



FXV3 Closed Circuit Cooling Towers

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The FXV3 Closed Circuit Cooling Tower is perfect for applications that require maximum performance. The FXV3 provides the added value of reduced operating costs, improved reliability, and a cost effective solution to both the owner and the installing contractor for large projects. Newly redesigned, the FXV3 offers XE (Extreme Efficiency) models which are at least 3 times more efficient than the minimum energy requirements in ASHRAE Standard 90.1-2016.



BAC's FXV3: Maximizes Performance for Large Scale Projects

Designed for Medium to Large Tonnage Requirements
278 to 765 Tons in a Single Cell
Up to 7,110 USGPM for Process Applications

Outbox
Competition

CTI Certified
with Water
and Glycol

Reduced
Installation
Time

Low
Environmental
Impact

Durable
Construction



FXV3 Benefits

With performance enhancements of over 20% versus the previous generation, the all new FXV3 is the largest modular closed circuit cooling tower on the market. The FXV3 is CTI Certified, IBC compliant, and FM approved. XE (Extreme Efficiency) models are also available with energy efficiency levels at least three times the minimum requirements established in ASHRAE Standard 90.1-2016.

> Reduced Operating Costs

- ▶ The highest performance in the industry in a single unit enables reduced HP while maintaining the same heat transfer
- ▶ Closed loop cooling minimizes process fouling, maintaining process efficiency
- ▶ Combined Flow Technology provides the highest efficiency with the lowest maintenance cost and energy consumption
- ▶ CTI Certification for both water and glycol, eliminates the need for field thermal performance testing costs
- ▶ Optional ENDURADRIVE™ Fan System provides additional energy savings and reliability
- ▶ Up to 40% reduction of total cost of ownership with the XE Models
- ▶ Heavy duty premium efficient motors are standard



Multi-Cell FXV3 Installation Showing Simplified Piping

> Improved Reliability

- ▶ Upgraded seismic and wind load capabilities to meet most requirements worldwide
- ▶ Optional ENDURADRIVE™ Fan System backed by a 7 year warranty
- ▶ Welded, not bolted, Stainless Steel basin reduces potential for leaks and increases the life of the unit (optional)
- ▶ Coils fabricated per ASME B31.5 standard
- ▶ Scale reducing technology increases system efficiency and simplifies water treatment
- ▶ Coils shipping into Canada are available with CRN



Large Oversized Access Doors

> Cost Effective Installation

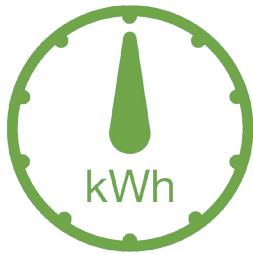
- ▶ Combined Flow Design packs more cooling into smaller footprints resulting in reduced installation cost, space, weight and maintenance
- ▶ Modular design minimizes site installation (less than half the lead time of field erected units)
- ▶ Dual air intakes allow for simple steel designs and layout flexibility
- ▶ Reduced number of coil connections save time and material on piping, welding and valves
- ▶ Flexibility of coil connection location simplifies piping
- ▶ Single fan and motor reduces wiring and controls
- ▶ Built in rigging guides allow for fast rigging
- ▶ Factory pre-assembled external platforms (option) reduces installation time



Standard Rigging Guides



FXV3 XE Models



XE Models are at least 3 times more efficient than the minimum ASHRAE Standard 90.1-2016 requirements



High energy efficiency levels help contribute to LEED® credits



Low fan HP reduces sound levels by 5 dB while maintaining the same heat transfer



Lowest Operating Costs

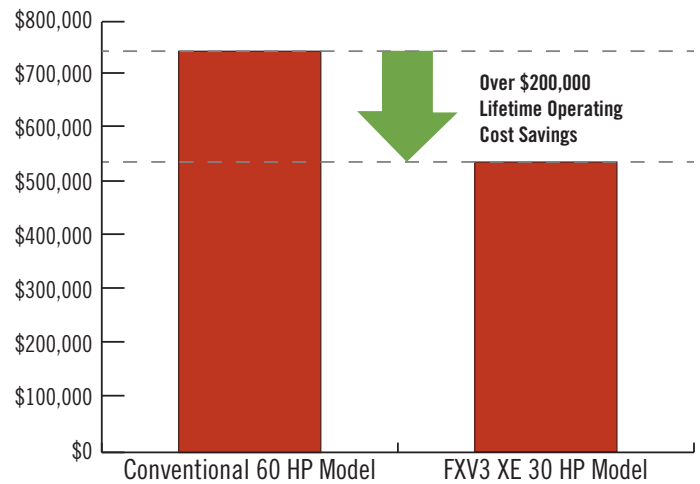
- ▶ 40% reduction in operating cost for an 550-Ton unit
- ▶ Payback of less than two years



Application Assurance

- ▶ At least three times more efficient than minimum energy requirements in ASHRAE Standard 90.1-2016
- ▶ Extends the life of the mechanical drive components (minimum L₁₀ bearing life 190,000 hours, 40% longer than the standard FXV3)

