FXT
Open Cooling Towers

Product Detail

FXT
Cooling Towers

Single Cell Capacity:
6 – 257 Nominal Tons
18 – 771 GPM at 95˚F/85˚F/78˚F

FXT Cooling Towers deliver independently verified, fully rated thermal performance over a wide range of flow and temperature requirements. Standard design features satisfy today's environmental concerns, minimize installation costs, maximize operating reliability, and simplify maintenance requirements.

FXT Cooling Towers

- **Low energy consumption**
- **Low installed cost**
- **Easy maintenance**
- **Long service life**
- **ASHRAE Standard 90.1 compliant**
- **5-year warranty on mechanical equipment**

CTI CERTIFIED

Benefits

Low Energy Consumption

Evaporative cooling equipment minimizes the energy consumption of the entire system because it provides lower operating temperatures. The owner saves money while conserving natural resources and reducing environmental impact.

The FXT provides the heat rejection required at the lowest possible energy input via:

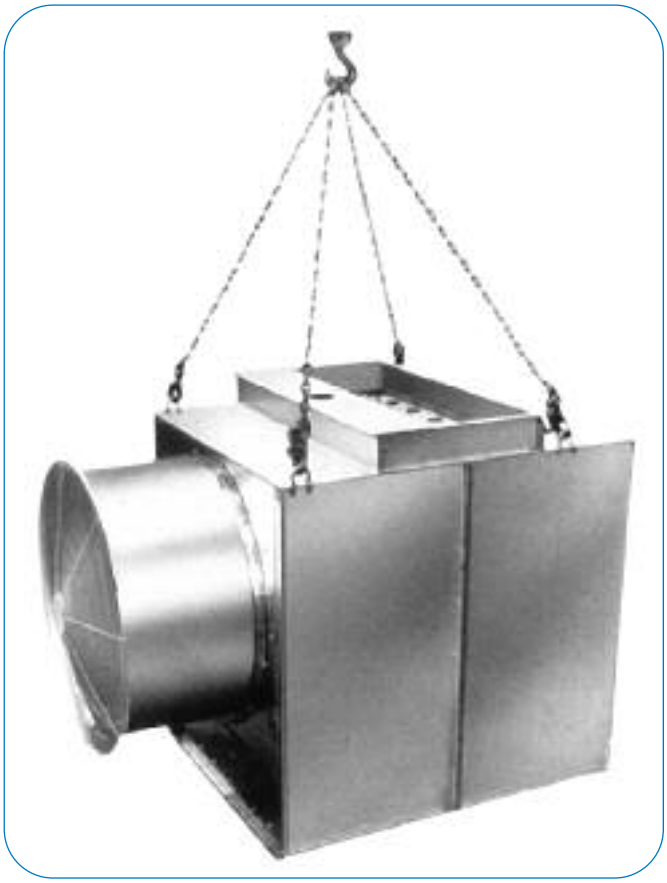
- High efficiency, low horsepower axial fans
- High efficiency BACross® Fill, which provides maximum air/water contact time at low air pressure drops
- Variable frequency drives (optional) (see page G1 for details)

All units meet or exceed ASHRAE Standard 90.1 energy efficiency requirements.

Low Installed Cost

All single cell FXT Cooling Towers ship completely assembled, minimizing installation time and cost:

- No motors to mount
- No sheaves to align
- No belts to install
- No make-up system to assemble



This single cell unit is placed with one lift and ships fully assembled

Easy Maintenance

Easy access – The interior of the unit is accessible through a circular access doors for adjusting the float valve, cleaning the strainer or flushing the basin

