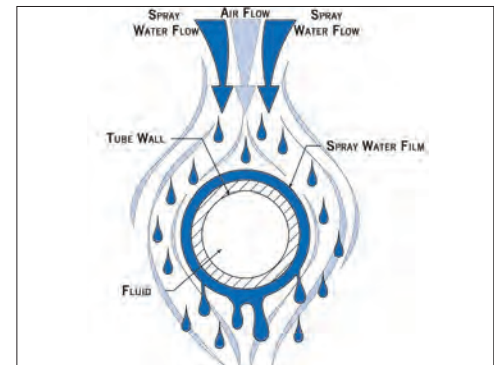
- Capacity is certified by the Cooling Technology Institute using water, ethylene glycol, and propylene glycol
- All units meet or exceed ASHRAE Standard 90.1 energy efficiency requirements
- Patented Advanced Coil Technology reduces evaporation directly off the coil and minimizes the potential for scaling and fouling, maintaining capacity
- Closed loop cooling process further reduces fouling, maintaining process efficiency
- Premium efficient/inverter duty fan motors and high efficiency pumps are standard
- Variety of coil configurations and HP options to minimize system energy use
- Independent fan operation (option)

### ▶ SOUND REDUCTION OPTIONS

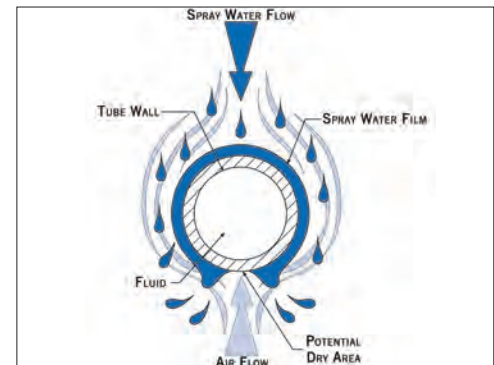
- Standard fan is low sound and high efficiency
- Particularly sound sensitive installations can be accommodated by facing the quiet blank-off panel to the sound sensitive direction
- For further reduced sound levels, Low Sound Fans, Whisper Quiet Fans, and sound attenuation are available (optional)

## > Low Installation Costs

- ▶ Reduced weight simplifies rigging and reduces support steel costs
- ▶ Modular design reduces installation time
- ▶ Minimal coil connections reduce piping costs
- ▶ Reduced glycol charge
- ▶ Designed to mount directly on existing steel support
- ▶ Factory pre-assembled platforms allow quick field assembly (option)



Patented Advanced Coil Technology



Conventional Coil Technology



Modular Design Simplifies Rigging



## > Reliable Year-Round Operation

### ▶ BALTIDRIVE® POWER TRAIN FAN SYSTEM

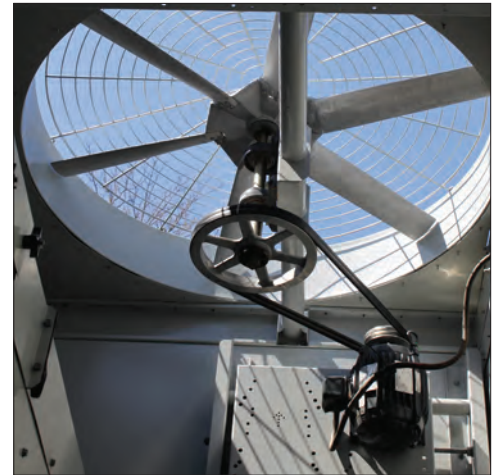
- 10% minimum fan speed is required
- ▶ Cooling tower duty motors designed for hostile environments

## > Durable Construction

- ▶ Meets wind and seismic requirements of the International Building Code (IBC)
- ▶ Designed to withstand wind loads of up to 167 psf
- ▶ Seismically verified through dynamic shake table testing up to a  $S_{DS}$  of 2.40g
- ▶ Enhanced longevity with a variety of durable materials of construction (see **page C17** for details)

## > Easy Maintenance

- ▶ Crossflow configuration provides direct access for easy maintenance to the cold water basin, spray distribution system, coil, and drive system
- ▶ Spray distribution system is easy to inspect while the unit is operating
- ▶ Hinged access doors and standard internal walkway provide easy access to the unit's cold water basin, drift eliminators, fan drive system, and heat transfer coil
- ▶ Combined inlet shields smooth airflow for optimal thermal performance and block sunlight in locations susceptible to algae growth
- ▶ Fill surface is elevated to facilitate flushing of the dirt and debris from critical areas
- ▶ Motor removal system facilitates motor replacement (option)



