



Pro-Kool® 42" Evaporative Cooler USER'S MANUAL



SCHAEFER
Ventilation Equipment

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WHY USE EVAPORATIVE COOLERS IN YOUR WORKPLACE

- The Pro-Kool® evaporative cooler requires little space, has a low initial cost, is inexpensive and simple to operate and requires minimal scheduled maintenance.
- Due to the design and construction of the cooling pads, cooling efficiency is normally maintained near optimum throughout the life of the pads (approximately two seasons).
- In many cases, evaporative coolers are a better solution than mechanical refrigeration systems because they are more economical to operate and maintain and do not use environmentally sensitive and costly refrigerants.

HOW EVAPORATIVE COOLING WORKS

Evaporative cooling is the same process your body uses to cool itself. When you perspire, and air moves across your skin, a portion of the perspiration (water) evaporates. Evaporation requires heat to change liquid water to water vapor and this heat is taken from your skin, producing the cooling effect.

In an evaporative cooler, the cellulose cooling pads take the place of your skin, water instead of perspiration wets them and a fan moves the air. The air blows across the cooling pads and evaporates moisture. Heat is drawn from the pads and the air, dropping the air temperature and producing the cooling effect. The cooled air is then forced through a building or space and displaces the warm air out building openings, cooling the surroundings. In addition, air velocity increases the cooling effect as it moves over the skin of people in the airflow path.

Pro-Kool® evaporative coolers are portable and use the latest technology to provide large volumes of cool air, efficiently and inexpensively for cooling small to medium size areas. Simply adding more units can accommodate larger areas. With proper sizing and application, a Pro-Kool® evaporative cooler can lower the effective air temperature by up to 20°. Even in high humidity, the efficiency of the Pro-Kool® evaporative cooler provides effective cooling.

About this Manual

The intent of this manual is to help you in two ways: to provide you with step-by-step instructions for quick and easy assembly of your product and to serve as a reference for simple maintenance and questions regarding your product.

Read ALL instructions carefully before starting your Pro-Kool®.

Optional equipment contains necessary instructions for assembly or operation.

Pay particular attention to all SAFETY information.

All information, illustrations and specifications in this manual are based on the latest product information available at the time of printing. Product specifications subject to change. We reserve the right to make changes at any time without notice.

Safety Information

Warning and Danger Decals have been placed on the equipment to warn of potentially dangerous situations. Care should be taken to keep this information intact and easy to read at all times. Replace missing or damaged safety decals immediately.

Using the equipment for purposes other than specified in this manual may cause personal injury and/or damage to the equipment.



Safety Alert Symbol

This is a safety alert symbol. When you see this symbol on your equipment, be alert to the potential for personal injury. This equipment is designed to be installed and operated as safely as possible... however, hazards do exist.

Signal words are used in conjunction with the safety-alert symbol to identify the severity of the warning.

CAUTION indicates an imminently hazardous situation, which, if not avoided, COULD cause damage to your equipment or equipment failure.

WARNING indicates a potentially hazardous situation, which, if not avoided, COULD result in death or serious injury.

Follow Safety Instructions

Carefully read all safety messages in this manual and on your equipment safety decals. Follow recommended precautions and safe operating practices.

Keep safety decals in good condition. Replace missing or damaged safety decals.

Decal Descriptions

This diagram shows the proper location of the safety decals as shipped from the factory. Replace damaged or missing decals. Make sure the decals are easy to see at all times.



CAUTION
KEEP FINGERS
AWAY FROM
BLADE

CAUTION
**DO NOT MOVE FAN
WHEN IN OPERATION**
**ALWAYS UNPLUG FAN
BEFORE MOVING**

PLEASE NOTE

- Minimum inlet pressure is 10 PSI.
- Maximum inlet pressure is 100 PSI.
- Never leave unit unattended while in operation.

Safety Recommendations

READ AND SAVE THESE INSTRUCTIONS!

- This is an electric device with moving components. There is the possibility of fire, electric shock, or injury to persons. Ensure all the safety recommendations are adhered to in order to minimize this risk.
- Disconnect all power and unplug the unit before you inspect, clean or perform maintenance on the components of the unit.
- Never reach into the unit when it is running; you could become entrapped by the V-belt or injured by the rotating fan blades.
- The frame edges may be sharp; do not run your hand along them. Be careful and wear gloves when you reach under the frame to inspect the PVC pipes and mesh socks.
- A GFCI (Ground Fault Circuit Interrupter) is recommended for use with this product.
- If pads and grates are removed for servicing, they must be replaced prior to operating unit.

