BALTIMORE
AIRCOIL AUSTRALIA

RC Series

OPERATION & MAINTENANCE MANUAL

Construction Details

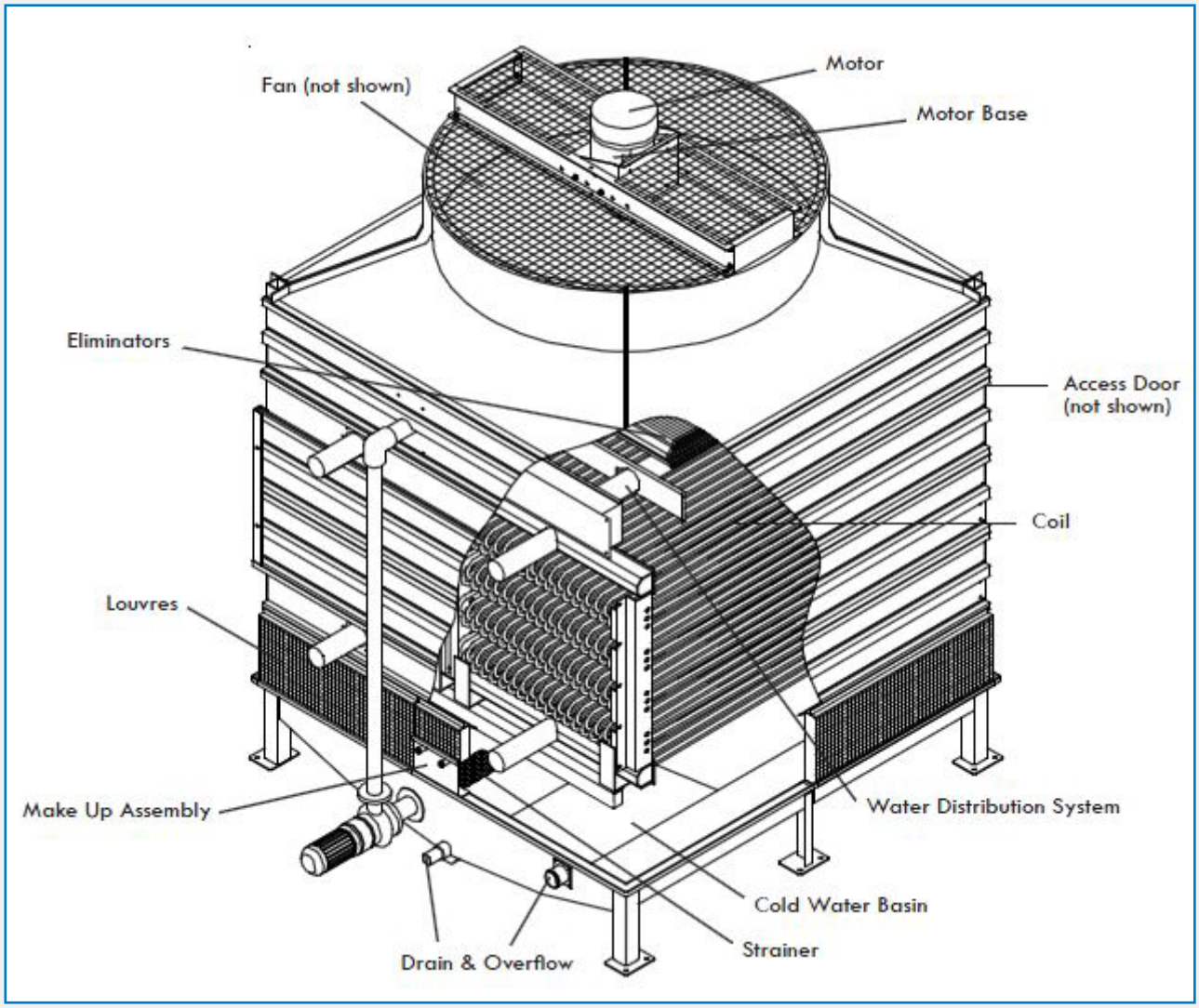

Figure 1. Typical cross section

Warnings

- **WARNING:** Do not perform any service on or near the fans, motors, and drives, or inside the unit without first ensuring that the fans and pumps are disconnected, locked out, and tagged out.
- **WARNING:** Check to ensure the controls for the fan motor are set to allow a maximum of six on-off cycles per hour to prevent motor overload.
- **WARNING:** Openings and/or submerged obstructions may exist in the bottom of the cold water basin. Use caution when walking inside this equipment.
- **WARNING:** The top horizontal surface of the unit is not intended to be used as a walking surface or working platform. If access to the top of the unit is desired, the purchaser/end-user is cautioned to use appropriate means complying with applicable safety standards of governmental authorities.
- **WARNING:** Drift eliminators on RC Series units are not designed to support the weight of a person or to be used as a storage or work surface for any equipment or tools.
- **WARNING:** When the fan speed of the unit is to be changed from the factory set speed, including changes achieved by the use of a variable fan speed device, steps must be taken to avoid operation at or near the fan's "critical speed" which could result in fan failure and possible personal injury or damage. Contact your local BAC Representative regarding any such applications. Additionally, inverter duty motors are required on installations that are to be controlled by VFDs.
- **WARNING:** The re-circulating water system may contain chemicals or biological contaminants, including Legionella, which could be harmful if inhaled or ingested. Personnel exposed directly to the discharge airstream and the associated drift mists, generated during operation of the water distribution system and/or fans, or mists produced by high pressure water jets or compressed air (if used to clean components of the re-circulating water system), must wear respiratory protection equipment approved for such use by governmental occupational safety and health authorities.
- **WARNING:** The basin heater is not designed to prevent icing during unit operation.

General Maintenance Information

The services required to maintain a piece of evaporative cooling equipment are primarily a function of the quality of the air and water in the locality of the installation:

- **AIR:** The most harmful atmospheric conditions are those with unusual quantities of industrial smoke, chemical fumes, salt, or heavy dust. Such airborne impurities are carried into the equipment and absorbed by the re-circulating water to form a corrosive solution.
- **WATER:** The most harmful conditions develop as water evaporates from the equipment, leaving behind the dissolved solids originally contained in the make-up water. These dissolved solids may be either alkaline or acidic and, as they are concentrated in the circulating water, can produce scaling or accelerated corrosion.

The extent of impurities in the air and water determines the frequency of most maintenance services and also governs the extent of water treatment which can vary from a simple continuous bleed and biological control to a sophisticated treatment system.

Cautions

- **CAUTION:** BAC units are typically installed immediately after shipment and many operate year round. However, if the unit is to be stored for a prolonged period of time either before or after installation, certain precautions should be observed. For instance, covering the unit with a clear plastic tarpaulin during storage can trap heat inside the unit, potentially causing damage to the fill and other components. If units must be covered during storage, an opaque, reflective tarp should be used. For normal seasonal shutdowns, refer to the applicable section in this manual.
- **CAUTION:** All electrical, mechanical, and rotating machinery are potential hazards, particularly for those not familiar with their design, construction, and operation. Accordingly, use appropriate lockout procedures. Adequate safeguards (including the use of protective enclosures where necessary) should be taken with this equipment both to safeguard the public from injury and to prevent damage to the equipment, its associated system, and the premises.
- **CAUTION:** When reversing the direction of fan rotation, allow the fan to come to a complete stop before restarting the motor.
- **CAUTION:** Do not use oils containing detergents for bearing lubrication. Detergent oils will remove the graphite in the bearing sleeve and cause bearing failure. Also, do not disturb bearing alignment by tightening the bearing cap adjustment on a new unit, as it is torque adjusted at the factory.
- **CAUTION:** Do not use steam or high pressure water to clean PVC eliminators or materials other than steel.
- **CAUTION:** This equipment should never be operated without all fan screens, access panels, and access doors in place. For the protection of authorised service and maintenance personnel, install a lockable disconnect switch located within sight of the unit on each fan motor associated with the equipment.
- **CAUTION:** Mechanical and operational methods must be employed to protect these products against damage and/or reduced effectiveness due to possible freeze-up. Contact your local BAC Representative for recommended protection alternatives.
- **CAUTION:** Pressure greater than 69 kPa may cause damage to the distribution system.
- **CAUTION:** Never use chloride or chlorine based solvents such as bleach or muriatic (hydrochloric) acid to clean stainless steel. It is important to rinse the surface with warm water and wipe with a dry cloth after cleaning.
- **CAUTION:** All cooling equipment should be located as far away as possible from occupied areas, open windows or air intakes to buildings.
- **CAUTION:** Installation and operation of cooling equipment may be subject to local regulations, such as establishment of risk analysis. Ensure legislative and regulatory requirements are consistently met.