BALTIDRIVE® Power Train Fan System



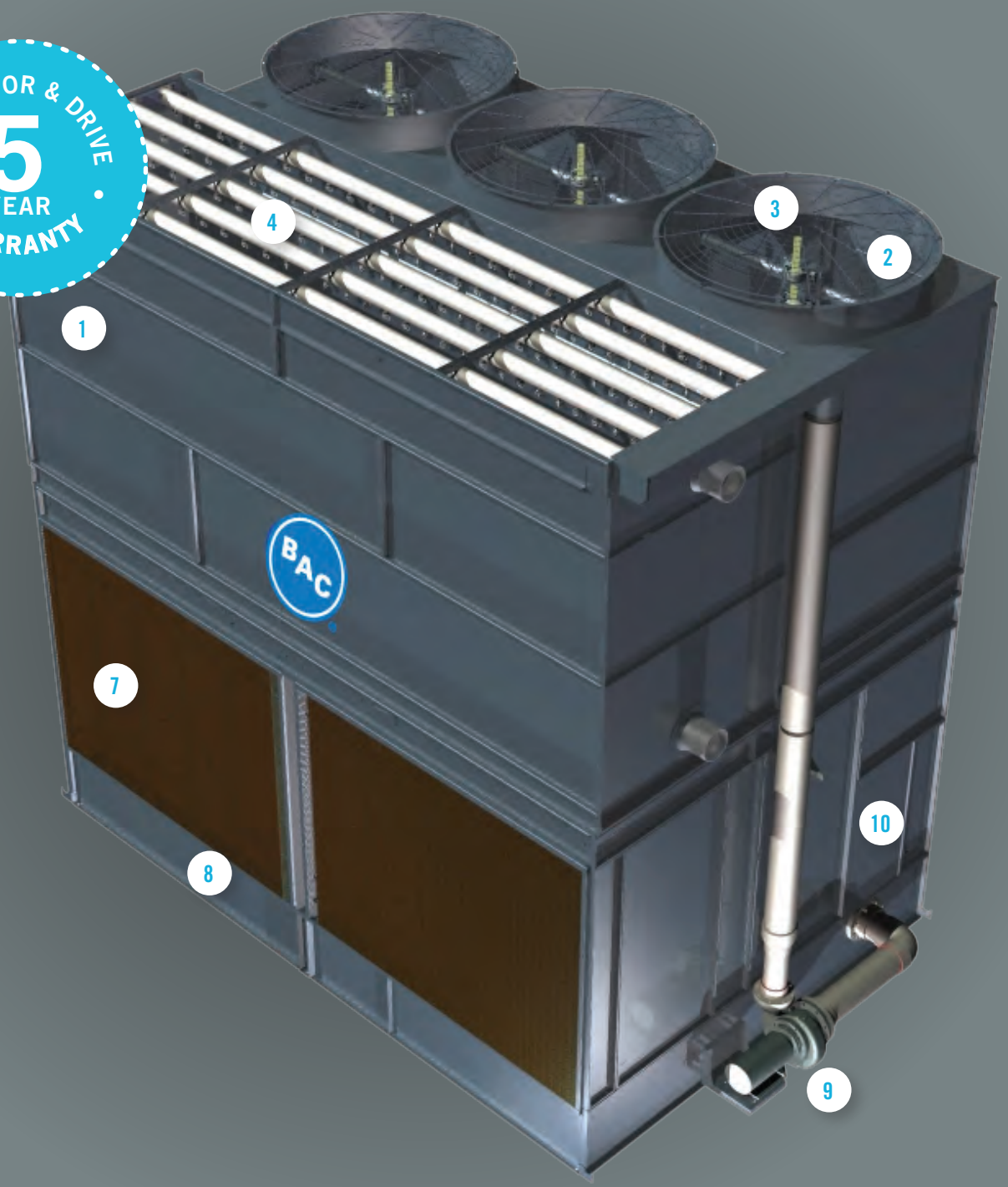
Shake Table Tested



Motor Removal System

# FXV Construction Details

BAC MOTOR & DRIVE  
**5**  
YEAR  
WARRANTY



## 1 Heavy-Duty Construction

- ▶ G-235 (Z700 metric) mill galvanized steel panels
- ▶ Shake tested with a  $S_{DS}$  seismic rating up to 2.40g at grade
- ▶ Designed to withstand wind loads of 167 psf
- ▶ Meets seismic and wind requirements for International Building Code

## 2 BALTIDRIVE® Power Train

- ▶ Premium quality, solid-backed, multi-groove belt
- ▶ Corrosion resistant cast aluminum sheaves
- ▶ Heavy-duty bearings  $L_{10}$  80,000 hours
- ▶ Premium efficient/inverter duty motors are standard
- ▶ 5-year motor and drive warranty

## 3 Low HP Axial Fan(s)

- ▶ Quiet operation
- ▶ High efficiency
- ▶ Corrosion resistant aluminum

## 4 Water Distribution System

- ▶ Visible and accessible during operation
- ▶ Overlapping spray patterns ensure proper water coverage
- ▶ BAC 360 Spray Nozzle, large non-clog orifice

## 5 Coil Section (NOT SHOWN)

- ▶ Continuous serpentine, steel tubing
- ▶ Hot-dip galvanized after fabrication (HDGAF)
- ▶ Pneumatically tested at 375 psig
- ▶ Sloped tubes for free drainage of fluid
- ▶ Fabricated per ASME B31.5 standards
- ▶ When required, 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 cold water basin

## 7 Combined Inlet Shields

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

## 8 Cold Water Basin

- ▶ Sloped cold water basin for easy cleaning
- ▶ Suction strainer with anti-vortex hood accessible from internal walkway
- ▶ Standard internal walkway

## 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

- ▶ 24"W x 45"H hinged access doors
- ▶ Inward swinging door on each end wall
- ▶ Opening to a standard internal walkway

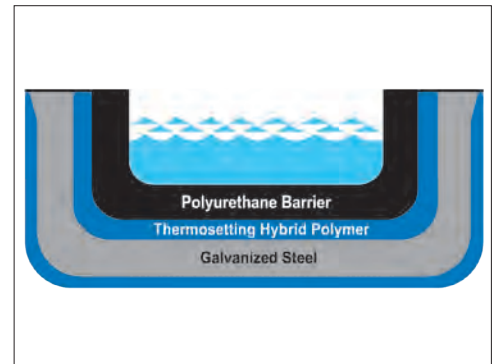
# FXV Custom Features & Options

## ➤ 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



TriArmor® Corrosion Protection System Triple Layer Protection of the Cold Water Basin



Application of TriArmor® Corrosion Protection System



### 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 comfort cooling and industrial applications.



### 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, such as the strainer, within the basin 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 5 years.