Specifications

- **Length x Width x Height:** 51" x 33" x 68"
- **Shipping Weight:** 300 pounds
- **Fan Motor:** 1 Hp, 115 volt, 2-speed, 60 Hz. (also available in 230V and 50/60 Hz), 12.4 amps, 12,480 CFM
- **Pump** - Little Giant 115 volt, 60 Hz, submersible, 1200 GPH
- **Reservoir Capacity:** 38 Gallons
- **Optional Water Supply** - Standard 3/4" hose connection (garden hose size)
- **Housing** - High impact poly w/UV protection
- **Evaporation Media** - Chemically treated cellulose paper to resist deterioration - 8" thick pads

Description

The Pro-Kool® evaporative cooler is a completely self-contained, portable unit capable of delivering 15 MPH velocity of air with a temperature drop of up to 20°. The unit is composed of:

- Level-controlled water supply system
- Cooling pad assembly
- Motor-driven fan
- Frame and housing

The bottom is made of high impact poly and holds approximately 40 gallons at normal operating level (about 6" deep).

A float-operated valve automatically maintains proper water level when the unit is connected to a water supply.

The bottom rests on, and is fixed to, a rugged steel support frame. Four casters (2 locking, 2 regular) are attached to the underside of the steel frame.

A pump draws water from the bottom and discharges it through the vinyl hose to the PVC pipes located above the cooling pads. The PVC pipes distribute water onto the top of the cooling pads; saturating them. Excess water drips back into the bottom through the holes in the cooling pad support channels.

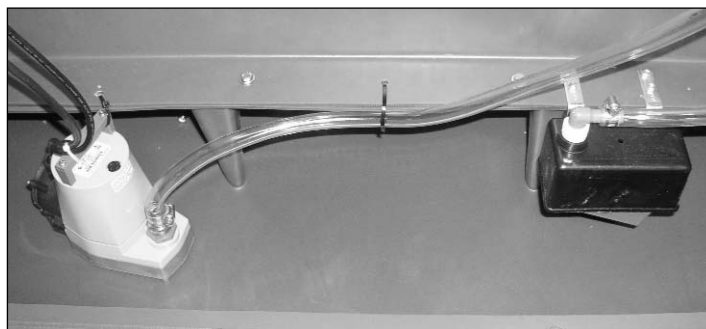
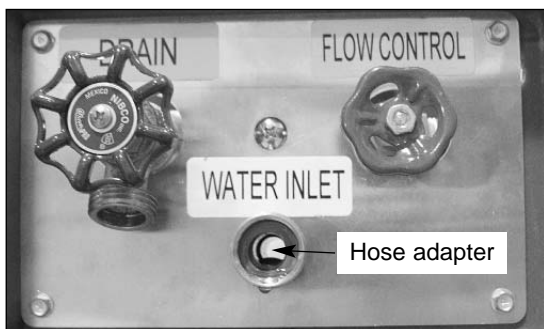
The cellulose cooling pads sit in support channels and are held in place by the tray and pad support plate.

The fan is powered by a belt drive 1hp electric motor. The fan draws room air through the cooling pads where it picks up moisture and cools by evaporation. The fan blade then discharges the cooled air.

It is important the cooled space has sufficient air openings so the warmer air can flow out and be replaced by the cooled air. A closed-in space or high humidity will reduce the cooling effect. See UNIT PLACEMENT AND OTHER CONSIDERATIONS in the Operation and Maintenance section of this manual.

Water weighs about eight pounds per gallon, so when the unit is full, it weighs over 500 pounds. During setup and before startup, place the unit in the desired location and then fill the bottom. Do not attempt to lift the unit once it is filled and be careful to avoid spills when moving it; even over smooth ground. Do not try to push it over rough or soft ground as you can overstress the wheels and frame and cause structural and component damage, which is not covered by warranty.

Water Supply System



The water can be supplied continuously with an ordinary garden hose by attaching it to the supplied hose adapter to the fill connection, or it can be filled manually.

With a continuous water supply connected, the float valve in the bottom rises and falls with the water level. A linkage attaches the float to the shutoff valve in the fill connection. As the water level rises to normal operating level (about 5" deep), the float valve shuts off the water supply. When the water level drops, the float valve opens to maintain a normal operating level.

After unplugging the unit, the bottom can also be manually filled with a hose or bucket; if a hose connection is impractical. Simply remove any of the pad sections and place the hose, or pour the water, directly into the bottom. When you fill the bottom manually it can be filled to a higher level, but make sure someone monitors the filling operation to avoid overfilling and flooding.

Water damage due to overfilling is not covered by the warranty.

When you run the unit and manually fill it, check the water level frequently so it does not run dry. Operating the pump without water will damage it or reduce its service life. This is not covered by the warranty. The cooling effect also stops if the pads are dry.

Pads must be replaced before operating unit.

A drain in the bottom allows you to drain the unit for cleaning and maintenance. A drain cap on the underside covers the drain during operation. Make sure the cap is in place before filling.

The pump is attached to the fan housing. Plastic ties hold the pump in its proper position.

The pump can be easily removed and replaced. A small plastic screen covers the pump inlet to prevent foreign matter from entering and damaging the pump impeller.

A dirty water supply will quickly reduce the unit's performance and the unit will require more frequent cleaning to maintain cooling effectiveness. Always try to use a filtered, treated water supply.



