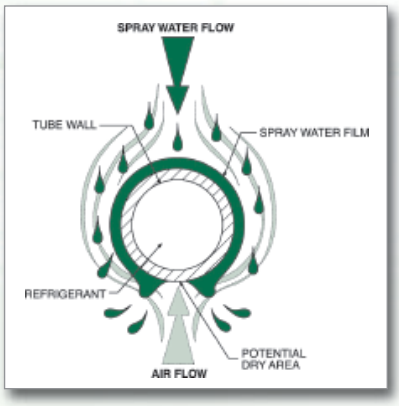
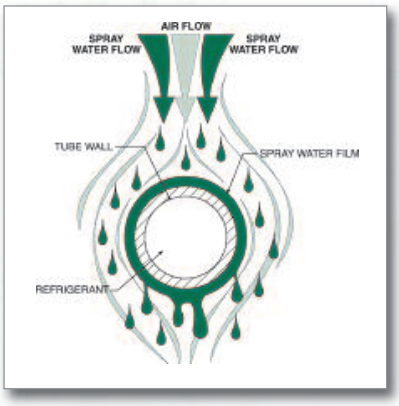
FXV
Closed Circuit Cooling Towers

Product Detail

FXV Spotlight

- Advanced Coil Technology
- Ideal Replacement Unit
- Easy Maintenance
- Sound Sensitive Applications
- Independent Fans





CTI CERTIFIED

Benefits

Low Energy Consumption

- Evaporative cooled equipment minimizes the energy consumption of the entire system because it provides lower operating temperatures. Owners save money while conserving natural resources and reducing environmental impact.

- The FXV provides heat rejection at the lowest possible energy input and maintenance requirements via:
  - High efficiency, low horsepower axial fans
  - Closed loop cooling, which minimizes process fouling
  - Patented combined flow technology, which reduces evaporation directly off the coil, minimizing the potential for scaling and fouling (see page E11)
  - Premium efficient/VFD duty fan motors are standard
  - Variable Frequency Drives (optional) (see page K1 for details)
  - BALTIGUARD™ Fan System (optional) (see page E20 for details)
  - BALTIGUARD PLUS™ Fan System (optional) (see page K1 for details)

Low Installed Cost

- **Support —** All models mount directly on parallel I-beams and ship complete with motors and drives factory-installed and aligned.

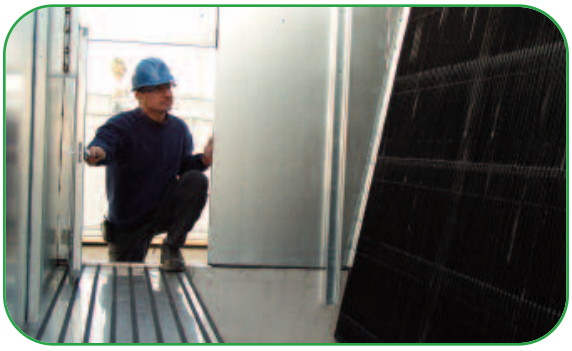
- **Modular Design —** Units ship in multiple sections to minimize the size and weight of the heaviest lift, allowing for the use of smaller, less costly cranes.

The Unit Shown Ships in Two Pieces to Minimize Shipping and Rigging Costs

Easy Maintenance

- **Access —** Hinged access doors on each end wall and a standard internal walkway provide easy access to the unit interior.

- **Spacious Interior —** Provides easy access to the cold water basin, drift eliminators, fan drive system and heat transfer coil.



Oversized, Hinged Access Door

- **Access to Spray Distribution —** Parallel flow of air and spray water over the coil allows for inspection and access to the top of the coil during full operation.

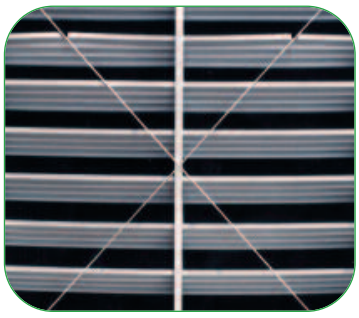
Spray Distribution System

Application Flexibility

- **Difficult Thermal Duties —** The combined flow design is ideal for applications requiring a close approach and/or large range.
- **Replacement Applications —** Single air inlet models are designed to mount directly on existing support steel of both crossflow and counterflow units.
- **Coil Configurations —** Alternate coil configurations and materials are available. ASME “U” Stamp Coils are available (see page E20 for details).
- **Highest Capacity In The Industry —** Dual air inlet models offer the highest single cell capacity of any closed circuit cooling tower in the industry. Projects benefit from fewer required cells, lower overall fan horsepower, and fewer piping connections.

Reliable Year-Round Operation

- **BALTIDRIVE® Power Train —** Backed by a 5-year fan motor and drive warranty, 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.
- **Separate Air Inlet Louvers —** Reduce the potential for scale build-up and damaging ice formations at the air/water interface by providing a line of sight from the outside of the unit into the fill.