Comparison of First and Operating Costs



Reduced Sound Levels

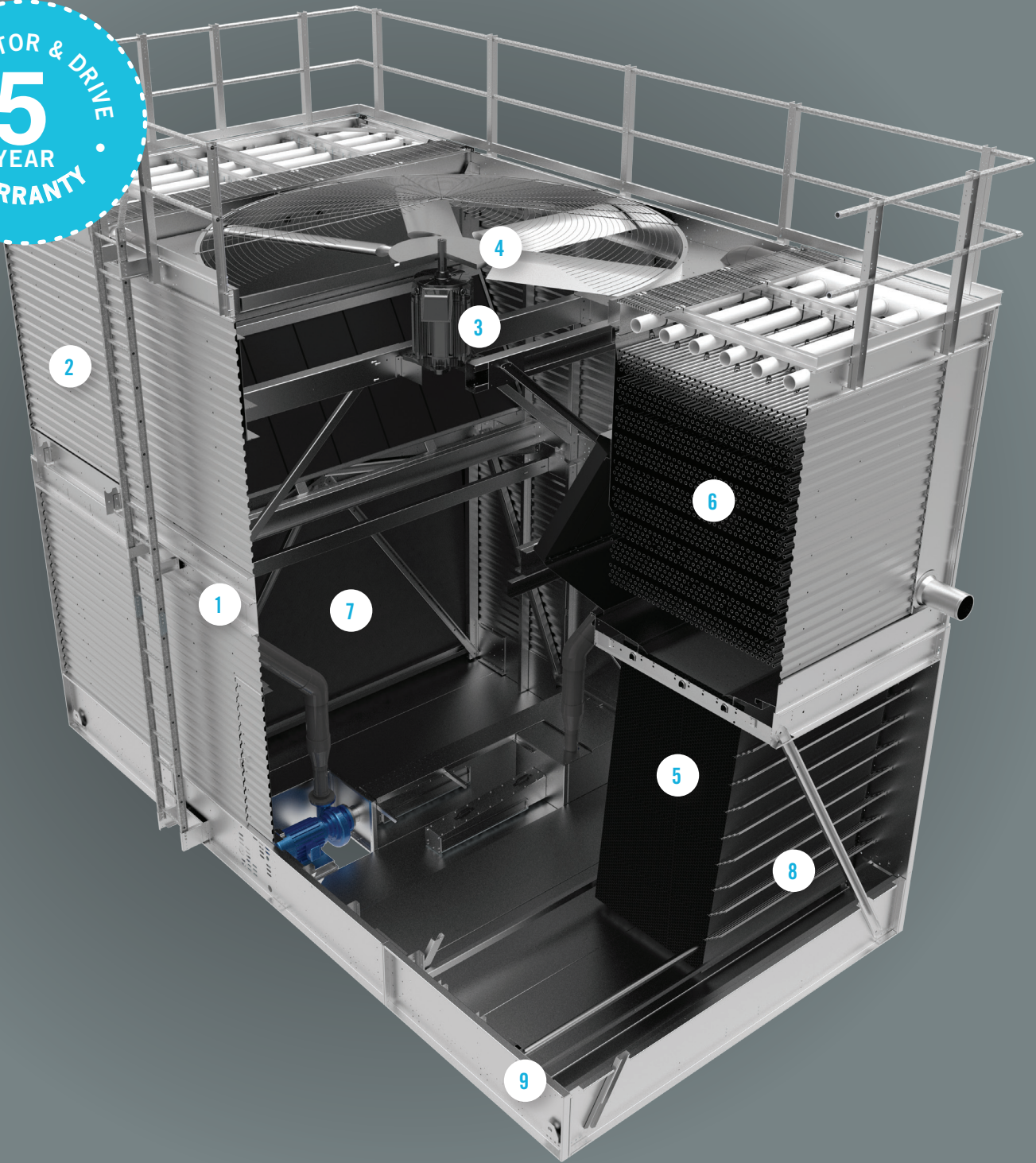
- ▶ Sound reduction up to 5 dB
- ▶ Fans optimized to minimize sound levels while maximizing efficiency
- ▶ Additional sound reducing options available



NOTE: Operating costs based on fan and pump kW x \$0.12kWh x 8760 hours x 50% average load for the year x 20 years.

FXV3 Construction Details

BAC MOTOR & DRIVE
5
YEAR
WARRANTY



1 Heavy-Duty Construction

- ▶ G-235 (Z700 metric) mill galvanized steel frame
- ▶ Meets wind and seismic requirements of the International Building Code (IBC)

2 FRP Casing Panels

- ▶ Corrosion resistant
- ▶ Maintenance free
- ▶ UV-resistant finish

3 BALTIDRIVE® Power Train

- ▶ Premium quality, solid backed, multi-groove belt
- ▶ Corrosion resistant cast aluminum sheaves
- ▶ Heavy-duty bearings with a minimum L_{10} 80,000 hours
- ▶ Premium efficient, cooling tower duty motors suitable for VFD applications
- ▶ 5-year motor and drive warranty

4 Low HP Axial Fan

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

5 Coil Sections

- ▶ 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 standard
- ▶ When required, orders shipping into Canada are supplied with a CRN

6 Water Distribution System

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

7 BACross® Fill with Integral Drift Eliminators

- ▶ 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 for cleanability

8 FRP Air Intake Louvers

- ▶ Corrosion resistant
- ▶ UV-resistant finish
- ▶ Maintenance free

9 Hygienic Cold Water Basin

- ▶ Sloped cold water basin at air intake face eliminates stagnant water for easy cleaning
- ▶ Suction strainer with removable, cleanable anti-vortex hood

10 Integral Recirculating Spray Water Pumps (NOT SHOWN)

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

11 Hinged Access Doors (NOT SHOWN)

- ▶ Inward swinging door on each end wall
- ▶ Easy safe access to the interior of the unit

FXV3

Custom Features & Options

➤ Materials of Construction

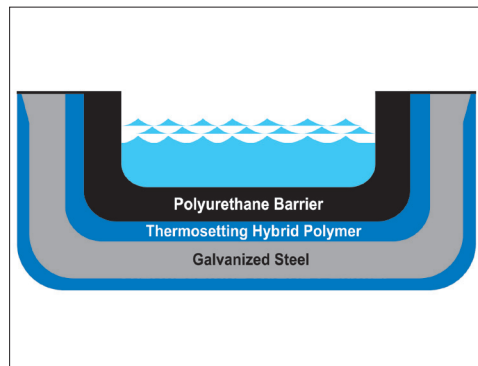
Determining the appropriate material of construction for a project depends on several factors, including water quality, climate and environmental conditions, availability of time and manpower for maintenance, unit lifetime requirements, and budget. BAC provides the widest variety of material of construction options in the industry and has the ability to provide a solution to meet virtually 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, a G-235 mill galvanized steel frame with fiberglass reinforced polyester (FRP) casing panels and louvers is used as the standard material of construction. The structural integrity of the unit is provided by its strong steel frame. With proper maintenance and water treatment, G-235 galvanized steel and FRP will provide an excellent service life under the operating conditions normally encountered in most applications.