Warranties

Please refer to the Limitation of Warranties in the submittal packet applicable to and in effect at the time of the sale/purchase of these products. Described in this manual are the recommended services for start-up, operation, and shutdown, and the approximate frequency of each.

Recommended **Maintenance** Service

Inspect and clean as necessary:	Start-Up	Monthly	Quarterly	Annually	Shutdown
Inspect general condition of the unit[2] and check unit for unusual noise or vibration	✓	✓			
Inspect cold water basin	✓		✓		
Flush water distribution system/Inspect spray nozzles	✓		✓		
Drain basin and piping	✓				✓
Inspect combined inlet shields	✓	✓			
Check and adjust water level in basin(s)	✓	✓			
Check operation of make-up valve	✓	✓			
Inspect coil			✓		
Check and adjust bleed rate	✓	✓			
Inspect tower finish				✓	
Mechanical equipment system:	**Start-Up**	**Monthly**	**Quarterly**	**Annually**	**Shutdown**
Check belt condition	✓	✓			
Adjust belt tension[3]	✓		✓		
Lubricate fan shaft bearings	✓		✓		✓
Lubricate motor base adjusting screw	✓		✓		✓
Check drive alignment				✓	
Check motor voltage and current	✓		✓		✓
Clean fan motor exterior	✓		✓		
Check fan motor for proper rotation	✓				
Check general condition of the fan	✓		✓		
Check and unplug fan drain holes (hollow blade fans)			✓		
Check fan for uniform pitch			✓		
Check fan for rotation without obstruction	✓		✓		
Check and recoat steel shafts with RUST VETO®	✓		✓		✓

Table 1. Recommended Maintenance Services for RCC & RCF Units.

WARNING: Do not perform any service on or near the fans, motors and drives, or inside the unit without first ensuring that the fans and pumps are disconnected and tagged out.

NOTES:

1. **Recommended service intervals are the minimum for typical installations. Different environmental conditions may dictate more frequent servicing.**
2. **When operating in ambient temperatures below freezing, the unit should be inspected more frequently.**
3. **Tension on new belts must be readjusted after the first 24 hours of operation and quarterly, thereafter.**

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RC SERIES

Operation and Maintenance

INITIAL AND SEASONAL START -UP

EXTENDED SHUTDOWN

PROLONGED OUTDOOR STORAGE

Initial & Seasonal Start-Up

General

- If the unit is mounted on vibration isolators or isolation rails (by others), refer to the vibration isolation manufacturer's guidelines before loading/unloading weight from the unit.
- Verify fan and unit pump motors are disconnected, locked out, and tagged out.

Cleaning

- Drain the cold water basin with the strainer in place.
- Remove all dirt and debris from the fan guard(s).
- Flush the water distribution system. Inspect and clean all spray nozzles.
- Clean all of the mechanical components, such as the fan and motor.
- Flush the cold water basin to remove any accumulated dirt and debris.
- Remove, clean, and replace the basin strainer.

Inspection

- Conduct external inspection of the equipment. Check for leaks, corrosion, and any structural damage.
- Conduct internal inspection of the equipment. Check for anything unusual such as structural or mechanical component damage.
- Inspect piping and connections.
- Thoroughly inspect the fan(s) for any mechanical or physical damage.
- At seasonal start-up or after prolonged shutdown, check the motor insulation with an insulation tester prior to the motor start-up.
- For belt driven units, prior to seasonal start-up, check and adjust the belt tension. At the initial start-up, the belt tension may not require adjustment as the drive will be properly tensioned at the factory prior to shipment.

WARNING: Do not perform any service on or near the fans, motors, and drives, or inside the unit without first ensuring that the fans and pumps are disconnected, locked out, and tagged out.

Start-up

- Prior to seasonal start-up, lubricate the motor base adjusting screw(s) and fan shaft bearings. At initial start-up, no bearing lubrication is required since the bearings are factory lubricated prior to the shipment.
- Apply RUST VETO® to steel shafts.
- Fill the cold water basin with fresh water up to the overflow level via the make-up valve.
  - **Water Treatment for New Installations:** Initiate the biocide water treatment program at this time.
  - **Water Treatment for Seasonal Start-up or after a Shutdown period in excess of three days:** Resume the biocide treatment program or administer a shock treatment of appropriate biocides prior to operating the cooling tower fans. This will eliminate accumulated biological contaminants.
- Set the make-up valve float so the water shuts off at the overflow level.
- Start the unit pump and check for the proper rotation indicated by the arrow on the pump cover.
- On installations where the unit pump was not furnished by BAC, a globe valve should be installed in the pump discharge line and the pump flow rate adjusted to the correct water flow and pressure (2.25 psig at spray header connection).
- Check that the float operated make-up valve is operating freely. Closely monitor water level and adjust as necessary during the first 24 hours of operation.
- Check the nozzle spray pattern as described in "Water Distribution System and Heat Transfer System" on **Page 19**.
- Open the valve in the tower bleed line, and adjust the bleed by closing or opening the valve.
- Verify fan tip clearance is between 3mm and 13mm.
- For initial start-up, bump the fan motor and note the direction of rotation. Start the fan motor(s) and verify proper fan rotation without obstruction. The fan(s) should rotate in the direction indicated by the arrow on the fan cowl.
- Run the fan in manual mode for several minutes to check for any unusual noise or vibrations.
- For a 2-speed motor, check to ensure the starter includes 15 second time delay when switching from high speed to low speed.
- Check the operation of the optional vibration cutout switch.
- Once the cooling tower is operating, check the current and the voltage of all three phases (legs) of the fan motor with a heat load on the tower under warm ambient conditions. The current must not exceed the nameplate ratings.

CAUTION: Pressure greater than 69 kPa may cause damage to the distribution system.

After 24 hours of operation under thermal load, perform the following services:

- ✓ Check the unit for any unusual noise or vibrations.
- ✓ Check the operating water level in the cold water basin.
- ✓ Adjust make-up valve if necessary.
- ✓ Check the belt tension and readjust if necessary.
- ✓ Inspect the spray nozzles and heat transfer section.

Extended Shutdown

Perform the following services whenever the unit is shutdown in excess of three days:

- If the unit is mounted on vibration isolators or isolation rails (by others), refer to the manufacturer's guidelines before loading/ unloading weight from the unit.
- Disconnect, lock-out, and tag-out all fans and pumps.
- Close the shut-off valve in the make-up water line (supplied by others), and drain the cold water basin and all exposed water piping. Heat trace and insulate all exposed piping.
- Clean all the debris, such as leaves and dirt, from the interior and exterior of the unit.
- Leave the cold water basin drain open so rain and melting snow will drain from the unit.
- Clean the basin strainer and re-install.
- Cover the fan discharge to keep out dirt and debris.
- For belt driven units, lubricate the fan shaft bearings, motor base, and motor base adjusting screw.
- Apply RUST VETO® to steel shafts.
- Inspect the protective finish on the unit. Clean and refinish as required.
- Maintain the fan motor starting device in the "OFF" position to ensure personal safety in the case of future inspection or service.

WARNING: Rapid on-off cycling can cause the fan motor to overheat. It is recommended that controls be set to allow a max of 6 on-off cycles per hour.

