AEROCOOL®

PHOENIX MANUFACTURING

OWNER'S GUIDE

USE AND CARE MANUAL

RF42 & RF48 Series Industrial Fan Evaporative Air Cooler

U.L. Listed evaporative cooler for non-ducted, low static pressure installations in industrial or warehouse applications.

* Safety	* Operation
* Installation	* Maintenance
* Start-up	* Trouble Shooting

INSTALLER: Please deliver this guide to owner.

Congratulations: You have purchased a product of superior performance and design, which will give the best service when properly installed, operated and maintained.

This guide will provide you and your installer with the information needed to mount, operate, inspect, maintain, and troubleshoot your Industrial Fan evaporative air cooler.

The first section, Installation and Start-Up, is especially for the installer. The second section, Regular Maintenance, contains operational and maintenance instructions for the owner and/or maintenance operations personnel, while the Troubleshooting section includes information on commonly encountered problems.

⚠ WARNING - TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS, OBSERVE THE FOLLOWING.

READ AND SAVE THESE IMPORTANT SAFETY INSTRUCTIONS

- Read all instructions carefully before installation.
- Use only the fan motor and circulating pump combinations marked on the Model Nameplate indicating their suitability for use in this model. Any other motors or pumps cannot be substituted.
- Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
- When cutting or drilling through a roof or ceiling, do not damage electrical wiring or other concealed utilities (water /gas lines, sewer lines, etc.).
- Cooler motor, pump, cabinet and junction box must be grounded in accordance with all local and national codes. A ground wire must be used between the power supply and the cooler.
- Be sure that the cooler is connected to proper line voltage as shown on the pump and fan motor specification plate. NOTE: Improper voltage will void the pump and/or motor warranties and may cause serious personal injury or property damage.
- Do not operate this fan motor with any solid-state speed control device.
- Always disconnect electrical power to unit before working on or servicing cooler. More than one disconnect switch will be required to de-energize the equipment for servicing.
- Do not remove inlet or access panels while cooler is running, this may cause the fan motor to overload and damage the motor windings.

NOTE:

- Do not locate unit near exhaust or vent pipes as odors or fumes may be drawn into cooler.
- Use of anode devices, chemical additives, or treatments in this cooler will void the warranty.
- Your warranty does not cover shipping damage. Report all shipping damage at once to dealer or carrier making the delivery.
- For future reference, record the model, serial numbers and installation date of your evaporative cooler here:

Model # _____

Serial # _____

Install Date: _____

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INTRODUCTION

Read This Manual Completely Before Installing Your Industrial Fan Evaporative Cooler.

Your evaporative cooler is a well crafted unit built using decades of constant engineering research and product development to create an efficient, reliable, and economical to operate device. Your fan cooler was thoroughly tested and inspected before leaving the factory; with regular inspection and maintenance, it will serve as the heart of your building's overall air-cooling system for many years.

This manual is your guide to proper installation procedures along with information about reasonable care and maintenance that will ensure safe, economical and trouble free cooling. Failure to follow these instructions may damage your cooler, impair its operation, create the potential for serious personal injury and/or void the warranty.
Please read it carefully.

Don't attempt to perform any part of the installation described in this manual unless you are ***fully qualified*** to do so.

CAUTION: All mechanical, plumbing and electrical installations must comply with local and national building and safety codes, and must be performed by qualified personnel only.

Before attempting to install the cooler, confirm that the following preparations have been made:

- Verify that the supporting surface is strong enough to bear the weight of the cooler when in use; remember that when the system fills with water, the cooler will be much heavier than when dry.

Model Number	Aprox.Operating Weights (lbs.)
RF422_ Series	925
RF482_ Series	1000
RF483_ Series	1025
RF485_ Series	1400

- Make sure you have adequate resources (cranes, safety harnesses, rigging, etc.) for lifting the cooler into place.
- Check the electric power supply to see that it matches the requirements shown on the model and motor nameplates.
- Verify that the supporting surface is level in all directions; this is necessary to ensure proper distribution of water into the pad frame troughs, maximizing cooling performance.
- Confirm that any planned ductwork and electrical supply installation needs comply with local and national codes.

Location

Industrial Fan evaporative air coolers are not designed to be connected to a duct distribution system, they are designed for connection to a straight drop duct and the use of a low restriction diffuser for distribution of cooled air throughout an area. When these fan coolers are used to cool large areas, such as factories, warehouses or large covered areas, divide the total area and strategically locate units of proper capacity in each area.

Install coolers in a location where only fresh outside air can enter the cooling system. Do not install coolers in closed-in areas, such as an attic or storeroom, which restricts free air movement around and into the cooler, or near vent pipes, kitchen exhaust, etc.; as undesirable odors or fumes may be drawn into unit.