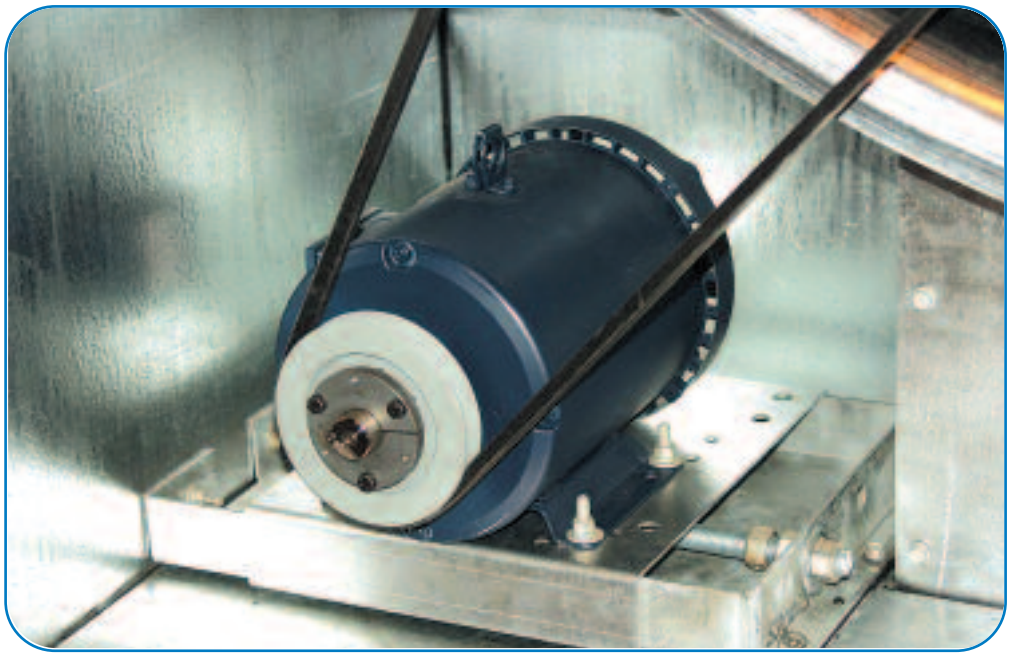
Motor location – The fan motor is located on the exterior of the unit for easy maintenance and belt adjustment. On most models, a single threaded bolt and nut assembly further simplifies belt adjustment.

Easy lubrication – Fittings for extended lubrication lines are provided as standard on the exterior of the unit for bearing lubrication.