Prolonged Outdoor Storage

Storage Preparation

- Conduct the "Extended Shutdown" procedure on page 5 if the unit is installed.
- Ensure the cold water basin is fully drained and the drain is open.
- For storage prior to installation, all components and accessories, which sometimes ship inside the unit and are not a permanent fixture in the basin, should be removed and stored indoors.
- Remove the bottom drain plug to the spray pump(s). Put the plug(s) in a marked plastic bag and attach to the spray pump(s) for future use.
- Remove and store fan belts (if supplied) at room temperature, keeping matched belts together. Tag belts appropriately for future identification.

Precautions for RCF Closed Circuit Cooling Towers

- RCF Storage Prior to Installation - The unit's coil connections should remain capped for the duration of storage.
- RCF Installed and Piped but not Filled - This unit does not require additional precautions.
- RCF Unit Installed and Operated - This unit should remain filled. If the unit is stored in a freezing climate, the coil must be protected from freezing. For protection against coil freeze-up, use of an inhibited glycol solution is recommended. If protecting the coils with glycol is not possible, the galvanized steel coils should be drained completely and capped once as much water and moisture is removed from the coil as possible.

Precautions for RCC Evaporative Condensers

- RCC Storage Prior to Installation - The coils are charged with nitrogen at 100kPa at the factory.
- RCC Extended Shutdown Periods after Start-Up - The coils should be charged with nitrogen at 100kPa in the field and capped by adding a threaded connection or a welded cap. Upon start-up, the coil connections will require cutting and bevelling.

- Apply a weather-resistant lubricant or heavy grease such as Anti-Seize (BAC Part # 160069) to all exposed threaded or flanged connections and the adjustable motor base threaded rod.
- Insert desiccant bags into the control panel (if supplied) to absorb moisture. Seal the control panel for storage.
- Spray coat electrical component housings (if supplied) with a suitable protective coating, such as Cosmoline® Weathershed, and individually cover them with plastic, taking care to leave openings for free air circulation.
- Inspect the protective finish on the unit. Clean and refinish as required. Refer to "Corrosion Protection" on page 24 for more details.

Motor Recommendations

BAC standard motors are designed for storage at ambient temperatures of -20ºC to 40ºC. Prolonged periods of exposure above or below these specified conditions could degrade components of the motor and cause malfunction or premature failure.

- Motors should be removed and stored inside whenever possible. When indoor storage is not possible the motors must be covered with a tarpaulin. Do not use plastic or plastic film. This cover should extend below the motor and be secured; however, it should not tightly wrap the motor. This will allow the captive air space to breathe, minimizing formation of condensation.
- Care must also be taken to protect the motor from flooding or from harmful chemical vapors.
- The storage area should be free from ambient vibration. Excessive vibration can cause bearing damage. Motors that must be stored in areas with high ambient vibration, such as from heavy construction equipment or other sources, must have the shaft locked to prevent any movement.
- Precautions should be taken to prevent rodents, snakes, birds, or other small animals from nesting inside the motors. In areas where they are prevalent, precautions must also be taken to prevent insects from gaining access to the interior of the motor.
- If not stored indoors in a controlled environment, some form of heating must be utilized to prevent condensation from accumulating in the motor. This heating should maintain the winding temperature at a minimum of 5ºC above the ambient temperature of the room, keeping it from dropping below the dew point where condensation could form inside the motor. If space heaters are supplied, they should be energized. If none are available, single phase or “trickle” heating may be utilized by energizing one phase of the motor’s winding with a low voltage. Request the required voltage and transformer capacity from your local BAC Representative. A third option is to use an auxiliary heat source and keep the winding warm by either convection or blowing warm air into the motor.

Maintenance Requirements

- Rotate all fans and motor shafts monthly by hand. Hand-turning will ensure that the shafts and bearings are free and will redistribute grease within the bearings.
- Inspect the cold water basin monthly to ensure that the drain is open and remove any leaves or debris that may have accumulated in the cold water basin.
- Inspect the axial fan(s) annually to ensure the blades are tight and there is no obvious corrosion between the hub and the fan blade
- Inspect the rust preventative coating on all motor external machined surfaces including shaft extensions monthly. If necessary, re-coat the surfaces with RUST VETO®.

Start-Up Preparation After Prolonged Storage

Keep in mind that start-up procedures after long periods of storage are just as important as pre-shutdown procedures.

- The motor should be thoroughly inspected, cleaned, and restored to its pre-storage condition.
- Inspect axial fans prior to start-up to ensure that the blades are tight and that there is no obvious corrosion between the hub and the fan blade. Do not energize the fans if there is obvious corrosion of fan components. Loose fan blades could result in fan failure and possible injury or damage.
- Reinstall all fan belts, motors, door gaskets, and drain plugs (as applicable), and remove all protective coverings.
- For units stored prior to installation, conduct rigging procedures as directed in the unit's Rigging and Assembly Instructions, available on www.BaltimoreAircoil.com.au or by contacting your local BAC Rep.
- Perform an insulation test of motor windings to ensure satisfactory insulation resistance.
- Conduct full start-up procedure as stated in the "Start-Up Procedure" on page 4. Be especially thorough for cleaning and inspection prior to start-up.

RC SERIES

Detailed Component Maintenance Procedures

2

Cold Water Basin

As water circulating through the cooling tower is cooled, it collects in the cold water basin and passes through the suction strainer into the system.

Water Levels

Model Number	At Overflow Level (mm)	At Operating Level (mm)
All RC models (except RC*-1111)	443	343
RC*-1111	548	448

Table 1. Cold Water Basin Water Levels

WARNING: Do not use acid to clean the strainers.

- The values shown in **Table 1** are relative to the base of the unit.
- The make-up valve controls the operating level, which is maintained at the levels shown in **Table 1**.
- The operating water level in the cold water basin will vary with system thermal load (evaporation rate), the bleed rate employed, and the make-up water supply pressure.
- Check the operating water level monthly, and readjust the float when necessary to maintain the recommended operating level.
- Consult "Water Level Control" on **Page 20** for information on how to set and maintain basin operating level.

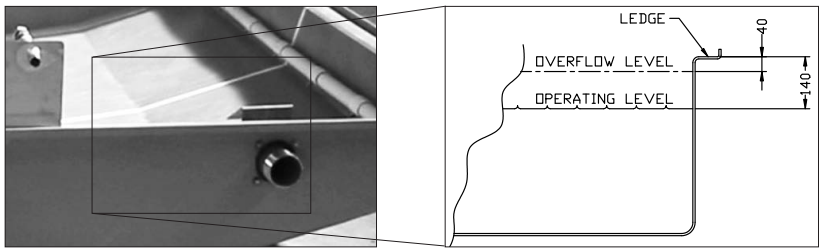

Figure 2. Water Operating Level

Inspection & Maintenance

WARNING: Openings and/or submerged obstructions may exist in the bottom of the cold water basin. Use caution when walking inside this equipment.

- Inspect the cold water basin regularly. Remove trash or debris accumulated in the basin or on the strainer.
- Quarterly or more often if necessary, drain, clean, and flush the entire cold water basin with fresh water. This will remove the sediment, which can collect in the basin during operation. If not removed, sediment can become corrosive and cause deterioration of the basin as well as be a potential area for biological growth.
- When flushing the basin, leave the strainer in place to prevent the sediment from re-entering the system.
- Remove the strainer after the basin has been flushed.
- Clean and replace the strainer before refilling the basin with fresh water.
- Adjust the float to maintain the design operating level. See **Table 1**.

Fan

Due to its size and speed, the fan has great potential for injury and destruction if damaged. Inspect closely, and as required, replace damaged or deteriorating members.