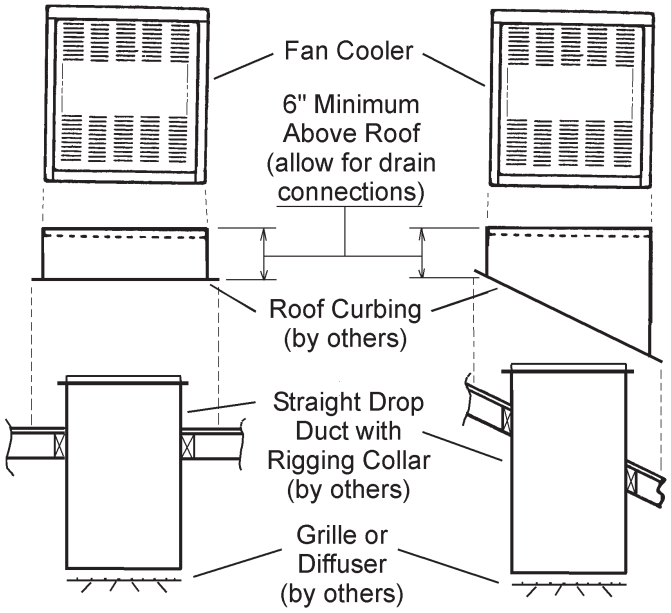
NOTE: When coolers are installed within the jurisdiction of the City of Los Angeles (C.O.L.A.) Building codes, it is required that any electrical components (motors, pumps, motor starters, etc) used in a C.O.L.A. installation shall be either:

1. Currently listed for its intended use as part of the cooling system equipment by a City of Los Angeles recognized electrical testing laboratory (i.e., UL , ETL, CSA, etc.), or

2. Currently approved for general use by the City of Los Angeles Electrical Testing Laboratory.

Duct System

This fan cooler is designed for use in non-ducted applications, where only a short vertical drop duct/plenum with or without a simple air diffuser at the lower (discharge) opening. If the lowest discharge point of the short duct is less than 10 feet above the floor, a guard or grille is required. This short duct, which is tailored to fit the building, should be designed, fabricated and installed by a competent HVAC sheet metal contractor, preferably while building is under construction.



Recommended Minimum Discharge
Height - 10 ft above floor level

Air Exhausting

Evaporative coolers will function correctly only if there is a way for the cooled air to exit the building. Windows, suitable vents or dampers, doors or other exhaust openings at a point most distant from cooled air inlet should be open to permit free movement of air out of the area being cooled, and to avoid building up excessive pressure inside the space. Proper location of these exhaust openings are important as they guide flow of air through areas where cooling is desired.

To utilize the maximum capacity of your cooler and to help keep insects, dust, dirt, etc out of the cooled space, the building/space should be maintained at a slightly positive air pressure (airflow into the building slightly more than leaving airflow). A general method for determining how much exhaust opening (vents, doors or windows, etc) is required for proper air exhausting is: 2 square feet of unrestricted opening per 1,000 CFM, using the standard CFM ratings listed for your cooler.

INSTALLATION

CAUTION: Disconnect all electrical power to the cooler before attempting to install, open, or service your cooler. More than one disconnect will be required to de-energize the equipment for servicing. If the cooler is thermostatically controlled, the thermostat may not be used as the power supply disconnect, as it may reset and start the unit unexpectedly.

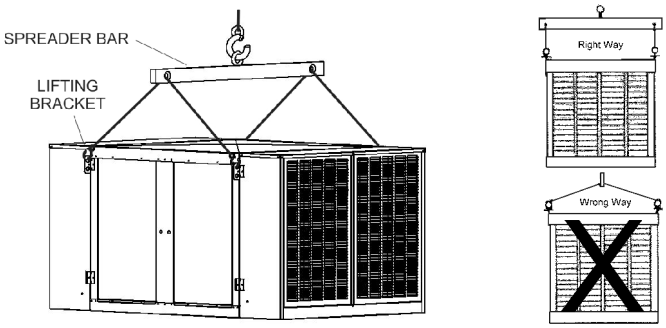
Even while routinely inspecting or servicing the inside, the cooler can be accidentally started. Keep all personnel away from the cooler and electrical supply when you are working on it. Before servicing or cleaning unit, switch power off at the service disconnects and lock the disconnecting means to prevent power from being switched on accidentally. When the service disconnects cannot be locked, securely fasten a prominent warning device, such as a tag, to the service disconnect or panel.

Unit Assembly

The unit is shipped with the fan and media modules assembled and ready to hoist into place. Once the unit is in its final location, remove the shipping tape from around the circulating pumps, install the float valves, water lines, drain lines and connect the electrical systems .

Hoisting

With the use of a spreader bar, the brackets that bolt the modules together also provide a convenient means for lifting the cooler into place. Assure that the hoisting equipment is of adequate capacity to safely lift unit into place. Attach lifting means as shown below.



CAUTION: DO NOT HOIST ASSEMBLED COOLER IN A WAY THAT COULD CAUSE THE LIFTING BRACKETS TO BEND.

Electric Power Supply / General Wiring Requirements

CAUTION: All electrical installations must comply with local and national building & safety codes; all work must be performed by qualified personnel only.

NOTE - References in this manual to: National Electric Code (N.E.C.), local or national codes means that those items must comply with applicable installation codes as specified by the building code authority having jurisdiction at the installation location. It is the installer's duty to comply with all requirements.

The motor Hp / full load current, voltage, phase, number of motor speeds and the length of wire from the power supply to the motor are all factors in determining the gauge of wire used in the circuit.

IMPORTANT:

This UL Listed Industrial Fan Evaporative Air Cooler requires the use of two separate electrical power supply circuits to the unit:

Fan motor: (depending on model purchased)

The motor will be one of the following voltage combinations:

- Single phase - 120/ 208- 230 Volt AC / 60 Hz or,
- 3 phase - 208- 230/ 460 Volt AC / 60 Hz

The factory installed motor is a multiple voltage motor that has been pre-wired to the voltage indicated on the unit nameplate.