Circular access door

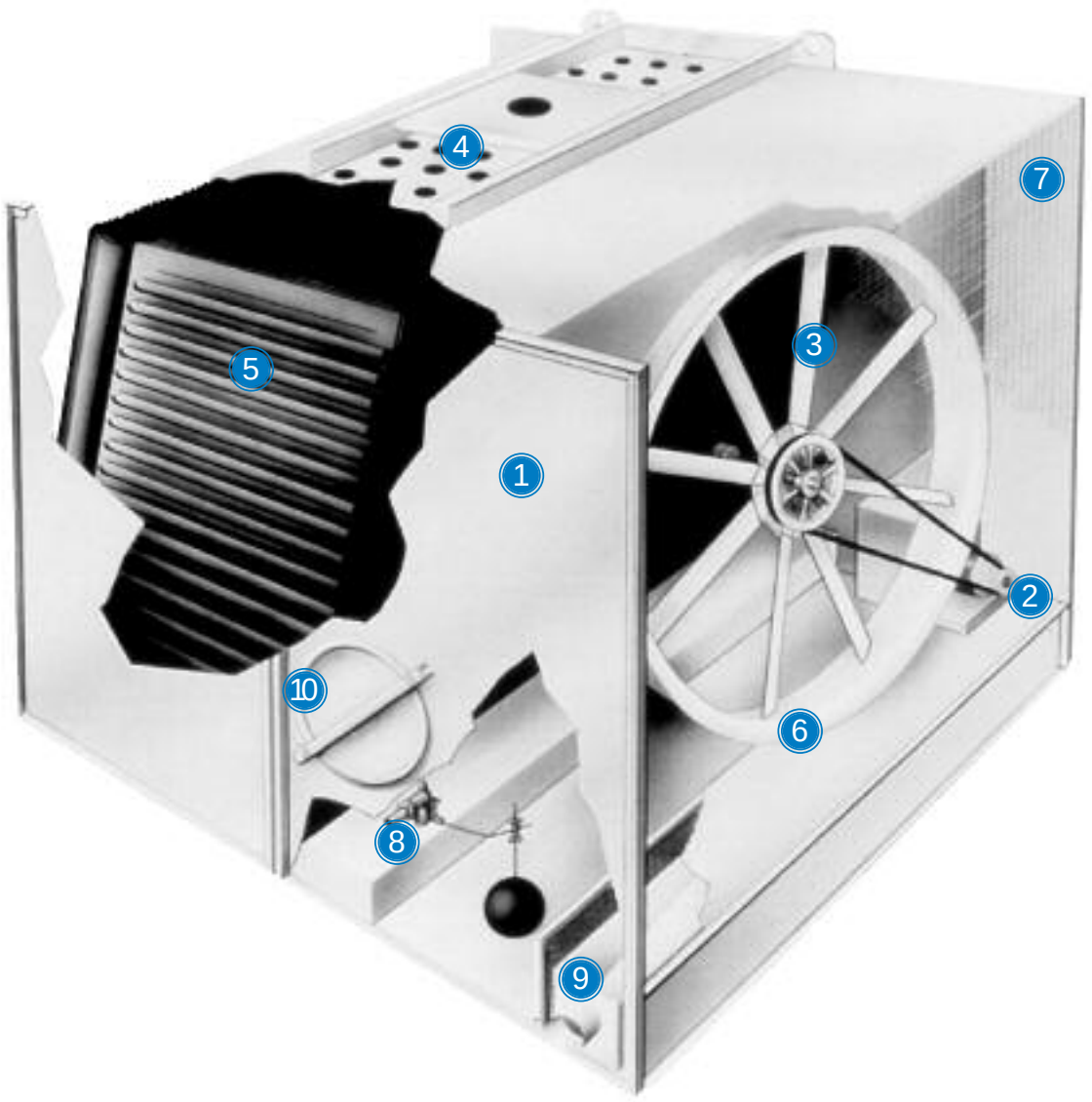
Long Service Life

Materials of construction – Various materials are available to meet the corrosion resistance, unit operating life, and budgetary requirements of any project (see page D62 for construction options).



The fan motor is easily accessible at the base of the unit's exterior

Construction Details



1 Heavy-Duty Construction

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

2 Fan Drive System

Direct drive: Models FXT-6 through FXT-20

V-belt drive: Models FXT-26 and above

Heavy-duty bearings (280,000 hour average life)

Extended lubrication lines

Cooling tower duty fan motor

5-year motor and drive warranty

B.A.C. FAN DRIVE 5 YEAR WARRANTY

3 Low HP Axial Fan(s)

High efficiency

Corrosion resistant

4 Water Distribution System

Non-clog nozzles

Low pump head gravity distribution basin

Steel distribution covers (not shown)

5 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 E84-77a

6 Air Inlet Cylinder

Streamlines air entry for maximum efficiency

7 Inlet Screens

Protection from moving parts

Easily removed for access to fans, bearings, motor and drives

8 Water Make-up Valve Assembly

Bronze float valve

Large diameter plastic float

9 Strainer

Anti-vortexing design to prevent air entrainment

10 Access Door

Circular access door

Construction Options

Standard Construction:
All steel panels and structural elements are constructed of heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel.

Optional BALTIBOND® Corrosion Protection System:
The BALTIBOND® Corrosion Protection System, a hybrid polymer coating used to extend equipment life, is applied to all hot-dip galvanized steel components of the cooling tower.

Optional Stainless Steel Cold Water Basin:
A Series 300 stainless steel cold water basin is provided on most models.

Optional Stainless Steel Construction:
All steel panels and structural elements are constructed of Series 300 stainless steel.

Factory Mutual Approval:

FXT Cooling Towers are available with Factory Mutual (FM) Approved construction as an option.

Accessories

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 to either switch type to activate an alarm.

Basin Heaters

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.

Heater Sizing 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
FXT - 6, 7.5	1	2	1	2
FXT - 11 to 20	1	2	1	3
FXT - 26 to 68	1	3	1	5
FXT - 74 to 95	1	4	1	6
FXT - 115 to 136	2	3	2	5
FXT - 160 to 257	2	4	2	6

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

High Temperature Fill

If operation above 125°F (51.7°C) is anticipated, an optional high temperature fill material is available which increases the maximum allowable entering water temperature to 140°F (60.0°C).

Discharge Screens

Wire mesh screens are available to cover the discharge of the tower to prevent debris from entering the eliminators and cold water basin.

Discharge Air Turning Vanes

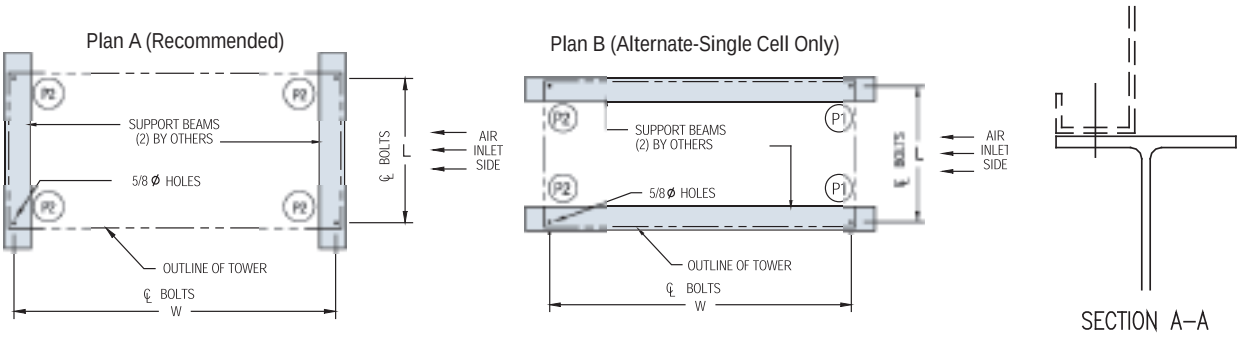
Discharge air turning vanes are available to direct the discharge air up and away from the unit. The turning vanes are installed at the factory on the discharge of the tower and require no increase in fan motor horsepower.

