MasterCool® II

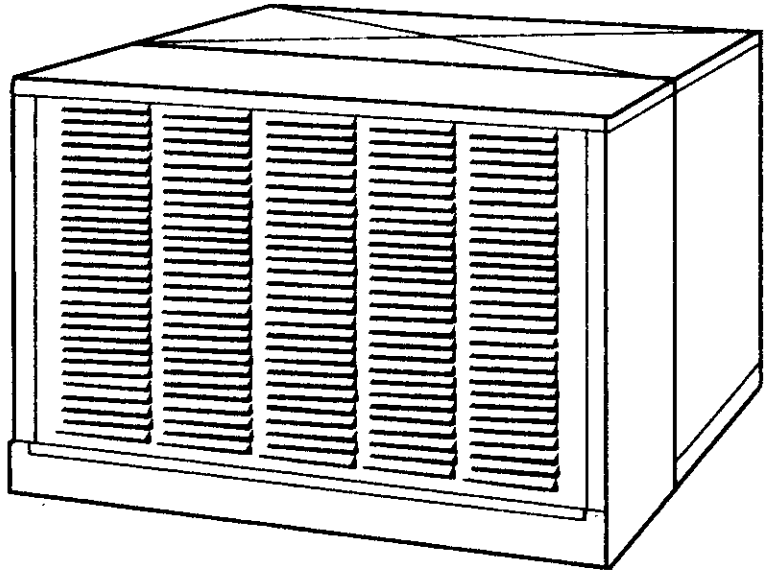
INSTALLATION
USE AND CARE
PARTS REPLACEMENT

Evaporative cooling works on the principle of heat absorption by moisture evaporation.

Your evaporative cooler draws outside air into specially made pads soaked with water, where the air is cooled by evaporation, then circulated into your home.

Your MasterCool evaporative cooler has been designed to provide more efficient, consistent cooling through use of a long-life MasterCool pad. It is a cellulose fiber treated with stiffening and wetting agents to provide the most reliable evaporative pad ever devised.

Your cooler has two modules – wet and dry – which may be separated for service and cleaning, and incorporates the most reliable components for long, trouble-free life.



MODELS:
MC43/44B
HC43/44A
MC63/64B
HC63/64A

REQUIRED: A special MasterCool motor kit is necessary for installation.

NOTE! READ AND SAVE THIS MANUAL – "IMPORTANT SAFETY INSTRUCTIONS"

Model Number _____
Serial Number _____
The model and serial numbers for your unit are located on the data plate attached to your cooler. Record this information in the space allotted above.

This product covered by City of Los Angeles Research Reports RR930224 (for all single phase applications), or RR930190 (for 3 phase applications) Electrical, and RR8141 Mechanical. Copies of these reports are available from the manufacturer upon request.

Installation and Start-Up

Read carefully before installing your MasterCool evaporative cooler.

To install the unit the following tools are needed:

- 5/32" hex key allen wrench
- Channel locks
- Pliers
- Adjustable wrenches
- Tubing cutter
- Screwdrivers
- Hammer
- 1/4" Socket wrench
- 7/16" Socket wrench

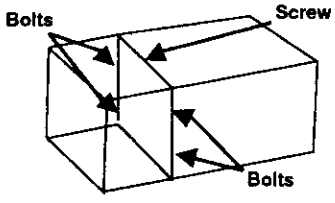
Before attempting to install the cooler, make sure the following preparations have been made:

- Assure that the mounting 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. The operating weight for MC units is 250 pounds, and for HC units is 295 pounds.
- Make sure you have adequate means for lifting the cooler in place.
- Make sure the mounting surface is level in all directions.
- Make sure any ductwork and electrical needs comply with local, state, county, and federal codes.

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

Mounting

The blower module and the media module can be separated before mounting by removing four bolts and one shipping screw -see drawing below.



Placement and Securing

The duct opening for the 63/64 units should be about 20" x 20". The cooler discharge opening for these models is 19-3/4 x 19-3/4". For the 43/44 units the duct opening should be about 18" x 18". The cooler discharge opening for these models is 17-3/4" x 17-3/4".