Circulating pumps: (1 120 V. pump is factory supplied with each wet section)

- Single phase - 120 Volt AC / 60 Hz. The pump power supply circuit must be a GFCI protected circuit. Consult with factory for wiring requirements for other than 120 V. pumps.

Verify that the power supplied to the circulating pumps and fan motor are the voltage and frequency (Hz) stamped on the unit nameplate.

NOTE: Improper motor voltage connections will void motor warranties.

Electrical Ground

For maximum safety, make sure cooler cabinet, fan motor and pump(s) are properly grounded to a suitable ground connection as required by all local and national codes.

Safety Disconnect Switches

Each unit must have safety disconnect switches (motor circuit and pump circuit) compatible with the installation location and installed in accordance with the National Electric Code (N.E.C.), Article 430 and/or local codes. Each disconnect switch shall be a U.L. Listed disconnect which breaks all ungrounded conductors that can carry current to the unit.

Over-current (short circuit) Protection

Each unit must have over-current protection equipment intended to protect all ungrounded pump and motor branch-circuit conductors, motor control apparatus, pumps and motors against overcurrent due to short circuits or ground faults. They shall have minimum enclosure classifications compatible with the installation location and installed in accordance with N.E.C., Articles 240 and 430. These devices shall be U.L. Listed short circuit protection devices, sized and installed in accordance with specifications as stated in N.E.C., Article 430.

Overload Protection

All pumps and single-phase motors available from Phoenix Manufacturing, Inc. for use in Industrial Fan Evaporative Air Coolers have integrated thermal running and locked rotor overload protection as required by the N.E.C.

All 3-phase motors require installation of properly sized and mounted thermal running / locked rotor overload protection.

Branch circuit protection should be properly sized and installed by a competent electrician in accordance with local and national code requirements.

Motor Start Switch / Motor Starter

All motor applications require the use of Start/Stop switches and/or motor starters of the proper current capacity.

In applications where a switch is deemed adequate to start the motor, as defined by N.E.C., Article 430, the branch circuit shall be sized in accordance with N.E.C., Articles 210 and 430. The enclosure for the switch and its installation location shall comply with N.E.C. requirements for the installation of the switch.

A motor starter with integrated thermal (running and locked rotor) overload protection is used to start/stop 3-phase motors. Motor starter shall be sized in accordance with specifications stated in the N.E.C., Article 430. Starters mounted to the unit shall have a minimum NEMA 3R (raintight/rainproof) enclosure rating. Starters mounted remote to the unit shall have a minimum enclosure classification compatible with the location and installed in accordance with N.E.C., Article 430.

Pump Power Supply Circuit

The pump supply circuit shall be a GFCI protected circuit with overcurrent (short circuit) protection of 15 AMP and have a minimum of 600 volt rated, #14 AWG copper wire to the pump receptacle in the junction box assembly. Conduit to the junction box shall be rain-tight or liquid-tight, flexible metal conduit with a separate ground wire, installed per N.E.C., Article 351. Use of a voltage transformer for the pump power supply circuit is not recommended

Control Circuit Transformer

If required, a control circuit transformer shall be a N.E.C. Class 2 transformer of adequate capacity, installed and protected in accordance to national and local codes.

Belt Adjustment

CAUTION: Disconnect all electrical power to the cooler and insure that belt is not rotating before adjusting belt tension.

CAUTION: Never operate unit with inlet or access panels removed. This will result in an overloaded condition and may damage the fan motor.

Correct belt tension and alignment is important, proper setup reduces power consumption and prolongs life of belt and motor. When installing or adjusting belt, loosen the motor plate mounting bolts and adjust to proper tension (25 lbs).

Recirculating Pump

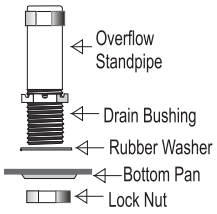
CAUTION: Do not allow any pump to fall over and become submerged; water will damage pump motor.

Remove shipping tape from around pumps, verify that they are upright and mounted securely in place.

Install Overflow Standpipe / Drain Line

Install overflow drain bushing in bottom of each wet section as follows:

- Slide rubber washer over drain bushing.
- Push drain bushing through bottom pan, assemble and tighten lock nut.
- Screw plastic overflow standpipe into the drain bushing and tighten snugly (hand tight) to prevent leakage.
- Connect a suitable drain line (copper / PVC / garden hose) to drain bushing. Never drain water onto a roof; mineral build-up or damage to roof may occur.



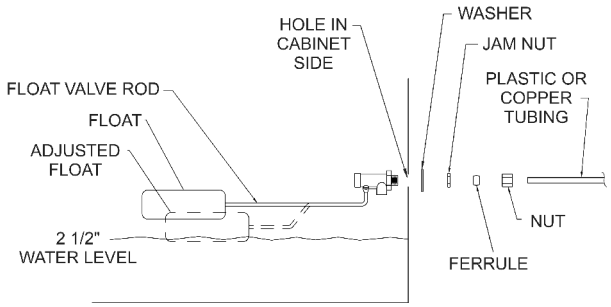
NOTE: Drain water in accordance with local plumbing codes.

Connect Water Supply

CAUTION: All plumbing installations must comply with local building and safety codes, and must be performed by qualified personnel only.

