



**BALTIMORE  
AIRCOIL COMPANY**



## **TSC-C-D Ice Chiller® Thermal Storage Coil only**

### **RIGGING AND INSTALLATION INSTRUCTIONS**





# About rigging and installation

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 job site.

## Recommended maintenance and monitoring programme

Inspections and monitoring	Start-Up	Monthly	Quarterly	Every 6 months	Annually	Shutdown
General condition	X	X				
Ice Chiller® tank	X				X	
Ice Chiller® water (1) - Quality - Level	X X			X X		
Ice thickness	X	X				
Coil	X					
Ice-Logic™ Ice Quantity controller: - condition of sensor - conductivity of tank water	X X	X			X	
Air pump - Air filter replacement	X	X			X	
Refrigerant: - Glycol quality - NH <sub>3</sub> purge oil				X X		
Air distribution piping	X					

Cleaning procedures	Start-Up	Monthly	Quarterly	Every 6 months	Annually	Shutdown
Mechanical cleaning - Air filter	X	X	X		X	X
Disinfection	X				X	X

### 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 installation should be inspected more frequently.

# Table of contents

## RIGGING AND INSTALLATION INSTRUCTIONS



<b>1</b>	<b>General information</b>	<b>4</b>
	About engineering and application practices	4
	Shipping	4
	Inspection Before Rigging	4
	Unit weights	4
	Leveling	5
	Connecting pipework	5
	Coil connections	5
	Freeze protection	6
	Safety precautions	6
	Non-walking surfaces	7
	Modifications by others	7
	Warranty	7
<b>2</b>	<b>Rigging</b>	<b>8</b>
	General notes	8
	Rigging method	8
	Installation for coils only	10
	Piping	11
	Air pump installation (if ordered)	11
<b>3</b>	<b>Inspection prior to start-up</b>	<b>13</b>
	General	13
<b>4</b>	<b>Further Assistance &amp; Information</b>	<b>14</b>
	The service expert for BAC equipment	14
	More information	14

## 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 equipment is factory assembled to assure uniform quality and minimum field assembly. For the dimensions and weights of a specific unit or section, refer to the certified drawing.

## Inspection Before Rigging

When the unit is delivered to the job site, 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:

- Ice coils
- Ice-Logic™ Ice Quantity Controller (if ordered)
- Air pump (if ordered)

The air pump (if ordered) is shipped loose in a separate crate.

If shipping damage has occurred, this should be clearly indicated on the CMR.

## Unit weights

Before rigging any BAC equipment, the weight of each section should be verified on the unit certified drawing. Refer to the Rigging section for weight values.



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



### CAUTION

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

## Leveling

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

## Connecting pipework

All piping external to BAC cooling equipment must be supported separately.

All connections in the external pipework (installed by others) must be leak free and tested accordingly.

## Coil connections

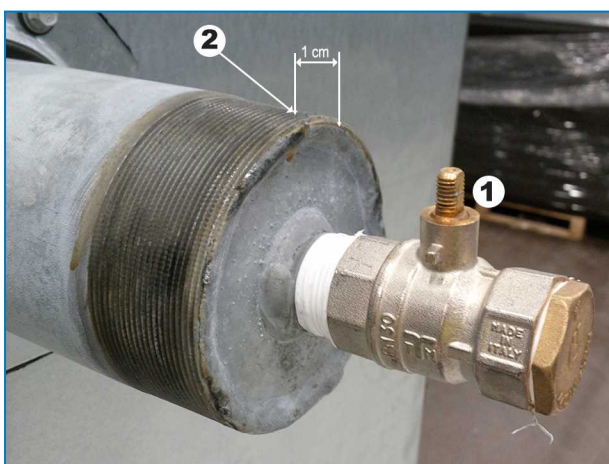
BAC Ice coils are filled with a low pressure inert gas at the factory before shipping, to ensure an optimal internal corrosion protection. It is recommended to check the overpressure every six months (connect a manometer to the valve).

In case of threaded connections, clean up the thread prior to connecting it to the pipework.

Non-threaded connections must be bevelled on site before they can be welded.



*Non-threaded coil connection with pressure release valve on ice thermal storage unit for direct refrigerant feed.*



*Upper coil connection with pressure release valve (on closed circuit towers with connections up to ND100).*

*Threaded coil connection with pressure release valve on ice thermal storage unit for glycol execution.*

1. Closed pressure release valve of upper coil connection.
2. After releasing the low pressure inert gas, cut coil connection here.



## Freeze protection

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

## Safety precautions

All electrical, mechanical and rotating machinery constitutes 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 advice.

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.

Air piping between air pump and TSC can have temperatures above 40°C. Insulate the piping if necessary to prevent personal injury.