### 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).

- Specifically, the following materials are used in EVERTOUGH™ Construction:
  - The cold water 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 cold water basin are constructed of heavy-gauge G-235 mill galvanized steel and further protected with a thermosetting hybrid polymer.
  - The distribution system is non-corrosive Schedule 40 PVC.
  - Other components such as the strainer, within the basin 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 COLD WATER BASIN

A welded stainless steel cold water basin is available. All steel panels and structural members of the cold water basin are constructed from stainless steel. Seams between panels inside the cold water basin are welded, providing an advantage over bolted stainless steel cold water 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 cold water 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 Cold Water Basin

# FXV 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 cooling 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 is pneumatically tested at 375 psig (2,586 kPa) and is fabricated per ASME B31.5 standards to ensure the highest quality and integrity.

### ▶ **LOW PRESSURE DROP COIL DESIGNS**

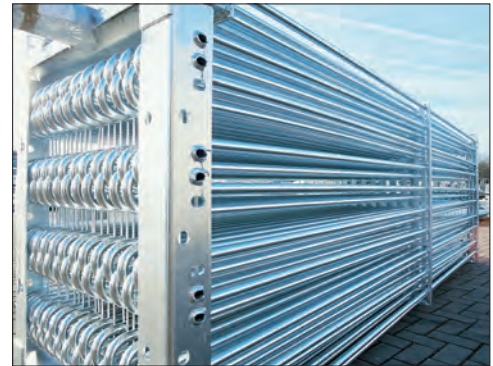
Multiple coil configurations have been designed by BAC and are available to meet all system pressure drop requirements. A higher pressure drop across the coil requires greater system pumping energy and therefore increases operating costs. These coil configurations drastically reduce pressure drop while ensuring the highest thermal performance.

### ▶ **CLEANABLE HEADER COIL (OPTION)**

The cleanable header tube bundle provides removable cover plates on the inlet and outlet header boxes to permit access to each serpentine tube circuit for solvent or air-pressure cleaning. Coil material options include carbon steel coils (hot-dip galvanized outside surface). Each coil is pneumatically tested at 125 psig (860 kPa).

### ▶ **STAINLESS STEEL COIL (OPTION)**

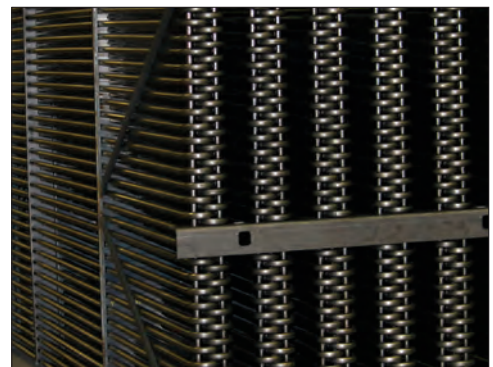
Coils are available in stainless steel for specialized applications. The coil is designed for low pressure drop with sloping tubes for free drainage of fluid. Each coil is pneumatically tested at 375 psig (2,586 kPa) and is fabricated per ASME B31.5 standards to ensure the highest quality and integrity.



Standard Coil Construction



Cleanable Header Coil



Stainless Steel Coil Construction





▶ **STRAIGHT-THROUGH CLEANABLE COIL (OPTION)**

A header box with a removable cover plate at each end of the coil allows access to every tube end for mechanical cleaning or plugging. It is available in carbon steel (hot-dip galvanized inside and out). Each coil is pneumatically tested at 125 psig (860 kPa).



Straight-Through Cleanable 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).

▶ **EXTENDED SURFACE (FINNED) COIL (OPTION)**

Coils are available with half or all rows finned at 5 fins per inch for seasonal wet/dry operation. The fins increase the surface area of the coil, therefore increasing the heat transfer capability. The coil is hot-dip galvanized after fabrication (HDGAF) to apply a thick zinc corrosion barrier over the entire exterior surface of the coil and fins. BAC coils are designed for low pressure drops and to be completely drainable with sloping tubes for free drainage of fluid. Each coil is pneumatically tested at 375 psig (2,586 kPa) and is fabricated per ASME B31.5 standards to ensure the highest quality and integrity.



Multiple Circuit Coils

▶ **MULTIPLE CIRCUIT COILS (OPTION)**

Split coil configurations are available to allow separate process fluid loops through the same unit. Separate loops may be needed for multiple applications requiring different temperature processes or multiple types of process fluids.



**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 shipped into Canada.

# FXV Custom Features & Options

## > 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 of a cooling tower 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.



### 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. As 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 Fan System



### INDEPENDENT FAN OPERATION (OPTION)

Models FXV-0809, FXV-0812, and FXV-1212 are provided with one fan motor driving two fans. The FXV-0818, and FXV-1218 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 ensures redundancy for the fan and motor system.



BALTIGUARD™ Fan System Provides Built in Redundancy



▶ **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 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, 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.



BALTIGUARD™ Fan System  
Used for VFD Applications

▶ **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.



Vibration Cutout Switch

▶ **VIBRATION CUTOFF 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.

▶ **EXTENDED LUBRICATION LINES (OPTION)**

Extended lubrication lines are available 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

# FXV Custom Features & Options

## > Cold Water Basin

The spray water collects in the cold water basin which is pumped back over the heat transfer coil. During operation, the FXV cold water basin helps eliminate 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 existing 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.



Mechanical Water Level Control



### 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 which illuminates 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

### ▶ BASIN SWEEPER PIPING (OPTION)

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



### BASIN HEATERS (OPTION)

Evaporative cooling equipment exposed to below freezing ambient temperatures require protection to prevent freezing of the water in the cold water 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
FXV-0806	1	4	1	6
FXV-0809	1	6	1	9
FXV-0812	1	8	1	12
FXV-0818	1	12	1	18
FXV-1212	1	12	1	16
FXV-1218	1	16	1	24



Basin Heater



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

## Water Distribution System

The FXV water distribution system is provided with BAC 360 Spray Nozzles. These nozzles are large orifice and non-clogging. The design of the FXV uses parallel air and water flow to allow for easy inspection and access to the top of the coil during full operation.