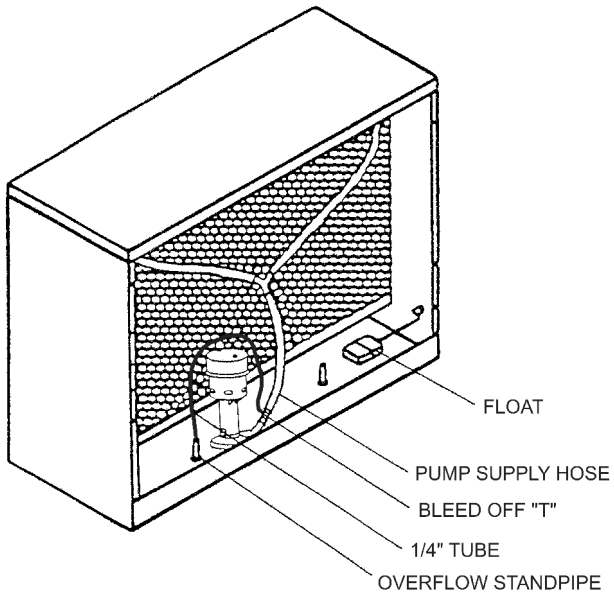
NOTE: Coolers should not be connected to “soft” water systems. Soft water will accelerate corrosion and decrease the effective life of pads and cooler cabinet. Connect water line as follows:

- A water supply valve should be installed at a convenient location, to allow the water supply to be turned on and off for servicing or winterizing. A minimum 3/8” diameter waterline tubing should be used to provide water to the cooler. However, larger tubing is recommended if the distance from the valve to the cooler is greater than 100 feet, then reduced to 1/4” at the unit.
- Install float valve in the side panel of each wet section.
- Connect tubing from water supply to float valve. Place compression nut and ferrule over end of tubing, insert tube into float valve then tighten compression nut to secure



Install Bleed-off

To minimize mineral scale “build-up”use the included bleed-off assembly. Remove the cap from the bleed-off tee; insert the black tubing and route the tubing through standpipe opening into the drain line. To prevent siphoning of the water, make sure that the bleed-off tee is above the water level.



GENERAL INSPECTION

Initial Start-up or Annual Inspection

CAUTION: Disconnect all electrical power to the cooler before attempting to install, open, or service your cooler. More than one disconnect will be required to de-energize the equipment for servicing. If the cooler is thermostatically controlled, the thermostat is not to be used as the power supply disconnect, as it may reset and start the unit unexpectedly.

Before start-up the cooler for the first time, or at the beginning of each cooling season, make sure that all required connections, adjustments, etc. have been made. Verify that:

- Cooler mounting is level; ductwork is sealed.
- Cabinet is securely fastened to mounting.
- Cooler cabinet is properly grounded. Electrical connections are correctly made, safe and secure.
- Motor, pump, drain, bleed-off, float valve, etc. are correctly installed and fully functional.
- Water line securely connected, turned on, no leaks noted.
- Float adjusted for proper water level.
- Pump impeller turns free and smooth. If in doubt, remove impeller cover (see “Cleaning Pump”) and check rotation.
- Fan blade, shaft, pulley and motor mounting bolts / setscrews are tight.
- Motor sheave / Fan blade pulley alignment okay; belt correctly tensioned, fan blade turns freely.

Start-up Check List

CAUTION: Never operate cooler with inlet or access panels removed. This will result in an overloaded condition and may damage the fan motor.

To verify and check out the cooler installation on initial or annual start-up, the following procedure should be followed.

- Turn electrical supply to pump on.
- Verify that pump starts and pads are evenly wet.
- Open building exhaust / relief vents (windows, doors, etc.)
- Turn electrical supply to fan motor on.
- Observe that motor starts and runs, confirm air delivery.
- Verify motor amperage does not exceed nameplate.

In case of trouble on any of these steps, refer to the Troubleshooting Chart .

Cabinet Inspection Checklist

After initial start-up and for a few weeks afterwards, check for and/or observe the following: Refer to the Troubleshooting Chart if necessary.

- Leaks from water lines, drain lines, cabinet, etc.
- Cooler pads: even wetting, no dry streaks.
- Confirm water level depth setting is correct.
- Verify full, even flow in water distribution system.
- Fan blade / motor rotates freely, no unusual noises.
- Belt condition / tension / alignment OK.
- Check motor mounting, cabinet hardware, setscrews on pulleys, fan blade are tight.

Maintenance Schedule

Regular maintenance and periodic inspection is the key to long and successful service from your Industrial Fan Cooler. The cooler should receive major servicing at least once a year, more often if conditions require (dusty environment, constant use, poor water quality, etc.) For maximum cooling efficiency, long life and appearance, every two months during operation, the cooler should be inspected and cleaned.

NOTE: Do Not Undercoat the Water Reservoir

Your cooler's water reservoir is finished with our Peblar XT® appliance-type finish. It is so hard that asphalt-type cooler water pan under-coatings will not stick to it. Undercoating will break free, clogging the pump and water distribution system.

NOTE: Do not use cooler cleaners, cooler treatments, anodes or other chemical additives in this evaporative cooler. Use of any additives or water treatment other than the furnished bleed-off will void your warranty and may decrease the life of the cooler.

Before starting any maintenance operation, thoroughly read all operating and maintenance instructions and observe all cautions and warnings.

Cleaning

CAUTION: Never wash your cooler cabinet with a garden hose; water may harm motor and pump or seep through ductwork into building. Motors damaged by water are NOT covered under warranty.

All foreign materials, mineral scale, hard water deposits, dirt, etc. should be removed from pads, water pans and other components. Your cooler's long lasting finish can be brought to like-new condition by using warm water and a soft cloth.

