

FXT

Open Cooling Towers



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FXT Open Cooling Towers

Capacity

Single Cell Capacity:

3 - 145 l/s

General Description

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.

Key Features

- Low energy consumption
- Low installed cost
- Easy maintenance
- Long service life
- Crossflow design
- Forced draught configuration
- Single side horizontal air entry
- Horizontal air discharge
- Aluminium axial fans
- Gravity water distribution





Open Cooling Towers



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Benefits

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 FXT unit is placed with one lift and ships fully assembled.

Easy Maintenance

- The interior of the unit is accessible through circular access doors for adjusting the float valve, cleaning the strainer or flushing the basin
- 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. Extended lubrication fittings are located on the exterior of the unit for bearing lubrication.



Circular Access Door



The Fan Motor is easily accessible at the base of the unit's exterior

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 section Technical Resources, Materials of Construction" for more details)

Low Energy Consumption

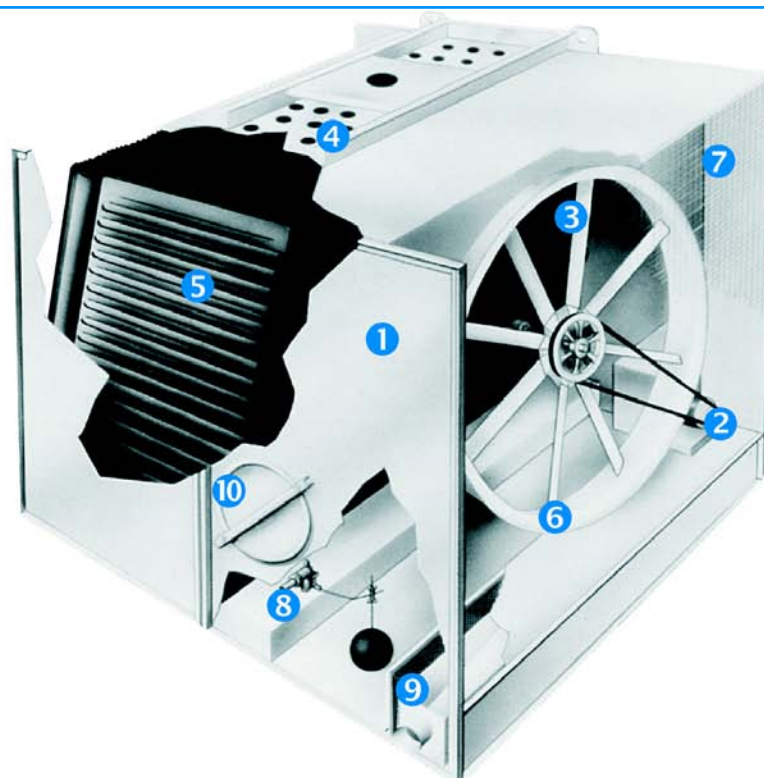
- Evaporative cooling equipment minimizes the energy consumption of the entire system because it provides lower operating temperatures. The owner saves money while conserving natural resources and reducing environmental impact.
- The FXT provides the heat rejection required at the lowest possible energy input via:
 - High efficiency, low kW axial fans
 - High efficiency BACross® Wet Deck, which provides maximum air/water contact time at low air pressure drops
 - Variable frequency drives



Construction Details



Open Cooling Towers



1. Heavy Duty Construction

- Z600 hot-dip galvanized steel panels

2. Fan Drive System

- V-type belt drive
- Heavy-duty bearings
- Extended lubrication lines

3. Low kW Axial Fan(s)

- Quiet operation
- Corrosion resistant aluminum

4. Water Distribution System

- Low pump head gravity distribution basin
- Large orifice, non-clog nozzles
- Steel distribution covers

5. BACross® Wet Deck Surface with Integral Drift Eliminators

- Plastic material

- Impervious to rot, decay and biological attack

- Designed and manufactured by BAC

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

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Custom Features and Options

Construction Options

- **Standard Construction:**

Steel panels and structural elements are constructed of heavy-gauge hot-dip galvanized steel protected with the Baltiplus Corrosion Protection on the outside of the cooling towers.