If the cooler is to be mounted on the roof, construct a suitable roof stand to support the **entire** weight of the cooler. (The roof jack or ducting should **NOT** be used to support any weight of the unit). For models MC63 or MC64 our #785 leg kit, sold separately as an accessory, will adequately support the unit and secure it to the roof. For High-Performance models HC43, HC44, HC63 and HC64 we recommend that a full stand be constructed in such a manner as to support the entire perimeter of the cooler. A leg kit only may not provide adequate support for these models due to their increased size and weight.

Place the cooler over the roof jack and position so that it is level. Carefully seal the space between the roof jack and bottom of cooler with caulking compound, silicone, asphalt or industrial sealing tape to prevent air leakage. Then carefully seal the roof jack to roof with asphalt or caulking compound to prevent air leakage from cooler or rain water from leaking into roof. (See Figure 1). There should be 24 inches clearance on all sides of the cooler for maintenance.

For maximum cooling performance and even water distribution, the cooler must be level. The base of the cooler at the drain fitting should have at least 4" clearance to allow drain installation.

Electrical Connections

For the convenience of thermostat control, we recommend installing a MasterStat™ Universal Cooler Control Kit, Model CC1000A. Complete installation instructions are furnished with the CC1000A Kit. For electrical connections to a rotary wall switch, use the following instructions:

Locate the junction box installed in the dry module. Junction box is to be installed with the **receptacle facing away from the pad**. Make certain all electrical cords are clear of the belt, water, pulleys and blower wheel. Note that there are two plug-ins, one for the motor and one for the pump. The building power supply must be connected to this junction box to provide power to the motor and pump. The wiring diagram in Figure 1 shows how the junction box receptacle should be connected to the power supply. Make sure contro switch and circuit breaker are in the **OFF** position. Low voltage electrical supply (below 105 V) may cause insufficient water supply to pad.

Caution: Turn off all electrical power to the cooler before attempting to install, open, or service your cooler.

Grounding

Install a ground wire to suitable ground according to local codes.

Install Motor

NOTE: A special MasterCool motor kit is necessary for installation due to the custom designed receptacle in the junction box.

1. Adjust motor cradle spacing.
2. Place motor in cradle (see Figure 2).
3. Place straps over each end, connect to cradle and tighten.
4. Align sheave (motor pulley) with blower pulley by moving sheave in and out on motor shaft until visual alignment is achieved. Tighten alignment set screw to 125 in-lbs. Do not adjust to the point where the motor sheave comes in contact with the motor face plate (see Figure 2). Belt tension should be adjusted so the belt will deflect 1/2 to 3/4 inch at the center of the span per Figure 3. Re-adjust belt tension after any pulley adjustment. Replace worn or damaged belts.

Figure 2

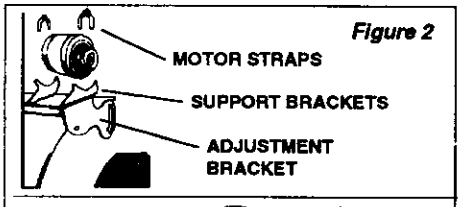


Figure 3

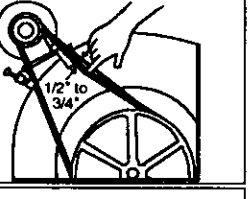
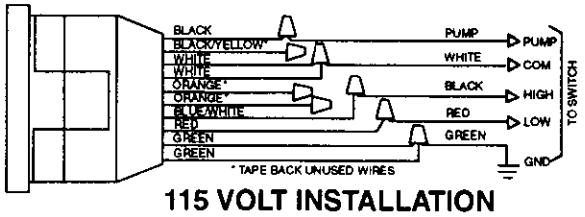
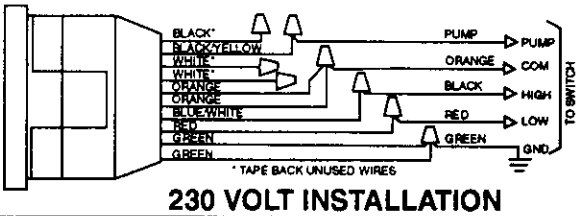


Figure 1



115 VOLT INSTALLATION



230 VOLT INSTALLATION

Caution: Disconnect all electrical power to the cooler and insure that belt is not rotating before adjusting belt tension. Do not adjust belt tension by changing diameter of adjustable sheave. Adjust belt tension only by adjusting motor bracket.