NOTE: Avoid using scouring pads, steel wool or wire brushes, as these will damage the finish and encourage corrosion.

Maintenance & Inspection

IMPORTANT: Before operating cooler at the beginning of each cooling season, turn fan blade, cooler motor and pump motor shafts by hand to make sure they turn freely. Failure to do so may result in burning out motor.

Periodic inspection of your Industrial Fan Cooler will enhance the chance for long, trouble-free service life. For maximum efficiency, every two months during operation, or any time the cooler is opened, the cooler should be inspected. Some suggested items to look for:

- Check for leaks from drain lines, cabinet, etc.
- Any dry spots or streaks on pads when pump is operating?
- Are bolts, nuts and set screws still snug?
- Are the bearings, etc., making any unusual noises?
- Does the fan blade and motor turn freely?
- Are the float levels set correctly?
- Is water in the bottom pans clean?
- Belt condition / tension / alignment OK?

Adjust Belt Tension

Each time you inspect your cooler, be sure to check belt tension on the motor/fan assembly. Check belt condition and replace it if frays or cracks appear. Check alignment of fan blade pulley with motor pulley (see page 4 for detailed steps).

Cleaning Water Pump & Hose

CAUTION: Disconnect all electrical power to the cooler before attempting to install, open, or service your cooler. More than one disconnect will be required to de-energize the equipment for servicing. If the cooler is thermostatically controlled, the thermostat is not to be used as the power supply disconnect, as it may reset and start the unit unexpectedly.

CAUTION: Do not allow pump to fall over and become submerged; water will damage pump motor.

Clean water pump and hose assembly as follows:

- Unplug pump cord, remove mounting bracket screw and remove pump from cooler. Shake gently to remove water.
- To prevent breakage, carefully release the five snap-out tabs in order noted on base plate and remove impeller base plate from the pump body.
- Using a mild detergent solution and a soft cloth, clean deposits from screen, around impeller and base plate.
- Spin impeller to dislodge any remaining foreign material.
- Remove any foreign material in the hose adapter (between the pump and hose), or between the hose and the water distributor assembly.
- Rinse and reinstall impeller base plate.
- Reinstall pump and reconnect pump cord.

Draining

Drain the cooler (with power off and pads removed) as follows:

- Connect a drain hose to the drain fitting on the bottom of the reservoir, if not already connected to drain line.
- Remove overflow standpipe from the drain fitting.
- Drain and clean reservoir (never drain water onto a roof, mineral build-up or damage to roof may occur).

Touch-Up

The hardness, adhesion and smoothness of the internal and external finish on your cooler makes it extremely unlikely that scratches or chipping will occur. In the event that finish damage does occur, it should be promptly repaired by the following procedures:

1. Sand the area around bare metal spots.
2. Prime and paint with a quality paint.

Do not use asphalt type cooler undercoat material in water reservoir. Undercoat will break free, clogging the pump and water distributor.

Lubrication

Motor Bearings

Some single phase motors used in Industrial Fan coolers have ports for lubricating the motor and are oiled at the factory. If the need for oiling is indicated, see individual motor nameplate for specific instructions on re-lubricating the motor. Under normal use, these motors require oiling about every 12 months of operation.
Do Not Over-Oil.

All other motors use ball bearings and are permanently lubricated and do not require additional lubrication.

Fan Shaft Bearings / Pump Motor Bearings

Fan shaft bearings are sealed and do not require oiling.

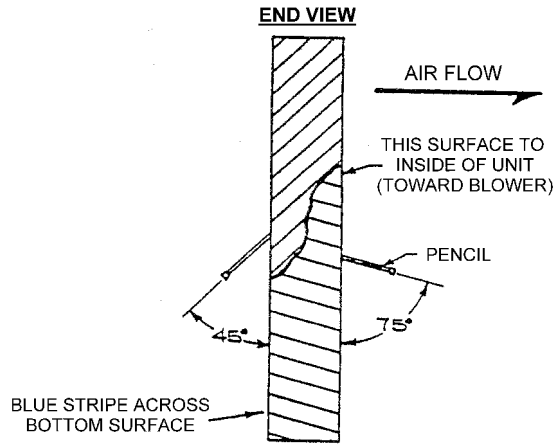
The pump motor does not require lubrication.

Cleaning or Replacing Wet section Cooler Pads

CAUTION: Disconnect all electrical power to the cooler before attempting to install, open, or service your cooler. More than one disconnect will be required to de-energize the equipment for servicing. If the cooler is thermostatically controlled, the thermostat is not to be used as the power supply disconnect, as it may reset and start the unit unexpectedly.