- **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.

Note: See section Technical Resources, Material Options for more details on the materials described above.

Fan Drive System

FXT cooling towers are belt-driven. The belts are easily adjusted by means of a threaded bolt and nut arrangement.

BACross® Wet Deck Surface

An efficient wet deck surface designed, manufactured and tested by BAC is furnished as standard in all FXT cooling towers. It is impervious to rot, decay, biological attack. The special configuration with integral eliminators provides maximum air/water contact and low air pressure drop to ensure efficient heat transfer while minimizing power requirements.



Accessories

Basin Heaters

Units 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 heaters, which maintain the water temperature at 4°C, are a simple and inexpensive way of providing such protection. The heater package includes the heaters, a thermostat and a low level cut out switch to protect the heaters if the water level is too low. Standard electric heaters are selected for -18°C ambient temperature.

Model	Heaters -18 °C (kW)
FXT 27 - FXT 68	1 x 3
FXT 74 - FXT 86	1 x 4
FXT 97 - FXT 133	2 x 3
FXT 160 - FXT 250	2 x 4
FXT 194 - FXT 266	4 x 3
FXT 320 - FXT 500	4 x 4

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 float switch mounted in the basin and a solenoid activated valve in the make-up water line. The valve is slow closing to minimize water hammer.

High Temperature Wet Deck

If operation above 50°C is anticipated, an optional high temperature wet deck material is available which increases the maximum allowable entering water temperature to 55°C.

Air Discharge Screens

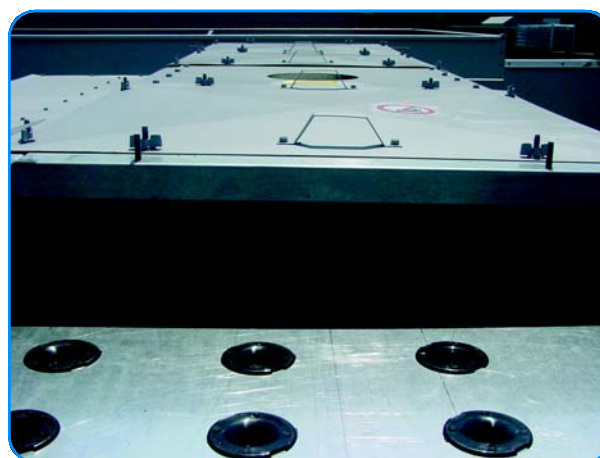
Wire mesh screens are available to cover the discharge of the tower to prevent debris from entering the eliminators and cold water basin.

Distribution Basin Covers

Removable covers for the hot water distribution basins will significantly reduce maintenance and cleaning requirements of the basins and nozzles. The covers will have either Baltiplus or Baltibond[®] Corrosion Protection System to match the equipment material specification.

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 kW.



Distribution Basin Covers

Note: Discharge Air Turning Vanes are not compatible with Air Discharge Screens.