Inspection & Maintenance

- If the unit is already in operation, while the fan is running, check for any unusual noise or vibration.
- With the fan off and the motor locked out and tagged out, check the general condition of the fan:
  - Inspect for any loose or missing bolts in the fan shaft bushing, the fan hub, and the fan shaft bearing(s).
  - Check the fan blades for looseness, first by twisting the blade by hand, and then by moving the blade tip up and down. There should be no play or slippage.
  - Inspect each blade for excessive scale build-up that could cause vibration.
  - Check each blade in the area of the shank for any signs of cracking. If cracking is found, the fan motor should be locked out immediately. Contact your local BAC Representative for assistance.
- **Tip Clearance:** Check the clearance between the tip of the blade and the fan cowl. The clearance should be between 3mm and 13mm.
- **Blade Pitch:** Check to ensure that the blades are all at the same pitch. If uncertain, measure the pitch with an inclinometer. All blades should be within 1/2° of each other.
- **Rotation:** Turn the fan by hand to ensure that it moves freely with no rough spots, binding, or other malfunctions that could cause vibration or fan motor overload. While rotating the fan, check the blade tracking. All blades should track within a 13mm band at any single point around the cowl.
- **Direction of Rotation:** On initial start-up, or if the fan motor has been rewired, bump the fan motor and note the direction of rotation. It should rotate in the direction indicated by the arrow on the fan cowl.
- **Operation:** On initial start-up, run the fan in the manual position for several minutes and check for any unusual noises or vibration.

WARNING: Do not perform any service on or near the fans, motors, and drives, or inside the unit without first ensuring that the fans and pumps are disconnected, locked out, and tagged out.

WARNING: Check to ensure the controls for the fan motor are set to allow a maximum of six on-off cycles per hour to prevent motor overload.

Fan Drive System (Belt Drive Units)

Belt Drive Power Train

The drive train consists of SPB belts, a fan sheave and a motor sheave. The high efficiency belts provide the premium quality necessary for evaporative cooling equipment.

Together these components provide a highly reliable system with low maintenance requirements. The drive train should be inspected periodically to check the belt tension, condition of the sheaves and belt, and when necessary adjust the tension. The recommended service intervals are specified elsewhere.

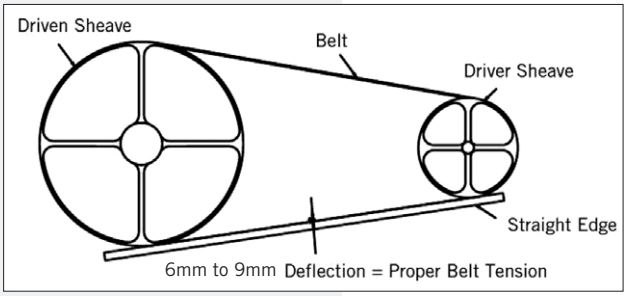

Figure 3a. Belt Tension with a Straight Edge

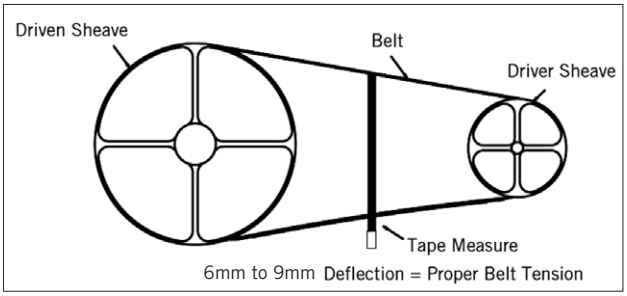

Figure 3b. Belt Tension with a Tape Measure

Inspection & Maintenance

The belt drive power train requires a periodic check of belt condition and, when necessary, tension adjustment. The recommended service intervals are as follows:

- **Initial Start-Up:**
  - If the equipment was supplied in assembled major sections, no servicing is required prior to initial startup since the drive has been tensioned and aligned at the factory. If equipment was supplied completely knocked down (CKD) then check drive alignment & belt tensioning as per procedures outlined below.
- **Seasonal Start-Up:** Readjust the tension on the belt.
- **Operation:** After the first 24 hours of operation, readjust the belt tension on a new unit start-up or installation of a new belt. Thereafter, check the belt condition monthly, and adjust tension as necessary. Readjust tension at least once every three months.

WARNING: No service work should be performed on the drive train without first ensuring the fan and pump motors have been isolated, tagged and locked in the off position.

- **Belt tension check:**
  - Place a straight edge along the belt from sheave to sheave as shown in **Figure 3a**, or use a tape measure as shown in **Figure 3b** to measure belt deflection.
  - Apply a moderate force by hand (approximately 2kg) evenly across the width of the belt in the centre of the span between the sheaves.
  - There is adequate belt tension if the belt deflects between 6mm and 9mm as shown in **Figures 3a** and **3b**.
  -
- **Belt tension adjustment (if required):**
  1. Loosen the motor pulley guard retaining nuts.
  2. Loosen the lock nuts on the Motor Base Adjusting Screws.
  3. Turn the Motor Base Adjusting Screws clockwise to tension the belt, or counterclockwise to relieve belt tension. During adjustment of belt tension the drives should be rotated several times by hand to evenly distribute the tension throughout the belt.
  4. When the belt is properly tensioned, retighten the locking nuts on the Motor Base Adjusting Screws.
  5. Tighten guard nuts.

Note: There should be no “chirp” or “squeal” when the fan motor is started.

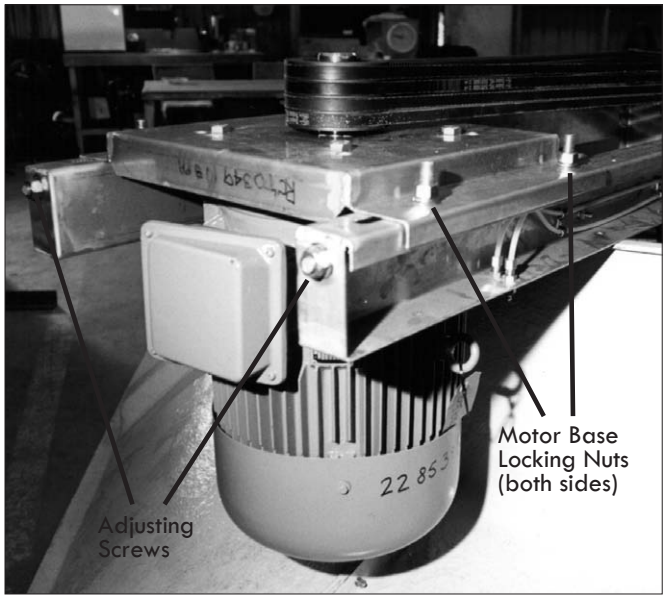

Figure 4. Adjustable Motor Base (cover removed)

NOTE: There should be no “chirp” or “squeal” when the fan motor is started.

Alignment

- Check the drive alignment annually to ensure maximum belt life.
- Drive alignment check and adjustment:
  - Place a straight edge across the driver and the driven sheaves as shown in **Figure 5**.
  - The straight edge should contact all four points as shown in **Figure 5** indicating that the drives are properly aligned.
  - There should be no more than 1.5mm deviation from four points of contact.
  - In case of realignment, loosen the motor sheave and align it with the fan sheave. Allow 6mm for draw-up as the bushing screw is retightened.

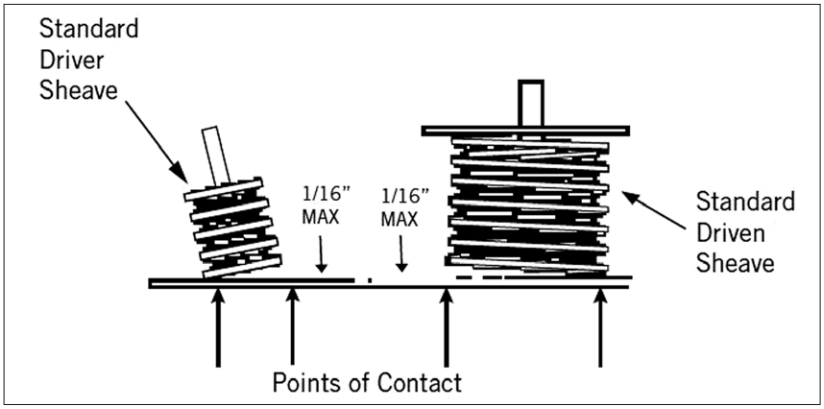

Figure 5. Drive Alignment

WARNING: Check to ensure the controls for the fan motor are set to allow a maximum of six on-off cycles per hour to prevent motor overload.