Rotate blower wheel by hand to see that it moves freely without rubbing against housing.

Check motor mounting to be sure all screws and nuts are tightened down.

If cooler is connected to ductwork, air delivery and motor amperage will be decreased due to increased duct resistance. To compensate for this, the motor pulley is adjusted out or in, using an ammeter to check motor amperage. For maximum air flow check motor amperage with all service panels in place. To prevent overloading of the motor, check amperage with all windows and doors open and all relief systems operating. Tighten pulley set screw to 125 in-lbs.

A qualified serviceman is required to adjust motor before start-up.

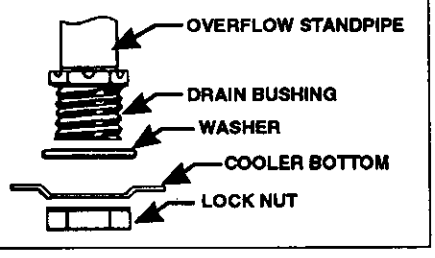
Caution: Do not exceed maximum amperage output as stamped on the motor specification plate or motor can overload. Only qualified persons with proper electrical equipment and knowledge should adjust variable pitch sheaves. Do not allow water to get on the motor, as it will burn out the windings.

Note on multi-speed switches: A switch with separate terminals for the pump is recommended.

Install Overflow Standpipe and Drain Line

Install overflow drain bushing in bottom wet section on the right side. Screw plastic overflow standpipe into the drain bushing and tighten snugly. Slide rubber washer over drain bushing, push through bottom of cooler, and tighten nut. Connect a permanent drain (copper/pvc/garden hose) to the drain bushing for draining the unit and overflow protection. Drain should be in accordance with local plumbing codes.

Figure 4



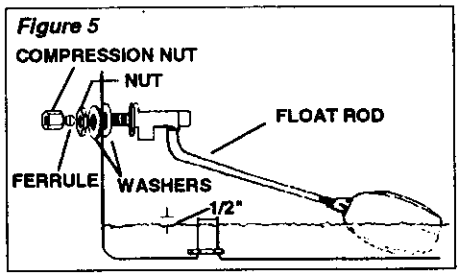
Connect Water Supply

Connect water line to cooler as follows:

- A water valve should be installed at a convenient location, to allow the water supply to be turned on and off. 1/4" tubing is used to provide water to the cooler. A water connector kit, available from your dealer provides the necessary items.
- Install float valve in the side panel of the wet section opposite the pump.
- Place tube nut and ferrule over end of tubing.
- Insert tube into float valve, and tighten to secure.

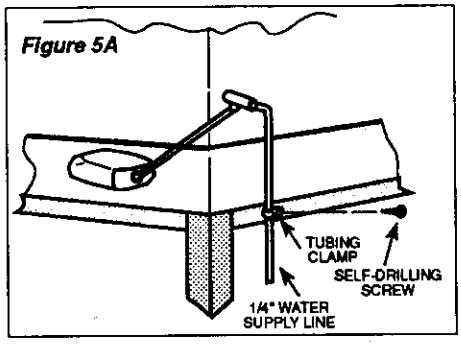
NOTE: Soft water equipment should not be attached to any water lines going to a cooler. "Soft Water" will cause corrosion and decrease effective life of cooler.