TriArmor® Corrosion Protection System Triple Layer Protection of the Basin



▶ 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, are fabricated 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.



Factory Application of TriArmor® Corrosion Protection System



EVERTOUGH™ CONSTRUCTION (OPTION)

EVERTOUGH™ Construction offers a unique combination of highly 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.
- Fiberglass reinforced polyester (FRP) casing panels are corrosion and UV resistant, ensuring long life.
- Designated steel components above the 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 within the basin, such as the strainer and submerged structural supports, will be constructed of stainless steel.

▶ 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 an additional 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 options are available.

• WELDED STAINLESS STEEL BASIN

A welded stainless steel basin is available. 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.



Standard FRP Panels



Thermosetting Hybrid Polymer



Welded Stainless Steel Basin

FXV3

Custom Features & Options

- **ALL STAINLESS STEEL CONSTRUCTION (OPTION)**

All unit structural elements and the basin are constructed of stainless steel. Seams between panels inside the basin are welded, providing an extreme advantage over bolted 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. Casing panels and air intake louvers are constructed of corrosion and UV-resistant fiberglass reinforced polyester (FRP).

- ▶ **BASINLESS UNIT CONSTRUCTION (OPTION)**

The basinless unit construction option enables FXV3 Closed Circuit Cooling Towers to be directly installed on new or existing concrete basins. This custom feature reduces maintenance costs by eliminating the integral basin from traditional units. It simplifies piping and pumping requirements of multi-cell installations, eliminates concern for basin corrosion, simplifies water treatment and provides a cost-effective solution for many field-erected replacement projects. BAC is the only leading evaporative cooling equipment manufacturer to provide basinless construction for factory assembled equipment.

- ▶ **STEEL CASING PANELS AND LOUVERS (OPTION)**

Steel casing panels and louvers are available in G-235 mill galvanized steel, thermosetting hybrid polymer, and stainless steel.

> Coil Configurations

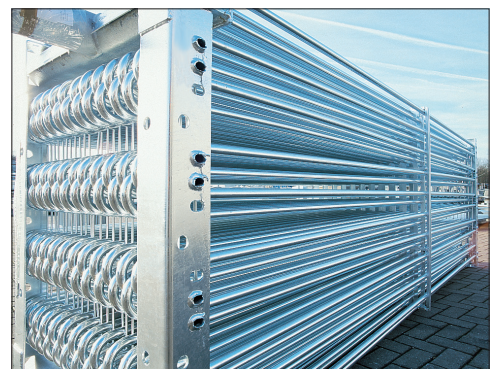
BAC offers a large selection of coil configuration options to fulfill any thermal and pressure drop requirements.

- ▶ **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 the ASME B31.5 standard to ensure the highest quality and integrity.



Basinless Unit Construction



Standard Coil Construction



▶ **CLEANABLE HEADER COIL (OPTION)**

The cleanable header tube bundle provides removable cover plates on the intake and outlet header boxes to permit access to each serpentine tube circuit for solvent or air-pressure cleaning. Tubes are all prime surface steel tubing formed into a serpentine shape and welded into an assembly. 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 the ASME B31.5 standard to ensure the highest quality and integrity.

▶ **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).

▶ **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 (FINNED) SURFACE 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 the ASME B31.5 standard to ensure the highest quality and integrity.

▶ **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.



Straight-Through Cleanable Coil



Multiple Circuit Coils



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 standard serpentine coil configurations shipped into Canada.

FXV3

Custom Features & Options

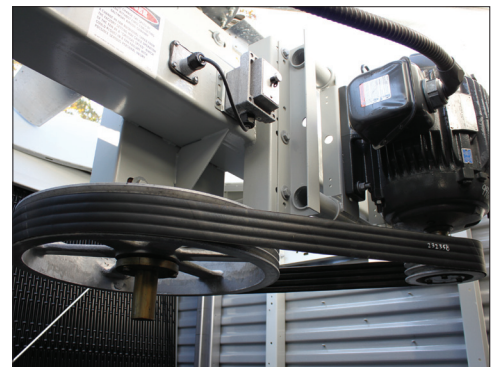
> Drive System Options

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.

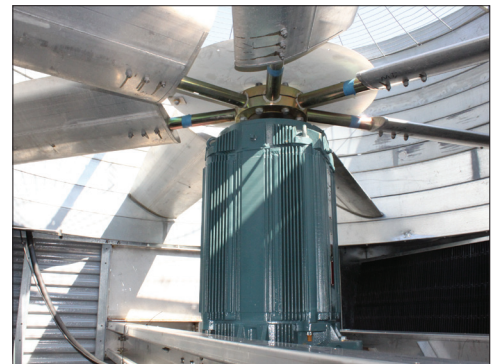


BALTIDRIVE® Power Train Fan System



ENDURADRIVE™ FAN SYSTEM (OPTION)

The ENDURADRIVE™ Fan System offers an energy efficient direct drive motor for large cooling tower applications. This system is designed to replace conventional gear drive designs and provides additional energy savings with the lowest maintenance, and highest reliability. Additionally this system comes with the industries best **7 year motor warranty** and 5 year VFD (limited warranty).

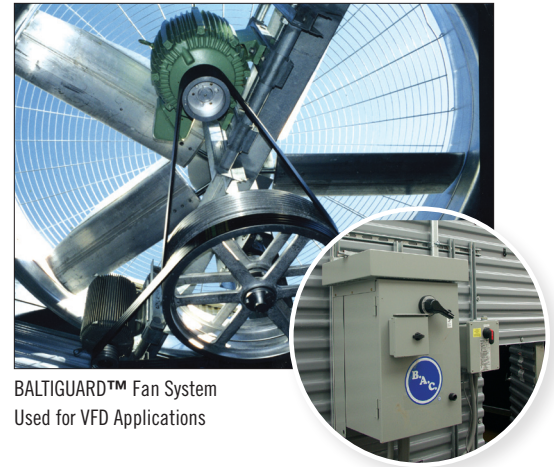


ENDURADRIVE™ Fan System



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 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, especially on projects with critical process loads. 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)**

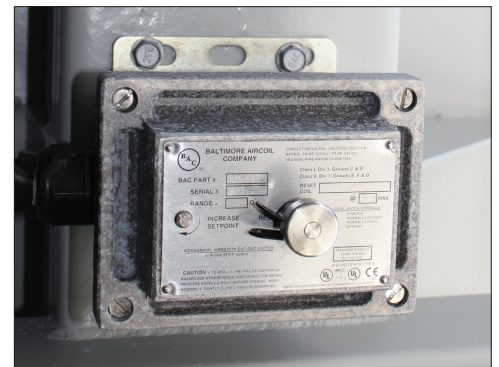
The BALTIGUARD PLUS™ Fan System builds on the advantages of the BALTIGUARD™ Fan System by adding a variable frequency drive (VFD) to either the pony or the main motor, depending on system requirements. This offers the benefits of additional capacity control and energy savings, along with the redundancy 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.