A clear vinyl hose connects the pump to the valve. From the valve, a T connector supplies two lines that run along the top of the pads and up to supply the PVC pipe with water. Each piece of vinyl hose connects to a PVC pipe, which run horizontally along the top of the inlet above the cooling pads.

The PVC pipes have a series of holes that run the full length of the pipe. The holes direct the water inward at a 90° angle against a deflector plate to continuously saturate the cooling pads from the top down. Excess water drains back to the bottom through drainage holes in the bottom support channels which support the cooling pads.

Water cleanliness has a major effect on the cooler's performance. Use a clean water supply and consider a water softener if your water is hard. Dissolved solids in hard water deposit on the cooling pad surfaces and reduce the airflow through the unit and therefore the amount of evaporation.

Control

The Pro-Kool® PROK142-2 control switch is mounted on the front of the unit in the upper right corner. It has the following positions:

OFF - Power is off to the blower motor and the pump motor.

LOW VENT - The fan runs at low speed and the pump is off.

HIGH VENT - The fan runs at high speed and the pump is off. Use this setting to quickly dry the cooling pads for removal and cleaning.

LOW COOL - The fan runs at low speed and the pump is on. Use this setting for low cooling loads.

HIGH COOL - The blower runs at high speed and the pump is on. Use this setting for maximum cooling.

PUMP ONLY - Pump is on and the fan is off. Use this setting to drain unit only.



Pro-Kool® Control Switch

Cooling Pad Assembly

The cooling pads are critical for proper, efficient cooler operation. They are made of laminated cellulose (paper) fibers and arranged to give a large surface area for evaporation and to provide a rigid structure. The shape of the cells allows high velocity airflow through the pad at a minimum pressure drop. At the same time, the air passages between the cells force the incoming air to impinge on the wet cell surfaces and maximize evaporation.

The Pro-Kool® evaporative cooler also acts as an air filter and removes dust and other particles from the air. This dirt collects on the cooling pads and lowers cooler efficiency. The pads should be cleaned at least weekly and more frequently in dusty conditions. See REGULAR CLEANING under Operation and Maintenance.

The pump supplies a continuous flow of water over the pads causing a "sheet flow" which constantly replaces the water lost to evaporation and keeps the pads saturated.

One cubic foot of the cooling pad material holds about a gallon of water during operation. One cubic meter holds about 100 liters of water.

The cooling pads are relatively strong but are subject to crushing, especially when wet. Handle them carefully when you clean them. Crushed cells reduce the total airflow through the unit and therefore lowers its cooling capacity.

The cooling pad sections (four total) sit in plastic tray at the back and bottom of the unit. The tray holds the cooling pads in position and form a back to completely enclose the unit.

Do not remove or handle the cooling pads when they are wet, as they damage easily. Run the fan without the pump until pads are dry. With normal care, the pads should last at least two seasons. Abuse or mishandling will reduce their effectiveness and shorten their life.

Operation and Maintenance

UNIT PLACEMENT AND OTHER CONSIDERATIONS

The Pro-Kool® unit(s) should be placed at one end of the building and an appropriate exhaust fan should be at the opposite end to pull the cool air from the Pro-Kool® unit and discharge the warm air out of the building.

Try to get all the air flowing in the same direction. Do not direct other fans against the Pro-Kool® unit. It will counter the Pro-Kool®'s airflow and stop the cooling effect.

Obstructing the airflow from the Pro-Kool® unit severely reduces the cooling effect.

Avoid using ceiling fans as they disrupt the airflow from the Pro-Kool® unit.

Use as many exhaust fans as possible to create a natural draft through the building. This will enhance the Pro-Kool®'s performance.

UNPACKING AND INITIAL SETUP

The Pro-Kool® 1HP Evaporative Cooler is shipped upright on a pallet. The Pro-Kool® is fully assembled and ready for service except for thoroughly cleaning manufacturing dust from the cooling pads before running it for the first time.



CAUTION Be careful when you move the unit. Avoid jarring or dropping the unit to prevent damage to the bottom.