Equipment Controls

BAC control panels are specifically designed to work seamlessly with all BAC units and engineered to meet your particular application. For more information on BAC Equipment Controls, see pages G1-G13.

Structural Support

The recommended support arrangement for the FXT Cooling Tower consists of parallel “I” beams positioned as shown in 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. FXT towers may also be supported on columns at the anchor bolt locations shown, if required. A minimum bearing surface of 6” x 6” (152.4mm x 152.4mm) inches square must be provided under each of the concentrated load points.



Model Number	Weight (lbs)		L	W	P1	P2
	Shipping	Operating				
FXT - 6	370	980	1’ 3”	5’ 1”	264	226
FXT - 7.5	370	980	1’ 3”	5’ 1”	264	226
FXT - 11	470	1,420	2’	5’ 1”	369	341
FXT - 16	570	1,330	2’	5’ 1”	372	293
FXT - 20	590	1,350	2’	5’ 1”	378	297
FXT - 26	940	2,080	3’ 6”	5’ 1”	624	416
FXT - 30	950	2,090	3’ 6”	5’ 1”	627	418
FXT - 33	950	2,090	3’ 6”	5’ 1”	627	418
FXT - 38	1,000	2,420	3’ 6”	5’ 1”	726	484
FXT - 42	1,000	2,420	3’ 6”	5’ 1”	726	484
FXT - 47	1,020	2,440	3’ 6”	5’ 1”	732	488
FXT - 58	1,220	3,140	5’	5’ 1”	989	581
FXT - 68	1,230	2,150	5’	5’ 1”	992	583
FXT - 74	1,720	4,230	5’	7’ 1-7/8”	1,163	952
FXT - 87	1,730	4,240	5’	7’ 1-7/8”	1,166	954
FXT - 95	1,770	4,280	5’	7’ 1-7/8”	1,178	962
FXT - 115	2,220	6,080	8’	7’ 1-7/8”	1,672	1,368
FXT - 130	2,260	6,120	8’	7’ 1-7/8”	1,683	1,377
FXT - 136	2,300	6,160	8’	7’ 1-7/8”	1,695	1,385
FXT - 160	2,880	8,030	11’	7’ 1-7/8”	2,208	1,807
FXT - 175	2,920	8,070	11’	7’ 1-7/8”	2,219	1,816
FXT - 192	2,970	8,120	11’	7’ 1-7/8”	2,234	1,826
FXT - 216	3,560	9,420	11’	7’ 1-7/8”	2,543	2,167
FXT - 240	3,610	9,470	11’	7’ 1-7/8”	2,557	2,178
FXT - 257	3,630	9,490	11’	7’ 1-7/8”	2,563	2,182

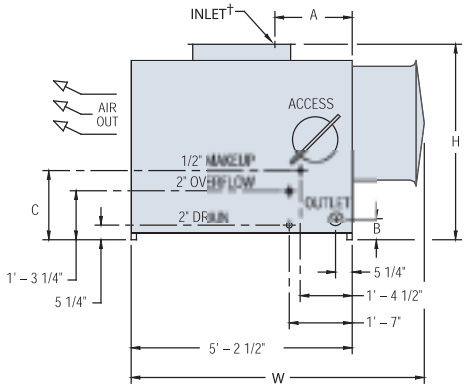
Notes:

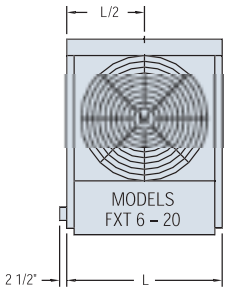
1. Support beams and anchor bolts are to be selected and installed by others.
2. All support steel must be level at the top.
3. The BAC standard vibration isolation rail package is designed for support Plan A.
4. When determining the length of the supporting steel, allow for the length of the vibration isolation rails as they are sometimes longer than the cooling tower dimensions shown.
5. Operating weight is based on the water level in cold water basin at overflow height.

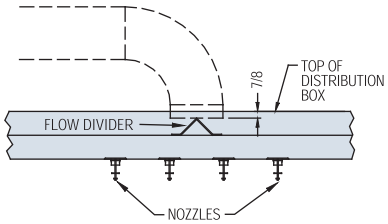
Engineering Data

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**.