### STANDARD SPRAY WATER PUMP

The FXV 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 full operation.

### REDUNDANT PUMPS (OPTION)

An optional secondary spray pump is available. A manual valve will be supplied.



Standard Spray Water Pump

# FXV 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 most efficient thermal capacity. PVC is virtually impervious to rot, decay, and biological attack. The fill is elevated above the cold water 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.



BACross® Fill Manufacturing



### STANDARD FILL

Standard fill can be used in applications with spray water temperatures 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)

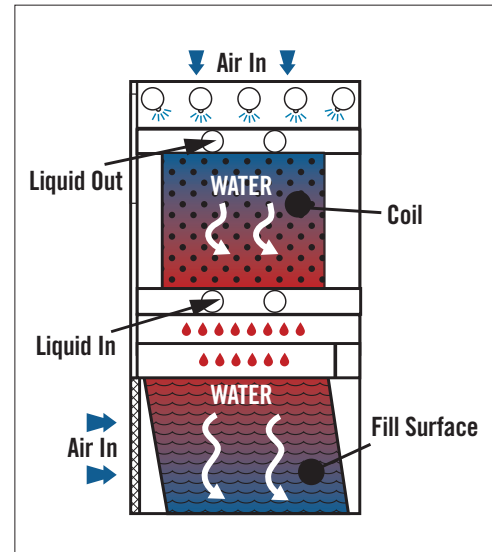
An optional high temperature fill material is available which increases the maximum allowable spray water temperature to 140°F (60°C). The BAC selection program determines if a fill change is required by considering all of the design requirements. The spray water temperature should not be confused with the temperature of the process fluid contained in the coil, which can go up to 180°F (82.2°C).

## > 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 installation time.

### ▶ KNOCKDOWN UNITS (OPTION)

Knockdown units are available for jobs where access to the cooling tower 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 tower is excessive. All materials of construction and design features are the same as those of a factory assembled unit. Welded stainless steel cold water basins and TriArmor® Corrosion Protection System cold water basins are excluded due to the need for in-plant assembly.



Coil Fill Technology



## > 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 FXV Closed Circuit Cooling Towers is selected to optimize low sound levels and maximize thermal performance.

#### ▶ 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. The thermal performance with the Low Sound Fan has been certified in accordance with CTI Standard STD-201.

#### ▶ WHISPER QUIET FAN (OPTION)

For the most extreme sound limitations, BAC's Whisper Quiet Fan reduces sound up to 14 dBA. The FXV thermal performance with the Whisper Quiet fan is certified in accordance with CTI Standard STD-201.

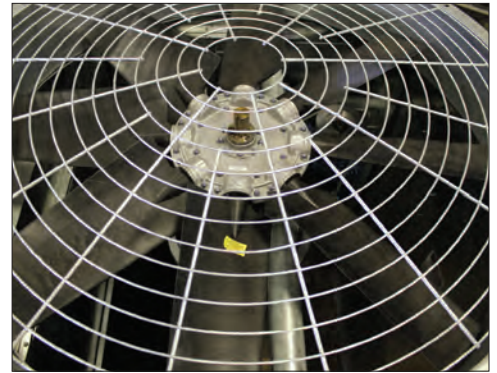
#### ▶ SOUND ATTENUATION (OPTION)

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. The FXV thermal performance with intake sound attenuation is certified in accordance with CTI Standard STD-201.



### 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.



Low Sound Fan



Single Side Air Intake

# FXV Custom Features & Options

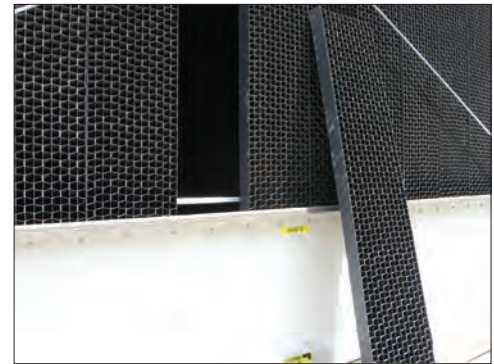
## ➤ Air Intake and Discharge Options

In a closed circuit cooling tower, airborne debris can be entrained in the water through the unit's air intake. The FXV 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 tower lowers maintenance requirements and helps to maintain thermal efficiency.



### COMBINED INLET SHIELDS (CIS)

The Combined Inlet Shields' (CIS) bent flow path blocks sunlight from the cold water 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, are CTI certified, 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.



Combined Inlet Shields

### ▶ PCD HOODS AND INSULATION (OPTION)

The innovative design of BAC closed circuit cooling tower's results in a low heat loss when the unit is idle. When additional heat loss prevention is desired, PCDs with stainless steel linkages and damper actuators can be provided. The motor actuators are easily accessible. The addition of factory mounted insulation to the hood and/or casing further reduces the heat loss by minimizing losses due to conduction. Per ASHRAE 90.1-2010 either an automatic 3 way valve or PCDs are required on Closed Circuit Cooling Towers used on heat pump applications when used in heating applications.



PCD Hood Installation



### 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.





## > Access Options

BAC provides a broad offering of access options. Our evaporative equipment is designed to be the most 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 available, allowing access to the spacious plenum area for maintenance and inspection of the cold water basin, make-up, fill, and drive system.

### ▶ MOTOR REMOVAL SYSTEM (OPTION)

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

### ▶ 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.

### INTERNAL LADDER (OPTION)

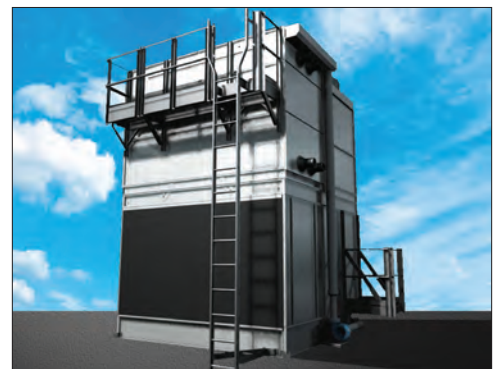
For access to the motor and drive assemblies on single air intake models, a movable internal ladder is available.