Figure 5



Fasten 1/4 inch water supply line to cooler stand using tubing clamp and self-drilling screw. Locate tubing clamp 18 inches or less from water supply line entry into cabinet. (See Figure 5A)

Figure 5A



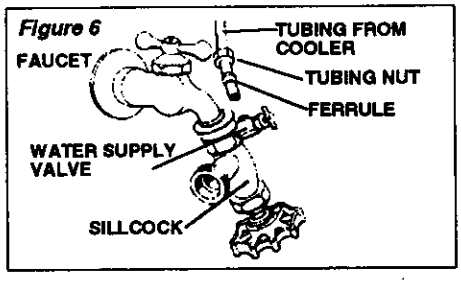
Faucet Use

Connect water line to water supply, as follows (refer to Figure 6).

- Install a sillcock and water valve on faucet, as shown. Place tubing nut and ferrule on tube end and insert in valve. Tighten nuts on valve and tube.

If faucet is not to be used for water supply, install valve on water line to be used. Follow instructions above for securing tubing to valve.

Figure 6



Adjusting Water Level and Float Valve

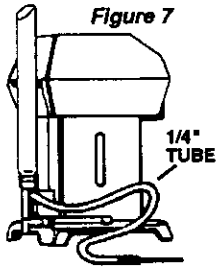
Fill reservoir as follows:

- Turn water supply on. Check for good pressure and flow from float valve.
- When float valve shuts off, check water level. **Water level should be from 1/2 to 1 inch below top edge of overflow standpipe.** It may be necessary to adjust float valve by bending the rod (refer to Figure 5).
- Check reservoir and all connections for leaks.

Install Bleed-Off

A bleed-off system is provided with your MasterCool cooler. We recommend the bleed-off be installed and maintained while operating this unit. Its purpose is to eliminate a small quantity of water from recirculation thus reducing scale build-up.

Figure 7



Install bleed-off as follows:

- Install 1/4" black plastic tubing into pump as shown in Figure 7.
- Insert smaller black plastic tubing into 1/4" tubing as shown in Figure 7.

Adjust bleed-off by shortening small tube to get the proper bleed rate shown below. Disposal of bleed-off water should comply with local codes. Use of chemical additives or any water treatment other than bleed-off is not recommended for this cooler. Failure to use the bleed-off with MasterCool pad greatly increases the mineral deposits and reduces the expected life of the MasterCool pad, and could result in early replacement of pad at your expense.

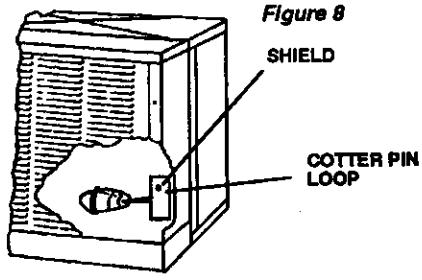
SECONDS TO FILL A 12 OZ. CAN

Model	Motor Hp	Seconds to fill
MC43/44	1/2	100
MC43/44	3/4	80
HC43/44	1/2	80
HC43/44	3/4	65
MC63/64	3/4	70
MC63/64	1.0	60
HC63/64	3/4	60
HC63/64	1.0	50

Install Float Shield

- Install shield over float valve as shown in Figure 8.
- Loop of cotter pin fits into hole in shield.
- Cotter pin loop and hole must face MasterCool pad.

Figure 8



Required Exhaust Openings

Using standard CFM ratings, a common method of determining how much to open doors or windows for proper exchange is: 2 square feet per 1000 CFM.

Pre-Start-Up Inspection

Assure that:

- Cooler mounting is level; duct is sealed.
- Cabinet is securely fastened to mounting.
- Cooler cabinet is grounded. Electrical connections are safe and secure.
- Motor, pump, and float installed. Motor and pump plugged into junction box.
- Pump impeller turns freely. Remove pump and basket. Remove impeller cover (see Figure10 and spin the impeller to assure free rotation).
- Water line connected securely without leaks. Water supply turned on.
- Float adjusted for proper water level.
- Blower, shaft, collar, and pulley set bolts are snug (do not overtighten pulley bolt).
- Pulley alignment okay; belt tension okay (see page 3 for instructions).
- Blower bearings are lubricated. Fill oil cup with a good grade SAE 20W or 30W oil.
- Pad is pre-soaked. Check to see that pump starts and pad is evenly wet.
- Open windows or vents in house.
- In case of trouble in any of these stages, refer to the Troubleshooting Chart on page 7.