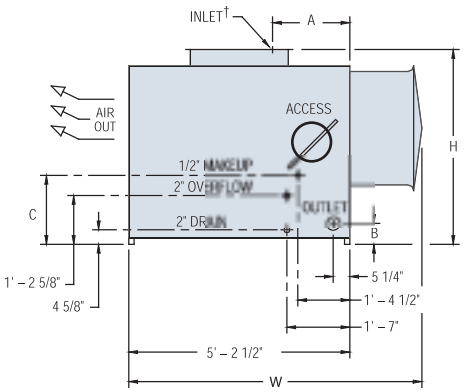
Models FXT-6 to 68

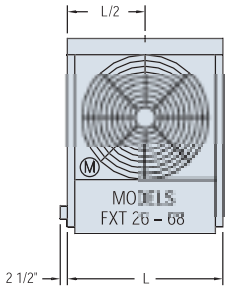






† Inlet piping must rest on the flow divider located 7/8" below the top of the water distribution box. The inlet piping to the distribution box must be the correct size, as indicated below.





Model Number	Nominal Tonnage	Motor HP	Airflow (CFM)	Dimensions						Weights (lbs)		Connection Sizes	
				L	W	H	A	B	C	Operating	Shipping	Inlet	Outlet
FXT - 6	6	1/3	2,400	2' 1/8"	6' 9-3/8"	4' 7-7/8"	22 5/8"	7"	1' 8-1/2"	980	370	3"	3"
FXT - 7.5	7.5	1/2	3,000	2' 1/8"	6' 9-3/8"	4' 7-7/8"	22 5/8"	7"	1' 8-1/2"	980	370	3"	3"
FXT - 11	11	1/2	4,400	3' 1/8"	6' 9-7/8"	4' 7-7/8"	22 5/8"	7"	1' 8-1/2"	1,420	470	3"	3"
FXT - 16	16	1/2	5,700	3' 1/8"	6' 10-7/8"	5' 11-7/8"	19 3/4"	7 1/2"	1' 8-1/2"	1,330	570	4"	4"
FXT - 20	20	1	7,100	3' 1/8"	6' 10-7/8"	5' 11-7/8"	19 3/4"	7 1/2"	1' 8-1/2"	1,350	590	4"	4"
FXT - 26	26	1	9,200	4' 6-1/8"	7' 7-7/8"	5' 11-7/8"	19 3/4"	6 7/8"	1' 8"	2,080	940	4"	4"
FXT - 30	30	1 1/2	10,600	4' 6-1/8"	7' 7-7/8"	5' 11-7/8"	19 3/4"	6 7/8"	1' 8"	2,090	950	4"	4"
FXT - 33	33	2	11,700	4' 6-1/8"	7' 7-7/8"	5' 11-7/8"	19 3/4"	7 7/8"	1' 8"	2,090	950	4"	4"
FXT - 38	38	1 1/2	12,100	4' 6-1/8"	7' 7-7/8"	7' 3-1/4"	16 7/8"	7 7/8"	1' 10-1/2"	2,420	1,000	6"	6"
FXT - 42	42	2	13,400	4' 6-1/8"	7' 7-7/8"	7' 3-1/4"	16 7/8"	7 7/8"	1' 10-1/2"	2,420	1,000	6"	6"
FXT - 47	47	3	15,000	4' 6-1/8"	7' 7-7/8"	7' 3-1/4"	16 7/8"	7 7/8"	1' 10-1/2"	2,440	1,020	6"	6"
FXT - 58	58	3	18,500	6' 1/8"	7' 7-7/8"	7' 3-1/4"	16 7/8"	7 7/8"	1' 10-1/2"	3,140	1,220	6"	6"
FXT - 68	68	5	21,700	6' 1/8"	7' 7-7/8"	7' 3-1/4"	16 7/8"	7 7/8"	1' 10-1/2"	3,150	1,230	6"	6"

Notes:

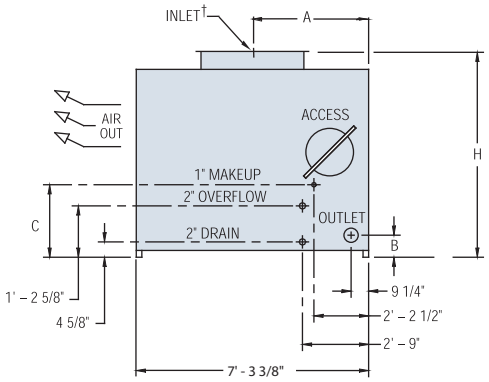
1. Unless otherwise indicated, all connections 6" and smaller are MPT and connections 8" and larger are beveled for welding.