Air Inlet Louvers

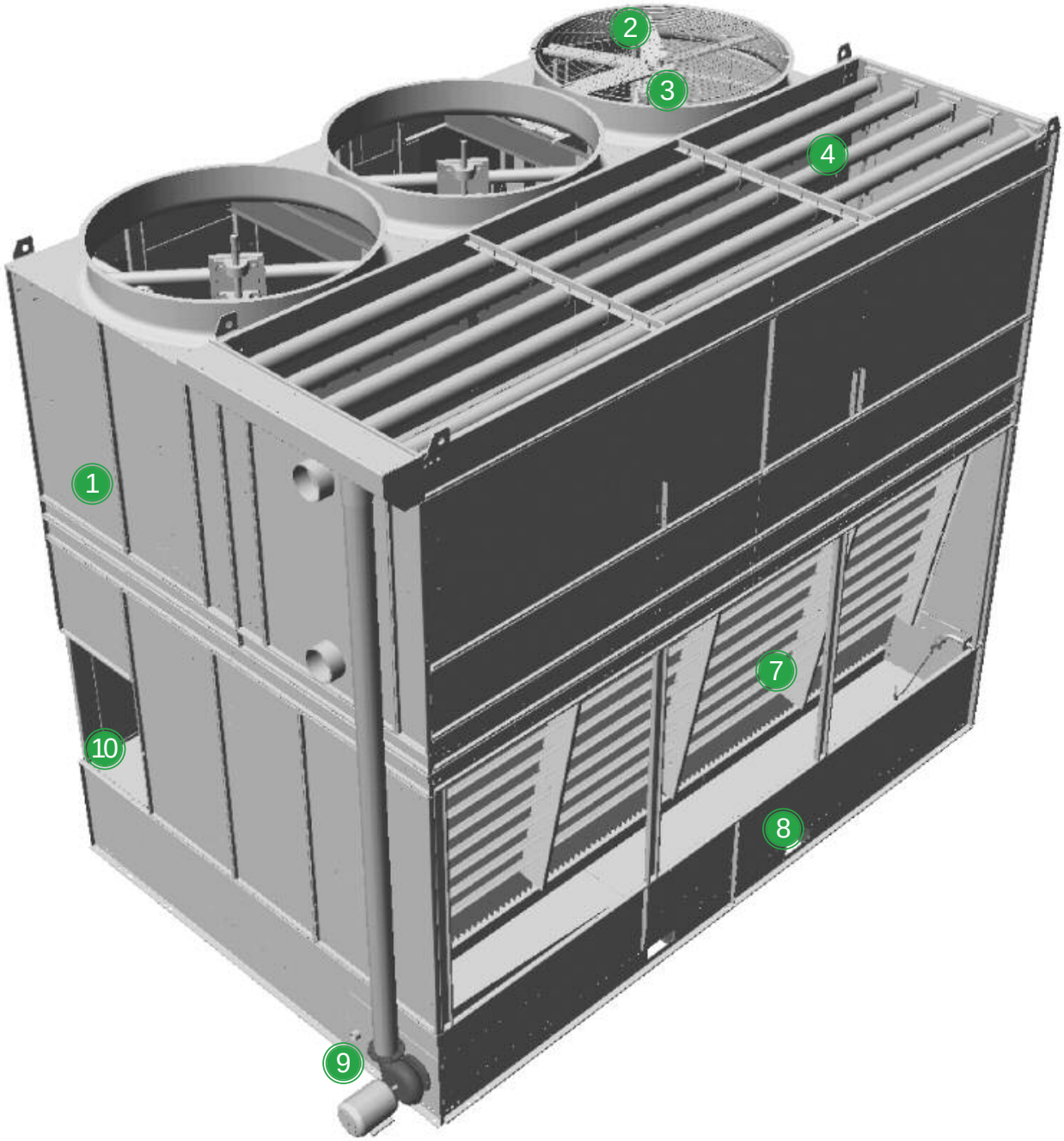
Long Service Life

Materials of Construction — Various materials are available to meet the corrosion resistance, unit operating life, and budgetary requirements of any project (see page E19 for construction options).

Construction Details

Single Air Inlet Models

FXV



1 Heavy-Duty Construction

- G-235 (Z700 metric) hot-dip galvanized steel panels

2 BALTIDRIVE® Power Train

- Premium quality, solid-backed, multi-groove belt
- Corrosion resistant cast aluminum sheaves
- Heavy-duty bearings L_{10} 40,000 hours (280,000 hour average life)
- Premium efficient/VFD duty motors are standard
- 5-year motor and drive warranty

B A C FAN DRIVE 5 YEAR WARRANTY

3 Low HP Axial Fan(s)

- High efficiency
- Quiet operation
- Corrosion resistant aluminum

4 Water Distribution System

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

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
- ASME B31.5 compliant
- 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
- Polyvinyl chloride (PVC)
- Impervious to rot, decay and biological attack
- Flame spread rating of 5 per ASTM E84

7 FRP Air Inlet Louvers

- Corrosion resistant
- UV-resistant finish
- Maintenance free

8 Cold Water Basin

- Sloped cold water basin for easy cleaning
- Suction strainer with anti-vortex hood accessible from louver face
- Adjustable water make-up assembly
- Integral internal walkway

9 Recirculating Spray Water Pump

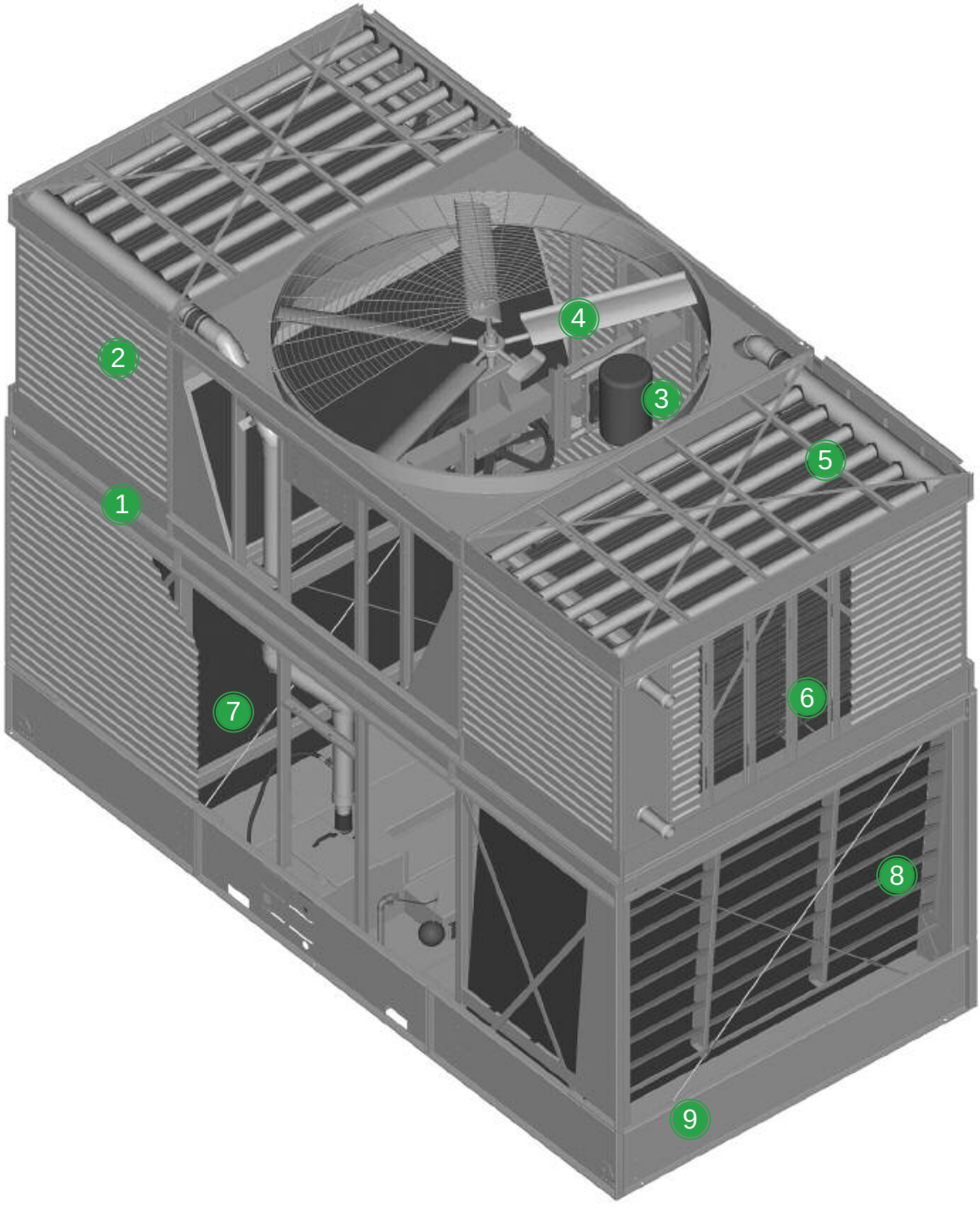
- Close coupled, bronze fitted centrifugal pump
- Totally enclosed fan cooled (TEFC) motor
- Bleed line with metering valve installed from pump discharge to overflow

10 Hinged Access Doors

- Inward swinging door on each end wall

Construction Details
Dual Air Inlet Models

FXV



1 Heavy-Duty Construction

- G-235 (Z700 metric) hot-dip galvanized steel frame

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 L_{10} 80,000 hours
- Premium efficient/VFD duty motors are standard
- 5-year motor and drive warranty

B.A.C. FAN DRIVE 5 YEAR WARRANTY

4 Low HP Axial Fan

- High efficiency
- Quiet operation
- Corrosion resistant

5 Water Distribution System

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

6 Coil Sections

- Continuous serpentine, steel tubing
- Hot-dip galvanized after fabrication (HDGAF)
- Pneumatically tested at 375 psig
- Sloped tubes for free drainage of fluid
- ASME B31.5 compliant
- When required, orders shipping into Canada are supplied with a CRN

7 BACross® Fill with Integral Drift Eliminators

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

8 FRP Air Inlet Louvers

- Corrosion resistant
- UV-resistant finish
- Maintenance free

9 Cold Water Basin

- Sloped cold water basin for easy cleaning
- Suction strainer with anti-vortex hood
- Adjustable water make-up assembly

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

11 Hinged Access Doors (Not Shown)

- Inward swinging door on each end wall

Custom Features and Options

Construction Options

- **Standard Construction:**
  Models 421 - 661: All steel panels and structural elements are constructed of heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel. Air inlet louvers are constructed of UV-resistant, fiberglass reinforced polyester (FRP).

