

RIGGING AND INSTALLATION INSTRUCTIONS



FXT Cooling Towers

The BAC equipment should be rigged and installed as outlined in this bulletin.







These procedures should be thoroughly reviewed prior to the rigging and operation to acquaint all personnel with the procedures to be followed and to assure that all necessary equipment will be available at the jobsite.

Be sure to have a copy of the unit certified drawing available for reference. If you do not have a copy of this drawing or if you need additional information about this unit, contact the local BAC Balticare representative. His name and phone number can be found on the BAC website: www.BaltimoreAircoil.eu. The model type and serial number of your equipment are indicated on the unit nameplate.



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About engineering and application practices

This bulletin only refers to the assembly of the unit. To ensure a proper operation, a correct integration of the unit in the overall installation is mandatory. For good engineering and application practices on layout, levelling, connecting pipework, etc..., please refer to our website: <http://www.baltimoreaircoil.eu/knowledge-center/application-information>.

Shipping

BAC cooling equipment is factory assembled to assure uniform quality and minimum field assembly. Units usually shipped fully assembled. Most units can be set in place with one lift and require only piping connections and electrical wiring before start-up. For the dimensions and weights of a specific unit or section, refer to the certified drawing.

Do not cover units with PVC eliminators or fill with a plastic tarpaulin. Temperature increase due to sun radiation could deform the fill or eliminators

Inspection before Rigging

When the unit is delivered to the jobsite, it should be checked thoroughly to ensure all required items have been received and are free of any shipping damage prior to signing the bill of lading. The following parts should be inspected:

- Sheaves and belts
- Bearings
- Bearing supports
- Fan motor(s)
- Fan(s) and Fan shaft(s)
- Wet deck surface
- Drift eliminators
- Water distribution system
- Strainer(s)
- Float valve assembly(s)
- Interior / Exterior surfaces
- Air Inlet Screens
- Miscellaneous items:

An envelope with checklist is stored in a wooden no nail crate or a plastic container which is placed in the lower section. For safety reasons, access doors / panels may be sealed with bolts. The following table specifies which wrench is required to open them.

Wrench to open access door	Wrench to open access panel
17 mm	14 mm (for air inlet screen: 10 mm)

Table 1: Required wrenches to open access door/panel

The wooden no nail crate / plastic container also contains miscellaneous parts such as gasket, hardware and accessory items.

Be sure to remove all miscellaneous items from the pan before the unit is assembled.

The hardware is packed in a plastic container and located inside the lower section of the unit.



Figure 1: Hardware location

Unit Weights

Before rigging any BAC cooling equipment, the weight of each section should be verified on the unit certified drawing.

Note: These weights are approximate only and should be confirmed by weighing before lifting when available hoisting capacity provides little margin for safety.

Before an actual lift is undertaken, ensure no water, snow, ice or debris has collected in the sump or elsewhere in the unit. Such accumulations will add substantially to the equipment's lifting weight.

Anchoring

The unit must be properly anchored in place. Refer to the suggested support details on the certified drawing for locations of the mounting holes. Anchor bolts must be provided by others. Holes suitable for 20 mm bolts are provided in the bottom flange of the lower section for bolting the unit to the support beams.



Leveling

The unit must be level for proper operation and ease of piping.

Connecting Pipework

All piping external to BAC cooling equipment must be supported separately. In case the equipment is installed on vibration rails or springs, the piping must contain compensators to eliminate vibrations carried through the external pipework.

Suction pipe sizing should be done according to good practice, which may for larger flows require larger pipe diameters than the cooling tower outlet connection. In such cases adapter pieces need to be installed.

Freeze Protection

These products must be protected against damage and/or reduced effectiveness due to possible freeze-up by mechanical and operational methods. Please refer to the BAC Product & Application Handbook or contact your local BAC Balticare representative for recommended protection alternatives.

Bleed line installation

On all open cooling towers and all units operating with a remote sump tank, install a bleed line with valve between the system circulating pump discharge riser and a convenient drain. Locate the bleed line in a portion of the riser piping that drains when the pump is off.