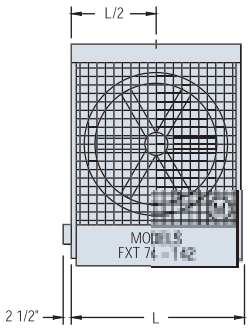
2. Operating weight is based on the water level in cold water basin at overflow height.

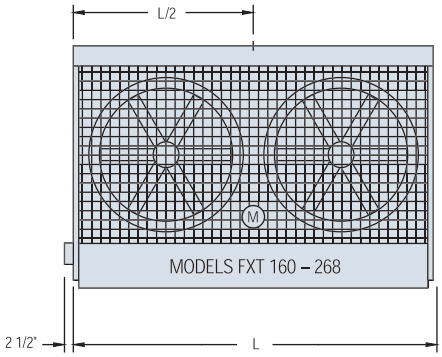
3. Nominal tons of cooling represents 3 GPM of water from 95ºF to 85ºF at a 78ºF entering wet-bulb temperature.

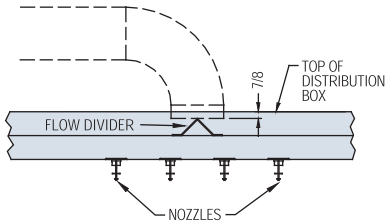
See page D92 for Engineering Considerations.

Models FXT-74 to 257









† Inlet piping must rest on the flow divider located 7/8" below the top of the water distribution box. The inlet piping to the distribution box must be the correct size, as indicated below.

Model Number	Nominal Tonnage	Motor HP	Airflow (CFM)	Dimensions					Weights (lbs)		Connection Sizes	
				L	H	A	B	C	Operating	Shipping	Inlet	Outlet
FXT -74	74	3	21,800	6' 1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	4,230	1,720	8"	8"
FXT - 87	87	5	25,600	6' 1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	4,240	1,730	8"	8"
FXT - 95[4]	95	7 1/2	29,100	6' 1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	4,280	1,770	8"	8"
FXT - 115	115	5	33,900	9' 1-1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	6,080	2,220	8"	8"
FXT - 130	130	7 1/2	38,300	9' 1-1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	6,120	2,260	8"	8"
FXT - 136[4]	136	10	41,800	9' 1-1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	6,160	2,300	8"	8"
FXT - 160	160	7 1/2	47,100	12' 1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	8,030	2,880	8"	8"
FXT - 175	175	10	51,500	12' 1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	8,070	2,920	8"	8"
FXT - 192[4]	192	15	58,900	12' 1/8"	8' 4"	4' 1-3/8"	8 1/2"	2' 1-1/8"	8,120	2,970	8"	8"
FXT - 216	216	10	56,400	12' 1/8"	11"	3' 7-3/4"	8 1/2"	2' 3-1/8"	9,420	3,560	8"	8"
FXT - 240[4]	240	15	65,300	12' 1/8"	11"	3' 7-3/4"	8 1/2"	2' 3-1/8"	9,470	3,610	8"	8"
FXT - 257[4]	257	20	70,000	12' 1/8"	11"	3' 7-3/4"	8 1/2"	2' 3-1/8"	9,490	3,630	8"	8"

Notes:

1. Unless otherwise indicated, all connections 6" and smaller are MPT and connections 8" and larger are beveled for welding.

2. Operating weight is based on the water level in cold water basin at overflow height.

3. Nominal tons of cooling represents 3 GPM of water from 95ºF to 85ºF at a 78ºF entering wet-bulb temperature.

4. FXT - 95, 136, 192, 240, 257 are supplied with a double set of eliminators. The width of the unit increases by 4 1/2".

Engineering Specifications

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

1.0 Cooling Tower

1.1 General: Furnish and install ___ factory-assembled, forced-draft, crossflow cooling tower(s). The tower(s) shall have air entry on one side only. The tower(s) shall have the fan and all moving parts located in the dry entering airstream to provide greater reliability and long life. Overall dimensions shall not exceed approximately ____ft (mm) long x ____ft (mm) wide, with an overall height not exceeding ____ft (mm). The total connected fan horsepower shall not exceed ___ HP (kW). The cooling tower shall be Baltimore Aircoil Company Model FXT _____.

1.2 Thermal Capacity: The cooling tower(s) shall be warranted by the manufacturer to cool _____ USGPM (l/s) of water from ___ºF (ºC) to ___ºF (ºC) at ___ºF (ºC) entering wet-bulb temperature. Additionally, the performance shall be certified by the Cooling Technology Institute in accordance with CTI Certification Standard STD-201. 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 CTI-accredited independent testing agency. The cooling tower(s) shall comply with the energy efficiency requirements of ASHRAE Standard 90.1.