Fan Drive System (Direct Drive Units)

Drive Train

The standard fan motor used on direct driven units is a TEAO (Totally Enclosed Air Over) motor. The motor has permanently lubricated ball bearings and special moisture protection on the bearings, shaft, and windings. The only servicing required during operation is to clean the outside surface of the motor at least quarterly to ensure proper motor cooling. After prolonged shutdowns, the motor insulation should be checked with a "megger" insulation tester before restarting the motor.

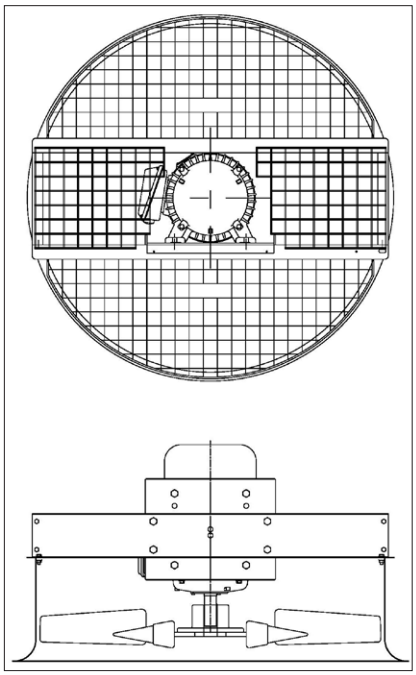

Figure 6. Belt Tensioning

Fan Motors

Fan Drive System Descriptions

Direct Drive Motors: For direct driven units the motor is TEAO epoxy coated IP66.

Belt Drive Motor: The fan motor used on belt driven units is a TEFC motor, with permanently lubricated ball bearings. The motor is installed fully outside of the wet air stream.

Electrical Connection (by others): All electrical connections should be carried out by qualified & approved/licensed electrical personnel and conform to all local authority requirements. All overload devices, fuses or other protective devices must be rated to suit motor running & starting characteristics.

Initial Start-up:

1. Insulation resistance test - minimum value should be 1 Mega Ohm (1,000,000 Ohms).
2. Thermistors, if fitted, should be checked for continuity with a multimetre but never mega-tested.
3. Ensure supply voltage and frequency correspond to the motor nameplate rating.
4. Ensure shaft turns freely.
5. Wire the motor in accordance with the wiring diagram as shown on the motor nameplate and/or in the motor terminal box.
6. Turn on unit and check amp draw does not exceed nameplate rating.

Note: If unit is not run for a prolonged time (or motor is stored with tower in kit form) the motor insulation should be checked with a "megger" insulation tester prior to starting the motor. If motor is stored it should be in a clean, dry place & have the shaft rotated occasionally. Storage areas should not be subject to vibration.

Inspection and Maintenance

- Clean the outside of the motor at least quarterly to ensure proper motor cooling.
- After prolonged shutdowns, check the motor insulation with an insulation tester prior to restarting the motor.
- Check motor voltage and current following start-up and every three months while in operation.

Adjustable Motor Base

Coat the motor base slides and adjusting screws prior to start-up, every three months while in operation, and following shutdown. Use good quality corrosion inhibiting grease such as one of those recommended for lubricating the fan shaft bearings.

WARNING: Electricity is dangerous and has the potential to cause fatal injury. Work of any nature involving electricity must only be carried out by licensed electricians, who must take all the appropriate/regulated safety precautions prior to commencement of such work.

Fan Shaft Bearings

The fan shaft is supported by two flange mounted ball bearings, each equipped with a lubrication fitting and a slinger/locking collar to keep out moisture. The bearings should be lubricated as follows:

Inspection and Maintenance

- Only lubricate the bearings with a manual grease gun. Do not use high-pressure grease guns since they may rupture the bearing seals.
- Bearings come pre-packed with Castrol EPL2 grease. BAC recommends re-packing only with a compatible water resistant, mineral base grease with a lithium thickener.
- Lubricate the bearings as follows:
  - **Initial Start-up:** Normally, no lubrication is required since the bearings have been lubricated at the factory prior to shipment. However, if the cooling tower has been stored at the job site for more than 1 year, both bearings should be lubricated with new grease before initial operation. When lubricating, purge the old grease from the bearing by gradually adding grease until a bead of new grease appears at the seal on the underside of the bearing.
  - **Seasonal Start-up:** Purge both bearings with new grease prior to start-up.
  - **Operation:** Purge bearings every three months while in operation.
  - **Extended Shutdown:** Purge bearings with new grease prior to any prolonged storage or downtime.

Locking Collars

Each eccentric locking collar should be checked every six months to ensure that the inner bearing race is secured to the fan shaft. The locking collar can be set using the following procedure (See **Figure 7**).

1. Loosen the set screw.
2. Using a drift pin, tap the collar (in the hole provided) tangentially in the direction of rotation while holding the shaft.
3. Retighten the set screw.

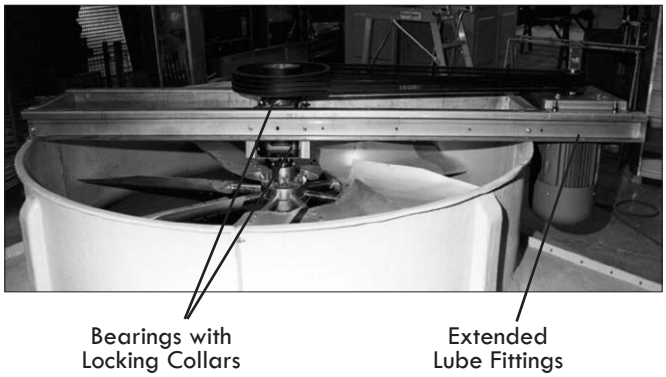

Figure 7. Fan Shaft Bearings

Fan Shaft

The fan shaft is fabricated from stainless steel. The exposed areas of the fan shaft are coated with a soft seal for added corrosion protection. It is recommended that the coating be inspected for continuity quarterly or at least every 6 months. Any signs of surface corrosion must be treated. This involves;

1. Removal of the protective coating with a suitable cleaning medium.
2. The removal of any surface corrosion with emery cloth.
3. The re-coating of the shaft with soft seal.

Access Door

The large access door is easily removed to provide complete access to drift eliminators, spray system and fill.

To remove the door, take out the louvres from door side. Loosen and remove the knobs that hold the door in place. Larger units are provided with convenient anchor points to assist in removing the door and securing the door to the unit when removed.

WARNING: The access door should not be removed without first ensuring the fan and pump motors have been isolated, tagged and locked in the off position.

Figure 8. Access Door Anchor Points

WARNING: Damaged or missing drift eliminators will result in excessive drift from the tower. This may constitute a hazard due to biological or chemical contaminants, including Legionella, being discharged from the tower. When such damaged or missing drift eliminators are noticed the tower MUST be stopped and not re-started until the sections are replaced.

Louvres and Eliminators

Inspect regularly and remove foreign objects that might impair air passage. Replace damaged and/or missing sections as necessary.

Water Distribution System and Heat Transfer Section

Water is distributed through a corrosion resistant polyvinyl chloride (PVC) spray distribution system. The drift eliminators are made of PVC, which requires no protection against rot, decay, rust, or biological attack.