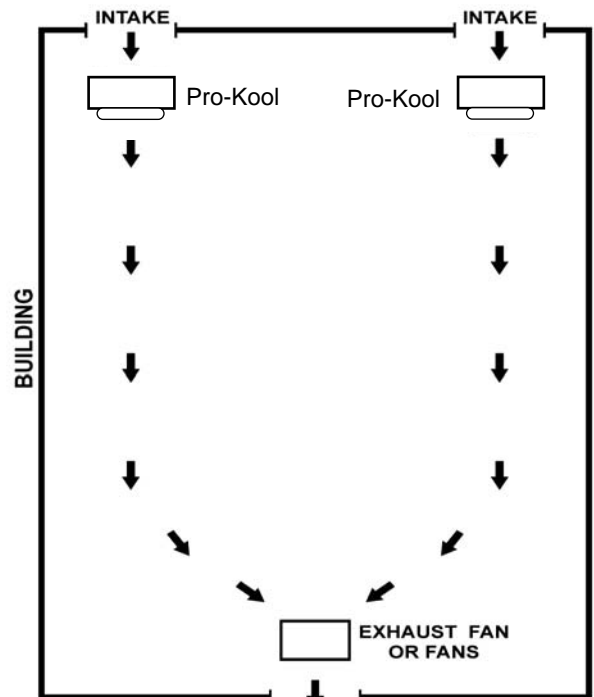
1. Cut the straps that wrap the unit.
2. Remove the shrink wrap.
3. Ensure the switch is OFF and the unit remains unplugged.
4. Remove the pad support plate from the back of the unit by removing all the set screws.
5. Remove the cooling pads from the unit. Pull pad out and then lift out of drain rail. With one pad out, the rest can be easily removed in the same manner.
6. Inspect the entire unit for shipping damage.
7. Ensure the fan belt is attached to the motor and fan pulleys. To ensure it is correct, press your finger on the belt about halfway between each pulley. It should have about a half-inch of play. If it is too loose, the V-belt will slap around while running. If it is too tight, it will cause the pulley bearings to wear and fail prematurely.

If you notice any damage to your unit, contact your dealer immediately.

8. Thoroughly clean all four cooling pad sections using a garden hose.

Do not use cleaning fluids or other chemicals to clean the pads as they can cause foaming during operation. Use only clean water. Refer to page 9 for approved cleaners.

9. Remove the drain cap from the underside and rinse with a hose to flush any manufacturing dust, etc. from the unit.
10. Replace the drain cap.
11. Replace the pads.
12. Proceed to NORMAL SETUP.



Typical Pro-Kool® Unit Arrangement



Pro-Kool® assembly

REGULAR CLEANING

The frequency with which the Pro-Kool® is cleaned will depend on the environment in which it is used. The more dirty the environment the more often it will need cleaning. In most cases the Pro-Kool® will need to be cleaned weekly.



CAUTION The pads should be dry before you handle them, as they are stronger when dry than when they are wet and less susceptible to damage. If they are wet, run the unit in the HIGH VENT position until they are dry. After cleaning, let the pads air dry before you replace them.

1. Turn the switch to OFF and unplug the unit.
2. Check the pads for cleanliness. If they are dirty, remove and clean by spraying with a garden hose, water only. If they are not dirty you will still need to remove the cooling pads to clean the inside of the unit. Dirty cooling pads reduce the unit's effectiveness.
3. Use a garden hose to rinse out the bottom and the inside of the unit. The dirt that accumulates is removed from the air during operation, as the Pro-Kool® unit also acts as an air filter.
4. Remove the drain cap from the underside of the unit and let the unit drain completely. Rinse out any remaining dirt.
5. Replace the drain cap (finger tighten only).
6. Replace the cooling pads once they are dry.

With proper use and regular cleaning, the cooling pads will last about two seasons. If you handle them wet and are abusive, however, they will be easily damaged. Refer to page 15 for recommended conditioning and cleaning chemicals.

NORMAL STARTUP

Some splattering may occur until pads are conditioned (may take several uses).

1. Move the unit to the place where it will be run. Do not attempt to lift or move the unit once it is filled as damage to the unit or a large spill may occur.

When you decide where to place the unit, make sure there are no obstructions in the way that will disrupt or block the airflow. Make sure the unit is level at all times. Keep the unit at least three feet away from walls or other obstructions that will interfere with airflow into the unit.

2. Check to insure the drain cap is in place and secure.
3. Connect the garden hose to the brass hose adapter. Check that there is a washer in the hose connection's female end.
4. Open the water supply valve and check that water enters the bottom through the float valve by removing one cooling pad. Allow the unit to fill and check that the float valve completely shuts off the water.
5. If you are manually filling, remove one or more cooling pads and fill the bottom with a bucket or hose.
6. Visually monitor the filling operation to avoid overflowing and causing spill damage.
7. Plug the unit into an outlet.
8. Turn the switch to the low cool position, then to high cool if more air is desired.



CAUTION Do not run the pump without water in the bottom or you will damage the pump. Running the pump dry will void the warranty on the pump.

NORMAL SHUTDOWN

1. Turn the switch to the HIGH VENT position, and let the unit run until the cooling pads are dry. This will maximize the life of the pads.
 2. Turn the switch to the OFF position. Unplug the unit if you are going to clean the pads or inspect the components.
 3. Shut off the water supply.
 4. Drain the bottom if you are going to clean it or store it. It can be done two ways:
 - a) Remove drain cap from bottom of unit.
 - b) Attach garden hose to hose fitting labeled DRAIN. Place valve handle in the DRAIN position and put switch to PUMP ONLY.
- Monitor water level and shut pump off when unit is empty. DO NOT RUN PUMP DRY.**
5. If the unit will be stored for the season, insure the cooling pads are completely dry, and then remove them. Wrap them in plastic bags or store them in a clean place where they will not be damaged or get dirty. The unit should be cleaned thoroughly before storing.