▶ **GEAR DRIVE SYSTEM, CLOSE-COUPLED MOTOR (OPTION)**

A gear drive system is available. Both the gear drive and couplings are selected with a 2.0 service factor. Gear construction includes a nickel-alloy steel shaft, casehardened gears, self lubrication, and a single piece, gray iron housing. This drive system ships completely installed and aligned.

▶ **GEAR DRIVE SYSTEM, EXTERNALLY MOUNTED MOTOR (OPTION)**

A gear drive system with a TEFC motor mounted outside the airstream is also available. A non-corrosive carbon-fiber composite drive shaft with stainless steel hubs is selected with a 2.0 service factor. The motor and drive shaft ship separately for easy field installation.



Vibration Cutout Switch

FXV3

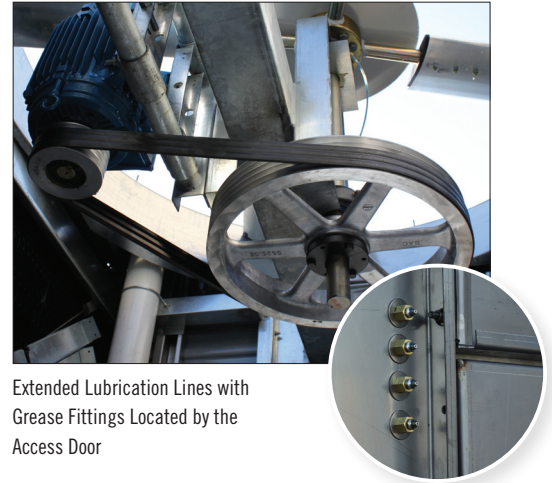
Custom Features & Options

▶ 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.

▶ 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

> Cold Water Basin



The spray water collects in the cold water basin which is pumped back over the heat transfer coil. During operation, the hygienic cold water basin helps eliminate any stagnant water zones, which can help to simplify water treatment.

▶ 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.

▶ 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.



Mechanical Water Level Control



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 in the Product Application Handbook.

▶ 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 requires protection to prevent freezing of the water in the cold water basin when the unit is idle. Factory-installed electric immersion heaters with thermostat, which maintain 40°F (4.4°C) water temperature, are a simple and inexpensive way of providing such protection.



Basin Heater

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
FXV3-1224	2	12	2	15
FXV3-1426	2	14	2	20



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

▶ Water Distribution System

The FXV3 comes standard with two integral spray water pumps sized to distribute the recirculating water over the coils 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 over the coils allow for inspection and access to the top of the coils during full operation.



Standard Spray Water Pumps

FXV3

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 while maintaining high thermal efficiency.

▶ 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 automatically determines if high temperature fill is needed based on the design requirements.

> 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.



BACross® Fill Manufacturing



Standard Rigging



STANDARD RIGGING GUIDES

Rigging guides allow easy alignment and engagement of the coil sections, the fan (plenum) section, and lower section of units. The guides ensure proper placement of the coil sections to the fan section making rigging much simpler and reducing the time required.



► **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 are excluded due to the need for in-plant assembly.

► **Sound Options**

Recognition for 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 marketplace and can provide the most cost effective option to meet any requirement.



Standard Fan



STANDARD FAN

The fan provided for all Dual Air Intake FXV Closed Circuit Cooling Towers is selected to minimize sound levels while maximizing thermal performance.

► **LOW SOUND FAN (OPTION)**

The Low Sound Fan option reduces sound up to 9 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.

► **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.



Intake and Discharge Sound Attenuation

FXV3

Custom Features & Options

> Air Discharge Options

For cold weather operation, freeze protection of the coils is an important factor. The FXV3 design results in a low heat loss when the unit is idle. If additional protection is necessary, PCD hoods and insulation are available.

▶ PCD HOODS AND INSULATION (OPTION)

The innovative design of the FXV3 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 Standard 90.1-2016 either an automatic three way valve or PCDs are required on Closed Circuit Cooling Towers used on heat pump applications when used in heating applications in certain climate zones.



PCD Hood and External Platform

> 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.

▶ MOTOR REMOVAL SYSTEM (OPTION)

The removal system includes davit arm(s) to facilitate motor replacement.



External Platform and Ladder Package



EXTERNAL PLATFORMS AND LADDER PACKAGES (OPTION)

Every external platform is preassembled and pre-fitted at the factory to ensure that every component will fit and function exactly as designed. The platform will ship secured in the basin and attach quickly in the field with minimum fasteners. Safety gates are available for all handrail openings.



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



▶ **ACCESS DOOR PLATFORM AND LADDER PACKAGES (OPTION)**

Access door platforms are available to access to the unit when installed on elevated supports. This allows for safe access to the unit, as well as a working platform to stage tools for maintenance.



HANDRAIL PACKAGES (OPTION)

Handrail packages are available to provide safe access to the top of the unit for maintenance to the distribution system. Fan deck extensions are available for passage around the fan on units designed with maximized fan diameters, or discharge sound attenuation. The specially designed handrail packages are secured for compact shipping in the cold water basin to minimize shipping costs and are ready for field assembly. Partial or full grating above the coil air intake is recommended with this option.



INTERNAL WALKWAY (OPTION)

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.