The bleed valve should always be open when the unit is in operation, unless the bleed rate is automatically controlled by a water treatment system.

Safety Precautions

All electrical, mechanical and rotating machinery constitute a potential hazard, particularly for those not familiar with its design, construction and operation. Accordingly, adequate safeguards (including use of protective enclosures where necessary) should be taken with this equipment both to safeguard the public (including minors) from injury and to prevent damage to the equipment, its associated system and the premises.

If there is doubt about safe and proper rigging, installation, operation or maintenance procedures, contact the equipment manufacturer or his representative for advise.

When working on operating equipment, be aware that some parts may have an elevated temperature. Any operations on elevated level have to be executed with extra care to prevent accidents.

AUTHORIZED PERSONNEL

The operation, maintenance and repair of this equipment should be undertaken only by personnel authorized and qualified to do so. All such personnel should be thoroughly familiar with the equipment, the associated systems and controls and the procedures set forth in this and other relevant manuals. Proper care, procedures and tools must be used in handling, lifting, installing, operating and repairing this equipment to prevent personal injury and/or property damage.

MECHANICAL SAFETY

Mechanical safety of the equipment is in accordance with the requirements of the EU machinery directive. Depending upon site conditions it also may be necessary to install items such as bottom screens, ladders, safety cages, stairways, access platforms, handrails and toe boards for the safety and convenience of the authorized service and maintenance personnel. At no time this equipment should be operated without all fan screens, access panels and access doors in place.

When the equipment is operated with a variable fan speed control device, steps must be taken to avoid operating at or near to the fan's «critical speed». For more information consult your local BAC Balticare representative.

ELECTRICAL SAFETY

Each fan and pump motor associated with this equipment should be installed with a lockable disconnect switch located within the sight of the equipment. No service work should be performed on or near the fans, motors, drives or inside the equipment unless fan and pump motors, heaters etc. are electrically isolated.

LIFTING

Failure to use designated lifting points can result in a dropped load causing severe injury, death and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions and generally accepted lifting practices; The use of supplemental safety slings may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

LOCATION

All cooling equipment should be located as far away as possible from occupied areas, open windows or air intakes to buildings.

Each unit must be located and positioned to prevent the introduction of discharge air into the ventilation systems of the building on which the unit is located and of adjacent buildings.

Note: For detailed recommendations on BAC equipment layout, please see the BAC Application Handbook EU-Edition, the BAC website: www.baltimoreaircoil.eu or contact your local BAC-Balticare Representative.

STEEL SUPPORT

The recommended support arrangement for FXT Cooling Towers is 2 I-beams running either the length or width of the unit as shown in the following figures. 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 in the following figures, if required. A minimum bearing surface of 15x15 cm must be provided under each of the concentrated load points.



GENERAL INFORMATION

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.

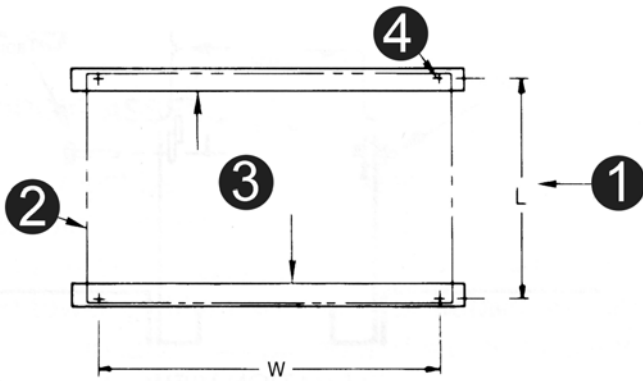


Figure 2: FXT-27 through FXT-250 (alternate – single cell only)