Troubleshooting

COOLING PADS NOT WETTING

1. Make sure the unit has water.
2. Check to insure the control switch is in the proper position.
3. Make sure the pump is running.
4. ***Pump is running but no water:***
 - a. Ensure hose is connected.
 - b. Ensure the impeller on the inside of the pump turns freely.
5. ***Pump is not running:***
 - a. A certified electrician must check wiring from pump to pump selector switch.
 - b. If the wiring is correct, replace the pump.

FOAMING

Foaming is generally caused by a dirty water supply or contaminated water in the bottom.

1. If foaming occurs, stop the unit, drain it and flush the bottom and insides thoroughly with clean water.
2. Clean the pads and do not use any kind of chemical cleaners. Refer to the REGULAR CLEANING section for proper procedure for cleaning the pads.
3. Reassemble, refill and restart.

LINE CLOGS OR OBSTRUCTIONS (little or no water flow)

Depending on the cleanliness of the water and the amount of dirt, dust, etc. in the supply air, you may have to clean the PVC pipes from time to time. Your own experience will dictate the frequency.

1. Turn off the unit and unplug it.
2. Remove the pads.
3. Locate the two PVC pipes in the top housing. Each PVC pipe is secured to an elbow connector by a hose. Remove this clamp from both PVC pipes.
4. Grip the opposite end of each PVC pipe with pliers and gently twist it out of its Y connector.
5. Direct a jet of water at the series of outlet holes in the PVC pipes to blow them clear.
6. Direct the water nozzle into the end of each pipe and blow them clear. Inspect them for cleanliness and repeat if necessary.
7. Replace the PVC pipes taking care to ensure the water outlet holes are facing inwards at 90° towards deflector plate.

Be sure you push the PVC pipes fully onto the elbow, and attach hose clamps.

ODOR CONTROL

Ensure water source is of good quality and regular maintenance is being conducted. Pro-Kool® Water Conditioner is available from the manufacturer. See page 9.

LIME OR SCALE BUILDUP

Ensure water source is of good quality and regular maintenance is being conducted. Pro-Kool® Water Conditioner is available from the manufacturer. See page 9.

SPLATTERING IN FRONT

If more or less water is desired, adjust PVC ball valve (see page 13, item 22).

LEAKING FROM THE BOTTOM

Check for cracks in the reservoir. If a crack is found, repair it by using a Pro-Kool® Repair Kit or replace the entire bottom. Be sure the drain cap is installed and hand tightened (drain cap must have gasket inside).

Your Pro-Kool® Evaporative cooler can be purchased with certain options and/or accessories, and some of these can be retrofitted to your Pro-Kool® after the initial purchase. Instructions are included with all equipment purchased separately from your Pro-Kool®.

Options and accessories available at time of purchase or after purchase:

- Pneumatic Wheels
- Water Conditioner and Cleaner

PNEUMATIC WHEELS

Pneumatic wheels are available at the time of your Pro-Kool® purchase or as a retrofit kit on a previously purchased Pro-Kool®.

The pneumatic wheel options includes two locking and two non-locking wheels.

Pneumatic wheels are designed to allow for easy rolling on rough or uneven surfaces.



WATER CONDITIONER

Pro-Kool® Water Condition is recommended to control odors found to be present in some water sources.

- Place the tab under the float valve water outlet for fast, effective odor control.
- Place the tab next to the pump for longer lasting odor control.



CLEANER

Pro-Kool® Cleaner is recommended to remove scale buildup from the water supply system.