INTERNAL SERVICE PLATFORM AND LADDER PACKAGES (OPTION)

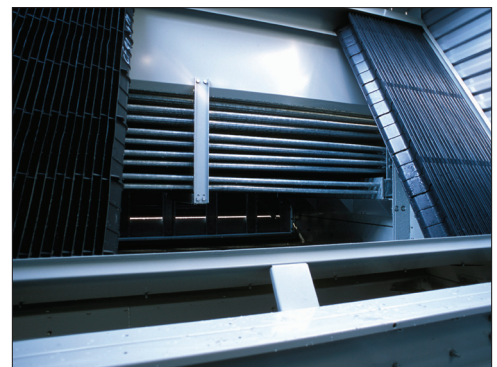
For access to the motor and drive assemblies, an internal ladder and upper service platform with handrails is available on larger units. Safety gates are available for all handrail openings, and all components are designed to meet OSHA requirements. An internal walkway is required with this package.



Handrail Package



External Motor Platform



Easy Access to the Coils

FXV3

Performance Data

Model Number	Nominal Tons ⁽¹⁾	Fan HP
FXV3-1224-20D-25	381	25
FXV3-1224-20D-30	399	30
FXV3-1224-20D-40	429	40
FXV3-1224-20D-50	452	50
FXV3-1224-20D-60	472	60
FXV3-1224-20D-75	488	75
FXV3-1224-24D-30	421	30
FXV3-1224-24D-40	455	40
FXV3-1224-24D-50	482	50
FXV3-1224-24D-60	504	60
FXV3-1224-24D-75	537	75
FXV3-1224-24T-25	376	25
FXV3-1224-24T-30	395	30
FXV3-1224-24T-40	426	40
FXV3-1224-24T-50	450	50
FXV3-1224-24T-60	471	60
FXV3-1224-24T-75	510	75
FXV3-1224-24Q-25	356	25
FXV3-1224-24Q-30	373	30
FXV3-1224-24Q-40	402	40
FXV3-1224-24Q-50	425	50
FXV3-1224-24Q-60	444	60
FXV3-1224-24Q-75	471	75
FXV3-1224-28D-30	437	30
FXV3-1224-28D-40	477	40
FXV3-1224-28D-50	508	50
FXV3-1224-28D-60	533	60
FXV3-1224-28D-75	565	75
FXV3-1224-30T-30	428	30
FXV3-1224-30T-40	465	40
FXV3-1224-30T-50	497	50
FXV3-1224-30T-60	521	60
FXV3-1224-30T-75	553	75
FXV3-1224-32D-40	502	40
FXV3-1224-32D-50	534	50
FXV3-1224-32D-60	562	60
FXV3-1224-32D-75	598	75

Model Number	Nominal Tons ⁽¹⁾	Fan HP
FXV3-1224-32Q-30	420	30
FXV3-1224-32Q-40	458	40
FXV3-1224-32Q-50	489	50
FXV3-1224-32Q-60	513	60
FXV3-1224-32Q-75	545	75
FXV3-1224-36D-40	520	40
FXV3-1224-36D-50	557	50
FXV3-1224-36D-60	586	60
FXV3-1224-36D-75	625	75
FXV3-1224-36T-40	500	40
FXV3-1224-36T-50	535	50
FXV3-1224-36T-60	562	60
FXV3-1224-36T-75	598	75
FXV3-1224-36Q-40	480	40
FXV3-1224-36Q-50	513	50
FXV3-1224-36Q-60	539	60
FXV3-1224-36Q-75	574	75
FXV3-1426-20D-40	502	40
FXV3-1426-20D-50	528	50
FXV3-1426-20D-60	550	60
FXV3-1426-20D-75	577	75
FXV3-1426-20D-100	600	100
FXV3-1426-24D-40	537	40
FXV3-1426-24D-50	567	50
FXV3-1426-24D-60	591	60
FXV3-1426-24D-75	622	75
FXV3-1426-24D-100	653	100
FXV3-1426-24T-40	499	40
FXV3-1426-24T-50	526	50
FXV3-1426-24T-60	549	60
FXV3-1426-24T-75	578	75
FXV3-1426-24T-100	612	100
FXV3-1426-24Q-40	476	40
FXV3-1426-24Q-50	502	50
FXV3-1426-24Q-60	523	60
FXV3-1426-24Q-75	550	75
FXV3-1426-24Q-100	583	100

Model Number	Nominal Tons ⁽¹⁾	Fan HP
FXV3-1426-28D-40	557	40
FXV3-1426-28D-50	591	50
FXV3-1426-28D-60	618	60
FXV3-1426-28D-75	651	75
FXV3-1426-28D-100	694	100
FXV3-1426-30T-40	549	40
FXV3-1426-30T-50	581	50
FXV3-1426-30T-60	608	60
FXV3-1426-30T-75	641	75
FXV3-1426-30T-100	684	100
FXV3-1426-32D-50	621	50
FXV3-1426-32D-60	651	60
FXV3-1426-32D-75	685	75
FXV3-1426-32D-100	732	100
FXV3-1426-32Q-40	543	40
FXV3-1426-32Q-50	575	50
FXV3-1426-32Q-60	602	60
FXV3-1426-32Q-75	635	75
FXV3-1426-32Q-100	679	100
FXV3-1426-36D-50	648	50
FXV3-1426-36D-60	679	60
FXV3-1426-36D-75	716	75
FXV3-1426-36D-100	765	100
FXV3-1426-36T-50	625	50
FXV3-1426-36T-60	654	60
FXV3-1426-36T-75	690	75
FXV3-1426-36T-100	738	100
FXV3-1426-36Q-50	604	50
FXV3-1426-36Q-60	633	60
FXV3-1426-36Q-75	655	75
FXV3-1426-36Q-100	713	100