Caution: Never operate unit with service panels, pad or inlet filter removed. This will result in an overloaded condition and may damage the blower motor.

Periodic Inspection

In addition to the planned maintenance schedule, regular inspection of your MasterCool cooler will enhance the chance for long trouble-free service life.

Checklist

- ☐ Check for leaks
- ☐ Is cooler level?
- ☐ Are there dry spots on the pad when cooler is in operation?
- ☐ Does blower turn freely?
- ☐ Is there 25 lbs. tension (models 63/64) 20 lbs. tension (models 43/44) on drive belt?
- ☐ Are bolts, nuts, and set screws snug?
- ☐ Is float set correctly?
- ☐ Is water pan clean?

Cabinet Cleaning and Touch-up

The cabinet and all internal parts except blower and drives are furnished with a hard appliance-type Polybond® coating. This surface is highly resistant to scale and corrosion. A soft cloth, warm water, and a mild cleanser will bring all surfaces back to like new appearance. Avoid steel wool or sandpaper in normal cleaning of the cabinet.

Scratches and Bare Metal

In the unlikely event that scratches or bare metal areas occur, sand or rub the area with steel wool to prepare the finish. Paint with standard paint or touch-up paint available through your dealer.

Changing Pad

This should be done after 5 years or if passages are clogged.

NOTE: Hosing off inlet face of pad can unclog passages of dust, and minerals accumulated there. Light scrapings of the intake edges of the pad will not harm its openings and will remove more stubborn scale.

Caution: Avoid splashing water on blower motor.

- Remove wet section top.
- Remove water distributor assembly, disconnecting hose.
- Lift out used pad sections.
- Replace with new MasterCool pad only, available from your dealer. Aspen and other evaporative pads **WILL NOT WORK.**

Maintenance Schedule

Regular maintenance is a key to long successful service of your MasterCool cooler. The service schedule will help you maintain an efficient unit with good appearance.

MAINTENANCE REQUIREMENTS (LOCATION IN MANUAL)	ANNUAL START-UP	ANNUAL SHUT DOWN
Changing pad (p. 5)	At beginning of 6th year or if passages are blocked.	
Cleaning & touch-up (p. 5)		X
Cleaning water pump (p. 6)	X	
Lubrication (p. 6)	X	
Adjusting belt tension (p. 6)	X	As needed
Periodic inspection (p. 5)	During cooling season	During cooling season
Snugging down set screws & nuts (p. 6)	X	
Adjusting bleed-off (p. 4)	X	
Washing down pad with hose (p. 6)		X
Drain all water lines to and from the cooler to prevent freezing		X

NOTES:

DO NOT UNDERCOAT THE WATER RESERVOIR.

Your MasterCool II cooler's water reservoir is finished with a Polybond® appliance type finish. It is so hard, asphalt type cooler undercoat will not stick to it. Undercoat will break free and clog pump and water distributor.

Do not use cooler cleaners, cooler treatments, or other additives in this evaporative cooler. The use of any of these products will void your warranty and may impair the life of your evaporative cooler.

Adjust Belt Tension

Each time you inspect your cooler, be sure to check belt tension on motor/blower assembly. Check belt condition and replace it if frays or defects appear. Check alignment of blower pulley with motor pulley.

Lubrication

Blower shaft bearings need periodic lubrication. The oil cups on the blower shaft bearings should be filled with a good grade SAE 20W or 30W oil when necessary. Under normal use, oiling is required every three months of operation. **DO NOT OVER OIL.** The pump and blower motor do not require lubrication.