  Models FXV-288 and 364: Casing panels and air inlet louvers are constructed of UV-resistant, fiberglass reinforced polyester (FRP).

- **Optional Thermosetting Hybrid Polymer:**
  A thermosetting hybrid polymer coating used to extend equipment life, is applied to select hot-dip galvanized steel components of the cooling tower. The thermosetting hybrid polymer has been tested to withstand 6000 hours in a 5% salt spray without blistering, chipping, or loss of adhesion.

- **Optional Stainless Steel Cold Water Basin:**
  A Type 304 stainless steel cold water basin is available. 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.

- **Optional Stainless Steel Construction:**
  Steel panels and structural elements are constructed of Type 304 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 five-year leak-proof warranty.

Coil Configurations

- **Standard Serpentine Coil:**
  The standard cooling coil is constructed of continuous lengths of all prime surface steel, hot-dip galvanized after fabrication (HDGAF). The galvanizing is on the outside surface. The coil is designed for low pressure drop with sloping tubes for free drainage of fluid. Each coil is pneumatically tested at 375 psig (2586 kPa) and is ASME B31.5 compliant.

- **Optional Cleanable Header Coil:**
  (available on Single Air Inlet Models)
  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. 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) or stainless steel coils. Each coil is pneumatically tested at 125 psig (860 kPa).

Serpentine Coil

- **Optional Stainless Steel Coil:**
  Coils are available in Type 304 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 (2586 kPa) and is ASME B31.5 compliant.
- **Optional Straight-Through Cleanable Coil: (Available on Single Air Inlet Models)**
  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) or stainless steel. Each coil is pneumatically tested at 125 psig (860 kPa).
- **Optional ASME "U" Stamp Coil:**
  The ASME coils are requested for heavy industrial or process applications. This serpentine coil is manufactured and tested in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, and bears the ASME "U" stamp. ASME coils are hot-dip galvanized (outside surface) after fabrication (HDGAF). The coil is designed for low pressure drop with sloping tubes for free drainage of fluid. Each coil is pneumatically tested at 375 psig (2586 kPa).

When required, coils shipping into Canada are supplied with a CRN. Other coil configurations are available for specific applications. Contact your local BAC Representative for details.

Fan Drive System

The fan drive system provides the cooling air necessary to reject unwanted heat from the system to the atmosphere. The standard fan drive system on all models is the BALTIDRIVE® Power Train. This BAC engineered drive system consists of a specially designed powerband and cast aluminum sheaves located on minimum shaft centerline distances to maximize belt life. A premium efficient fan motor provides maximum performance and is backed by BAC's comprehensive 5-year motor and fan drive warranty.

BALTIGUARD™ Fan System

The BALTIGUARD™ Fan System consists of two standard single-speed fan motors and drive assemblies. One drive assembly is sized for full speed and load, and the other is sized for approximately 2/3 speed and consumes only 1/3 the design horsepower. This configuration allows the reserve capacity 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. On some units the standby fan motor can be increased to the size of the main motor for 100% redundancy.

BALTIGUARD PLUS™ Fan System

The BALTIGUARD PLUS™ Fan System builds on the advantages of the BALTIGUARD™ Fan System by adding a VFD to one of the motors. For more information on the BALTIGUARD PLUS™ Fan System refer to page K1.

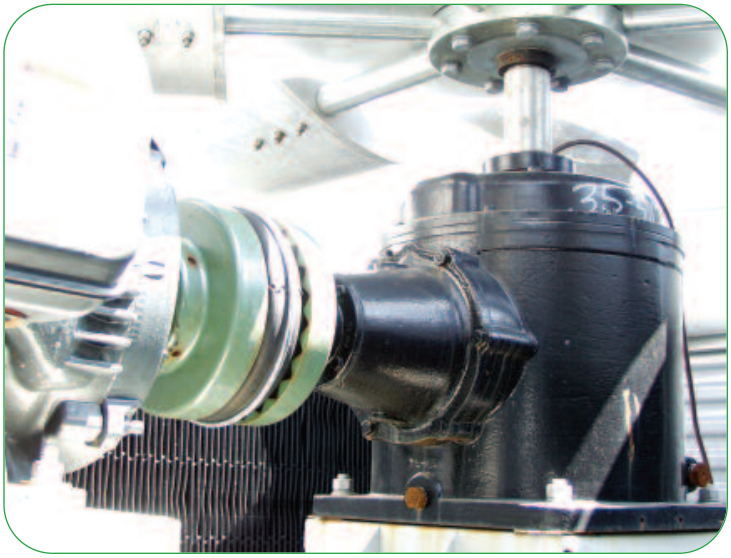
Custom Features and Options

Independent Fan Operation

Models FXV-43X, 44X, Q44X, 64X, T64X and Q64X are provided with one fan motor driving two fans as standard. Models FXV-66X, T66X and Q66X 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.

Gear Drive System, Close-Coupled Motor

Models FXV-288 and 364 are available with a close-coupled gear drive system. 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, Close-Coupled Motor

Gear Drive System, Externally Mounted Motor

Models FXV-288 and 364 are available with a gear drive system with an external (TEFC) motor. 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.

Equipment Controls

BAC control panels are specifically designed to work seamlessly with all BAC units and engineered to meet your particular application. For more on BAC Equipment Controls, see section K.

VFD

Low Sound Operation

The low sound levels generated by FXV Closed Circuit Cooling Towers make them suitable for installation in most environments. For very sound sensitive installations, a low sound fan option is available to reduce the sound levels generated from the tower with minimal impact on thermal performance. The FXV thermal performance with the low sound fan has been certified in accordance with CTI Standard STD-201.

For extremely sound sensitive installations, factory designed, tested and rated sound attenuation is available for both the air intake and discharge.

Unit With Intake and Discharge Sound Attenuation

Whisper Quiet Fans

FXV single air inlet models (FXV-42X through FXV-Q66X) are available with a Whisper Quiet Fan that significantly reduces the sound levels generated from the unit with minimal impact on thermal performance.

Basinless Unit Construction (FXV-288 and 364 Models Only)

The basinless unit construction option enables units to be directly installed on new or existing concrete cold water 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 and provides a cost-effective solution for many field-erected replacement projects.

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Installation on a Concrete Basin

Accessories

External Service Platforms

For external service, louver face and access door platforms can be added to the unit, when purchased or as an aftermarket item. Safety cages and safety gates are also available. All components are designed to meet OSHA requirements.

External Platform at Louver Face

Ladder, Safety Cage, Gate and Handrails (FXV-288 and 364 Models Only)

In the event the end-user elects to provide access to the fan deck, models FXV-288 and 364 can be furnished with ladders extending from the top of the unit to the base, as well as safety cages, safety gates, fan deck extensions and handrail packages. All components are designed to meet OSHA requirements.

Note: Partial or full grating above the coil air intake is recommended with this option.