The inspection procedure is as follows:

- Shut off the fan and lock out and tag out the fan motor. Turn off the recirculating pump.
- Remove the door and take out the drift eliminators to allow a clear view of the spray distribution system and nozzle patterns.
- Start the pump. Check to see if the nozzles are all spraying consistently and producing the spray pattern shown in **Figure 9.**
- Clean any nozzles that are clogged. If necessary, the nozzle and rubber grommet may be removed for cleaning. If additional cleaning is necessary the branch may be removed for cleaning.
- Inspect the coil surface. Any corrosion, damage, or obstructions must be corrected.
- The coil is designed for seasonal dry operation followed by seasonal wet operation, and not for frequent cycling of the spray pump. Frequent spray pump cycling may lead to excessive scale buildup.

With electrical heater tape, heat trace and insulate all exposed water piping, including pump piping below the overflow level and make-up water lines.

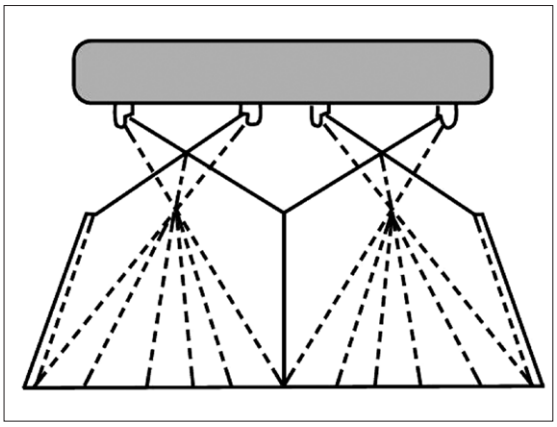

Figure 9. Nozzle Spray Pattern

NOTE: When working on fill section or above fill section, fill bundle edges should be protected from damage by service personnel, tools or debris by placing a temporary cover of plywood, or other suitable material, over the top of the fill bundles.

Water Level Control

There are two types of water level controls used on BAC cooling towers:

- Mechanical make-up valve assembly
- Optional electric water level control package

Mechanical Make-up Valve Assembly

A float-operated mechanical water make-up assembly is furnished as standard equipment on the cooling tower. The standard make-up assembly consists of a corrosion resistant make-up valve connected to a float arm assembly actuated by a polystyrene-filled plastic float. The float is mounted on an all-thread rod held in place by wing nuts. The cold water basin operating water level can be adjusted by repositioning the float and all-thread rod using the wing nuts provided.

NOTE: If the unit has been ordered with the optional electric water level control package or is intended for remote sump application, a mechanical water make-up valve will not be provided.

- Inspect the make-up valve assembly monthly and adjust if necessary.
- Inspect the valve annually for leakage. Replace the valve seat if necessary.
- Maintain the make-up water supply pressure between 100 and 350 kPa for proper operation. BAC recommends a surge protector (provided by others) for pressures over 350 kPa.
- Set the initial basin water level by adjusting the wing nuts so that the make-up valve is completely closed when the water level in the cold water basin is at the operating level.
- With the design thermal load and the average water pressure (100 to 350 kPa) at the valve, the above setting will produce operating water levels as stated in **Table 1** on **Page 10**.
- If the thermal load is less than the design load at the time of unit start-up, the procedure may produce operating levels greater than those shown in **Table 1**. If operating levels are higher than specified, readjust the float in order to attain the recommended operating level.
- Closely monitor the water level in the cold water basin and adjust the level if necessary during the first 24 hours of operation.
- Operating at the recommended water level will ensure that the unit basin contains sufficient water volume to prevent air entrainment in the circulating pump during system start-up and provides sufficient excess basin capacity to accept the total system pulldown volume.

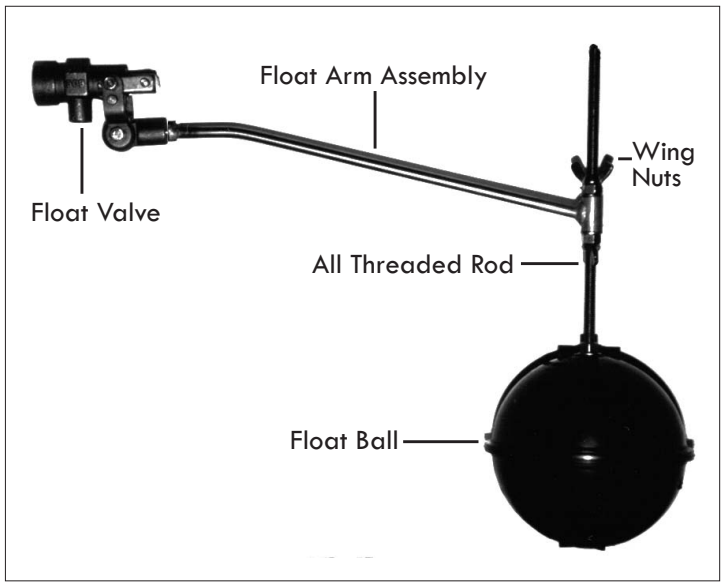

Figure 10. Water Make-Up Valve Assembly

CAUTION: Do not use steam or high pressure water to clean PVC eliminators or materials other than steel.

Optional Electric Water Level Control Package

As an option, an electric water level control package is available in lieu of the mechanical make-up assembly. The package consists of a probe type liquid level control assembly and a slow-closing solenoid valve.

Stainless steel electrodes, factory-set at predetermined lengths, extend from an electrode holder into the cold water basin.

- Clean the stainless steel electrodes periodically to prevent accumulations of scale, corrosion, sludge or biological growth, which could interfere with the electrical circuit.
- The water level is maintained at the recommended operating level regardless of the system thermal load.
- Therefore, it is not recommended that the operating level be adjusted.
- During the start-up of units equipped with the electric water level control package, bypass the control unit in order to fill the unit to the overflow connection.

3

RC SERIES

Corrosion Protection

BAC products are constructed of corrosion-resistant materials. Other materials listed below are used in the equipment construction:

- Galvanized Steel Components: Inspect the galvanized steel components for blemishes or corrosion. Wire brush and recoat the affected areas with a cold galvanizing compound such as zinc rich compound (ZRC).
- Stainless Steel Components: Inspect stainless steel components for signs of blemishes or corrosion. See “Long Term Care of Stainless Steel” on page 27 for cleaning and care instructions.

Water Treatment

A proper water treatment program, administered under the supervision of a water treatment specialist, is an essential part of routine maintenance to ensure the safe operation and longevity of evaporative cooling equipment, as well as other system components. In evaporative cooling products, cooling is accomplished by evaporating a small portion of the recirculating water as it flows through the unit. As the water evaporates, the dissolved solids originally present in the water remain behind and if not controlled, the concentration of dissolved solids will increase rapidly. This can lead to corrosion, scale, or biological fouling which may negatively affect heat transfer as well as the longevity of system components. A water treatment program must handle the following:

- Corrosion - Red rust on steel components and white rust on galvanized surfaces may affect the longevity of system components.
- Scale Formation - Scale not only reduces heat transfer and system efficiency, but also may lead to under deposit corrosion. If scale is not controlled, it may continue building on critical components and severely impact thermal performance.
- Biological Fouling - Slime and algae formations may reduce heat transfer, promote corrosion, and harbour pathogens such as Legionella.

Corrosion and Scale Control

1. To control corrosion and scale, maintain the water chemistry of the re-circulating water within certain parameters. The specific measures required vary from system to system and are dependent on the chemistry of the make-up water, the metallurgy of the piping and heat transfer devices exposed to the re-circulating water and the temperatures at which the system will be operating.
2. Bleed/blowdown, the continuous flow of a small portion of the re-circulating water to drain, is used to control the concentration of dissolved solids. On rare occasions, this may be adequate to control scale and corrosion. More often, however, chemical scale and corrosion inhibitors are necessary, which raise the allowable level of dissolved solids without the risk of scale and corrosion.
3. Keep the chemically treated water within the guidelines given in the below table. Your water treatment specialist may recommend more conservative limits than those shown in the table.

NOTE: Stainless steel cold water basins do not require passivation. However, if the upper structure is galvanized steel, passivation is required on the galvanized area including any Hot Dip Galvanized After Fabrication (HDGAF) coil(s).