The condition of your cooler pads should be checked at least once a year; at the beginning of the season is best. However, your pads may need to be checked more frequently, depending on local air and water conditions. For instance, in areas where mineral content of the water is high or the air is dusty, deposits may build up in the cooler pads, restricting airflow. Clean or replace pads as follows:

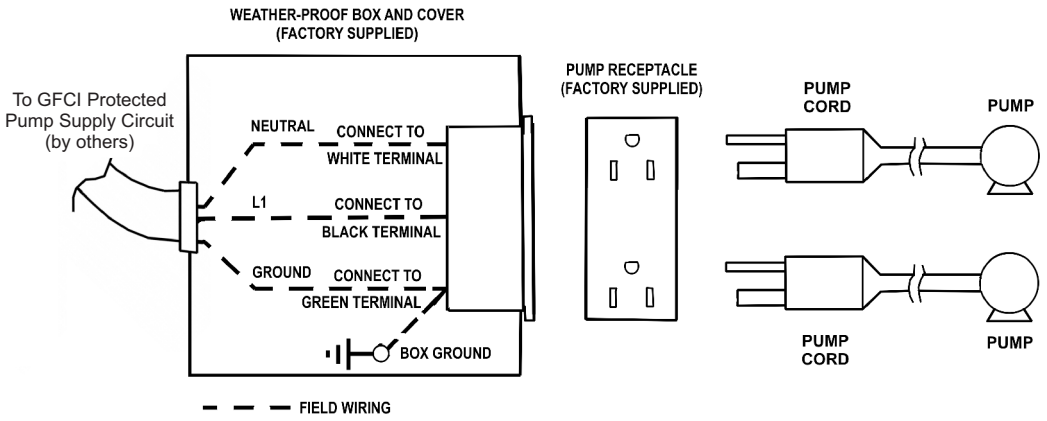
1. Disconnect power from unit.
2. Remove pads from wet section cabinet as follows:
   a. Remove inlet louver panels from cabinet.
   b. Remove top pan from cabinet.
   c. Remove water distributor cover and tube assembly.
   d. Remove pads by tilting slightly forward and carefully lifting up and out. If passages are clogged or pad is dirty, hose off inlet face of pad. Light, *gentle* brushing of the inlet edges of the pad with a stiff bristle brush (do not use a wire brush) will not harm the pad and will remove more stubborn scaling.
   e. If necessary, replace with new Aerocool pads, available only from your Aerocool dealer. Aspen, expanded paper or other types of evaporative cooling pads will not work and will void your warranty.
3. Using a mild detergent, wash dirt and scale from the inside of the wet section cabinet. Wire brushing is not recommended. If finish is damaged or rusting is noted, repair as noted in the "Touch-Up" section. Rinse with fresh water.
4. Reinstall pads, making sure they are positioned correctly (painted stripe on pad placed to the bottom, facing outside).
5. Reinstall water distributor cover and tube assembly.
6. Reinstall top pan to wet section cabinet.
7. Reinstall inlet louver panels.

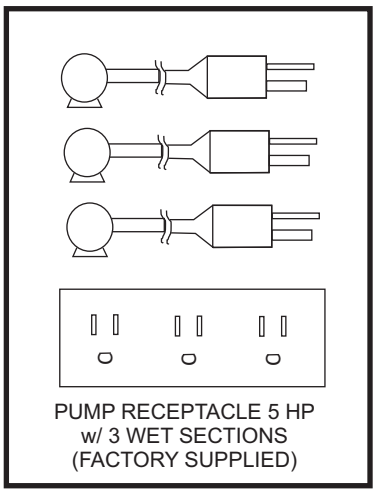


REPLACEMENT PARTS

When ordering replacement parts, always refer to the serial and model number of your cooler. Use the part numbers listed in the accompanying parts list, as illustrated in the diagrams for your model.

MOTOR AND PUMP CIRCUIT CONNECTIONS





PUMP RECEPTACLE 5 HP
w/ 3 WET SECTIONS
(FACTORY SUPPLIED)

RF42 / RF48 MODELS:

Field assembly required for pump receptacle box. Use factory provided junction box, 120V receptacle and weather proof cover & locate as shown and wire per schematic (above).

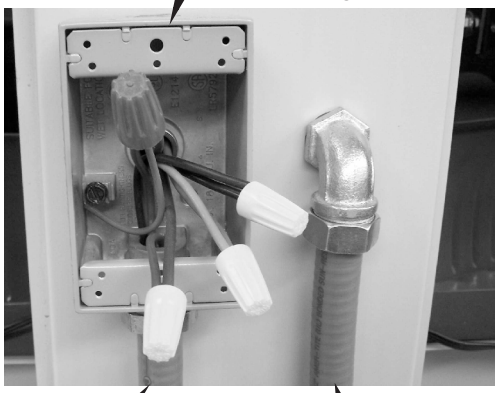
INSIDE VIEW - CENTER PANEL

Pump cords - route through provided clips on fan housing to prevent cord movement

Factory mounted Motor conduit

Factory mounted motor wiring box
Make power supply connections as required per wiring schematic (below), attach provided gasket and cover plate.