### 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, personal protective equipment, procedures and tools must be used in handling, lifting, installing, operating, maintaining and repairing this equipment to prevent personal injury and/or property damage. Personnel must use personal protective equipment where necessary (gloves, ear plugs, etc...)

### 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 access cover panels and access doors in place/closed and properly secured.

For more information consult your local BAC representative.

### ELECTRICAL SAFETY

All electrical components associated with this equipment should be installed with a lockable disconnect switch located within sight of the equipment.

In the event of multiple components, these can be installed after a single disconnect switch but multiple switches or a combination thereof are also allowed.

No service work should be performed on or near electrical components unless adequate safety measures are taken. These include, but are not limited to the following:

- Isolate the component electrically
- Lock the isolation switch in order to prevent unintentional restart
- Measure that no electrical voltage is present any more
- If parts of the installation remain energized, make sure to properly demarcate these in order to avoid confusion

Fan motor terminals and connections may have residual voltage after unit shut-down. Wait five minutes after disconnecting the voltage at all poles before opening the fan motor terminal box.



### CAUTION

**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.**

## LOCAL REGULATIONS

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

## Non-walking surfaces

Access to and maintenance of any component needs to be performed in accordance with all local applicable laws and regulations. If the proper and required access means are not present, temporary structures need to be foreseen. Under no circumstance can one use parts of the unit, that are not designed as an access mean, unless measures can be taken to mitigate any risks that might occur from doing so.

## Modifications by others

Whenever modifications or changes are made by others to the BAC equipment without written permission of BAC, the party who has done the modification becomes responsible for all consequences of this change and BAC declines all liability for the product.

## Warranty

BAC will guarantee all products to be free from manufactured defects in materials and workmanship for a period of 24 months from the date of shipment. In the event of any such defect, BAC will repair or provide a replacement. For more details, please refer to the Limitation of Warranties applicable to and in effect at the time of the sale/purchase of these products. You can find these terms and conditions on the reverse side of your order acknowledgement form and your invoice.

## General notes

1. To simplify rigging and installation, coils are shipped in one piece, so only one lift per coil is required. It is important to follow the guidelines listed below when rigging these coils.
2. Lifting devices have been provided for short lifts and final positioning. The table "Approximate shipping weights & dimensions" shows the location of the lifting devices for each coil size.
3. Lifting and transportation of the equipment by means of lift trucks is not permitted, as this may result in serious damage of the ice coils.
4. Spreader bars of the full width of the section must be used between the lifting cables to prevent damage to the section.
5. For extended lifts or where hazards exist, it is recommended to use the lifting devices in conjunction with safety slings.



### CAUTION

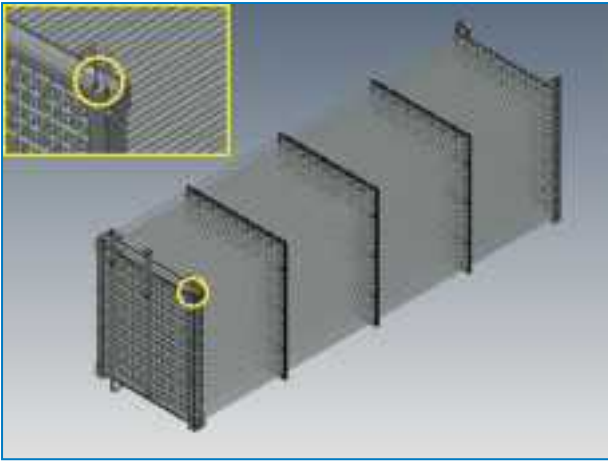
**When the unit is installed, all metal parts created by drilling, fastening self tapping screws, grinding, welding or other mechanical works must be removed from the unit. If they remain on the unit (typically on the double break flanges) this could lead to corrosion and eventually coating damage.**