	SST	ZAM / Galvanised Steel
PH	6.5 to 8.5	7.0 to 9.0
Hardness as CaCO3	300 to 500 ppm	300 to 500 ppm
Alkalinity as CaCO3	500 ppm max.	500 ppm max.
Total Dissolved Solids	1200 ppm max.	1000 ppm max.
Chlorides	250 ppm max.	125 ppm max.
Sulphates	250 ppm max.	125 ppm max.

Table 2. Recirculated Water Quality Guidelines

Biological Control

- The warm, oxygen and nutrient rich environment inside evaporative cooling equipment provides an ideal environment conducive to the growth of algae, slime, and other micro-organisms. Uncontrolled, this can reduce heat transfer, promote corrosion, and promote the growth of potentially harmful organisms such as Legionella.
- To avoid biological contamination and minimize the risk of Legionella, initiate the biocide treatment program at start-up and continue on a regular basis thereafter in accordance with the treatment supplier's instructions.
- Bleed/blowdown or chemical treatment used for corrosion and scale control alone is not adequate for control of biological contamination.
- Introduce solid or granular biocides through a chemical "pot" feeder installed in parallel with the system circulating pump. Diluted liquid biocides may be added directly to the cold water basin.
- If ozone water treatment is used, at no point should concentrations exceed 0.5 ppm to avoid corrosion.

Gray Water and Reclaimed Water

The use of water reclaimed from another process as a source of makeup water for evaporative cooling equipment can be considered as long as the resultant recirculating water chemistry conforms to the parameters noted in Table 2 on page 24. It should be noted that using water reclaimed form other processes may increase the potential of corrosion, microbiological fouling, or scale formation. Gray water or reclaimed water should be avoided unless all the associated risks are understood and documented as part of the site specific treatment plan.

Chemical Treatment Requirements

Chemical treatment programs must meet the following requirements:

- The chemicals must be compatible with the unit materials of construction as well as other materials used in the system (pipe, heat exchanger, chiller, etc.)
- Chemical scale and corrosion inhibitors, particularly acid (if used), should be introduced into the circulating water through automatic feeders. This should be done at a point in the system where total mixing and dilution occur before reaching the evaporative cooling equipment. The preferred injection point for chemical scale and corrosion inhibitors is on the discharge side of the system circulating pump(s). These chemicals should not be batch fed directly into the unit's cold water basin or water distribution system, as this can severely damage areas directly contacted.
- When chlorine is added to the system, free residual chlorine should not exceed 1 ppm, except during start-up if biological shock treatment is utilized during treatment. Refer to "Start-Up" on page 5 for limits. Exceeding this limit may accelerate corrosion.

Passivation

- Passivation is the formation of a protective, passive, carbonate layer on galvanized steel surfaces, including unit panels and galvanized coils.
- To provide maximum protection from corrosion on newly installed units take special measures to passivate galvanized steel surfaces.
- To ensure proper passivation of the galvanized steel, keep the pH of the circulating water between 7.0 to 8.2 for four to eight weeks after start-up, or until new zinc surfaces turn dull gray in colour.
- If white rust forms on galvanized steel surfaces after the pH is returned to normal service levels, the passivation process must be repeated.

Long Term Care of Stainless Steel

When the percentage of chromium in steel exceeds 10.5%, it is called stainless steel. The chromium in the steel reacts with the oxygen in the air to form a chromium-oxide surface layer, also called the passivation layer that provides the corrosion resistance in stainless steel.

BAC's Manufacturing Process

BAC takes precautions to prevent cross-contamination, processing galvanized and stainless steel parts separately. Also, stainless steel brushes are used to clean welds on stainless parts and care is taken to avoid scratching parts during processing. Organic cleaners are used to clean the finished product prior to shipping.

Jobsite Considerations

While stainless steel itself does not rust so long as the chromium-oxide surface layer is intact, it is not immune to contamination from its surroundings. Some common sources of surface contamination are:

- Dirt and soil
- Shop oil or grease that may carry other contaminants such as metal chips
- Machining or welding galvanized steel at the jobsite may cause debris to impinge itself into the stainless steel

These contaminants can deposit on the surface and scratch the passivation layer or prevent it from re-forming. They can also get trapped underneath the passivation layer and reduce corrosion resistance.

NOTE: Long term care of stainless steel information reprinted with permission from "The Care and Cleaning of Stainless Steel"; Specialty Steel Industry of North America; http://www.ssina.com

Recommended Cleaning Procedure

Stainless steel needs to be cleaned regularly to maintain the corrosion resistance as well as to maintain the overall aesthetics of the stainless steel.

It is fairly simple to clean most contaminants off the surface of stainless steel. Most dirt and soil can be cleaned with a clean cloth, warm water, and mild detergent. For persistent dirt, a little vinegar can be added in the cleaning water. It is important to always rinse the surface with warm water and wipe with a dry cloth after any cleaning, whether mild or aggressive.

- Fingerprints, mild stains or grease spots can be cleaned using organic solvents such as acetone, methyl or ethyl alcohol, or mineral spirits. Stainless steel wipes or glass cleaners commonly available in stores may also be used.
- Occasionally the surface of stainless steel can get iron chips or shavings embedded in it from having galvanized steel machined or welded in the vicinity. The iron chips can start to rust, reducing the corrosion resistance of the stainless steel, and stain the surface giving the impression that the stainless steel is rusting.
  These types of contaminants require more aggressive cleaning. Mild abrasives such as Scotch-Brite™ products may be used where aesthetic considerations are not important followed by solvent cleaning with organic solvents as described above. It is important to rinse the surface with warm water and wipe with a dry cloth after cleaning.
- If the iron chips are not removed with the Scotch-Brite™ Products, electro-chemical cleaning may be required. BAC uses commercially available equipment for electro-chemical cleaning in the field. Contact your local BAC Representative for more information.

System Cleaning

System Cleaning for RCF Models

Prior to start-up, the condenser water systems through a closed circuit cooling tower can be cleaned using an alkaline solution. When cleaning, follow the necessary precautions:

- Limit the duration of the cleaning to one day or at the most two days.
- The temperature of the solution should never exceed 38°C.
- The maximum concentration of chemicals in the circulation solution should not exceed any of the following:

– 5% Sodium Hydroxide
– 5% Sodium Metasilicate
– 2% Sodium Carbonate
– 2% Tetra Sodium Pyrophosphate
– 0.5% Trisodium Phosphate
– 0.5% Sodium Nitrate
– 5-10% Butyl Cellosolve

Coil Cleaning for RCF Models

The outside of the heat exchange coil may require occasional cleaning. The chemicals used must be compatible with the materials being treated. For example, the standard coil outside is galvanized steel. The inside of the coil is black carbon steel. For finned coils, the coil cleaning must be careful not to damage the fins (outside of the coils) and the coils themselves. For specific recommendations on coil cleaning, contact a qualified consultant.

Weld By-product Cleaning

The installation and manufacturing processes commonly used for field assembly of steel piped systems may leave weld by-products inside coils and connecting piping (especially in refrigeration systems). It is common practice to install filters and/or strainers that remove contaminants during initial system operation. Shortly after system start-up, the filters and/or strainers should be cleaned or replaced.

4

RC SERIES

Bleed Rate

In evaporative cooling, evaporation of a small portion of the recirculating spray water as it flows through the equipment causes the cooling effect. As this water evaporates, the impurities originally present remain in the recirculating water. The concentration of the dissolved solids increases over time and can reach unacceptable levels. In addition, airborne impurities are often introduced into the recirculating water. If these impurities and contaminants are not effectively controlled, they can cause scaling, corrosion, and sludge accumulations that reduce heat transfer efficiency and increase system operating costs, potentially shortening the useful life of the equipment. The degree to which dissolved solids and other impurities build up in the recirculating water may be defined as the cycles of concentration. Specifically, cycles of concentration equal the ratio of the concentration of dissolved solids (for example - chlorides, sulfates, etc.) in the recirculating water to the concentration of the same material in the make-up water.