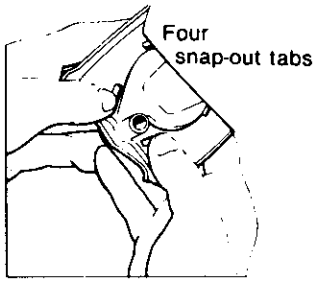


Figure 9

Cleaning Water Pump

Disassemble and clean water pump as follows:

- Disconnect pump from electrical box.
- Remove pump
- To prevent breakage, carefully release the four snap-out tabs, and lift impeller base plate from the pump body.
- Using a mild detergent solution, wash all deposits from inside around impeller and impeller base plate.
- Spin impeller to dislodge any foreign material.
- Rinse and reinstall impeller base.
- Reinstall pump.
- Make sure to use a pump screen or basket. Check to see if old one needs replacing due to clogging

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

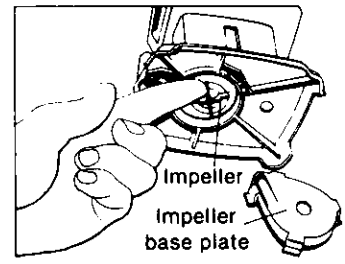


Figure 10

Snugging Down Set Screws and Nuts

Location of set screws and hardware that should be snugged down.

- Pulley set screw (150 in-lbs)
- Blower set screws (150 in-lbs)
- Wet and dry module connection bolts

Washing Pad

Annually, mineral accumulation and dust should be washed off the intake surface of the pad. Use garden hose and nozzle. A paint scrapper may be used to remove hardened scale from edges of intake passages in pad.

Parts Replacement

Motor

Removing old motor

- Disconnect power to cooler
- Unplug from junction box–4 pin plug
- Loosen alignment set screw on motor pulley (on motor side of pulley) and remove belt and motor pulley.
- Remove motor straps.
- Pull motor from brackets.

Replacing motor

- Reverse procedure to install new motor.

Pump

Removing old pump

- Disconnect power to cooler.
- Unplug from junction box (3 pin plug).
- Unscrew pump bracket.
- Lift out pump.

Replacing pump

- Remove impeller base plate at bottom of pump by releasing four tabs.
- Spin impeller to assure free rotation.
- Reinstall impeller base plate.
- Clean old pump basket or replace.
- Place pump in basket.
- Attach bracket to cabinet.
- Connect pump plug to junction box (3 pin receptacle).
- Connect pump hose to hose fitting.

Bleed-off

Removal of old bleed-off

- Replace bleed line if necessary.

Installation of bleed-off assembly

- To install bleed line to pump see Figure 7.
- Bleed line should fill a 12 ounce beverage can as indicated in chart on page 4.
- Adjust bleed rate by shortening small bleed tube.

Float

Removing old float

- Remove float shield
- Remove nut and ferrule from water line.
- Remove lock washer and nut from valve.
- Lift float out of cabinet.

Replacing or installing float valves:

- Secure nut and lock washer holding float to cabinet.
- Place tube nut and ferrule over end of tubing.
- Insert tube into float valve and tighten to secure.
- Turn on faucet allowing water to enter through valve.
- Fill from 1/2 to 1 inch below top edge of overflow standpipe.
- Adjust float ball by bending the float arm with a pair of pliers to achieve correct angle.
- Reinstall float shield.