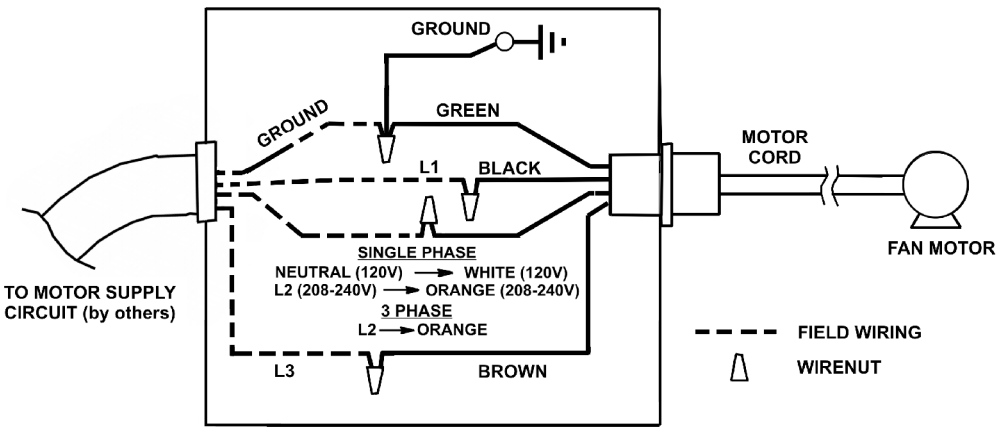
OUTSIDE VIEW
CENTER PANEL



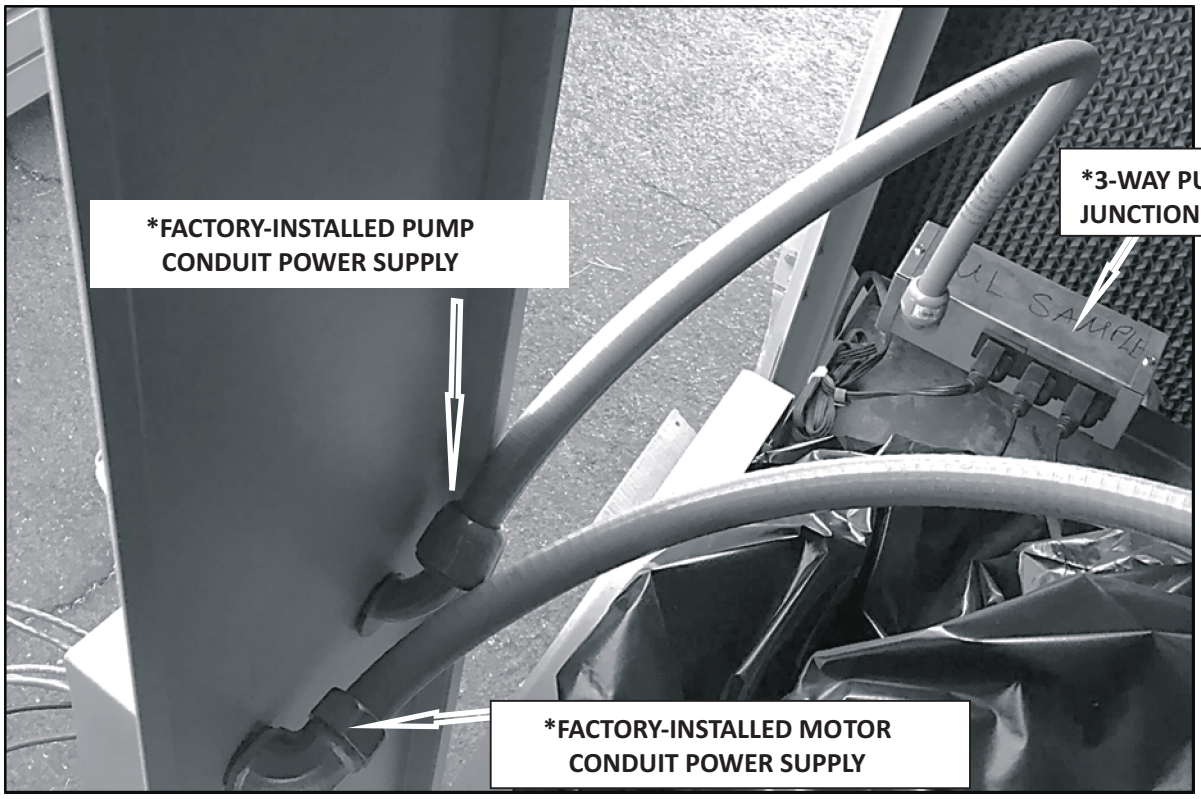
<u>To motor power supply</u> - conduit, fittings and wirenuts field supplied