1.3 Corrosion Resistant Construction: Unless otherwise noted in this specification, all steel panels and structural members shall be constructed of heavy-gauge, G-235 (Z700 metric) hot-dip galvanized steel with all cut edges given a protective coating of zinc-rich compound.

(Alternate) 1.3 Corrosion Resistant Construction: Unless otherwise noted in this specification, all steel panels and structural members shall be protected with the BALTIBOND® Corrosion Protection System. The system shall consist of G-235 (Z700 metric) hot-dip galvanized steel prepared in a four-step (clean, pre-treat, rinse, dry) process with an electrostatically sprayed, thermosetting, hybrid polymer fuse-bonded to the substrate during a thermally activated curing stage and monitored by a 23-step quality assurance program. Coatings other than the BALTIBOND® Corrosion Protection System must be submitted to the engineer for pre-approval. Approved equals must have undergone testing, resulting in the following results as a minimum:

1. When X-scribed to the steel substrate it shall be able to withstand 6000 hours of 5% salt spray per ASTM B117 without blistering, chipping, or loss of adhesion;
2. When X-scribed to the steel substrate it shall be able to withstand 6000 hours of exposure to acidic (pH=4.0) and alkaline (pH=11.0) water solutions at 95ºF (35ºC) without signs of chemical attack;
3. Shall withstand impact of 160 in-lbs per ASTM D2794 without fracture or delamination of the polymer layer;
4. Shall withstand 6000 hours of ultraviolet radiation equivalent to 120,000 hours of noontime sun exposure without loss of functional properties;
5. Shall withstand 200 thermal shock cycles between -25ºF (-32ºC) and +180ºF (82ºC) without loss of adhesion or other deterioration;
6. Shall withstand 6000 hours of exposure to 60 psi (42,184.5 kg/m^2) water jet without signs of wear or erosion.

(Alternate) 1.3 Stainless Steel Construction: Unless otherwise noted in this specification, all steel panels and structural members shall be constructed of Series 300 stainless steel and assembled with Series 300 stainless steel nut and bolt fasteners.

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 Cold Water Basin: The cold water basin shall be constructed of heavy-gauge, hot-dip galvanized steel. Standard accessories shall include circular access doors, large-area, lift-out hot-dip galvanized steel strainers with perforated openings sized smaller than water distribution nozzle orifices, an integral anti-vortexing hood to prevent air entrainment, and a bronze make-up valve with large diameter plastic float, arranged for easy adjustment.

(Alternate) 2.1 Stainless Steel Cold Water Basin: All steel components in the cold water basin below the overflow level and in contact with the basin water shall be made of Series 300 stainless steel. All other steel panels and structural elements shall be made from heavy-gauge G-235 (Z700 metric) hot-dip galvanized steel, with cut edges given a protective coating of zinc-rich compound.

2.2 Water Distribution System: Hot water distribution basin shall be open gravity type and constructed of heavy-gauge, G-235 (Z700 metric) hot-dip galvanized steel. Basin weirs and plastic metering orifices shall be provided to assure even distribution of water over the fill surface. Lift-off distribution covers shall be constructed of heavy-gauge, G-235 (Z700 metric) hot-dip galvanized steel.

3.0 Mechanical Equipment

3.1 Fan(s): Fan(s) shall be heavy-duty, axial flow type. Air shall be forced into the tower through a fan cylinder designed for streamlined air entry and minimum fan blade tip clearance for maximum fan efficiency.

3.2 Bearings: Fan(s) shall be mounted directly on the motor shaft or mounted on a horizontal solid steel shaft supported by two heavy-duty, self-aligning, relubricatable ball bearings with cast iron housings and designed for minimum L_{10} life of 40,000 hours (280,000 Hr. Avg. Life). Extended lubrication lines are provided for ease of maintenance.

3.3 Fan Drive: Fan(s) shall be direct driven or driven by V-belts designed for not less than 150% of motor nameplate horsepower. Drives and all moving parts shall be protected by removable steel screens that shall ship installed on the unit.

3.4 Fan Motor(s): Fan motor(s) shall be totally enclosed fan cooled (TEFC), reversible, squirrel cage, ball bearing type, designed specifically for cooling tower service. The motor shall be furnished with special moisture protection on winding, shafts and bearings and labeled specifically for “Cooling Tower Duty.”

(Alternate) 3.4 Fan Motor(s): Fan motor(s) shall be totally enclosed fan cooled (TEFC), reversible, squirrel cage, ball bearing type, designed specifically for cooling tower service. The motor shall be furnished with special moisture protection on winding, shafts and bearings and labeled specifically for “Cooling Tower Duty.” Fan motors shall be inverter duty type designed per NEMA Standard MG1, Section IV, Part 31.