### ▶ 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. An internal walkway is required with this package.



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



External Platform and Ladder with Access Door Platform



Internal Service Platform and Internal Ladder



# FXV Performance Data

Model Number	Nominal Tons <sup>(1)</sup>	Fan HP
FXV-0806A-12D-G	29	3
FXV-0806A-12D-H	33	5
FXV-0806A-12D-J	37	7.5
FXV-0806A-12D-K	39	10
FXV-0806A-16D-G	35	3
FXV-0806A-16D-H	40	5
FXV-0806A-16D-J	44	7.5
FXV-0806A-16D-K	47	10
FXV-0806A-20D-G	39	3
FXV-0806A-20D-H	45	5
FXV-0806A-20D-J	50	7.5
FXV-0806A-20D-K	53	10
FXV-0806A-24D-G	44	3
FXV-0806A-24D-H	51	5
FXV-0806A-24D-J	58	7.5
FXV-0806A-24D-K	63	10
FXV-0806B-12D-G	34	3
FXV-0806B-12D-H	38	5
FXV-0806B-12D-J	42	7.5
FXV-0806B-12D-K	44	10
FXV-0806B-12D-L	47	15
FXV-0806B-16D-G	41	3
FXV-0806B-16D-H	46	5
FXV-0806B-16D-J	51	7.5
FXV-0806B-16D-K	54	10
FXV-0806B-16D-L	57	15
FXV-0806B-20D-G	45	3
FXV-0806B-20D-H	52	5
FXV-0806B-20D-J	57	7.5
FXV-0806B-20D-K	61	10
FXV-0806B-20D-L	65	15
FXV-0806B-24D-G	53	3
FXV-0806B-24D-H	61	5
FXV-0806B-24D-J	67	7.5
FXV-0806B-24D-K	72	10
FXV-0806B-24D-L	78	15
FXV-0806B-28D-G	55	3
FXV-0806B-28D-H	64	5
FXV-0806B-28D-J	71	7.5
FXV-0806B-28D-K	77	10
FXV-0806B-28D-L	83	15

Model Number	Nominal Tons <sup>(1)</sup>	Fan HP
FXV-0806B-32D-G	58	3
FXV-0806B-32D-H	67	5
FXV-0806B-32D-J	75	7.5
FXV-0806B-32D-K	80	10
FXV-0806B-32D-L	87	15
FXV-0806B-36D-G	60	3
FXV-0806B-36D-H	69	5
FXV-0806B-36D-J	77	7.5
FXV-0806B-36D-K	83	10
FXV-0806B-36D-L	90	15
FXV-0809A-12D-G	47	3
FXV-0809A-12D-H	55	5
FXV-0809A-12D-J	61	7.5
FXV-0809A-12D-K	65	10
FXV-0809A-12D-L	72	15
FXV-0809A-16D-G	53	3
FXV-0809A-16D-H	62	5
FXV-0809A-16D-J	69	7.5
FXV-0809A-16D-K	75	10
FXV-0809A-16D-L	83	15
FXV-0809A-20D-G	57	3
FXV-0809A-20D-H	67	5
FXV-0809A-20D-J	75	7.5
FXV-0809A-20D-K	82	10
FXV-0809A-20D-L	91	15
FXV-0809A-24T-G	59	3
FXV-0809A-24T-H	69	5
FXV-0809A-24T-J	79	7.5
FXV-0809A-24T-K	86	10
FXV-0809A-24T-L	97	15
FXV-0809B-16D-G	61	3
FXV-0809B-16D-H	71	5
FXV-0809B-16D-J	79	7.5
FXV-0809B-16D-K	85	10
FXV-0809B-16D-L	94	15
FXV-0809B-16D-M	99	20
FXV-0809B-20D-G	66	3
FXV-0809B-20D-H	77	5
FXV-0809B-20D-J	86	7.5
FXV-0809B-20D-K	93	10
FXV-0809B-20D-L	103	15
FXV-0809B-20D-M	109	20

Model Number	Nominal Tons <sup>(1)</sup>	Fan HP
FXV-0809B-24D-G	128	3
FXV-0809B-24D-H	74	5
FXV-0809B-24D-J	87	7.5
FXV-0809B-24D-K	98	10
FXV-0809B-24D-L	107	15
FXV-0809B-24D-M	119	20
FXV-0809B-28D-G	76	3
FXV-0809B-28D-H	91	5
FXV-0809B-28D-J	103	7.5
FXV-0809B-28D-K	112	10
FXV-0809B-28D-L	125	15
FXV-0809B-28D-M	135	20
FXV-0809B-32D-G	78	3
FXV-0809B-32D-H	94	5
FXV-0809B-32D-J	106	7.5
FXV-0809B-32D-K	116	10
FXV-0809B-32D-L	130	15
FXV-0809B-32D-M	140	20
FXV-0809B-36D-G	80	3
FXV-0809B-36D-H	95	5
FXV-0809B-36D-J	109	7.5
FXV-0809B-36D-K	119	10
FXV-0809B-36D-L	134	15
FXV-0809B-36D-M	145	20
FXV-0809B-24T-G	69	3
FXV-0809B-24T-H	81	5
FXV-0809B-24T-J	91	7.5
FXV-0809B-24T-K	99	10
FXV-0809B-24T-L	111	15
FXV-0809B-24T-M	119	20
FXV-0809B-30T-G	74	3
FXV-0809B-30T-H	87	5
FXV-0809B-30T-J	99	7.5
FXV-0809B-30T-K	108	10
FXV-0809B-30T-L	120	15
FXV-0809B-30T-M	130	20
FXV-0809B-36T-G	77	3
FXV-0809B-36T-H	91	5
FXV-0809B-36T-J	104	7.5
FXV-0809B-36T-K	113	10
FXV-0809B-36T-L	127	15
FXV-0809B-36T-M	138	20