XE FXV3 Performance Data



Model Number	Nominal Tons ⁽¹⁾	Fan HP
FXV3-1224-20D-10	278	10
FXV3-1224-20D-15	314	15
FXV3-1224-20D-20	359	20
FXV3-1224-24D-10	293	10
FXV3-1224-24D-15	338	15
FXV3-1224-24D-20	376	20
FXV3-1224-24D-25	401	25
FXV3-1224-24T-10	281	10
FXV3-1224-24T-15	320	15
FXV3-1224-24T-20	354	20
FXV3-1224-24Q-10	268	10
FXV3-1224-24Q-15	306	15
FXV3-1224-24Q-20	335	20
FXV3-1224-28D-10	301	10
FXV3-1224-28D-15	348	15
FXV3-1224-28D-20	385	20
FXV3-1224-28D-25	414	25
FXV3-1224-30T-10	296	10
FXV3-1224-30T-15	342	15
FXV3-1224-30T-20	377	20
FXV3-1224-30T-25	404	25
FXV3-1224-32D-10	312	10
FXV3-1224-32D-15	362	15
FXV3-1224-32D-20	401	20
FXV3-1224-32D-25	431	25
FXV3-1224-32D-30	459	30
FXV3-1224-32Q-10	292	10
FXV3-1224-32Q-15	337	15
FXV3-1224-32Q-20	370	20
FXV3-1224-32Q-25	397	25

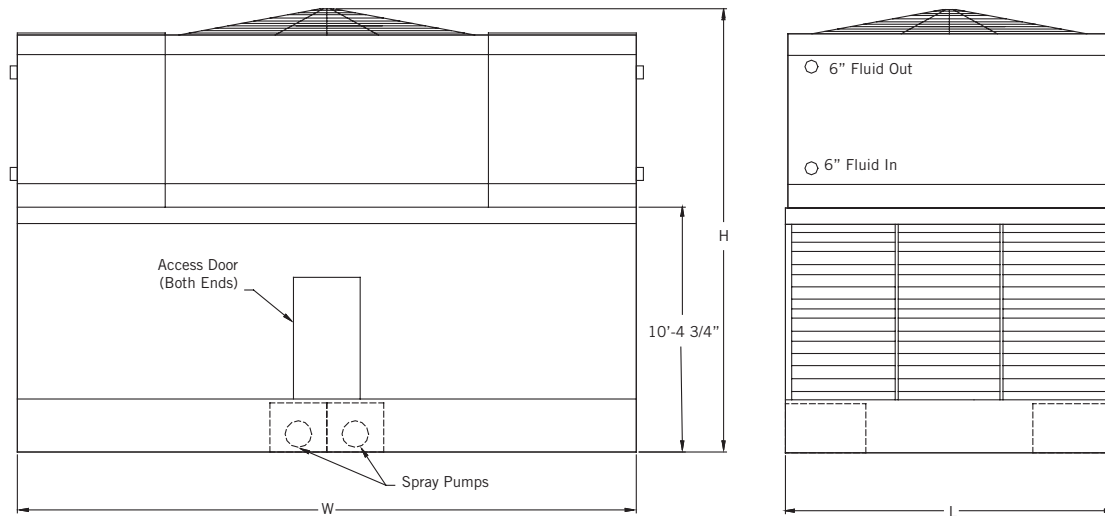
Model Number	Nominal Tons ⁽¹⁾	Fan HP
FXV3-1224-36D-10	320	10
FXV3-1224-36D-15	373	15
FXV3-1224-36D-20	415	20
FXV3-1224-36D-25	447	25
FXV3-1224-36D-30	476	30
FXV3-1224-36T-10	311	10
FXV3-1224-36T-15	361	15
FXV3-1224-36T-20	400	20
FXV3-1224-36T-25	430	25
FXV3-1224-36T-30	457	30
FXV3-1224-36Q-10	303	10
FXV3-1224-36Q-15	348	15
FXV3-1224-36Q-20	386	20
FXV3-1224-36Q-25	414	25
FXV3-1224-36Q-30	441	30
FXV3-1426-20D-15	369	15
FXV3-1426-20D-20	400	20
FXV3-1426-20D-25	449	25
FXV3-1426-20D-30	469	30
FXV3-1426-24D-15	398	15
FXV3-1426-24D-20	431	20
FXV3-1426-24D-25	476	25
FXV3-1426-24D-30	499	30
FXV3-1426-24T-15	378	15
FXV3-1426-24T-20	411	20
FXV3-1426-24T-25	443	25
FXV3-1426-24T-30	464	30
FXV3-1426-24Q-15	363	15
FXV3-1426-24Q-20	394	20
FXV3-1426-24Q-25	423	25
FXV3-1426-24Q-30	443	30

Model Number	Nominal Tons ⁽¹⁾	Fan HP
FXV3-1426-28D-15	418	15
FXV3-1426-28D-20	459	20
FXV3-1426-28D-25	490	25
FXV3-1426-28D-30	516	30
FXV3-1426-30T-15	412	15
FXV3-1426-30T-20	451	20
FXV3-1426-30T-25	481	25
FXV3-1426-30T-30	507	30
FXV3-1426-32D-15	435	15
FXV3-1426-32D-20	478	20
FXV3-1426-32D-25	513	25
FXV3-1426-32D-30	541	30
FXV3-1426-32D-40	586	40
FXV3-1426-32Q-15	407	15
FXV3-1426-32Q-20	445	20
FXV3-1426-32Q-25	476	25
FXV3-1426-32Q-30	502	30
FXV3-1426-36D-15	449	15
FXV3-1426-36D-20	496	20
FXV3-1426-36D-25	532	25
FXV3-1426-36D-30	562	30
FXV3-1426-36D-40	609	40
FXV3-1426-36T-15	436	15
FXV3-1426-36T-20	479	20
FXV3-1426-36T-25	514	25
FXV3-1426-36T-30	542	30
FXV3-1426-36T-40	586	40
FXV3-1426-36Q-15	422	15
FXV3-1426-36Q-20	447	20
FXV3-1426-36Q-25	497	25
FXV3-1426-36Q-30	525	30
FXV3-1426-36Q-40	568	40