1. Air inlet side
2. Outline of towers
3. (2) Support beams by others
4. 16 mm diam holes

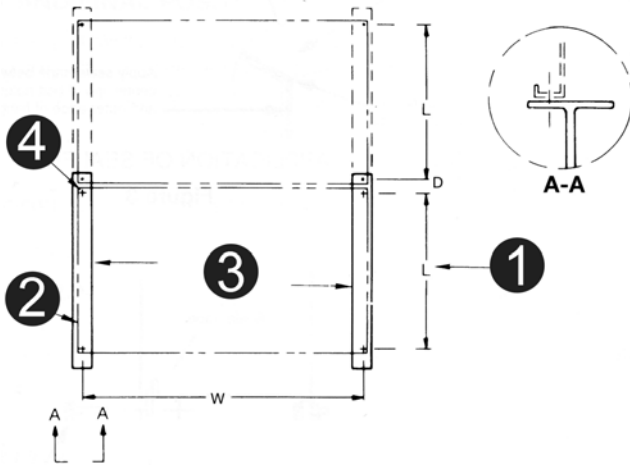


Figure 3: FXT-27 through FXT-500 (recommended multi-cell)

1. Air inlet side
2. Outlet of tower
3. (2) Support beams by others
4. 16 mm diam holes

Model No.	Shipping Weight (kg)	Operating Weight (kg)	Dimensions (center line bolts)		
			L (mm)	W (mm)	D (mm)
FXT-27	425	945	1067	1549	-
FXT-32	430	950	1067	1549	-
FXT-43	455	1100	1067	1549	-
FXT-51	465	1110	1067	1549	-
FXT-60	555	1425	1524	1549	-
FXT-68	560	1430	1524	1549	-
FXT-74	780	1920	1524	2181	-
FXT-88	785	1925	1524	2181	-
FXT-97	1000	2755	2438	2181	-
FXT-116	1010	2765	2438	2181	-
FXT-133	1025	2780	2438	2181	-
FXT-160	1310	3640	3353	2181	-
FXT-173	1325	3655	3353	2181	-
FXT-211	1620	4275	3353	2181	-
FXT-250	1640	4295	3353	2181	-
FXT-194	1995	5505	2438	2181	346
FXT-232	2015	5525	2438	2181	346
FXT-266	2055	5565	2438	2181	346
FXT-320	2615	7285	3353	2181	321
FXT-346	2650	7320	3353	2181	321
FXT-422	3230	8545	3353	2181	321
FXT-500	3275	8590	3353	2181	321

Table 2: Dimensions & Weights for steel support plan

LOCAL REGULATIONS

Installation and operation of cooling equipment may be subject of local regulations, such as establishment of risk analysis. Ensure regulatory requirements are consistently met.

Warranties

Please refer to the Limitation of Warranties applicable to and in effect at the time of the sale/purchase of these products.





General Notes

1. Unless unit ships fully assembled, unit must be rigged one section at the time.
2. If the delivery consists of separate sections, do not assemble before lifting, as the lifting devices provided are not designed to support the weight of the entire assembly.
3. When lifting the vertical distance "H", between the top of the unit to the apex of the lifting cables, it must be no less than given in the following table.

MODEL (*)	MINIMUM "H"
FXT-27 to 51	1,8 m
FXT-60 to 88	2,4 m
FXT-97 to 500	3,6 m

Table 3: Lifting Distance "H"

Note: (*) Model number and serial number are located on a label adjacent to the access door.

4. Spreader bars of the full width of the section must be used between the lifting cables to prevent damage to the section. For extended lifts or where hazards exist, it is recommended to use the lifting devices in conjunction with safety slings placed under the unit.

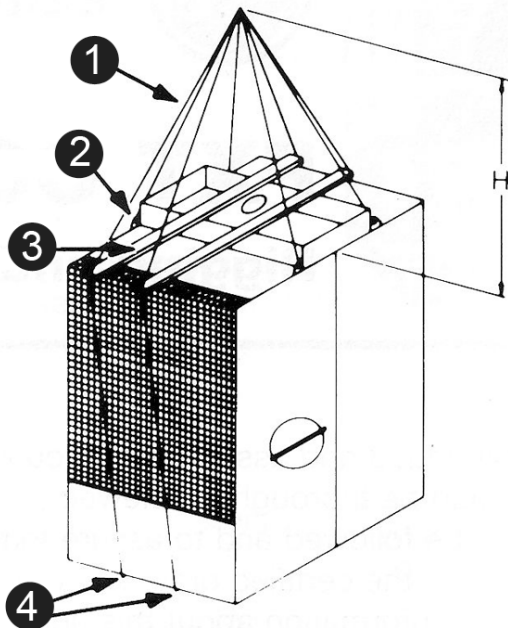


Figure 4: FXT lifting with safety slings

1. Lifting cables
2. Lifting devices
3. Spreader bars
4. Safety slings

5. FXT cooling towers may be hoisted short distances by using the lifting devices provided at the top of each unit as shown in the following figure.