Internal Ladder

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

Internal Service Platforms

For access to the motor and drive assemblies on single air inlet models FXV-L641 through FXV-Q661 and all dual air inlet models, an internal ladder and upper service platform with handrails is available. Safety gates are available for all handrail openings. All components are designed to meet OSHA requirements.

Internal Ladder and Service Platform

Vibration Cutout Switch

A factory mounted vibration cutout switch is available to effectively protect against equipment failure due to excessive vibration of the mechanical equipment system. 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.

Positive Closure Damper (PCD) Hoods

The FXV's innovative design results in a low heat loss when the unit is idle. When additional heat loss prevention is desired, coil air intake hoods with factory mounted PCDs and damper actuators can be provided. The addition of factory mounted insulation to the hood and casing further reduces the heat loss by minimizing losses due to conduction. See page E30 for heat loss data on all FXV models.

Basin Heaters

Closed circuit cooling towers 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.

Basin Heater

Heater kW Data

Model Numbers	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 - 42X	1	4	1	6
FXV - 43X	1	6	1	8
FXV - 44X	1	8	1	12
FXV - 64X	1	12	1	16
FXV - 66X	1	16	1	21
FXV - 288	2	12	2	15
FXV - 364	2	14	2	20

Electric Water Level Control Package

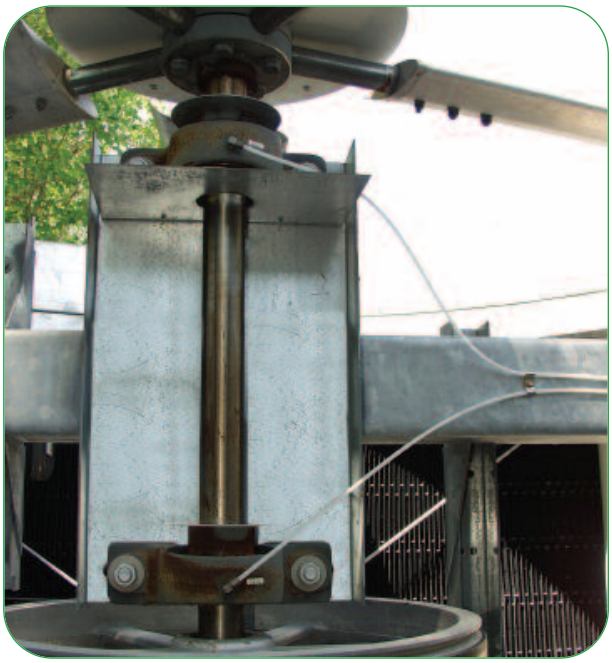
The electric water level control replaces the standard mechanical make-up valve when a more precise water level control is required. This package consists of a conductance-actuated level control mounted in the basin and a solenoid activated valve in the make-up water line. The valve is slow closing to minimize water hammer.

Electric Water Level Control Package

Accessories

Extended Lubrication Lines

Extended lubrication lines are available for lubrication of the fan shaft bearings. Grease fittings are located inside the plenum area next to the access door.



Grease Fittings at the Access Door and Bearings With the Extended Lubrication Line Option

High Temperature Fill

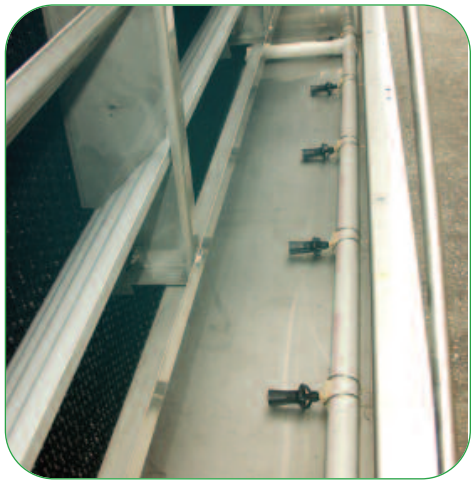
Optional high temperature fill material is available for high spray water temperatures up to 135˚F (57.2˚C).

Air Inlet Screens

Wire mesh screens can be factory-installed over the inlet louvers and the spray distribution system to prevent debris from entering the unit.

Basin Sweeper Piping

Basin sweeper piping provides an effective method of preventing debris from collecting in the cold water basin of the tower. A complete piping system, including nozzles, is provided in the tower basin for connection to side stream filtration equipment (by others). For more information on filtration systems, see page M163.



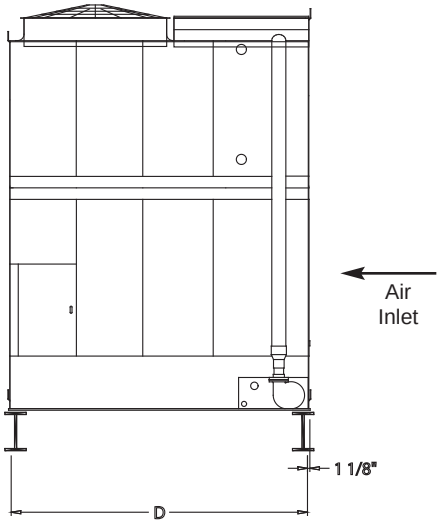
Basin Sweeper Piping

Factory Mutual Approved construction is available as an option.

Structural Support

The recommended support arrangement for FXV Closed Circuit Cooling Towers consists of parallel I-beams positioned as shown on the drawings. Besides providing adequate support, the steel also serves to raise the unit above any solid foundation to assure access to the bottom of the tower. Alternate steel support designs include a cantilevered plan as indicated by the optional minimum “D” dimension in the table below. To support an FXV on columns or in an alternate arrangement not shown here, consult your local BAC Representative.

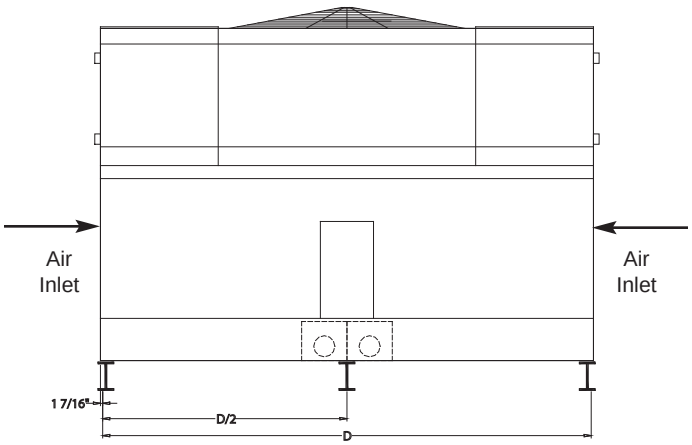
Single Air Inlet



Model Number	D	Optional Minimum D*	Maximum Deflection
FXV - 42x	8’ 3”	5’ 9”	3/16”
FXV - 43x	8’ 3”	5’ 9”	5/16”
FXV - 44x	8’ 3”	5’ 9”	3/8”
FXV - 64x	11’ 7-3/4”	8’ 0”	3/8”
FXV - 66x	11’ 7-3/4”	8’ 0”	1/2”

*When unit is supported with a cantilever plan, the side opposite the air inlet shall be cantilevered.

Dual Air Inlet



Model Number	D	Maximum Deflection
FXV-288-xxx	23’ 9-1/8”	1/2”
FXV-364-xxx	26’ 0-5/8”	1/2”

Notes:

1. Support steel and anchor bolts to be designed and furnished by others.
2. All support steel must be level at the top.
3. Beams must be selected in accordance with accepted structural practice. Maximum deflection of beam under unit to be 1/360 of span, not to exceed 1/2 inch.
4. If vibration isolation rails are to be used between the unit and supporting steel, be certain to allow for the length of the vibration rails when determining the length of the supporting steel, as vibration rail length and mounting hole locations may differ from those of the unit.
5. If point vibration isolation is used with multi-cell units, the isolators must be located under the support steel, not between the support steel and the closed circuit cooling towers.