<u>To pump power supply</u> - conduit and fittings field supplied

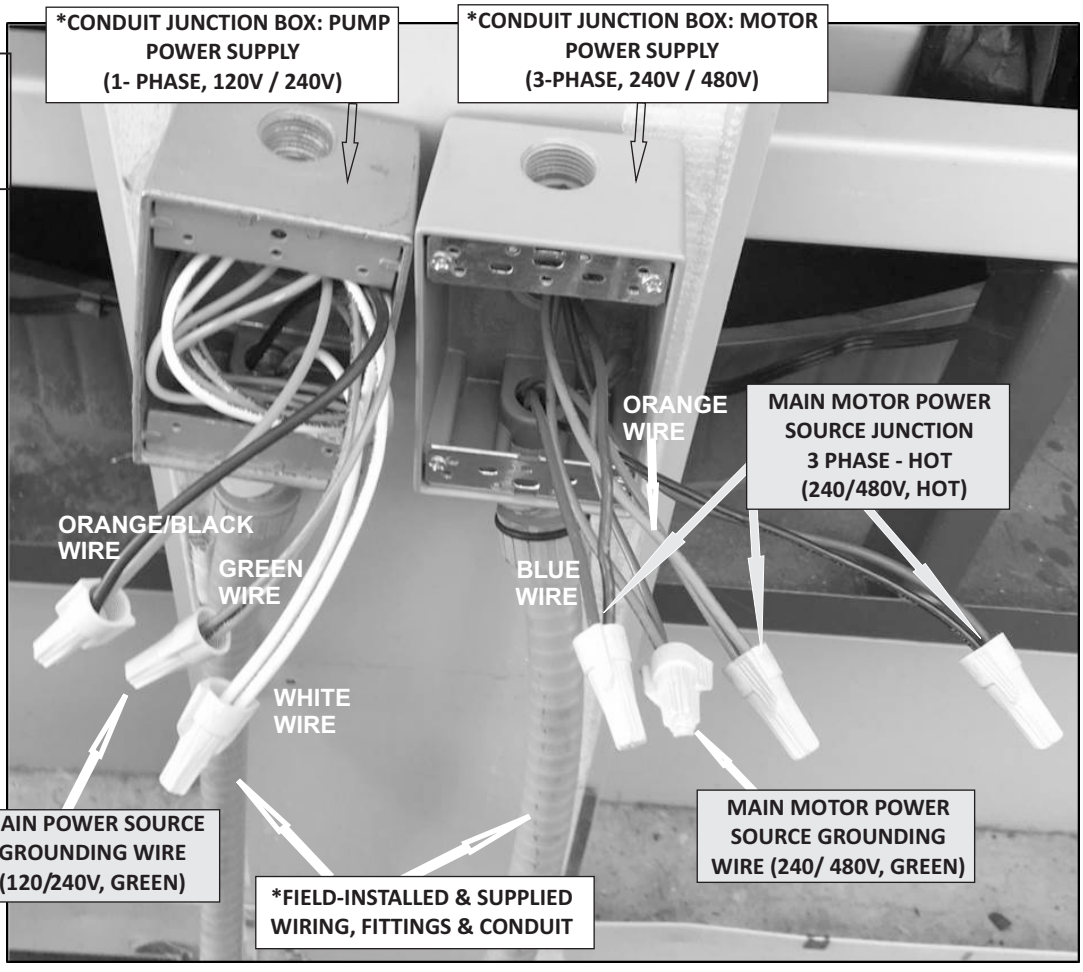
MOTOR WIRING BOX - FACTORY MOUNTED TO OUTSIDE OF CENTER PANEL



RF4853A / RF4854A MODELS:
ELECTRICAL CONDUIT-POWER SUPPLY CONNECTIONS (INSIDE OF UNIT)



NOTE: REMEMBER TO ATTACH PROVIDED GASKETS AND COVER-PLATES TO JUNCTION BOXES, AFTER WIRING.



Troubleshooting:

The following guide is intended to help you diagnose and fix some of the most commonly encountered problems; by no means does this guide cover all of the possible problems you may encounter. If you cannot diagnose and correct the problem, or if it persists, contact qualified service personnel. All electrical work should be done by, or with the help of, a qualified electrician.

PROBLEM / SYMPTOM:	POSSIBLE CAUSE:	CORRECTIVE ACTION:
Units fails to start or deliver air	1. No electrical power to unit	1. Check power supply
	A. Fuse blown	A. Replace fuse*
	B. Circuit breaker tripped	B. Reset breaker*
	2. Belt loose or broken	2. Adjust or replace belt
	3. Motor overloaded and/or frozen bearings	3. Replace motor or bearings
	A. Belt too tight or broken	A. Adjust belt tension or replace
	B. Fan blade bearings dry / frozen	B. Replace bearings
	C. Motor overloaded	C. Open relief vents to increase exhaust*
	D. Inadequate wiring, non-functional breaker or motor starter	D. Call electrician
Unit starts, air delivery inadequate	1. Lack of adequate air exhaust	1. Open relief vents to increase exhaust
	2. Pads clogged (mineral accumulation)	2. Clean or replace pads
	3. Belt too loose	3. Adjust belt tension or replace
Inadequate cooling	1. Inadequate exhaust from building	1. Open relief vents to increase exhaust
	2. Air registers / diffusers improperly set	2. Adjust to direct airflow as required
	3. Inadequate water supply / pad not wet	3. Check water distribution system
	A. Pads clogged (mineral accumulation)	A. Clean or replace pads
	B. Dry spots or streaks on pad	B. Check water distributor system
	C. Distributor tube holes plugged	C. Clean distributor holes
	D. Pump not working	D. Clean or replace pump
	E. Loose connections in water system	E. Check for leaks and correct
	F. Inadequate water in reservoir	F. Check float valve operation
	G. Inadequate bleed-off (pads clogging)	G. Clean or replace bleed-off
	H. Pump basket/screen clogged	H. Clean basket / screen
Motor cycles or fails to operate	1. Excessive belt tension	1. Adjust belt tension
	2. Fan blade shaft tight or frozen	2. Replace bearings
	3. Motor overloaded	3. Adjust relief vents to increase exhaust*
	4. Pulleys mis-aligned	4. Check and correct alignment
Water draining from unit	1. Float arm improperly set	1. Adjust float
	2. Seat in float valve leaking	2. Replace float valve
	3. Standpipe not tight	3. Tighten standpipe (hand tight)
Knocking or banging sound	1. Bearings dry or worn-out	1. Replace bearings
	2. Rotating off-balance	2. Inspect fan assembly, replace if necessary
	3. Loose parts	3. Inspect fan components, tighten
Fan assembly shakes or rattles	1. Belt or pulley loose	1. Inspect and adjust, replace as required
Excessive humidity inside	1. Inadequate exhaust from building	1. Open relief vents to increase exhaust
Musty or unpleasant odor	1. Stale or stagnant water in cooler	1. Drain, clean and flush reservoir
	2. Pads clogged or mildewed	2. Check bleed-off, replace pads
	3. Pads not completely wet before starting fan motor	3. Turn pump ON for several minutes prior to starting cooler

* - If condition persists, call electrican