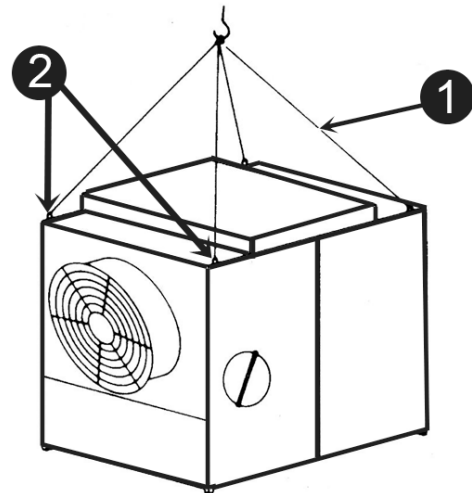


Figure 5: Short and final positioning

1. Lifting cables
2. Lifting devices

Inlet Piping Assembly

1. All piping must be supported external to the tower and restraint provided to insure no vertical or horizontal movement of the inlet piping. Refer to unit certified drawings for details on inlet connection location. All piping and supports are to be furnished by others.

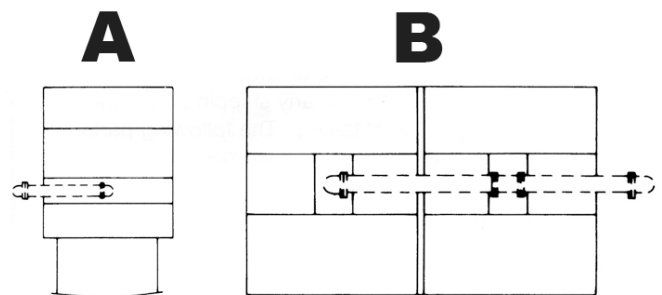


Figure 6: FXT Plan View – Inlet Piping Assembly

A: Single Cell Unit; B: Multiple-Cell Unit



2. Inlet piping must rest on the flow divider located 22mm below the top of the water distribution box (See Detail C).

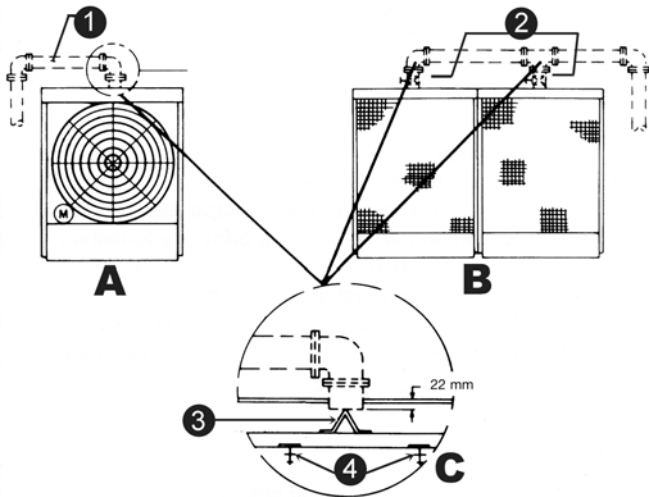


Figure 7: Elevation View

A: Single Cell Unit; **B:** Multiple Cell Unit

- 1. All piping supplied by others
- 2. Valves by others
- 3. Flow Divider
- 4. Nozzles

3. The inlet piping to the distribution box must be the correct size. Refer to the following table for the proper connection size.