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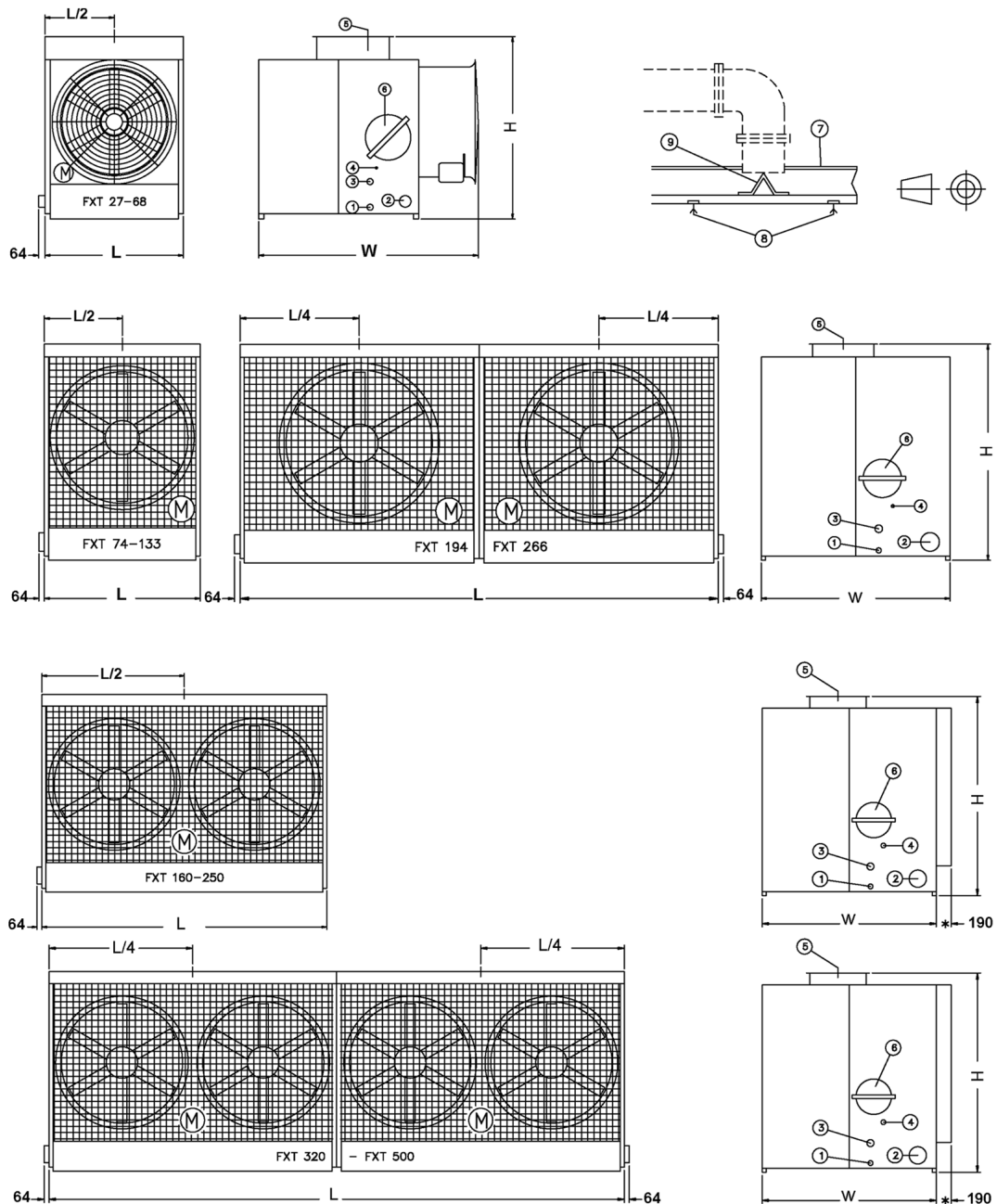


Engineering Data

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FXT 27 - FXT 500

FXT



1. Drain; 2. Water Outlet; 3. Overflow; 4. Make-Up; 5. Water Inlet; 6. Access Door; 7. Top of Distribution Box; 8. Metering Orifices; 9. Flow Divider; *External Screen section only on FXT 211, 250, 422, 500.