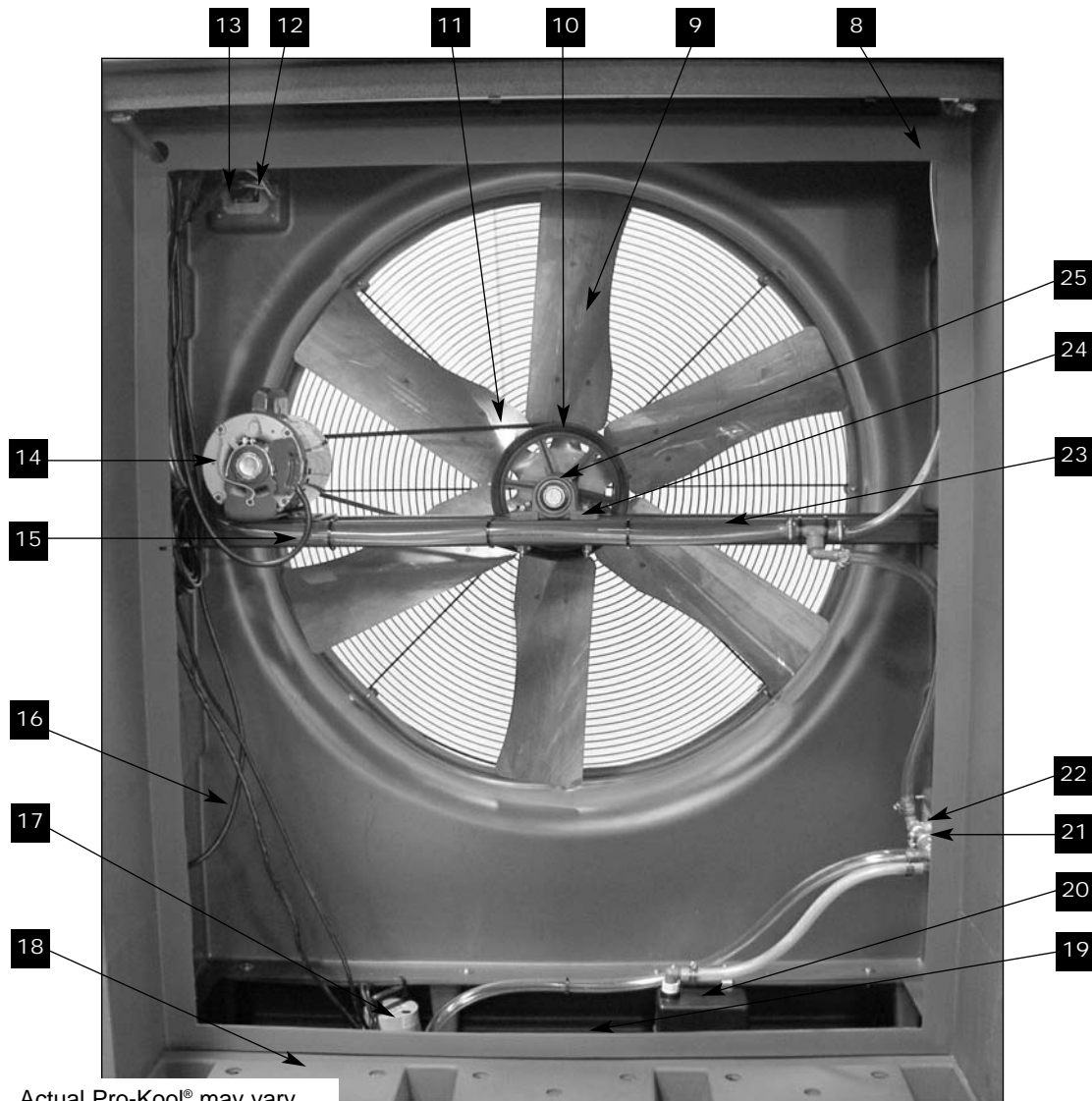
- Follow the instructions on page 9 to clean the unit. Refill with water and add one pint of Cooler Cleaner Treatment to the reservoir. Operate the Pro-Kool® in PUMP ONLY mode for approximately 20 minutes.
- Drain, clean and refill the Pro-Kool® with fresh water. Repeat steps if necessary. Repeat treatment when scale buildup becomes evident.



Parts List



<u>Item</u>	<u>Schaefer P/N</u>	<u>Description</u>
1	42PKTH	Top housing
2	42PKBH	Bottom housing
3	WC-CASTER5	5" caster
4	WC-CASTERLGLK	5" locking caster
5	42PKSF	Support frame
6	42PKFG	Front guard
7	WC-SWITCH	6-position switch



Actual Pro-Kool® may vary slightly from unit shown here.

Item	Schaefer P/N	Description
8	VH58ID	5/8" ID vinyl hose
9	SSFB-426	Stainless steel 42" 6-wing fan blade
10	AK-94C	9.25" diameter composite pulley
11	A55	55" V-belt
12	WC-SWITCHCORDLG	Switch to motor electrical pigtail
13	WC-PUMPCORD	Switch to pump electrical pigtail
14	WC-1HPMTR	1 HP 2-speed evap. cooler motor
15	WC-MTRCORD	Electrical motor cord
16	PK-PCB15	Black 15' power cord
17	PK-PUMP1200A	1200 GPH pump
18	42PKDR	Drain rail
19	PVCCAP112	1 1/2" drain cap (under unit)
20	DFV	Float valve
21	GV12	1/2" gate valve
22	BDV12	1/2" MPT drain valve
23	42PKMFMB	Motor/fan mounting bracket
24	PBBA205-16	Pillow block bearings
25	FS1X14	Fan shaft
26	PK-PVCP12X4512	1/2" PVC pipe
27	42PK-SDP	Spray deflector plate
28	42PKPAD	Evaporative cooling pad