- In order to optimise heat transfer efficiency and maximize equipment life, bleed or blowdown a small amount of recirculating water from the system. This controls the cycles of concentration to maintain the quality of the recirculating water within the guidelines given in Table 2, on page 24.
- Replenish the "bleed" water with fresh make-up water, thereby limiting the build-up of impurities.
- Bleed/blowdown:

  - To minimize water usage, accomplish the bleed automatically through a solenoid valve controlled by a conductivity meter. The set point is the water conductivity at the desired cycles of concentration and should be determined by a water treatment expert.

Bleed Line Calculations: Bleed rate is determined by the following formula:

$$B = \frac{E}{(n-1)}$$

Where: B = Bleed Rate (L/S)

E = Evaporation Rate (L/S) = Q (L/S) x R (ºC) x 0.0018

Q = Process Fluid Flow Rate (L/S)

R = Range (ºC)

n = Desired Number of Cycles of Concentration = CR/CM

The evaporation rate is dependent on the wet bulb temperature and load. The equation shown above provides the maximum bleed rate on the design day. Contact your local BAC representative for an exact calculation based on specific site conditions.

5

RC SERIES

Cold Weather Operation

Inspection & Maintenance

BAC products can be operated at subfreezing ambient temperatures provided proper operating methods are established and diligently followed.

- Carry out frequent visual inspections and routine maintenance services during operation in subfreezing weather.
- Ensure all controls for capacity and freeze protection are set properly and functioning normally.
- Prevent excessively high water levels and possible overflow of the cold water basin due to over pumping, clogged strainers, or make-up valve malfunction.
- Some unit icing can be expected in very cold weather. Usually this will not affect the operation of the unit. Resolve any icing conditions that may damage the unit or the supports, impair the system performance, or create a safety hazard.

Fan Section Icing Protection

There are three basic operational methods which can be used to provide the system's required cooling: temperature setting, fan control, and dry operation. The method of control employed on a given application depends upon the climatic extremes which are expected, the variations in heat load that will be encountered, and the compatibility of the control system with other portions of the installation.

In subfreezing ambient temperatures, effective icing control may require a combination of these three methods. Operate each unit with the highest thermal load it can handle, rather than evenly dividing the total heat load across all cells. During prolonged cold weather periods, bypass the idle units and drain the basins.

Temperature Setting (RCF Only)

Low leaving fluid temperatures promote ice formation. During operation in subfreezing ambient temperatures, maintain the leaving fluid temperature as high as possible. Ensure the unit operates with the maximum possible heat load. The recommended process fluid temperature is 10°C for RCF units with water (non-glycol) as the heat transfer liquid and 7.2°C for RCF units with glycol as the heat transfer liquid.

Fan Control

Reduce the unit capacity by cycling the fans, thus modulating the airflow through the unit. Rapid on-off cycles can cause the fan motor to overheat. Set the controls to allow a maximum of six on-off cycles per hour. Periodically, cycle the fans off to prevent ice formation and/or to melt ice that accumulates on the combined inlet shields.

NOTE: Modulating the water flow rate to the unit is NOT a recommended method of controlling cooling capacity.

The following are fan control methods:

- Variable Frequency Drives: VFDs offer the most precise method of capacity control by modulating fan motor speed. When using VFDs, avoid operating at or near resonant speeds. Units with VFDs require premium efficient/inverter duty motors.
- Fan Cycling: Cycle the fan off for five minutes every 15 to 20 minutes for each cell. If ice continues to build on the air intake, decrease the on-time. Observe the air intake of the unit at least every four to eight hours.
- Fan Reversal: This procedure should be used only after the other methods of fan control fail. If utilized, the fans should be run in reverse for no longer than 20 minutes and the unit should be observed during this time. Before returning to normal operation, visually inspect the fan blades for ice formation

Dry Operation

One method to prevent icing is dry operation. Dry operation of the unit protects fans from ice formation due to mist and splash from the cold water basin. The water in the cold water basin must be drained in dry operation. For dry operation switch points and recommendations, contact your local BAC representative.

Basin Water and Internal Piping Freeze

Cold Water Basin Protection

It is important to protect the basin and internal piping. The basin water could freeze when the unit is shutdown and exposed to subfreezing ambient temperatures.

- Remote Sump: The ideal method of protection is a remote sump located in a heated indoor space. When the circulating pump stops, the water in the connecting piping will drain by gravity to this indoor sump.
- Basin Heaters: On applications without a remote sump, heat must be provided to the cold water basin. Electrical immersion heaters can provide the required function. Contact your local BAC Representative for details.
- Electric Water Level Control: An electric water level control will maintain the proper water level regardless of the thermal load or variations in make-up water supply pressure. The two-position, slow closing solenoid valve provided with the BAC electric water level control package also minimizes valve freezing problems.
- Heat Tracing: Heat trace and insulate all exposed water piping including pump piping below the overflow level and make-up water lines with electrical heater tape.

Coil Freeze Protection

For protection against coil freeze-up, recommended solutions are an industrial grade inhibited ethylene glycol or propylene glycol solution. When the use of glycol is not practical, the system must be designed to meet both minimum flow and minimum temperature requirements.

Minimum Operation

- When a glycol solution is not utilized on an application utilizing water as the process fluid, operate the system to meet minimum flow and temperature requirements.
- Maintain a minimum heat load so that the temperature of the fluid leaving the coil is not less than 10°C. For RCF Closed Circuit Cooling Towers with glycol as the heat transfer liquid, maintain a minimum heat load so that the temperature of the glycol leaving the coil is not less than 7.2°C.
- To maintain the leaving fluid temperature at 10°C when the process load is extremely light or shut off, apply an auxiliary heat load to the circulating fluid and adjust the flow to ensure that fluid leaving the coil maintains the minimum required temperature.

Emergency Coil Drain (RCF Only)

Do not drain the coil as a normal method of freeze protection. Frequent draining promotes corrosion inside the coil tube. However, draining is acceptable as an emergency method of freeze protection if the coil is not protected by a glycol solution. If the coil is not protected, an automatic drain valve and vacuum breaker are recommended to drain the coil if flow stops or the fluid temperature drops below 10°C when the ambient temperature is below freezing. Further protection against coil freeze-up is possible with the installation of an alarm to alert personnel when the temperature of the fluid leaving the coil falls below 10°C. Contact your local BAC Representative for guidelines on the installation of an emergency coil drain system.

6

RC SERIES

Factory Authorised Parts

THE PERFECT FIT

The Perfect Fit

To Ensure Perfect Performance

Your evaporative cooling equipment is only as good as the sum of its parts. Baltimore Aircoil factory authorised replacement parts and accessories are engineered and manufactured to original equipment specifications and are guaranteed to be The Perfect Fit. These high quality components can eliminate unnecessary, costly and time consuming problems caused by non factory authorised parts. They are fully warranted to ensure long, trouble free operation. BAC original equipment parts also help maintain the thermal performance of CTI Certified models of BAC evaporative cooling equipment. In addition, BAC quality parts and accessories are fully compatible with other manufacturers' equipment.

For Service and Preventative Maintenance

BAC products are designed for long, trouble-free operation and BAC factory authorised parts provide everything you need to service and maintain your evaporative equipment with confidence. To ensure optimum performance and maximum service life, it is important that a program of regular inspection and maintenance be completed. Your experienced BAC sales & service office and/or BAC appointed representative is factory trained and available to assist you.

For Performance Enhancement

Baltimore Aircoil's ongoing research and development programs result in continual product performance and system durability improvements. As new developments are incorporated into our equipment designs, they are made available for retrofit on existing units to improve efficiency and reduce operating cost. Upgrade and retrofit kits are also available to improve the serviceability of existing installations or other manufacturers' equipment.

COOLING TOWERS

CLOSED CIRCUIT COOLING TOWERS

ICE THERMAL STORAGE

EVAPORATIVE CONDENSERS

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