**NOTE:** For notes on pages C29 and C30, see page C33.




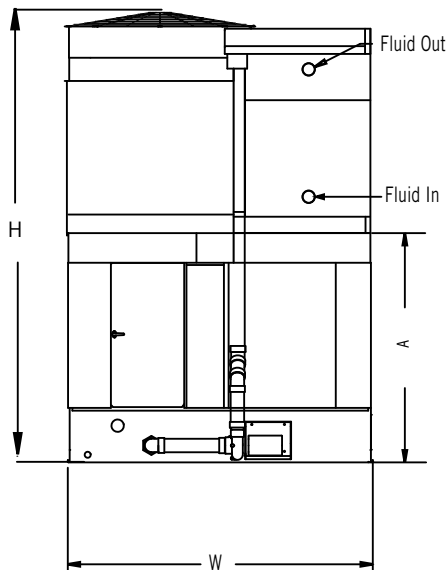
Model Number	Nominal Tons <sup>(1)</sup>	Fan HP
FXV-0812A-12D-J	83	7.5
FXV-0812A-12D-K	90	10
FXV-0812A-12D-L	101	15
FXV-0812A-12D-M	108	20
FXV-0812A-16D-J	93	7.5
FXV-0812A-16D-K	100	10
FXV-0812A-16D-L	113	15
FXV-0812A-16D-M	122	20
FXV-0812A-20D-J	99	7.5
FXV-0812A-20D-K	109	10
FXV-0812A-20D-L	121	15
FXV-0812A-20D-M	131	20
FXV-0812A-23T-J	101	7.5
FXV-0812A-23T-K	109	10
FXV-0812A-23T-L	122	15
FXV-0812A-23T-M	132	20
FXV-0812A-16Q-J	79	7.5
FXV-0812A-16Q-K	86	10
FXV-0812A-16Q-L	95	15
FXV-0812A-16Q-M	103	20
FXV-0812A-23Q-J	96	7.5
FXV-0812A-23Q-K	104	10
FXV-0812A-23Q-L	116	15
FXV-0812A-23Q-M	125	20
FXV-0812B-12D-J	98	7.5
FXV-0812B-12D-K	105	10
FXV-0812B-12D-L	117	15
FXV-0812B-12D-M	124	20
FXV-0812B-12D-N	129	25
FXV-0812B-12D-O	132	30
FXV-0812B-16D-J	109	7.5
FXV-0812B-16D-K	118	10
FXV-0812B-16D-L	131	15
FXV-0812B-16D-M	140	20
FXV-0812B-16D-N	145	25
FXV-0812B-16D-O	149	30
FXV-0812B-20D-J	117	7.5
FXV-0812B-20D-K	127	10
FXV-0812B-20D-L	141	15
FXV-0812B-20D-M	152	20
FXV-0812B-20D-N	157	25
FXV-0812B-20D-O	163	30

Model Number	Nominal Tons <sup>(1)</sup>	Fan HP
FXV-0812B-24D-J	130	7.5
FXV-0812B-24D-K	142	10
FXV-0812B-24D-L	161	15
FXV-0812B-28D-J	136	7.5
FXV-0812B-28D-K	148	10
FXV-0812B-24T-J	124	7.5
FXV-0812B-24T-K	136	10
FXV-0812B-24T-L	152	15
FXV-0812B-24T-M	165	20
FXV-0812B-24T-N	171	25
FXV-0812B-24T-O	178	30
FXV-0812B-30T-J	132	7.5
FXV-0812B-30T-K	144	10
FXV-0812B-30T-L	163	15
FXV-0812B-30T-M	177	20
FXV-0812B-30T-N	183	25
FXV-0812B-30T-O	191	30
FXV-0812B-36T-J	137	7.5
FXV-0812B-36T-K	150	10
FXV-0812B-36T-L	171	15
FXV-0812B-36T-M	185	20
FXV-0812B-36T-N	193	25
FXV-0812B-36T-O	201	30
FXV-0812B-16Q-J	93	7.5
FXV-0812B-16Q-K	100	10
FXV-0812B-16Q-L	111	15
FXV-0812B-16Q-M	119	20
FXV-0812B-16Q-N	122	25
FXV-0812B-16Q-O	125	30
FXV-0812B-23Q-J	112	7.5
FXV-0812B-23Q-K	120	10
FXV-0812B-23Q-L	133	15
FXV-0812B-23Q-M	142	20
FXV-0812B-23Q-N	147	25
FXV-0812B-23Q-O	153	30
FXV-0812B-32Q-J	129	7.5
FXV-0812B-32Q-K	142	10
FXV-0812B-32Q-L	160	15
FXV-0812B-32Q-M	174	20
FXV-0812B-32Q-N	180	25
FXV-0812B-32Q-O	187	30