Model FXT	Operating Weight (kg)	Shipping Weight (kg)	Heaviest Section (kg)	Air Flow (m ³ /s)	Fan Motor (kW)	Fluid Inlet ND (mm)	Fluid Outlet ND (mm)	Make Up ND (mm)	H (mm)	L (mm)	W (mm)
FXT 27	945	425	425	4,85	(1) 0,75	100	100	15	1810	1374	2181
FXT 32	950	430	430	5,32	(1) 1,1	100	100	15	1810	1374	2181
FXT 43	1100	455	455	7,08	(1) 1,5	150	150	15	2216	1374	2181
FXT 51	1110	465	465	8,11	(1) 2,2	150	150	15	2216	1374	2181
FXT 60	1425	555	555	9,93	(1) 2,2	150	150	15	2216	1832	2181
FXT 68	1430	560	560	11,76	(1) 4,0	150	150	15	2216	1832	2181
FXT 74	1920	780	780	11,03	(1) 2,2	200	200	25	2540	1832	2219
FXT 88	1925	785	785	13,07	(1) 4,0	200	200	25	2540	1832	2219
FXT 97	2755	1000	1000	14,68	(1) 2,2	200	200	25	2540	2772	2219
FXT 116	2765	1010	1010	17,40	(1) 4,0	200	200	25	2540	2772	2219
FXT 133	2780	1025	1025	19,93	(1) 5,5	200	200	25	2540	2772	2219
FXT 160	3640	1310	1310	24,10	(1) 5,5	200	200	25	2540	3660	2219
FXT 173	3655	1325	1325	26,53	(1) 7,5	200	200	25	2540	3660	2219
FXT 211	4275	1620	1620	30,22	(1) 7,5	200	200	25	3356	3660	2219
FXT 250	4295	1640	1640	34,60	(1) 11	200	200	25	3356	3660	2219
FXT 194	5505	1995	1000	29,36	(2) 2,2	(2) 200	(2) 200	50	2540	5556	2219
FXT 232	5525	2015	1010	34,81	(2) 4,0	(2) 200	(2) 200	50	2540	5556	2219
FXT 266	5565	2055	1030	39,85	(2) 5,5	(2) 200	(2) 200	50	2540	5556	2219
FXT 320	7285	2615	1310	48,19	(2) 5,5	(2) 200	(2) 200	50	2540	7334	2219
FXT 346	7320	2650	1325	53,04	(2) 7,5	(2) 200	(2) 200	50	2540	7334	2219
FXT 422	8545	3230	1620	60,44	(2) 7,5	(2) 200	(2) 200	50	3353	7334	2219
FXT 500	8590	3275	1640	69,19	(2) 11	(2) 200	(2) 200	50	3353	7334	2219

General Notes

1. Unless otherwise indicated, all connections ND 100 and smaller are MPT and connections ND 125 and larger are beveled for welding.
2. Operating weight is for tower with water level in the cold water basin at overflow.
3. Unit height is indicate, for precise value refer to the certified print.
4. Inlet piping must rest on the flow divider. The inlet piping to the distribution box must be the correct size as indicated in the table.

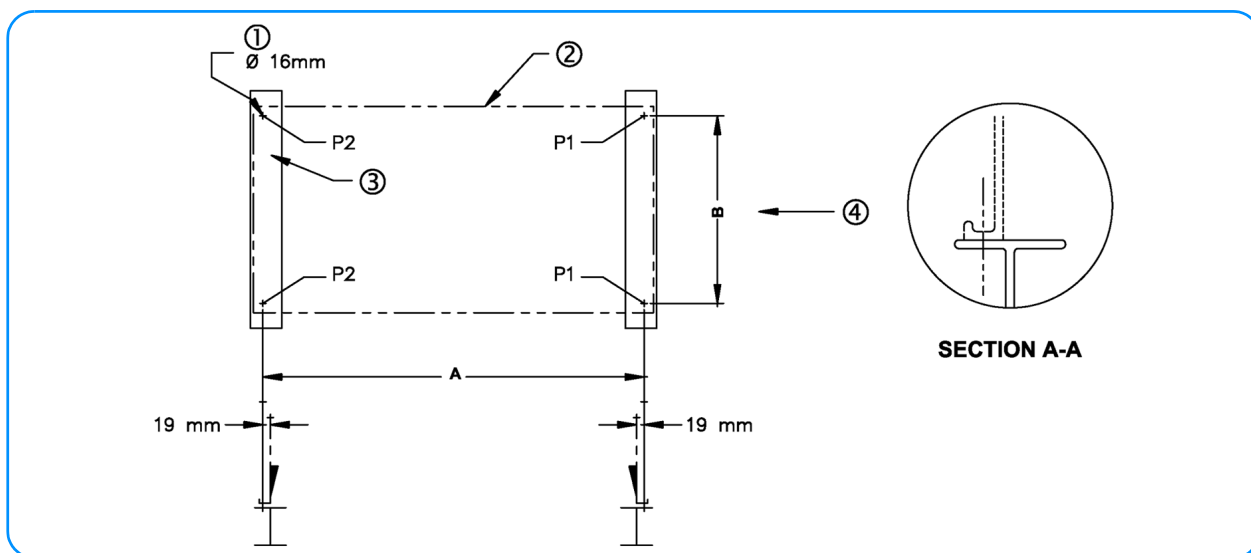
Structural Support

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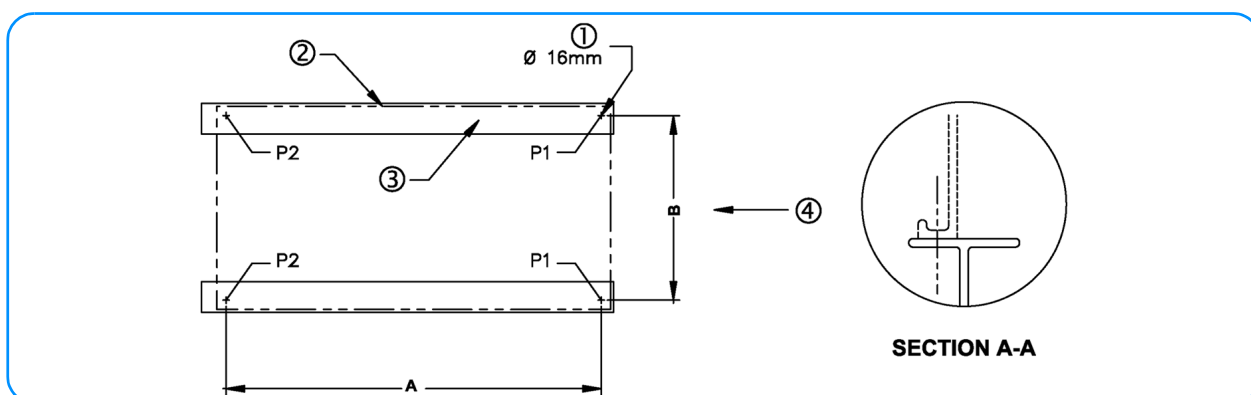
The recommended support arrangement for units consists of parallel I-beams running the full length of the unit, spaced as shown in the following drawing. Besides providing adequate support, the steel also serves to raise the unit above any solid foundation to ensure access to the bottom of the unit. To support units in an alternate steel support arrangement, consult your BAC Baltimore Representative.

- Supporting steelwork and anchor bolts are to be selected and installed by others.
- All supporting steel must be flush and level at the top and must be oriented to the gage line as shown in SECTION A-A.
- Recommended design loads for each beam should be 65% of the total operating weight applied as a uniform load to each beam. Beam should be designed in accordance with standard design practice. Refer to the below table for the maximum allowable deflection of beams
- All mounting holes are 16 mm diameter at the locations shown.
- If continuous vibration isolator rails are used, be certain to allow for the length of the rails when determining length of supporting steel. Vibration isolator rails are sometimes longer than the cooling tower dimensions shown. Refer to vibration isolator drawings for this information. If point vibration isolation is used, the isolators should be installed at the mounting hole locations shown.

Single Cell



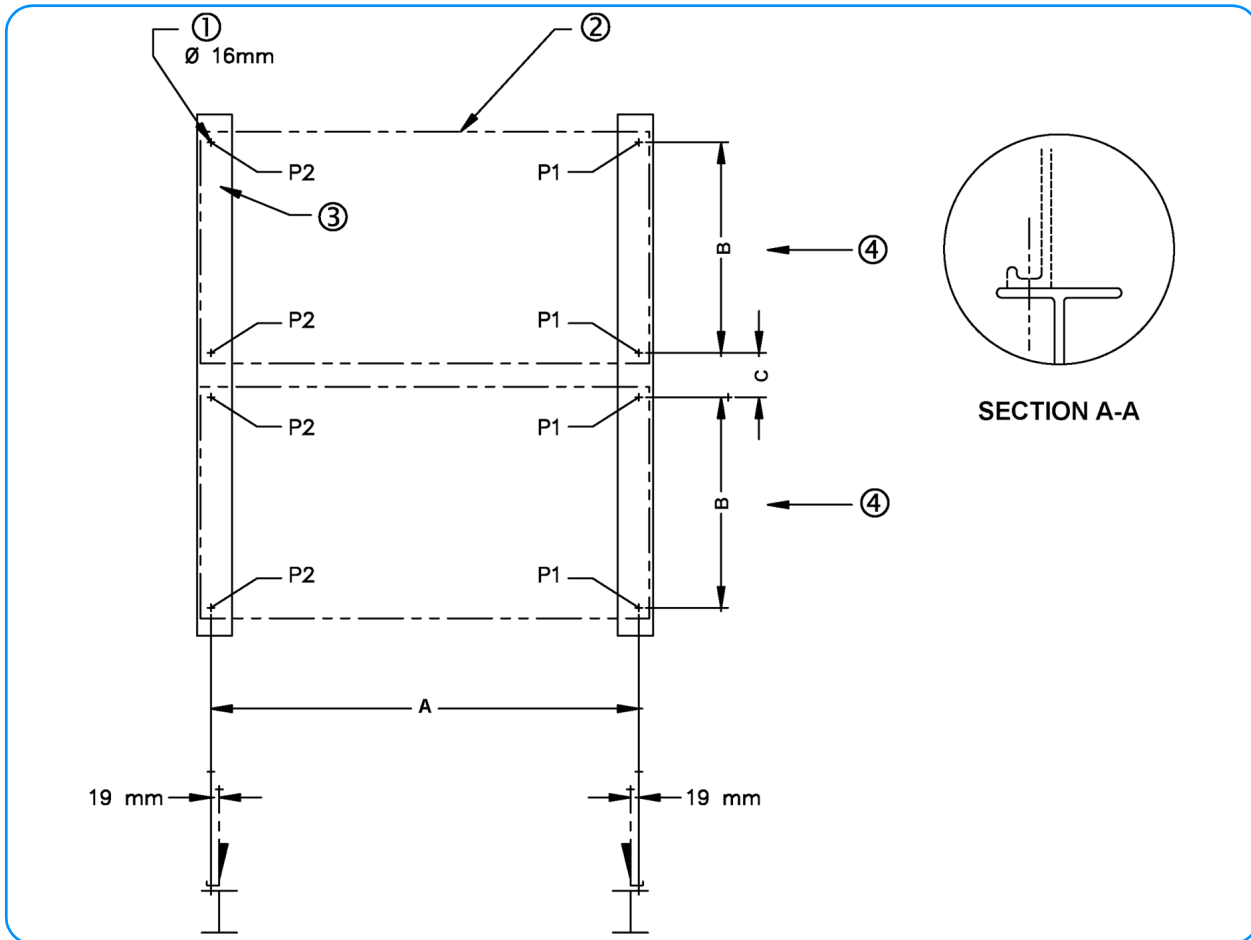
Recommended Support



Alternate Support

1. Holes; 2. Outline of Tower; 3. Support Beams (by others); 4. Air Inlet Side.

Double Cell



1. Holes; 2. Outline of Tower; 3. Support Beams (by others); 4. Air Inlet Side

Model FXT	A (mm)	B (mm)	C (mm)	P1 (kg)	P2 (kg)	Maximum Deflection (mm)
FXT 27	1549	1067	-	284	189	13
FXT 32	1549	1067	-	285	190	13
FXT 43	1549	1067	-	330	220	13
FXT 51	1549	1067	-	333	222	13
FXT 60	1549	1524	-	449	264	13
FXT 68	1549	1524	-	450	265	13
FXT 74	1549	1524	-	528	432	13
FXT 88	1549	1524	-	529	433	13
FXT 97	2181	2438	-	758	620	13
FXT 116	2181	2438	-	760	622	13
FXT 133	2181	2438	-	765	626	13
FXT 160	2181	3353	-	1001	819	13
FXT 173	2181	3353	-	1005	822	13
FXT 211	2181	3353	-	1154	983	13
FXT 250	2181	3353	-	1160	988	13
FXT 194	2181	2438	346	758	619	13
FXT 232	2181	2438	346	760	622	13
FXT 266	2181	2438	346	765	626	13
FXT 320	2181	3353	321	1001	820	13
FXT 346	2181	3353	321	1007	823	13
FXT 422	2181	3353	321	1154	983	13
FXT 500	2181	3353	321	1160	988	13



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Engineering Specifications

1.0 Cooling Tower

1.1 General: Furnish and install _____ factory-assembled, forced-draft, axial fan, 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 provide greater reliability and long life. Overall dimensions shall not exceed approximately _____ mm long x _____ mm wide x _____ mm high. The total connected fan kW shall not exceed _____ kW. The cooling tower(s) shall be Baltimore Aircoil Model _____.

1.2 Thermal Capacity: The cooling tower(s) shall be warranted by the manufacturer to cool _____ l/s of water from _____ °C to _____ C at _____ °C entering wet-bulb temperature.

1.3 Corrosion Resistant Construction (standard): Unless otherwise noted in this specification, all steel panels and structural members shall be constructed of heavy-gauge Z600 metric hot-dip galvanized steel with all edges given a protective coating of zinc-rich compound and the exterior protected with the BALTIPLUS Corrosion Protection.

(Alternate 1.3) Corrosion Resistant Construction (optional): 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 Z600 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.