FXV3

Engineering Data

Model Number	Motor HP	Weights (lbs)			Dimensions			Spray Pump (USGPM)	Internal Coil Volume (gal)
	Pump	Operating ^[2]	Shipping	Heaviest Section	L	W	H		
FXV3-1224-20D-XX	(2) 7.5	56315	33170	11790	11'-11"	24'-1"	18'-11"	1900	585
FXV3-1224-24D-XX	(2) 7.5	59170	35060	11790	11'-11"	24'-1"	18'-11"	1900	702
FXV3-1224-24T-XX	(2) 7.5	59170	35050	11790	11'-11"	24'-1"	18'-11"	1900	702
FXV3-1224-24Q-XX	(2) 7.5	59725	35310	11790	11'-11"	24'-1"	18'-11"	1900	738
FXV3-1224-28D-XX	(2) 7.5	62625	37625	11790	11'-11"	24'-1"	20'-7"	1900	808
FXV3-1224-30T-XX	(2) 7.5	65215	39325	11790	11'-11"	24'-1"	20'-7"	1900	915
FXV3-1224-32D-XX	(2) 7.5	65425	39475	11790	11'-11"	24'-1"	20'-7"	1900	922
FXV3-1224-32Q-XX	(2) 7.5	66960	40375	11790	11'-11"	24'-1"	20'-7"	1900	998
FXV3-1224-36D-XX	(2) 7.5	68210	41315	11870	11'-11"	24'-1"	20'-7"	1900	1035
FXV3-1224-36T-XX	(2) 7.5	68355	41405	11915	11'-11"	24'-1"	20'-7"	1900	1042
FXV3-1224-36Q-XX	(2) 7.5	67990	41055	11790	11'-11"	24'-1"	20'-7"	1900	1040
FXV3-1426-20D-XX	(2) 7.5	67700	37420	13180	14'-0"	26'-4"	19'-10"	1900	686
FXV3-1426-24D-XX	(2) 7.5	71060	39640	13180	14'-0"	26'-4"	19'-10"	1900	823
FXV3-1426-24T-XX	(2) 7.5	71085	39650	13180	14'-0"	26'-4"	19'-10"	1900	825
FXV3-1426-24Q-XX	(2) 7.5	71610	39890	13180	14'-0"	26'-4"	19'-10"	1900	859
FXV3-1426-28D-XX	(2) 7.5	75020	42530	13180	14'-0"	26'-4"	21'-7"	1900	951
FXV3-1426-30T-XX	(2) 7.5	78040	44520	13180	14'-0"	26'-4"	21'-7"	1900	1075
FXV3-1426-32D-XX	(2) 7.5	78315	44710	13180	14'-0"	26'-4"	21'-7"	1900	1085
FXV3-1426-32Q-XX	(2) 7.5	80065	45750	13180	14'-0"	26'-4"	21'-7"	1900	1170
FXV3-1426-36D-XX	(2) 7.5	81615	46890	13620	14'-0"	26'-4"	21'-7"	1900	1219
FXV3-1426-36T-XX	(2) 7.5	81795	47000	13675	14'-0"	26'-4"	21'-7"	1900	1227
FXV3-1426-36Q-XX	(2) 7.5	81290	46560	13455	14'-0"	26'-4"	21'-7"	1900	1219



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 of the inlet and outlet connection 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 Low Sound Fans may have heights up to 10 1/2" greater than shown.
6. Standard make-up, drain, and overflow connections are located on the bottom of the unit. Make-up connection is 1 1/2" MPT standpipe, drain is 2" FPT, and overflow is 3" FPT.
7. For all models the riser pipe diameter is 6".

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.

FXV3

Engineering Data

DUAL AIR INTAKE FXV HEAT LOSS DATA (BTUH)

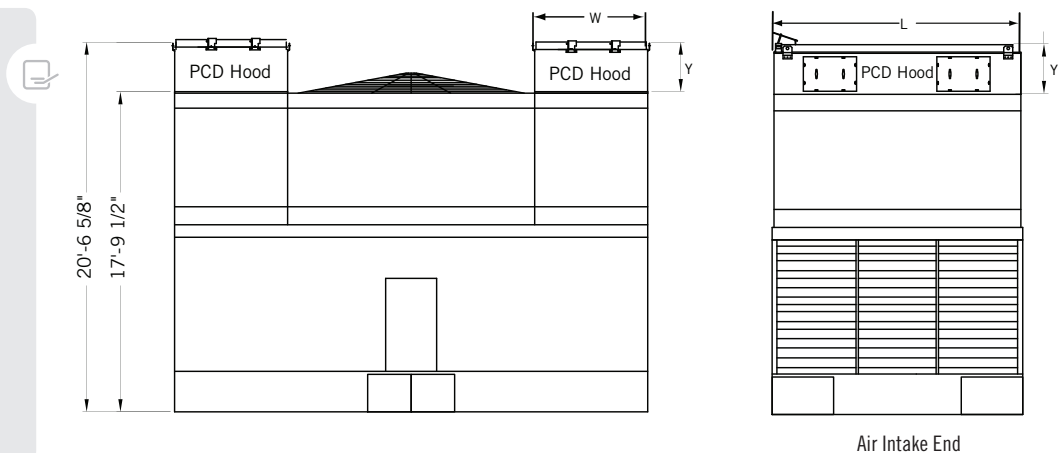
Model Number	Standard Unit	Unit with PCD Hood	Unit with PCD Hood and Insulation
FXV3-1224-20D-xx	792,606	208,434	173,763
FXV3-1224-24D-xx	899,090	205,427	171,256
FXV3-1224-24T-xx	915,201	212,156	176,866
FXV3-1224-24Q-xx	938,656	215,384	179,557
FXV3-1224-30T-xx	1,135,020	244,392	197,682
FXV3-1224-32D-xx	1,115,917	234,489	189,671
FXV3-1224-32Q-xx	1,201,698	248,502	201,006
FXV3-1224-36D-xx	1,202,457	231,613	187,345
FXV3-1224-36T-xx	1,237,100	242,150	195,868
FXV3-1224-36Q-xx	1,236,005	247,939	200,551
FXV3-1426-20D-xx	915,125	227,892	193,913
FXV3-1426-24D-xx	1,037,587	224,047	190,641
FXV3-1426-24T-xx	1,060,647	232,678	197,986
FXV3-1426-24Q-xx	1,085,827	236,913	201,589
FXV3-1426-30T-xx	1,312,863	267,264	220,448
FXV3-1426-32D-xx	1,286,958	254,520	209,936
FXV3-1426-32Q-xx	1,392,742	272,565	224,820
FXV3-1426-36D-xx	1,386,028	250,858	206,915
FXV3-1426-36T-xx	1,432,479	264,344	218,039
FXV3-1426-36Q-xx	1,432,560	271,840	224,221