Engineering Data

Do not use for construction. Refer to factory certified dimensions. This handbook includes data current at the time of publication, which should be reconfirmed at the time of purchase. Up-to-date engineering data, free product selection software, and more can be found at **www.BaltimoreAircoil.com**.

Single Air Inlet Models

Model Number	Nominal Tons[5]	Motor HP		Weights (lbs)			Dimensions					Connection Sizes[2,3]		Spray Pump (GPM)	Internal Coil Volume (GAL)
		Fan	Pump	Operating[1]	Shipping	Heaviest Section	L	W	H	A	P	Make-Up Water	Coil		
FXV-L421	30	5	1.5	7,730	5,050	2,900	6' 1-1/4"	8' 5-1/4"	13' 2-3/4"	6' 3/4"	1' 3-3/4"	1-1/2"	4"	190	46
FXV-L422	41	5		8,190	5,370	3,220									60
FXV-L423	46	5		8,680	5,710	3,560									74
FXV-L424	55	7.5		9,160	6,050	3,900									88
FXV-421	33	7.5		7,730	5,050	2,900									46
FXV-422	46	7.5		8,190	5,370	3,220									60
FXV-423	52	7.5		8,680	5,710	3,560									74
FXV-424	59	10		9,160	6,050	3,900									88
FXV-L431	53	7.5	2	11,230	7,160	4,240	9' 1-1/4"	8' 5-1/4"	13' 2-3/4"	6' 3/4"	1' 4-1/4"	1-1/2"	4"	290	69
FXV-L432	68	7.5		11,930	7,650	4,730									90
FXV-L433	75	7.5		12,630	8,140	5,220									112
FXV-L434	86	10		13,380	8,680	5,760									133
FXV-431	57	10		11,230	7,160	4,240									69
FXV-432	73	10		11,930	7,650	4,730									90
FXV-433	81	10		12,630	8,140	5,220									112
FXV-434	95	15		13,380	8,680	5,760									133
FXV-L441	83	10	3	14,200	8,760	5,120	12' 1-1/4"	8' 5-1/4"	13' 2-3/4"	6' 3/4"	1' 8-1/4"	1-1/2"	4"	500	91
FXV-L442	100	10		15,150	9,410	5,770									120
FXV-L443	110	10		16,080	10,060	6,420									149
FXV-L444	130	15		17,070	10,770	7,130									178
FXV-441	92	15		14,200	8,760	5,120									91
FXV-442	111	15		15,150	9,410	5,770									120
FXV-443	122	15		16,080	10,060	6,420									149
FXV-444	140	20		17,070	10,770	7,130									178
FXV-LQ440	79	10		15,150	9,410	5,770						1-1/2"	6"		124
FXV-LQ441	116	15		17,070	10,770	7,130									182
FXV-Q440	88	15		15,150	9,410	5,770									124
FXV-Q441	125	20		17,070	10,770	7,130									182
FXV-L641	126	15	5	18,560	10,890	6,730	12' 1-1/4"	11' 10"	15' 10-3/4"	8' 8-3/4"	1' 8-3/4"	1-1/2"	4"	715	146
FXV-L642	154	15		20,050	11,930	7,770									192
FXV-L643	169	15		21,550	12,980	8,820									238
FXV-L644	193	20		23,050	14,040	9,880									284
FXV-641	144	25		18,560	10,890	6,730									146
FXV-642	175	25		20,050	11,930	7,770									192
FXV-643	193	25		21,550	12,980	8,820									238
FXV-644	215	30		23,050	14,040	9,880									284
FXV-LT642	169	15		21,550	12,980	8,820						1-1/2"	6"		284
FXV-T642	192	25		21,650	13,080	8,920									284
FXV-LQ640	118	15		20,050	11,930	7,770									194
FXV-LQ641	168	20		23,050	14,040	9,880									286
FXV-Q640	134	25		20,050	11,930	7,770									194
FXV-Q641	186	30		23,050	14,040	9, 880									286
FXV-L661	202	22.5	7.5	27,070	15,510	9,690	18' 1-1/4"	11' 10"	16' 4-1/4"	9' 2-1/4"	2' 3/8"	1-1/2"	4"	900	218
FXV-L662	234	22.5		29,290	17,070	11,250									288
FXV-L663	257	22.5		31,570	18,670	12,850									358
FXV-L664	297	30		33,810	20,280	14,460									429
FXV-661	231	40		27,070	15,510	9,690									218
FXV-662	267	40		29,290	17,070	11,250									288
FXV-663	295	40		31,570	18,670	12,850									358
FXV-664	331	45		33,810	20,280	14,460									429
FXV-LT662	263	22.5		33,790	20,260	14,440						1-1/2"	8"		429
FXV-T662	297	40		33,810	20,280	14,460									429
FXV-LQ660	189	22.5		29,290	17,070	11,250									299
FXV-LQ661	269	30		33,810	20,280	14,460									439
FXV-Q660	215	40		29,290	17,070	11,250									299
FXV-Q661	299	45		33,810	20,280	14,460									439

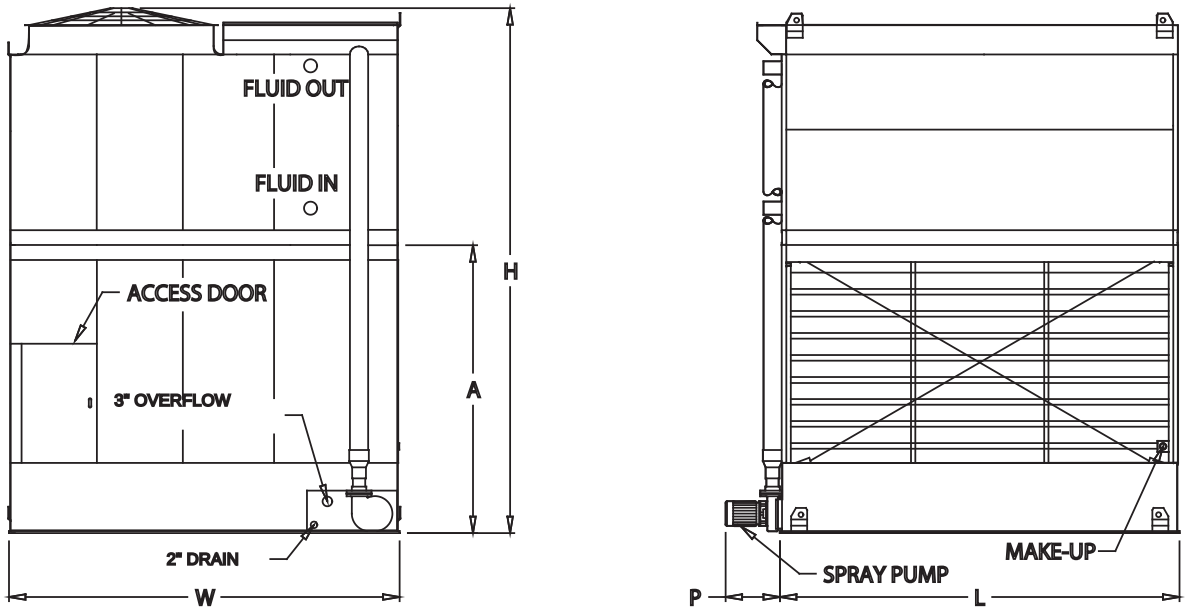
See page E77 for Engineering Considerations.