## Rigging method

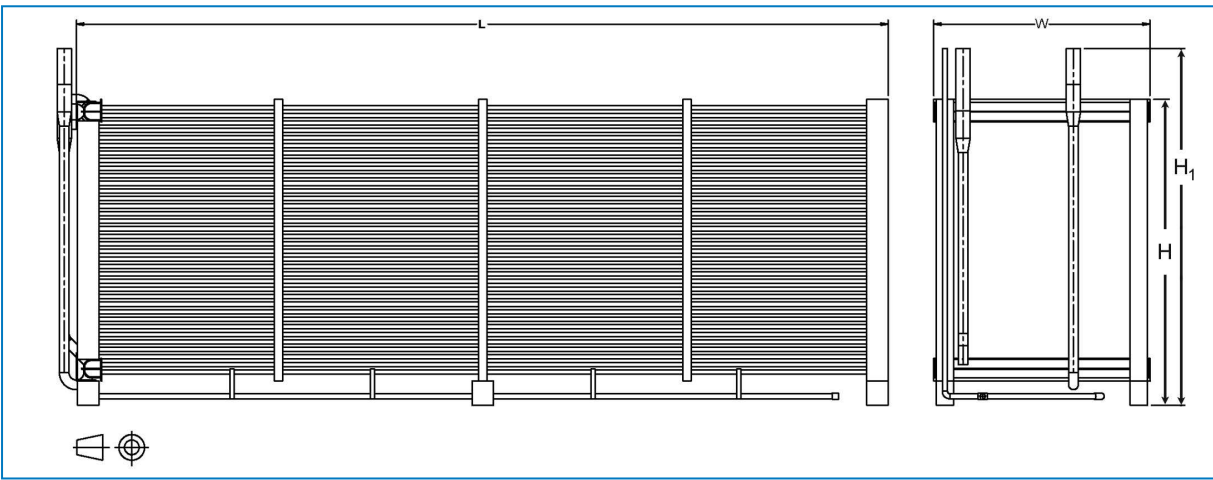
### RECOMMENDED LIFTING METHOD FOR COILS ONLY

When lifting the coils, use the U-bolts provided on each corner. Hoisting cables should be at a minimum of 45° up to maximum vertically with the horizontal top line of the coil.





U-bolts for lifting TSC coil only



Rigging dimensions for TSC coil only

Model	L (mm)	W (mm)	H (mm)	H1 (mm)
<b>TSC-95C</b>	2654	1055		
<b>TSC-115C</b>	3258	1055		
<b>TSC-120C</b>	2654	1350		
<b>TSC-145C</b>	3258	1350	1912	2260
<b>TSC-170C</b>	3861	1350		
<b>TSC-200C</b>	4464	1350		
<b>TSC-225C</b>	5070	1350		
<b>TSC-185C</b>	2654			
<b>TSC-230C</b>	3258			
<b>TSC-270C</b>	3861	1055	1912	2260
<b>TSC-310C</b>	4464			
<b>TSC-350C</b>	5070			



Model	L (mm)	W (mm)	H (mm)	H1 (mm)
TSC-290C	3258	1350	1912	2260
TSC-340C	3861			
TSC-400C	4464			
TSC-450C	5070			
TSC-480C	2721	1350	1912	2260
TSC-590C	3327			
TSC-700C	3928			
TSC-800C	4534			
TSC-910C	5137			
TSC-1050C	4030			
TSC-940D	3327	1645	2102	2448
TSC-790D	3931			
TSC-1080D	4534			
TSC-1220D	5140			
TSC-1440D	6045			

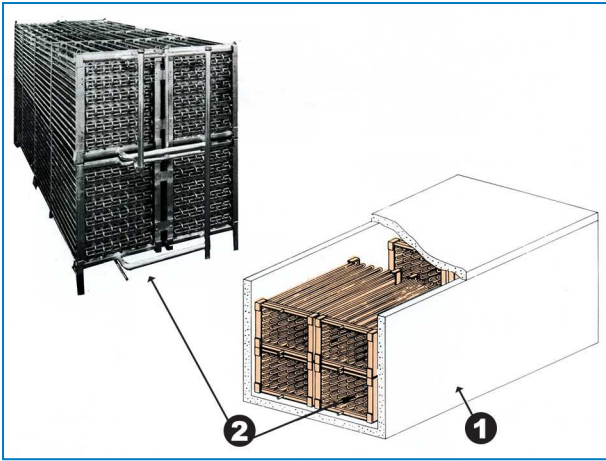
*Approximate shipping weights and dimensions*

## Installation for coils only

Whenever TSC coils are to be installed in a concrete tank the following components are provided together with the coils:

- The Ice-Logic™ Ice Thickness Controller: sensors are installed on the coil, control box is shipped loose, wiring to be done on site.
- The air pump: shipped loose
- Air piping: mounted underneath the coils
- Coil supports: with sufficient height to elevate the coils above the tank bottom in order to provide space underneath for water distribution piping supplied by other
- Hold down channels and covers are required to prevent the coils from floating when completely loaded with ice. These channels and covers on top of a concrete tank are not part of BAC's standard supply.

Contact your BAC representative if assistance is required for the design of these components.



*Ice Chiller<sup>®</sup> thermal storage coils only - TSC*

1. Concrete tank (by others)
2. Ice Chiller<sup>®</sup> thermal storage coils

## Piping

### WATER CONNECTIONS

Balancing valves must be installed on all water inlet connections to adjust the flow through each connection.

### REFRIGERANT CONNECTIONS ON SITE

All connections in the external pipework (installed by others) must be leak free and tested accordingly. All piping external to BAC cooling equipment must be supported separately.