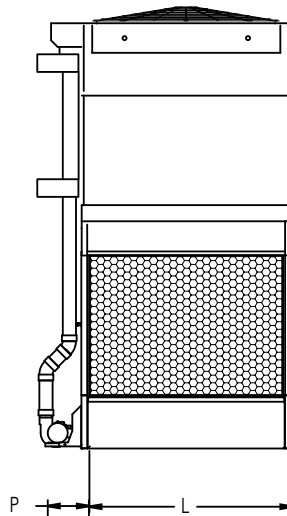
Model Number	Nominal Tons <sup>(1)</sup>	Fan HP
FXV-0818A-12D-K	147	15
FXV-0818A-12D-L	163	22.5
FXV-0818A-12D-M	173	30
FXV-0818A-16D-K	161	15
FXV-0818A-23T-K	183	15
FXV-0818A-23T-L	203	22.5
FXV-0818A-23T-M	217	30
FXV-0818A-24T-K	185	15
FXV-0818A-24T-L	209	22.5
FXV-0818A-24T-M	226	30
FXV-0818A-16Q-K	144	15
FXV-0818A-16Q-L	160	22.5
FXV-0818A-16Q-M	171	30
FXV-0818A-23Q-K	177	15
FXV-0818A-23Q-L	195	22.5
FXV-0818A-23Q-M	209	30
FXV-0818A-24Q-K	180	15
FXV-0818A-24Q-L	203	22.5
FXV-0818A-24Q-M	218	30
FXV-0818A-32Q-K	192	15
FXV-0818A-32Q-L	218	22.5
FXV-0818A-32Q-M	237	30
FXV-0818A-36H-K	190	15
FXV-0818A-36H-L	214	22.5
FXV-0818A-36H-M	233	30
FXV-0818B-12D-K	167	15
FXV-0818B-12D-L	181	22.5
FXV-0818B-12D-M	194	30
FXV-0818B-12D-N	199	37.5
FXV-0818B-12D-O	206	45
FXV-0818B-24T-K	215	15
FXV-0818B-24T-L	239	22.5
FXV-0818B-24T-M	257	30
FXV-0818B-24T-N	264	37.5
FXV-0818B-24T-O	275	45
FXV-0818B-30T-K	227	15
FXV-0818B-16Q-K	164	15
FXV-0818B-16Q-L	180	22.5
FXV-0818B-16Q-M	191	30
FXV-0818B-16Q-N	197	37.5
FXV-0818B-16Q-O	204	45

# FXV Engineering Data

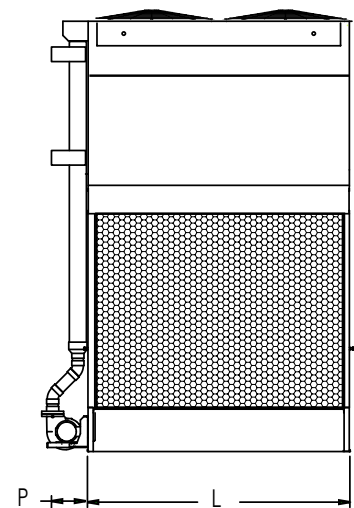
 **NOTE:** Up-to-date engineering data, free product selection software, and more can be found at [www.BaltimoreAircoil.com](http://www.BaltimoreAircoil.com).



**Connection Side:**  
Models FXV-0806x and FXV-0809x



**Air Intake End:**  
Models FXV-0806x



**Air Intake End:**  
Models FXV-0809x

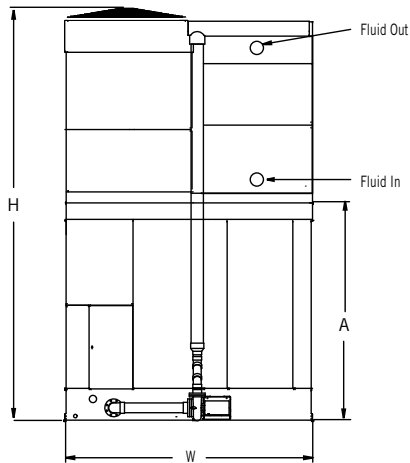
 **NOTES:**

1. Nominal tons of cooling represents 3 USGPM of water cooled from 95°F to 85°F at a 78°F entering wet-bulb temperature.
2. Operating weight is for the unit with the water level in the cold water basin at the overflow.
3. The actual size and number of the coil inlet and outlet connections may vary with the design flow rate. Consult unit print for dimensions.
4. Standard coil inlet and outlet connections are beveled for welding.
5. Models with Whisper Quiet Fans may have heights up to 5 1/2" greater than shown.
6. Standard make-up, drain and overflow connections are located near the bottom of the unit. Make-up connection is 1 1/2" MPT standpipe, drain is 2" FPT, and overflow is 3" FPT. Standard make-up is MPT and standard drain and overflow are FPT.

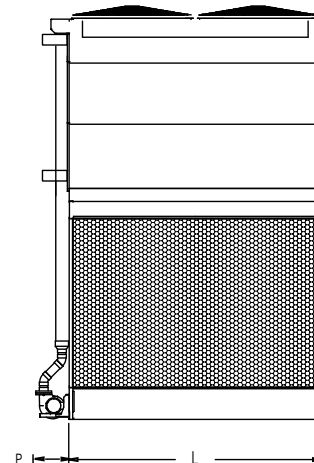
**Do not use for construction.** Refer to factory certified dimensions. This catalog includes data current at the time of publication, which should be reconfirmed at the time of purchase.