Dual Air Inlet Models

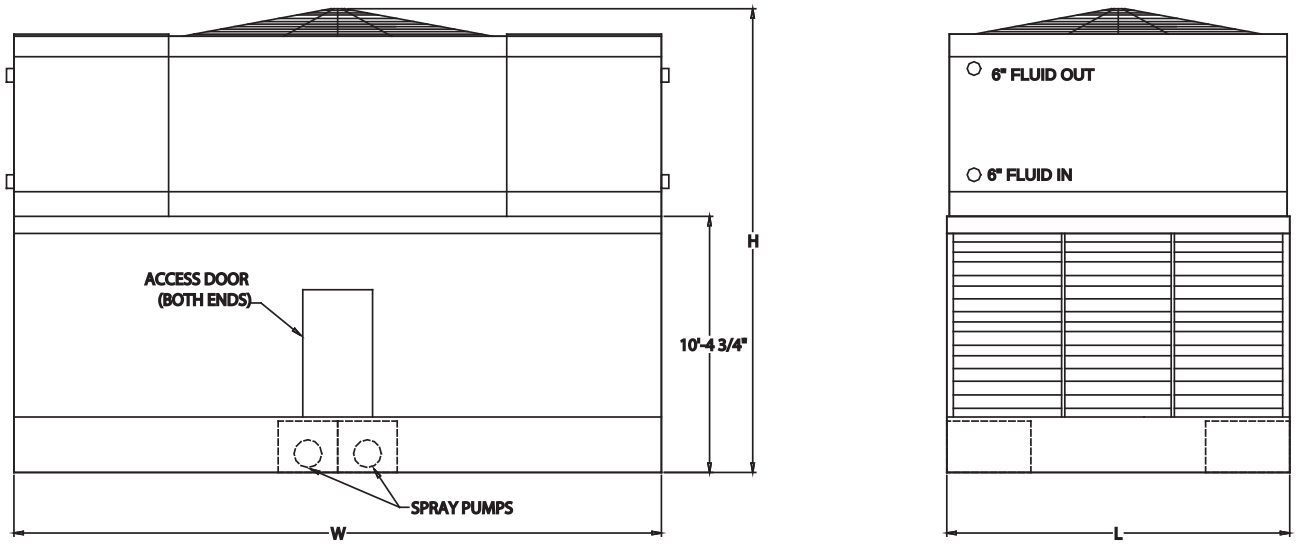
Model Number	Nominal Tons[6]	Motor HP		Weights (lbs)			Dimensions			Spray Pump (GPM)	Internal Coil Volume (GAL)
		Fan	Pump	Operating[1]	Shipping	Heaviest Section	L	W	H		
FXV-288-31M	344	20	15	46,000	27,680	8,050	11' 11"	24' 1/2"	18' 10-3/8"	1,720	600
FXV-288-31N	367	25		46,030	27,710	8,050					600
FXV-288-31O	386	30		46,080	27,760	8,050					600
FXV-288-31P	419	40		46,240	27,920	8,050					600
FXV-288-31Q	445	50		46,250	27,930	8,050					600
FXV-288-31R	468	60		46,465	28,145	8,050					600
FXV-288-41M	364	20		49,690	30,440	9,430					712
FXV-288-41N	389	25		49,720	30,470	9,430					712
FXV-288-41O	412	30		49,770	30,520	9,430					712
FXV-288-41P	448	40		49,930	30,680	9,430					712
FXV-288-41Q	478	50		49,940	30,690	9,430					712
FXV-288-41R	502	60		50,155	30,905	9,430					712
FXV-288-2TM	349	20		49,690	30,440	9,430					712
FXV-288-2TN	372	25		49,720	30,470	9,430					712
FXV-288-2TO	392	30		49,770	30,520	9,430					712
FXV-288-2TP	424	40		49,930	30,680	9,430					712
FXV-288-2TQ	449	50		49,940	30,690	9,430					712
FXV-288-2TR	470	60		50,155	30,905	9,430					712
FXV-288-1QM	325	20		49,690	30,440	9,430					706
FXV-288-1QN	347	25		49,720	30,470	9,430					706
FXV-288-1QO	365	30		49,770	30,520	9,430					706
FXV-288-1QP	394	40		49,930	30,680	9,430					706
FXV-288-1QQ	418	50		49,940	30,690	9,430					706
FXV-288-1QR	439	60		50,160	30,910	9,430					706
FXV-364-31N	442	25	15	53,900	31,630	9,390	13' 11-1/8"	26' 3-1/2"	19' 0-3/8"	1,720	696
FXV-364-31O	463	30		53,950	31,680	9,390					696
FXV-364-31P	496	40		54,110	31,840	9,390					696
FXV-364-31Q	525	50		54,120	31,850	9,390					696
FXV-364-31R	550	60		54,335	32,065	9,390					696
FXV-364-31S	579	75		54,435	32,165	9,390					696
FXV-364-41N	464	25		58,260	34,910	11,030					828
FXV-364-41O	489	30		58,310	34,960	11,030					828
FXV-364-41P	530	40		58,470	35,120	11,030					828
FXV-364-41Q	561	50		58,480	35,130	11,030					828
FXV-364-41R	589	60		58,695	35,345	11,030					828
FXV-364-41S	624	75		58,795	35,445	11,030					828
FXV-364-2TN	443	25		58,260	34,910	11,030					828
FXV-364-2TO	463	30		58,310	34,960	11,030					828
FXV-364-2TP	498	40		58,470	35,120	11,030					828
FXV-364-2TQ	526	50		58,480	35,130	11,030					828
FXV-364-2TR	549	60		58,695	35,345	11,030					828
FXV-364-2TS	574	75		58,795	35,445	11,030					828
FXV-364-1QN	420	25		58,260	34,910	11,030					862
FXV-364-1QO	442	30		58,310	34,960	11,030					862
FXV-364-1QP	472	40		58,470	35,120	11,030					862
FXV-364-1QQ	499	50		58,480	35,130	11,030					862
FXV-364-1QR	522	60		58,700	35,350	11,030					862
FXV-364-1QS	550	70		58,800	35,450	11,030					862

Notes:

1. Operating weight is for the tower with the water level in the cold water basin at the overflow.
2. The actual size of the inlet and outlet connection may vary with the design flow rate. Consult unit print for dimensions.
3. Inlet and outlet connections are beveled for welding.
4. 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. On single air-inlet models, standard make-up, drain and overflow connections are MPT.
5. Models shipped with an optional gear drive or low sound fan may have heights up to 10.5" greater than shown. Models with Whisper Quiet Fans may have heights up to 5-1/2" greater than shown.
6. Nominal tons of cooling represents the capability to cool 3 GPM of water from a 95ºF entering water temperature to an 85ºF leaving water temperature at a 78ºF entering wet-bulb temperature.
7. For FXV-44xx, the riser pipe diameter is 4". For FXV-6xx and all dual air inlet models, the riser pipe is 6".