### PURGE REQUIREMENTS

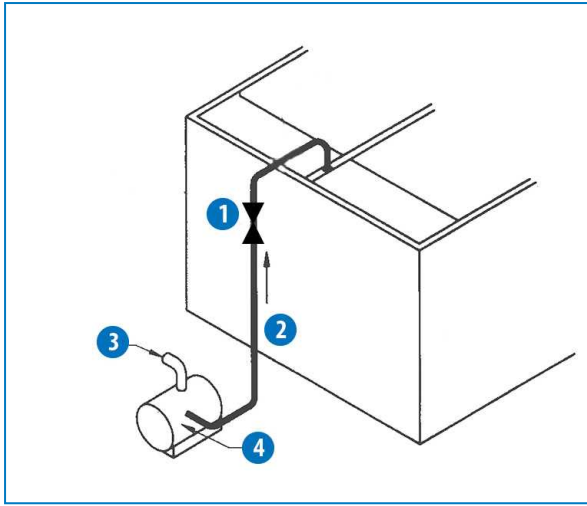
The installer of BAC equipment must ensure proper system purging of air prior to operation. Entrained air can obstruct the proper flow of glycol solution, resulting in higher operating pressures than design and reduced thermal storage capacity.

## Air pump installation (if ordered)

The standard BAC delivery consists of a centrifugal air pump (with an inlet air filter), a threaded adaptor and a flexible discharge sleeve to be connected to the customer provided air piping. A non-return valve is shipped loose with the air pump for field installation in the vertical raiser pipe.

After the unit has been rigged into position, the air pump can be installed. The recommended air piping is shown in the figure: the air supply is taken from the ambient air. The air pump is to be mounted on a clean, dry and vibration free surface which is flat and will support the unit. Special pads are not required.

The mounting surface should be levelled and the pumps must be securely bolted in place. It is recommended that, in case of outdoor installation, the air pump is installed under a shelter. The air pump should be located within 6 meters of the air distribution inlet piping. If a more remote location of the air pump is required, consult your local BAC representative.



*Recommended air pump piping arrangement*

1. Non-return valve
2. Steel pipe for initial 3 m; then PVC for remainder of air supply (by others)
3. Filter
4. Air pump



TSC-C-D

## INSPECTION PRIOR TO START-UP

### 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 programme" ) 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.

## The service expert for BAC equipment

We offer tailored services and solution for BAC cooling towers and equipment.

- Original spare parts and fill -for an efficient, safe and year round reliable operation.
- Service solutions - preventive maintenance, repairs, refurbishments, cleaning and disinfection for reliable trouble-free operation.
- Upgrades and new technologies - save up energy and improve maintenance by upgrading your system.
- Water treatment solutions - equipment for controlling corrosion scaling and proliferation of bacteria.

For more details, contact your local BAC representative for further information and specific assistance at [www.BACservice.eu](http://www.BACservice.eu)

## More information

### REFERENCE LITERATURE

- Eurovent 9-5 (6) Recommended Code of Practice to keep your Cooling System efficient and safe. Eurovent/Cecomaf, 2002, 30p.
- Guide des Bonnes Pratiques, Legionella et Tours Aéroréfrigérantes. Ministères de l'Emploi et de la Solidarité, Ministère de l'Economie des Finances et de l'Industrie, Ministère de l'Environnement, Juin 2001, 54p.
- Voorkom Legionellose. Ministerie van de Vlaamse Gemeenschap. December 2002, 77p.
- Legionnaires' Disease. The Control of Legionella Bacteria in Water Systems. Health & Safety Commission. 2000, 62p.
- Hygienische Anforderungen an raumluftechnische Anlagen. VDI 6022.

### INTERESTING WEBSITES

Baltimore Aircoil Company	<a href="http://www.BaltimoreAircoil.com">www.BaltimoreAircoil.com</a>
BAC Service website	<a href="http://www.BACservice.eu">www.BACservice.eu</a>
Eurovent	<a href="http://www.eurovent-certification.com">www.eurovent-certification.com</a>
European Working Group on Legionella Infections (EWGLI)	<a href="http://EWGLI">EWGLI</a>
ASHRAE	<a href="http://www.ashrae.org">www.ashrae.org</a>
Uniclîma	<a href="http://www.uniclîma.fr">www.uniclîma.fr</a>
Association des Ingénieurs et techniciens en Climatique, Ventilation et Froid	<a href="http://www.aicvf.org">www.aicvf.org</a>
Health and Safety Executive	<a href="http://www.hse.gov.uk">www.hse.gov.uk</a>

### ORIGINAL DOCUMENTATION



This manual is originally made in English. Translations are provided for your convenience. In the event of discrepancies, the English original text shall prevail over the translation.



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COOLING TOWERS

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CLOSED CIRCUIT COOLING TOWERS

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