Troubleshooting

Symptom	Possible Causes	Remedy
Unit fails to start or deliver air	No electrical power to unit	Check power
	• Fuse blown	• Replace fuse*
	• Circuit breaker tripped	• Reset breaker* *If condition persists, call electrician
	• Cord(s) damaged or unplugged	• Plug in cord or replace if damaged
	• Belt too loose or too tight	• Adjust belt tension
	• Motor overheated and frozen	• Replace motor
	• Belt too tight or broken	• Adjust belt tension or replace
	• Blower wheel bearings dry	• Lubricate blower bearings
	• Motor overloaded	• Using ammeter, adjust motor to full load amps (see motor nameplate).
	• Faulty wiring or shorts	• Call electrician
Unit starts but air delivery inadequate	Lack of sufficient air exhaust	Open windows or doors to increase ventilation
	Motor underloaded	Using ammeter, adjust motor to full amps (see motor nameplate)
	Belt too loose	Adjust belt tension or replace if needed
	MasterCool pad plugged	Rinse or replace pad
Inadequate cooling	Inadequate exhaust in house.	Open windows or door to increase ventilation.
	Air registers improperly positioned.	Adjust to direct air as desired.
	Insufficient water flow to pad, pad not wet.	Check water distribution system
	• Pad plugged	• Rinse or replace pad
	• Distribution holes clogged	• Clear holes
	• Pump not working	• Unplug pump. Clean impeller housing of all foreign matter
	• Loose connection in water system	• Check for leaks and correct
	• Insufficient bleed-off water	• Reset or replace bleed-off kit
	• Pump basket clogged	• Clean basket
Motor cycles on and off	Excessive belt tension	Adjust belt tension
	• Blower shaft tight or frozen	• Lubricate blower bearings and rotate shaft by hand (power off)
	Motor overloaded	Correct–do not exceed name plate amps.
	Incorrect sheave adjustment	Serviceman should adjust
	Pulleys misaligned	Check alignment
	Service panels, pad or inlet filter removed	Never operate unit with service panels, pad or inlet filter removed. This will result in an overloaded condition and may damage motor.
Water draining from overflow standpipe	• Float arm improperly adjusted	• Adjust float
	• Seat in float valve leaking	• Replace float valve
	• Standpipe not tight	• Tighten standpipe
Knocking or banging sound	Bearings dry	Lubricate blower bearings
	• Wheel rubbing blower housing or rotating off balance	• Inspect blower shaft, collars, belt and pulley alignment and motor mounting
	• Loose parts	• Re-secure or re-connect
Blower shakes or rattles	Belt or pulley loose	Inspect belt and adjust if needed. Adjust belt or replace pulley.
Excessive humidity in house	Inadequate exhaust	Open doors or windows to increase ventilation.
Musty or unpleasant odor	Stale or stagnant water in reservoir	Drain, flush and clean reservoir
	• Pad mildewed or clogged	• Check bleed-off setting
	• Pad not completely wet before cooler is turned on	Dry pad and bottom pan
	• New pad	• Turn on water before starting unit
		• NOTE: There will be a slight odor noticed on initial start-up. The odor will disappear within the first few days of operation if bleed-off is used.

Getting the most from your cooler

Your evaporative cooler is a finely crafted, economically operating unit built on decades of know-how and research. It serves as the heart of an overall air cooling and moving system for your home. But there are a number of ways you can maximize the comfort, efficiency, economy and convenience of your total cooling system.

Maintenance

Regular maintenance as recommended in this manual, is essential for cooling comfort, extending the life of your cooler, and avoiding unnecessary parts replacements. Start-up and shutdown servicing should never be overlooked.

Add-On Coolers

Coolers come in a wide array of sizes, horsepower, and capacities, suitable for patio, garage, guestroom, and so forth, More than one cooler in a single home improves the cooling effectiveness of the system. Owners of refrigerated air conditioning have found that the addition of an evaporative cooler vastly reduces their electric bills.

Insulation

Once your cooler forces cooled air into your home and pushes the hot air out, good insulation around your ductwork will keep the air as cool as possible. Whole-house insulation will prevent heat from seeping in and will also improve cooling comfort.

Multi-Speed Motor

The cooling rate can be controlled by increasing and reducing the amount of cooled air blown into your home. Two-speed motors allow you to use higher speeds during the hottest part of the day, lower speeds for milder temperatures.

Attic Vents

By exhausting cool air through the attic, you can reduce the temperature of this hotspot and make your home more comfortable.

Thermostat Control

The addition of automatic control makes your system convenient and efficient. We recommend the MasterStat™, Model CC1000A, Universal Evaporative Cooler Thermostat and Control Kit.

AdobeAir, Inc. *• 500 S. 15th Street • Phoenix, AZ 85034*

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