Single Air Inlet Models

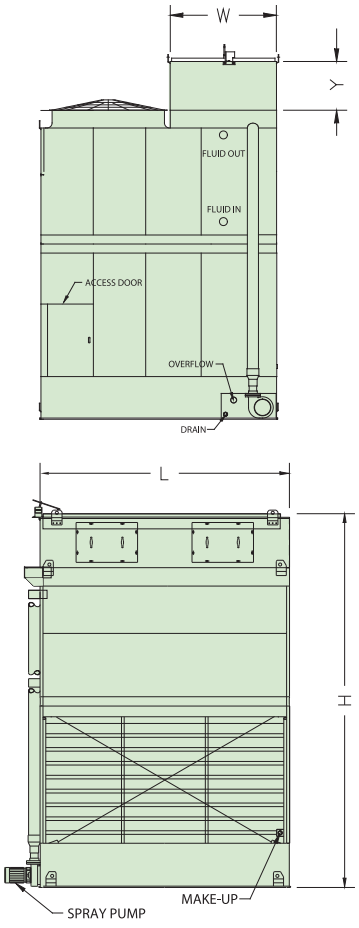


Dual Air Inlet Models

Engineering Data:
Cold Weather Operation

FXV Heat Loss Data (BTUH)

Model Number	Standard Unit	Unit w/ PCD Hood	Unit w/ PCD Hood & Insulation
FXV-421	68,400	43,500	30,100
FXV-422	87,100	47,100	32,300
FXV-423	105,200	50,500	34,700
FXV-424	122,400	54,000	37,000
FXV-431	102,800	60,800	43,200
FXV-432	131,200	65,600	46,500
FXV-433	158,000	70,600	49,600
FXV-434	183,000	74,900	52,800
FXV-441	135,700	76,700	55,200
FXV-442	172,900	82,100	59,100
FXV-443	208,000	87,600	62,900
FXV-444	241,000	92,900	66,500
FXV-Q440	172,900	82,100	59,100
FXV-Q441	241,000	92,900	66,500
FXV-641	203,400	103,800	75,300
FXV-642	259,800	109,700	79,300
FXV-643	313,100	115,600	83,200
FXV-644	362,900	121,300	86,900
FXV-T642	362,900	121,300	86,900
FXV-Q640	259,800	109,700	79,300
FXV-Q641	362,900	121,300	86,900
FXV-661	304,500	158,200	118,000
FXV-662	387,500	165,500	123,000
FXV-663	404,700	172,400	127,600
FXV-664	536,900	179,100	132,200
FXV-T662	536,900	179,100	132,200
FXV-Q660	387,500	165,500	123,000
FXV-Q661	536,900	179,100	132,200
FXV-288-31x	760,200	280,700	202,000
FXV-288-41x	881,100	294,500	211,000
FXV-288-2TX	881,100	294,500	211,000
FXV-288-1Qx	881,100	294,500	211,000
FXV-364-31x	894,000	330,100	237,600
FXV-364-41x	1,036,200	346,400	248,100
FXV-364-2TX	1,036,200	346,400	248,100
FXV-364-1Qx	1,036,200	346,400	248,100



Notes:

1 Heat loss based on 50ºF entering coil water and -10ºF ambient with 45 MPH wind (fans and pump off).

2. One inch thick PVC nitrite rubber blend thermal insulation on both the PCD hood and the casing panels surrounding the coil.

Dimensional Data of Positive Closure Damper Hood

Model Number	Hood Ship. Weight (lbs.)	Operating Weight Add (lbs.)	Length (L)	Width (W)	Hood Height (Y)	Unit Height (H)
FXV-42x	390	320	5' 11-7/8"	3' 5-1/4"	2' 5-1/8"	15' 1-3/4"
FXV-43x	540	430	8' 11-7/8"	3' 5-1/4"	2' 5-1/8"	15' 1-3/4"
FXV-44x	720	570	11' 11-7/8"	3' 5-1/4"	2' 5-1/8"	15' 1-3/4"
FXV-64x	1,160	920	11' 11-7/8"	5' 3-1/2"	2' 5-1/8"	17' 9-3/4"
FXV-66x	1,650	1,300	17' 11-7/8"	5' 3-1/2"	2' 5-1/8"	17' 9-3/4"
FXV-288-xxx	1,300	1,040	11' 11"	6' 3-3/8"	2' 5-1/8"	20' 2-5/8"
FXV-364-xxx	1,500	1,200	13' 11-1/8"	6' 3-3/8"	2' 5-1/8"	20' 2-5/8"

Notes:

1. Hood shipping weight includes shipping skid weight.

Engineering Specifications

See our website at www.BaltimoreAircoil.com for an electronic copy of product engineering specifications.

1.0 Closed Circuit Cooling Tower

1.1 General: Furnish and install, as shown on the plans, ___ factory-assembled closed circuit cooling tower(s) of induced draft design with vertical air discharge. Overall dimensions shall not exceed approximately ___ ft (mm) x ___ ft (mm), with an overall height not exceeding approximately ___ ft (mm). Operating weight shall not exceed _____ lbs (kg). The closed circuit cooling tower shall be Baltimore Aircoil Company Model FXV-___.

1.2 Thermal Capacity (water as heat transfer fluid): The closed circuit cooling tower shall be warranted by the manufacturer to have capacity to cool _____ USGPM (l/s) of water from _____°F (°C) to _____°F (°C) at _____°F (°C) entering wet-bulb temperature. Coil pressure drop shall not exceed _____ psi (kPa). The performance shall be certified by the Cooling Technology Institute in accordance with CTI Certification Standard STD-201 or, lacking such certification, a field acceptance test shall be conducted within the warranty period in accordance with CTI Acceptance Test Code ATC-105, by the Cooling Technology Institute, or other qualified independent third party testing agency. Manufacturers' performance guarantees or performance bonds without CTI Certification of water ratings shall not be accepted.

1.3 Wind and Seismic Forces: When supported as recommended, the unit shall be suitable for applications requiring equipment anchorage to resist wind loads up to ___ psf, and an S_{DS} of ___ with an Importance factor of 1.0.

1.4 Quality Assurance: The cooling tower manufacturer shall have a Management System certified by an accredited registrar as complying with the requirements of ISO-9001:2000 to ensure consistent quality of products and services.

2.0 Construction Details

2.1 Structure: Unless otherwise noted in this specification, all steel panels and structural elements shall be constructed from heavy-gauge, G-235 (Z700 metric) hot-dip galvanized steel, with cut edges given a protective coat of zinc-rich compound.

2.2 Coil Section: The heat transfer section of the closed circuit cooling tower shall be encased with removable heavy-gauge galvanized steel panels (or corrosion resistant, fiberglass reinforced polyester (FRP) on Models FXV-288 to 364). The coil shall be constructed of continuous serpentine all prime surface steel, be pneumatically tested at 375 psig (2,685 kPa), and be hot-dip galvanized after fabrication. The coil shall be designed for free drainage of fluid and shall be ASME B31.5 compliant. Maximum allowable working pressure shall be 300 psig (280 psig for coils supplied with a CRN).

2.3 Cold Water Basin: The cold water basin shall be constructed of heavy-gauge hot-dip galvanized steel. The basin shall include a depressed section with drain/clean-out connection. Standard accessories shall include large area, lift-out steel strainers with perforated openings sized smaller than water distribution nozzle orifices, an integral anti-vortexing hood to prevent air entrainment, waste water bleed line, and corrosion resistant make-up valve with large diameter plastic float arranged for easy adjustment.

2.4 Casing Panels: Models FXV-4xx, 6xx, Lxxx, Txxx, & Qxxx: Casing panels shall be constructed of steel matching the structure.

Or, for Models FXV-288 and 364:

Casing panels shall be constructed of corrosion resistant, fiberglass reinforced polyester (FRP).