Model Number	Pump Motor HP	CFM	Approximate Weight (lbs)			Dimensions					Connection Size <sup>(3,6)</sup>		Spray Pump (USGPM)	Internal Coil Volume (gal)	Riser Pipe Dia.
			Operating Weight <sup>(2)</sup>	Shipping Weight	Heaviest Section	L	W	H	A	P	Make-Up Water	Coil			
FXV-0806A-12D-x	2	33,060	7,780	4,890	2,920	6'-0"	8'-6"	12'-7"	6'-5"	1'-6"	1 1/2"	4	290	44	4"
FXV-0806A-16D-x		32,400	8,210	5,190	3,210			12'-7"	6'-5"					59	
FXV-0806A-20D-x		31,830	8,630	5,500	3,500			12'-7"	6'-5"					73	
FXV-0806A-24D-x		31,480	9,460	6,200	4,180			15'-5"	6'-5"					88	
FXV-0806B-12D-x		41,970	8,320	5,420	3,000			15'-3"	9'-1"					44	
FXV-0806B-16D-x		41,450	8,740	5,730	3,290			15'-3"	9'-1"					59	
FXV-0806B-20D-x		40,990	9,160	6,030	3,580			15'-3"	9'-1"					73	
FXV-0806B-24D-x		40,590	9,990	6,740	4,250			18'-1"	9'-1"					88	
FXV-0806B-28D-x		40,330	10,420	7,040	4,540			18'-1"	9'-1"					103	
FXV-0806B-32D-x		40,390	10,840	7,340	4,830			18'-1"	9'-1"					117	
FXV-0806B-36D-x		39,860	11,270	7,650	5,120			18'-1"	9'-1"					132	
FXV-0809A-12D-x		5	48,800	11,040	6,610			3,890	9'-0"					8'-6"	
FXV-0809A-16D-x	47,700		11,670	7,060	4,320	12'-5"	6'-5"	4		88					
FXV-0809A-20D-x	46,860		12,300	7,510	4,740	12'-5"	6'-5"	4		110					
FXV-0809A-24T-x	46,380		13,440	8,470	5,660	15'-3"	6'-5"	6		132					
FXV-0809B-16D-x	58,000		12,260	7,650	4,340	15'-1"	9'-1"	4		88					
FXV-0809B-20D-x	57,350		12,890	8,100	4,770	15'-1"	9'-1"	4		110					
FXV-0809B-24D-x	57,160		13,960	8,990	5,610	17'-11"	9'-1"	4		132					
FXV-0809B-28D-x	56,670		14,590	9,440	6,040	17'-11"	9'-1"	4		154					
FXV-0809B-32D-x	56,320		15,220	9,880	6,460	17'-11"	9'-1"	4		176					
FXV-0809B-36D-x	56,320		15,850	10,330	6,890	17'-11"	9'-1"	4		197					
FXV-0809B-24T-x	57,030		14,040	9,060	5,680	17'-11"	9'-1"	6		132					
FXV-0809B-30T-x	56,480		14,980	9,730	6,320	17'-11"	9'-1"	6		165					
FXV-0809B-36T-x	55,960		15,920	10,400	6,960	17'-11"	9'-1"	6		197					

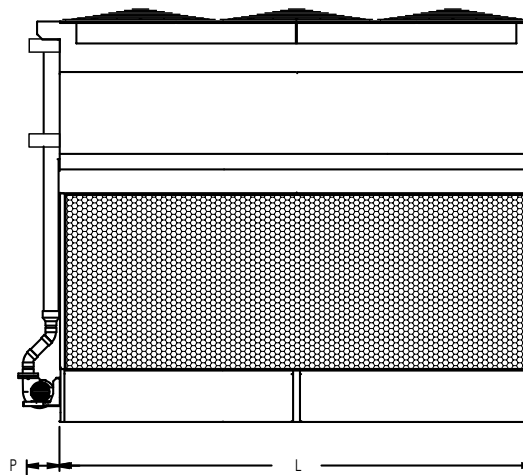
# FXV Engineering Data



**Connection Side:**  
Models FXV-1212x and FXV-1218x



**Air Intake End:**  
Models FXV-1212x



**Air Intake End:**  
Models FXV-1218x



## NOTES:

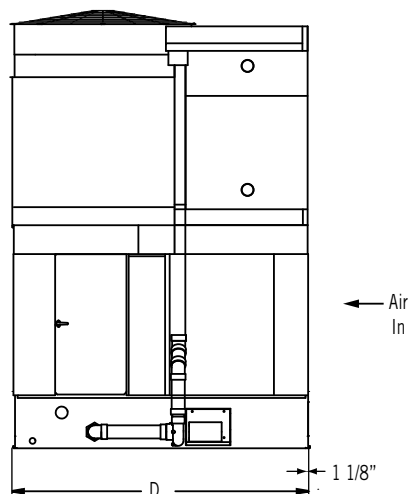
1. Nominal tons of cooling represents 3 USGPM of water cooled from 95°F to 85°F at a 78°F entering wet-bulb temperature.
2. Operating weight is for the unit with the water level in the cold water basin at the overflow and a full coil.
3. The actual size and number of the coil inlet and outlet connections may vary with the design flow rate. Consult unit print for dimensions.
4. Standard coil inlet and outlet connections are beveled for welding.
5. Models with Whisper Quiet Fans may have heights up to 5 1/2" greater than shown.
6. Standard make-up, drain and overflow connections are located near the bottom of the unit. Make-up connection is 1 1/2" MPT standpipe, drain is 2" FPT, and overflow is 3" FPT. Standard make-up is MPT and standard drain and overflow are FPT.

**Do not use for construction.** Refer to factory certified dimensions. This catalog includes data current at the time of publication, which should be reconfirmed at the time of purchase.

# FXV Structural Support



The recommended support arrangement for FXV Closed Circuit Cooling Towers consists of parallel structural members positioned as shown on the drawings. In addition to providing adequate support, the members also serve to raise the unit above any solid foundation to ensure access to the bottom of the tower. To support an FXV on columns or in an alternate arrangement not shown here, consult your local BAC Representative.



## SINGLE AIR INTAKE

Model Number	D
FXV-0806	8'-3 1/2"
FXV-0809	8'-3 1/2"
FXV-0812	8'-3 1/2"
FXV-0818	8'-3 1/2"
FXV-1212	11'-7 3/4"
FXV-1218	11'-7 3/4"



### NOTES:

1. Support members and anchor bolts shall be designed, furnished, and installed by others.
2. Design of support members and anchor bolts shall be in accordance with the strength and serviceability requirements of the applicable building code and project specifications.
3. Support members shall be level at the top.
4. Refer to the certified unit support drawing for loading and additional support requirements.
5. If vibration isolation (provided by others) is used, the isolators should be located under a structural base that complies with one of the recommended support arrangements. Contact your local BAC Representative for all other isolator configurations.