3.5 Mechanical Equipment Warranty: The fan(s), fan shaft(s), 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.

4.0 Fill and Drift Eliminators

4.1 Fill and Drift Eliminators: The fill and integral drift eliminators shall be formed from self-extinguishing polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, and fungus or biological attack. The fill shall be suitable for entering water temperatures up to and including 125°F (51.7°C). The fill shall be manufactured and performance tested by the cooling tower manufacturer to provide single source responsibility and assure control of the final product.

4.1 Fill and Drift Eliminators: The fill and integral drift eliminators shall be formed from self-extinguishing polyvinyl chloride (PVC) having a flame spread rating of 5 per ASTM E84 and shall be impervious to rot, decay, and fungus or biological attack. The high temperature fill shall be suitable for entering water temperatures up to and including 140°F (60.0°C). The fill shall be manufactured and performance tested by the cooling tower manufacturer to provide single source responsibility and assure control of the final product.

5.0 Accessories

5.1 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) basin 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.

5.2 Basin Water Level Control: The cooling tower manufacturer shall provide an electric water level control (EWLC) system. The system shall consist of water level sensing and control units in quantities and locations as indicated on the drawings. Each water level sensing and control unit shall consist of the following: NEMA 4 enclosure with gasketed access cover; solid state controls including all necessary relays and contacts to achieve the specified sequence of operation; stainless steel water level sensing electrodes with bronze holder; Schedule 40 PVC standpipe assembly with vent holes, and all necessary stainless steel mounting hardware. Provide PVC union directly below the control enclosure to facilitate the removal and access of electrodes and control enclosure.

The number and position of water level sensing electrodes shall be provided to sense the following: high water level, low water leve, high water alarm level, low water alarm level, and heater safety cutout.

5.3 Vibration Cutout Switch: Provide a mechanical local reset vibration switch. The mechanical vibration cutout switch shall 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 set in a frequency range of 0 to 3,600 RPM and a trip point of 0.2 to 2.0 g’s.

(Alternate) 5.4 Vibration Cutout Switch: Provide an electronic remote reset vibration switch with contact for BAS monitoring. Wiring shall be by the installing contractor. The electronic vibration cutout switch shall be set to trip at a point so as not to cause damage to the cooling tower. To ensure this, the trip point will be set in a frequency range of 2 to 1000 Hertz and a trip point of 0.45 in/sec (0.0114 m/sec).

5.4 Variable Frequency Drive(s): A variable frequency drive (VFD) specifically configurated shall be provided for each fan motor. The supplier of the VFD shall be the manufacturer of the evaporative cooling equipment. The VFD shall have a 3-contactor bypass, 3% input line reactor, a removable keypad, an RS232 terminal for PC connection, and a circuit breaker disconnect. Fuse protection will not be accepted. Control voltage shall be 24V to minimize the size of the enclosure which should not exceed _____ ft (mm) x _____ ft (mm) x ____ ft (mm) and the weight should not exceed ____ lbs. VFD shall be provided in a NEMA (1)(3R)(12) enclosure. The VFD shall be compatible with a (ModBus) (LonWorks) (Johnson N2) Building Automation System.

OR

5.4 Enclosed Controls: An enclosed control panel shall be provided for each cell of the evaporative cooling equipment. The panel shall include full voltage, non-reversing (FVNR) fan motor and pump motor (if applicable) starters in a common enclosure. The panel shall be provided with a main circuit breaker disconnect and a separate circuit breaker for each motor or speed. Fuse protection will not be accepted. Panels containing basin heaters shall have an Earth Leakage Breaker containing ground fault protection. Starters above 25 A shall be NEMA rated. IEC starters will be accepted for motors below 25 A. Panel shall include a 120V/60Hz control power transformer, Hand-Off-Auto switches for each starter or contactor, and pilot lights for each component. Enclosed controls shall be provided in a NEMA (1)(3R)(4)(4X)(12) enclosure.Optional enclosed control features: (A temperature sensor shall be provided with the enclosed controls.)(A temperature controller shall be provided with the enclosed controls.) (A basin heater contactor with circuit breaker shall be provided.)(A vibration cutout switch input shall be provided.)

5.5 Safety Switch(es): A heavy-duty, non-fusible safety disconnect switch shall be provided by the manufacturer of the evaporative cooling equipment. Switch shall be single-throw, 3-pole design, rated up to 600 VAC. Switch shall have triple padlocking capability, a visible double break rotary blade mechanism, a clearly visible On/Off handle, an interlocking mechanism to prevent door opening with handle in On position, and a clear line shield. Safety switch shall be provided in a NEMA (1)(3R)(12) enclosure.