Performance Chart



1 Hp, **High Speed** in gallons per hour @ 1000 feet above sea level with 70% Cooling Efficiency

		Temperature °F						
		70	75	80	85	90	95	100
% Relative Humidity	10	8	8.8	9.5	10.3	11.1	11.9	12.8
	20	6.9	7.6	8.2	8.9	9.5	10.2	10.9
	30	5.9	6.5	7	7.5	8	8.6	9.1
	40	5	5.4	5.8	6.2	6.7	7.1	7.5
	50	4.1	4.4	4.7	5.1	5.4	5.7	6.1
	60	3.2	3.4	3.7	3.9	4.2	4.5	4.7
	70	2.3	2.5	2.7	2.9	3.1	3.3	3.4
	80	1.5	1.6	1.8	1.9	2	2.1	2.2

1 Hp, **Low Speed** in gallons per hour @ 1000 feet above sea level with 70% Cooling Efficiency

		Temperature °F						
		70	75	80	85	90	95	100
% Relative Humidity	10	5	5.5	5.9	6.4	6.9	7.5	8
	20	4.3	4.7	5.1	5.5	5.9	6.4	6.8
	30	3.7	4	4.4	4.7	5	5.4	5.7
	40	3.1	3.4	3.6	3.9	4.2	4.4	4.7
	50	2.5	2.7	3	3.2	3.4	3.6	3.8
	60	2	2.1	2.3	2.5	2.6	2.8	3
	70	1.5	1.6	1.7	1.8	1.9	2	2.2
	80	1	1	1.1	1.2	1.2	1.3	1.4

* Evaporation of 1 Gallon of water removes 8092 BTU's of heat from the air.
12,000 BTU's equals one ton of air-conditioning.



Wet Bulb Temperature = Wet Bulb Temperature @ Current Relative Humidity
 Dry Bulb Temperature = Current Ambient Air Temperature
 Temperature Difference = Dry Bulb Temperature Minus Wet Bulb Temperature
 Temperature Drop = Temperature Difference Multiplied by 72%
 Output Temperature = Dry Bulb Temperature Minus Temperature Drop

TEMPERATURE OUTPUT CHARACTERISTICS - 40% - 75% RELATIVE HUMIDITY

40% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
58°F (15c)	85°F (29c)	27°F (14c)	19.4°F (10c)	66°F (19c)
62°F (17c)	90°F (32c)	28°F (15c)	20.2°F (11c)	70°F (21c)
66°F (19c)	95°F (35c)	29°F (16c)	20.9°F (11c)	74°F (23c)
73°F (23c)	100°F (38c)	27°F (15c)	19.4°F (11c)	81°F (27c)
76°F (25c)	105°F (40c)	29°F (15c)	20.9°F (11c)	84°F (29c)
82°F (28c)	110°F (43c)	28°F (15c)	20.2°F (11c)	90°F (32c)

45% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
61°F (16c)	85°F (29c)	24°F (13c)	17.3°F (9c)	68°F (20c)
65°F (18c)	90°F (32c)	25°F (14c)	18.0°F (10c)	72°F (22c)
70°F (21c)	95°F (35c)	25°F (14c)	18.0°F (10c)	77°F (25c)
75°F (24c)	100°F (38c)	25°F (14c)	18.0°F (10c)	82°F (28c)
80°F (27c)	105°F (40c)	25°F (14c)	18.0°F (10c)	87°F (31c)
85°F (29c)	110°F (43c)	25°F (14c)	18.0°F (10c)	92°F (33c)

50% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
53°F (12c)	75°F (24c)	22°F (12c)	15.8°F (8.64c)	59°F (15c)
60°F (16c)	80°F (27c)	20°F (11c)	14.4°F (7.92c)	66°F (19c)
63°F (17c)	85°F (29c)	22°F (12c)	15.8°F (8.64c)	69°F (21c)
69°F (21c)	90°F (32c)	21°F (11c)	15.1°F (7.92c)	75°F (24c)
73°F (23c)	95°F (35c)	22°F (12c)	15.8°F (8.64c)	79°F (26c)
78°F (26c)	100°F (38c)	22°F (12c)	15.8°F (8.64c)	84°F (29c)

55% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
58°F (14c)	75°F (24c)	17°F (10c)	12.2°F (7.2c)	63°F (17c)
61°F (16c)	80°F (27c)	19°F (11c)	13.7°F (7.92c)	66°F (19c)
67°F (19c)	85°F (29c)	18°F (10c)	13.0°F (7.2c)	72°F (22c)
71°F (22c)	90°F (32c)	19°F (10c)	13.7°F (7.2c)	76°F (24c)
76°F (24c)	95°F (35c)	19°F (11c)	13.7°F (7.92c)	81°F (27c)
81°F (27c)	100°F (38c)	19°F (11c)	13.7°F (7.92c)	86°F (30c)

Humidity Chart

60% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
60°F (16c)	75°F (24c)	15°F (8c)	10.8°F (5.76c)	64°F (18c)
65°F (18c)	80°F (27c)	15°F (9c)	10.8°F (6.48c)	69°F (21c)
70°F (21c)	85°F (29c)	15°F (8c)	10.8°F (5.76c)	74°F (23c)
75°F (24c)	90°F (32c)	15°F (8c)	10.8°F (5.76c)	79°F (26c)
78°F (26c)	95°F (35c)	17°F (9c)	12.2°F (6.48c)	83°F (28c)
84°F (29c)	100°F (38c)	26°F (9c)	11.5°F (6.48c)	88°F (31c)

65% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
62°F (17c)	75°F (24c)	13°F (7c)	9.4°F (5.04c)	66°F (19c)
67°F (19c)	80°F (27c)	13°F (8c)	9.4°F (5.76c)	71°F (22c)
72°F (22c)	85°F (29c)	13°F (7c)	9.4°F (5.04c)	76°F (24c)
77°F (25c)	90°F (32c)	13°F (7c)	9.4°F (5.04c)	81°F (27c)
81°F (27c)	95°F (35c)	14°F (8c)	10.1°F (5.76c)	85°F (29c)
87°F (31c)	100°F (38c)	13°F (7c)	9.4°F (5.04c)	91°F (33c)

70% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
60°F (16c)	70°F (21c)	10°F (5c)	7.2°F (3.6c)	63°F (17c)
65°F (18c)	75°F (24c)	10°F (6c)	7.2°F (4.3c)	68°F (20c)
69°F (21c)	80°F (27c)	11°F (6c)	7.9°F (4.3c)	72°F (22c)
74°F (23c)	85°F (29c)	11°F (6c)	7.9°F (4.3c)	77°F (25c)
78°F (26c)	90°F (32c)	12°F (6c)	8.6°F (4.3c)	81°F (27c)
83°F (28c)	95°F (35c)	12°F (7c)	8.6°F (5.04c)	86°F (30c)

75% RH				
Wet Bulb Temperature	Dry Bulb Temperature	Temperature Difference	Temperature Drop	Output Temperature
57°F (14c)	66°F (18c)	8°F (4c)	5.8°F (2.88c)	59°F (15c)
62°F (17c)	70°F (21c)	8°F (4c)	5.8°F (2.88c)	64°F (18c)
66°F (19c)	75°F (24c)	8°F (5c)	6.5°F (3.6c)	69°F (21c)
71°F (22c)	80°F (27c)	8°F (5c)	6.5°F (3.6c)	74°F (23c)
76°F (24c)	85°F (29c)	8°F (5c)	6.5°F (3.6c)	79°F (26c)
81°F (27c)	90°F (32c)	8°F (5c)	6.5°F (3.6c)	84°F (29c)

Warranty

Schaefer Ventilation Equipment, LLC Schaefer Limited Warranty Policy

Schaefer Ventilation Equipment, LLC (SVE) provides the following limited warranty from the date of purchase to the original purchaser of our products:

- I. Two-year coverage (unless otherwise indicated below) applies to all products, components and assemblies provided by SVE that prove to be defective in material or workmanship. Any such defective product will be repaired or replaced at SVE's option, with the defective product returned upon approval to SVE, F.O.B Schaefer Ventilation Equipment, LLC, Sauk Rapids, Minnesota.
- II. This warranty does not cover:
 - a. Failure, damage or malfunction as a result of:
 - i. Improper installation or installation not in accordance with installation instructions.
 - ii. Operating conditions that vary from SVE's operating instructions.
 - iii. Misuse, abuse, negligence, alteration, or accident.
 - iv. Transporting the product.
 - v. Improper operation or lack of appropriate or regular maintenance of the product.
 - b. Loss of time, inconvenience, loss of use of the product or other consequential or incidental damages.
 - c. Parts that need replacement due to normal wear and tear.
 - d. Superficial or cosmetic rust or corrosion.
 - e. Any product whose name plate has been removed.

Products with warranty periods that differ from the standard 2-year warranty are as follows:

- | | |
|--|----------|
| • Poly Housings | 25 years |
| • Fiberglass Housings | 15 years |
| • Low-intensity Tube Heater Exchange Tubes | 5 years |
| • K-Series, 2-Stage, Compact and Stainless Steel Tube Heaters | 1 year |
| • Quartz and Zubri Heaters | 1 year |
| • Shutter Motors and Aluminum Riveted Fan Blades | 1 year |
| • HotZone™ Electric Elements | 120 days |
| • Quartz Bulbs | 90 days |
| • Evaporative Cooling Pads | 90 days |
| • Economy Line Fans | 90 days |
| • Any product or part noted as an exception to the standard 2-year warranty in the product's operating manual. | |

SVE reserves the right to add or delete products from this exception list at any time.

THERE ARE NO WARRANTIES OF MERCHANTABILITY OR FITNESS OF USE.

SVE reserves the right to change product design and specification without prior notice or liability.

The above constitutes the sole warranty offered by Schaefer Ventilation Equipment, LLC.

Effective Date: February 1, 2009

All information, illustrations and specifications provided here are based on the latest product information available at the time of printing. Product specifications subject to change.