MODEL	Connection Size Inlet mm
FXT-27 to 32	100
FXT-43 to 68	150
FXT-74 to 173	200
FXT-194	2 x 200
FXT-211	200
FXT-232	2 x 200
FXT-250	200
FXT-266 to 500	2 x 200

Table 4: Inlet Piping Size

4. Flow control valves are recommended on multi-cell towers to insure proper water distribution and are to be furnished by others.



Assembly of Multi-Cell Towers

Multiple Cell units (FXT-194, 232, 266, 320, 346, 422 and 500) are furnished with sump connectors to equalize the water level in the sump of each cell.

1. Cell A will ship with sump connector factory installed. Position Cell A on tower support and bolt in place.
2. Wipe down the flanges on the end of the sump connector. Apply two overlapping strips of sealer tape around the face of flange between the centre line of the bolt holes and the outer edge of the flange as illustrated in the figure below. Be sure to overlap the sealer at the corners as shown.

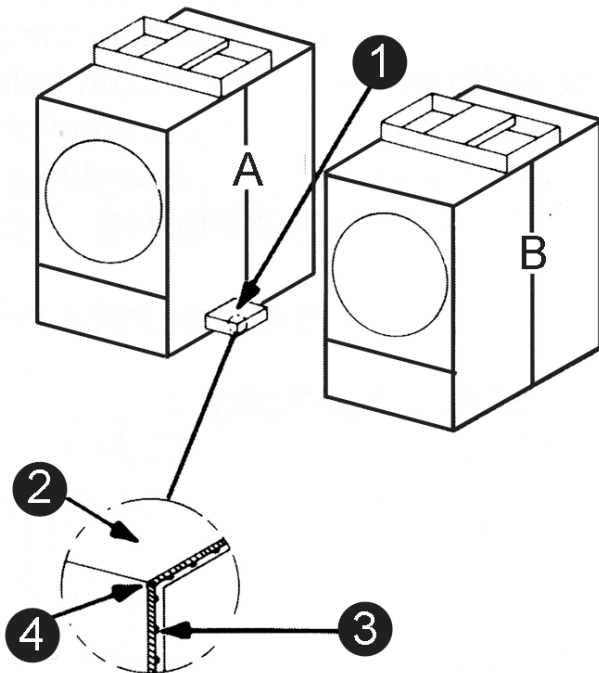


Figure 8: Application of Sealer

1. Sump connector (factory installed on Cell A)
2. Flanged end of sump connector
3. Apply sealer tape between center line of bolt holes and outer edge of flange
4. Overlap sealer tape at corners
3. Position cell B on the tower supports and wipe down the surface adjacent to the opening to remove any dirt or moisture.
4. Using drift pins to assure alignment, draw cell B tight against the sump connector.

5. As illustrated in the figure below, insert tappers in each hole and tighten.

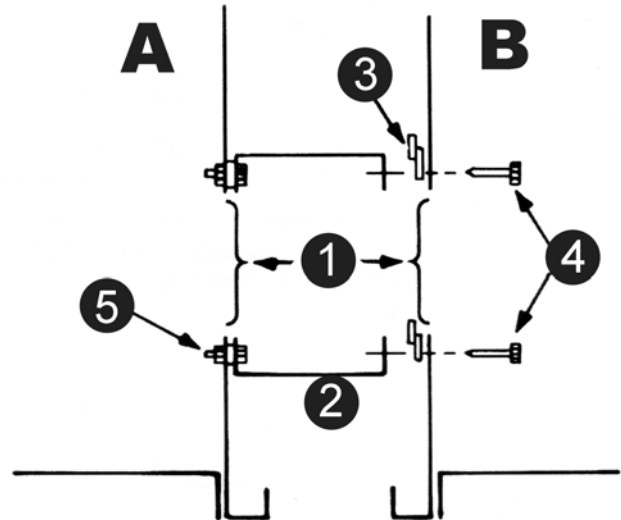


Figure 9: Elevation View – Tapper positions

- A:** Cell A; **B:** Cell B
1. Pan Opening
 2. Sump connector
 3. Sealer Tape
 4. Tappers
 5. Bolt & Nut



Positive Closure Plate Option

Optional Positive Closure Plates can be furnished on multiple cell units to enable individual cells to be isolated or cleaning and routine maintenance.