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.

1.5 Warranty: The manufacturer's standard equipment warranty shall be for a period of not less than one year from date of startup or eighteen months from date of shipment, whichever occurs first.

2.0 Construction Details

2.1. Cold Water Basin: The cold water basin shall be constructed of heavy-gauge Z600 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 brass make-up valve with large diameter plastic float, arranged for easy adjustment.

2.3. Water Distribution System: Hot water distribution basin shall be open gravity type and constructed of heavy-gauge, Z600 hot-dip galvanized steel. Basin weirs and plastic metering orifices shall be provided to assure even distribution of water over the wet deck surface. Lift-off distribution cover shall be constructed of heavy-gauge, Z600 hot-dip galvanized steel.

3.0 Mechanical Equipment

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

3.3. Fan Drive: Fan(s) shall be driven by V-belts and all moving parts shall be protected by removable steel screens that shall ship installed on the unit.

3.2. Bearings: Fan(s) shall be 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 L10 life of 40 000 hours (280 000 Hr. Avg. Life). Extended lubrication lines are provided for ease of maintenance.

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 windings, shafts and bearings.

4.0 BACross® Wet Deck Surface and Drift Eliminators

4.1. Wet Deck Surface and drift Eliminators: The wet deck surface and integral drift eliminators shall be impervious to rot, decay, and fungus or biological attack. The wet deck surface 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 Access

5.1 Basin Access: Circular access doors shall be provided for easy access to the make-up water assembly and suction strainer for routine maintenance.

6.0 Sound

6.1 Sound Level: To maintain the quality of the local environment, the maximum sound pressure levels (dB) measured 15 m from the

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									
End									
Top									