3.0 Spray Water System

3.1 Spray Water Pump(s): The closed circuit cooling tower shall include an appropriate number of close-coupled, bronze-fitted centrifugal pump and motor assemblies equipped with mechanical seal, mounted in the basin and piped from the suction connection to the water distribution system. The pump motor(s) shall be the totally enclosed fan cooled (TEFC) type suitable for _____ volts, ___ phase, and ____ hertz electrical service. The system shall include a metering valve and bleed line to control the bleed rate from the pump discharge to the overflow connection.

3.2 Water Distribution System: Water shall be distributed evenly over the coil at a flow rate sufficient to ensure complete wetting of the coil at all times. Large diameter, non-clog, 360° plastic distribution nozzles shall utilize a two stage diffusion pattern to provide overlapping, umbrella spray patterns that create multiple intersection points with adjacent nozzles. The branches and spray nozzles shall be held in place by snap-in rubber grommets, allowing quick removal of individual nozzles or complete branches for cleaning or flushing.

4.0 Fill and Drift Eliminators

4.1 Fill and Drift Eliminators: The fill and integral drift eliminators shall be formed from self-extinguishing (per ASTM-568) polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, fungus and biological attack. The fill shall be manufactured and performance tested by the closed circuit cooling tower manufacturer to provide single source responsibility and assure control of the final product. A separate set of drift eliminators shall be removable in easily handled sections for quick access to the coil. Eliminators shall have a minimum of three changes in air direction.

5.0 Air Inlet Louvers

5.1 Air Inlet Louvers: Air inlet louvers shall be wave-formed, fiberglass-reinforced polyester (FRP), spaced to minimize air resistance and prevent water splash-out.

6.0 Mechanical Equipment

6.1 Fan(s): Fan(s) shall be heavy-duty, axial flow, with aluminum alloy blades. Air shall discharge through a fan cylinder designed for streamlined air entry and minimum fan blade tip clearance for maximum fan efficiency. Fan(s) and shaft(s) shall be supported by heavy-duty, self-aligning, grease-packed ball bearings with moisture-proof seals and integral slinger rings, designed for minimum L_{10} life of 40,000 hours. Fan(s) shall be drive by a one-piece, multi-groove neoprene/polyester belt designed specifically for evaporative cooling service. Fan and motor sheave(s) shall be fabricated from cast aluminum.

6.2 Fan Motor: Fan motor(s) shall be totally enclosed reversible, squirrel cage, ball bearing type designed specifically for evaporative cooling duty on ____ volt/ ___ hertz/ ____ phase electrical service. The motor shall be furnished with special moisture protection on windings, shafts, and bearings. Fan motors shall be premium efficient/inverter duty type designed per NEMA Standard MG1, Section IV, Part 31.

6.3 Mechanical Equipment Warranty: The fan(s), fan shaft(s), sheaves, bearings, mechanical equipment support and fan motor shall be warranted against defects in materials and workmanship for a period of five (5) years from date of shipment.

7.0 Access

7.1 Plenum Access: A large, hinged access door shall be provided on each end wall for access to the coil, drift eliminators, and fan plenum section. The water make-up valve, float ball, and suction strainer shall be easily accessible. On single side air inlet units, the access door shall open to an internal walkway.

8.0 Sound

8.1 Sound Level: To maintain the quality of the local environment, the maximum sound pressure levels (dB) measured 50 ft (15,240 mm) from the closed circuit cooling tower operating at full fan speed shall not exceed the sound levels detailed below.

Location	63	125	250	500	1000	2000	4000	8000	dB(A)
Discharge									
Air Inlet									
Cased Face									

9.0 Accessories

9.1 Basin Heater(s): The cooling tower cold water basin shall be provided with electric heater(s) to prevent freezing in low ambient conditions. The heater(s) shall be selected to maintain 40°F (4.4˚C) pan water temperatures at ____° F(˚C) ambient. The heater(s) shall be_____V/ ____ phase/___Hz electric and shall be provided with low water cutout and thermostat.

9.2 Vibration Cutout Switch: Provide mechanical local reset vibration switch. The mechanical vibration cutout switch will be guaranteed to trip at a point so as not to cause damage to the cooling tower. To ensure this, the trip point will be a frequency range of 0 to 3,600 RPM and a trip point of 0.2 to 2.0 g's.

9.3 Heat loss: The heat loss for the FXV shall be equal to or less than _____ BTUH using either a standard unit, a unit with a hood, positive closure dampers, insulation or a combination.

The BAC 360™ Spray Nozzle

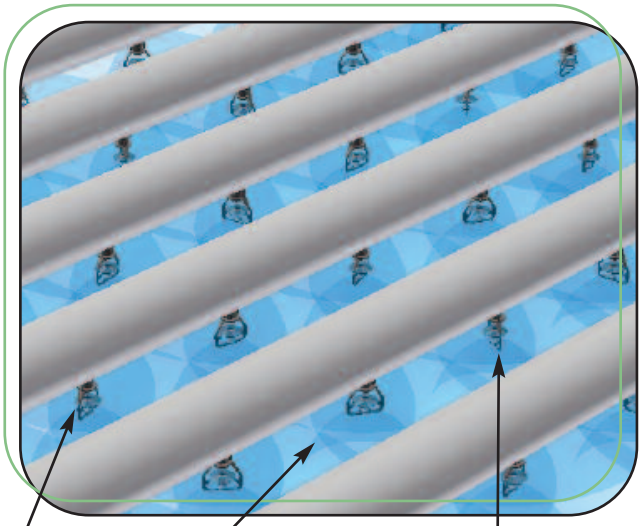
Product Report

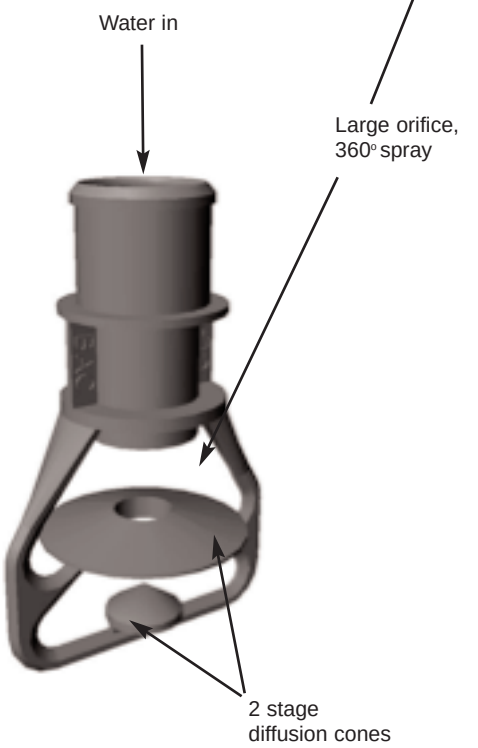
Standard on BAC Coil Products:

FXV, VFL, VF1, CXV, CXV-T, VC1, VCA, and VCL

Reduce maintenance costs and ensure efficient equipment operation with BAC's latest non-clog nozzle that combines scatter diffusion technology with BAC's largest nozzle orifice yet, to create the most technologically advanced spray nozzle in the industry!

The nozzles are designed in concert with BAC spray distribution systems to optimize the performance of your BAC equipment. These nozzles are an easy retrofit for many units from other manufacturers too! Contact BAC for competitive cross reference assistance.





Features and Benefits

- Ease of Maintenance
  - Easy snap in/out grommet design
  - Large non-clog orifice
- Robust, durable construction
- Universal alignment
- Anti-scale design
- No moving parts
- Eliminates dry spots inherent in other designs

A complete list of BAC Representatives is available at www.BaltimoreAircoil.com. Call yours and ask to see a BAC 360™ Spray Nozzle today!