DIMENSIONAL DATA OF POSITIVE CLOSURE DAMPER HOOD

Model Number	Hood Shipping Weight (lbs) ⁽³⁾	Hood Operating Weight (lbs)	Length (L)	Width (W)	Height (Y)
FXV3-1224	1,300	1,040	11'-11"	6'-3 3/8"	2'-9 1/8"
FXV3-1426	1,500	1,200	13'-11 1/8"		

NOTES:

- Heat Loss based on 50°F entering coil water and -10°F ambient with 45 MPH wind (fans and pumps off).
- One inch thick PVC nitrate rubber blend thermal insulation on both the PCD hood and the casing panels surrounding the coil.
- Hood shipping weight includes shipping skid weight.

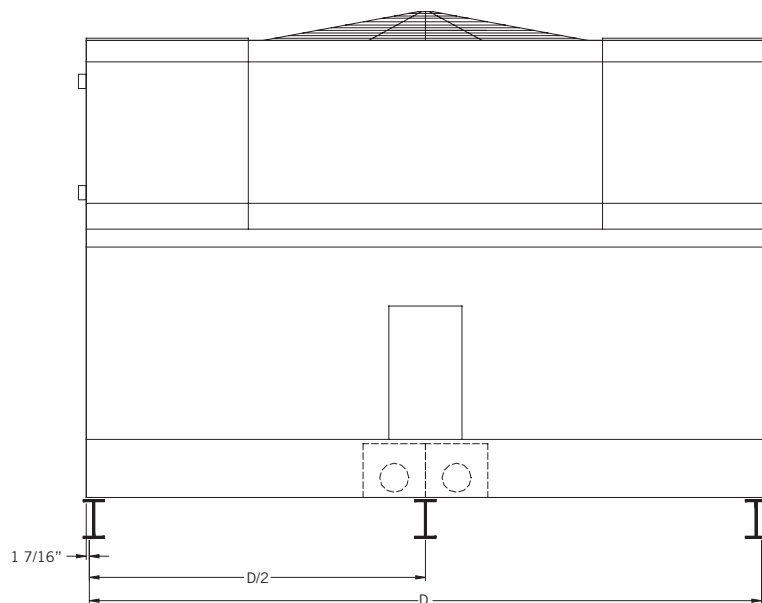


FXV3

Structural Support



The recommended support arrangement for Dual Air Intake 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.



STRUCTURAL SUPPORT

Model Number	D
FXV3-1224-XXX	23'-9 1/8"
FXV3-1426-XXX	26'-0 5/8"



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.



PRODUCT SPOTLIGHT:

Hygienic Cold Water Basin



One of the biggest cooling tower maintenance challenges can be keeping the cold water basin clean and free from biological growth. In open towers, closed circuit towers and evaporative condensers, water is distributed through a series of spray nozzles. The water cascades over sheets of fill in open towers, over a coil and fill combination in some closed circuit towers, and over a coil in some closed circuit towers and evaporative condensers. The water then collects in the cold water basin before being pumped either back to the top of the tower to be redistributed through the spray branches to provide more cooling or it is pumped out of the tower altogether. A major concern in all types of units is the accumulation of algae and other biological contaminants in the basin where this water collects. In competitors' units, airborne debris can pass through their typical louvers, and when it sits in the stagnant water of the cold water basin and is then exposed to the sunlight shining through their louvers, biological growth can occur. Water treatment chemicals are typically used to decrease the risks, but can be costly and dangerous at high concentration levels.

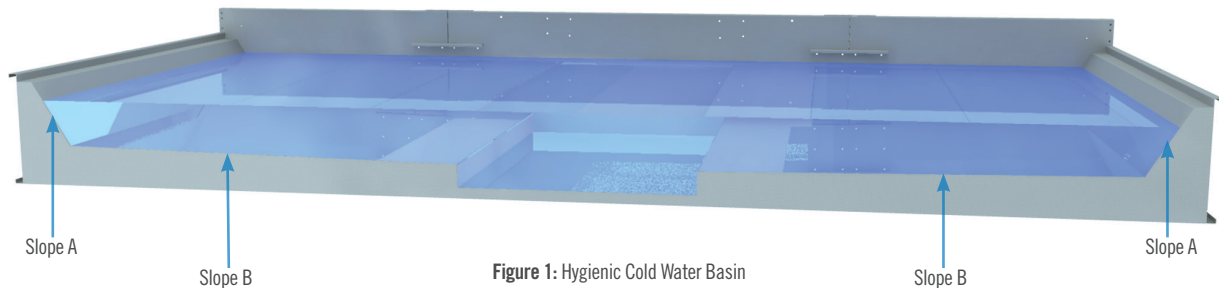


Figure 1: Hygienic Cold Water Basin

BAC, however, makes basin maintenance easier with its patented hygienic cold water basin. Available on the Series 3000 Cooling Towers, FXV3, and CXV Evaporative Condensers, the hygienic cold water basin eliminates any stagnant zones during operation. When used in conjunction with the hygienic cold water basin, BAC's honeycomb Combined Inlet Shields (CIS) lessen the potential for airborne debris to enter the unit's air intake face. As seen in **Figure 1**, the hygienic cold water basin has two different slopes. The steep slope of Slope A allows falling water with possible airborne debris to enter the cold water basin and flow towards the center without collection in stagnant corner areas. The second slope, Slope B, is not as severe, but continues to move the water towards the depressed center sump. Any debris moves towards the center of the basin where it is then easily removed but more importantly, water continues to move so that stagnant water, which is susceptible to biological growth, is avoided.