The unit will ship with the Positive Closure Plate factory installed on Cell A as shown in the figure below.

Units furnished with Positive Closure Plates have to be installed following the same steps 1 through 5 as described in "Assembly of Multi-Cell towers" on page 7.

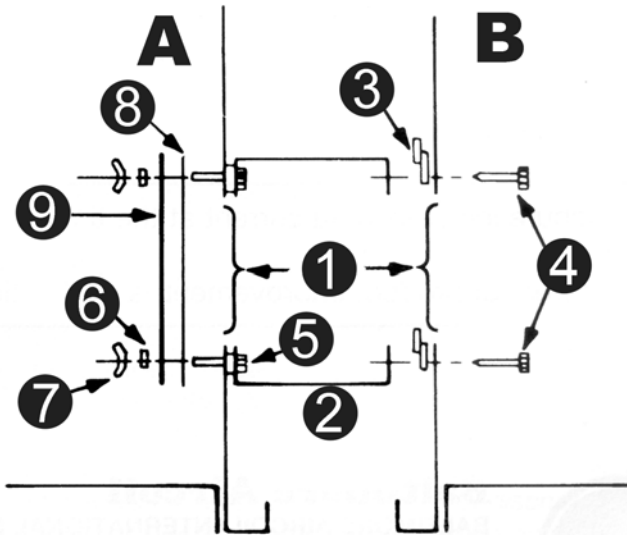


Figure 10: Elevation View – Positive Closure Plate Installation

A: Cell A; **B:** Cell B

1. Pan opening
2. Sump connector
3. Sealer tape
4. Tappers
5. Bolt
6. Flatwasher
7. Wing nut
8. Gasket
9. Positive Closure Plate



General

Prior to start-up, the following services, which are described in detail in the Operating and Maintenance Manual (see Table Recommended Maintenance and Monitoring Schedule- Start-up) must be performed.

Proper start-up procedures and scheduled periodic maintenance will prolong the life of the equipment and ensure trouble-free performance for which the unit is designed.







Schedule

Type of Action	Action	Start-Up	Weekly	Monthly	Quarterly	Every Six Months	Annually	Shutdown	
Checks and Adjustments	Hot water basin	X			X				
	Cold water basin and basin strainer	X			X				
	Operating level and make-up	X		X					
	Blow down	X		X					
	Sump heater Package	X				X			
	Belt tension	X		X					
	Drive alignment	X					X		
	Rotation of fan(s) and pump(s)	X							
	Locking Collar	X							
	Motor voltage and current	X				X			
	Unusual noise and/or vibration	X		X					
Inspections and Monitoring	General condition	X		X					
	Heat transfer section and drift eliminators	X			X				
	Spray Nozzles	X		X					
	Fan shaft	X				X			
	Axial Fan	X				X			
	Fan Motor	X				X			
	Electric Water Level Control Package (optional)	X				X			
	Hot water basin	X				X			
	TAB test (dip slides)	X	X						
	Circulating water quality	X		X					
	System overview	X					X		
	Record keeping		As per event						
	Lubrication	Fan shaft Bearings	X			X			
Motor Bearings*		X				X			
Adjustable motor base		X				X			
Cleaning procedures	Mechanical cleaning	X					X		
	Disinfection **	(X)					(X)	(X)	
	Drain Basin							X	

Table 5: Recommended Maintenance & Monitoring Schedule

* only for motors with grease fittings with typical frame size > 200L (>30 kW)

** depends on applied code of practice

Notes:

1. Water Treatment and auxiliary equipment integrated in the cooling system may require additions to the table above. Contact suppliers for recommended actions and their required frequency.
2. Recommended service intervals are for typical installations. Different environmental conditions may dictate more frequent servicing.
3. When operating in ambient temperatures below freezing, the unit should be inspected more frequently (see Cold Weather Operations in the appropriate Operating and Maintenance Instructions).
4. For units with Belt Drive, tension on new belts must be readjusted after the first 24 hours of operation and monthly thereafter.

Model:

Serialnumber:

