

Evaporative Cooling Optimizer

Water Wizard™

Maximize Cooling and Reduce Water Waste



Water Wizard

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Cooling with the Wizard

Greenheck's Water Wizard provides complete evaporative cooling control. The Wizard measures the outside temperature and humidity then adjusts the water supply to provide only the water needed for maximum evaporative cooling. On cool or humid days, the Wizard knows the evaporative cooling potential is low and reduces the water supply to save you money. On hot or dry days, the Wizard increases the water supply to meet the increased evaporative cooling potential, providing you with the most cooling possible.

Water Wizard Features

Freeze Protection

The Wizard protects the evaporative cooler from freeze damage by automatically shutting off the water and draining the supply line when the outside air temperature approaches freezing.

User Friendly Interface

Four control keys and a large LED display provide a simple and user friendly interface.

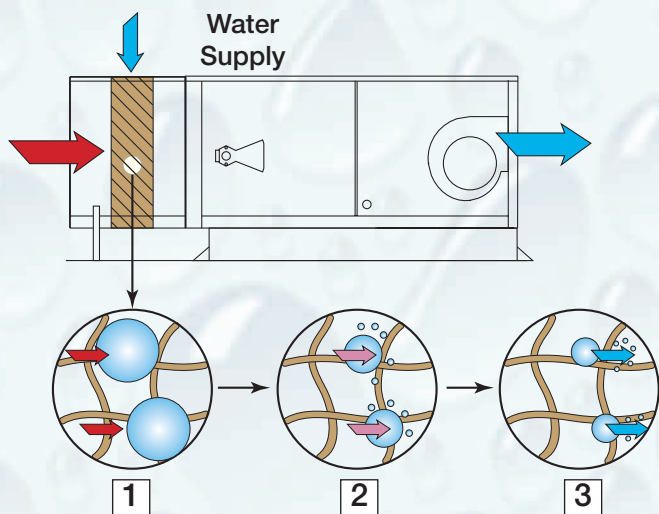
Easy and Accurate Set-Up

Factory provided pressure gauge and manual supply valve are standard, allowing the optimum water pressure to be quickly and accurately dialed in for peak performance.

Field Adjustable

The factory default settings are easily adjustable, allowing you to maximize your cooling and savings.

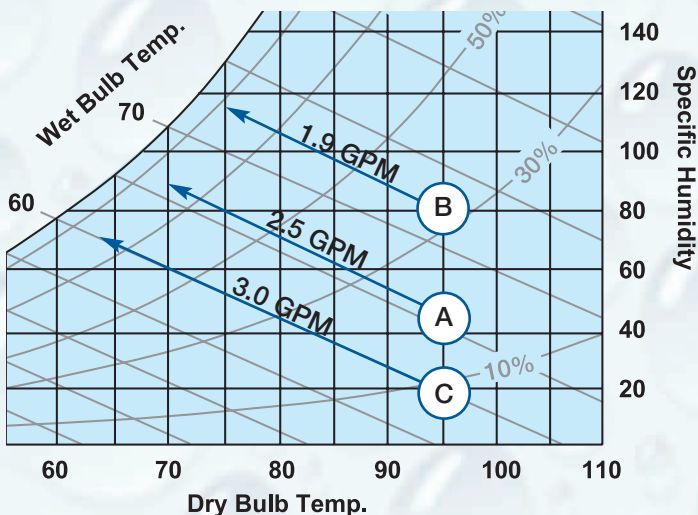
Optimum Evaporative Cooling



Optimum Evaporative Cooling

The Water Wizard guarantees you the optimum evaporative cooling cycle for your conditions.

1. Warm air enters the media.
2. Water evaporates and the airstream cools.
3. Cool air discharges from the moist media and the water supply replaces the water that was evaporated.



Varying Humidities

Even in the best evaporative cooling climates, the evaporative cooling potential can vary greatly from day to day. With the Wizard, you can always be sure your evaporative cooler is optimized – on a dry or humid day. Consider the following example at a 95°F T_d^* .

- A. On a day with a 67°F T_w , the Wizard provides 2.5 GPM of water and maximum cooling.
- B. On a day with a 73°F T_w , the Wizard reduces the water supply to 1.9 GPM, saving you water while still providing the maximum cooling.
- C. On a day with a 60°F T_w , the Wizard increases the water supply to 3.0 GPM and provides you with the maximum evaporative cooling.

* Calculated at 48,000 CFM with a 90% efficient evaporative cooler.

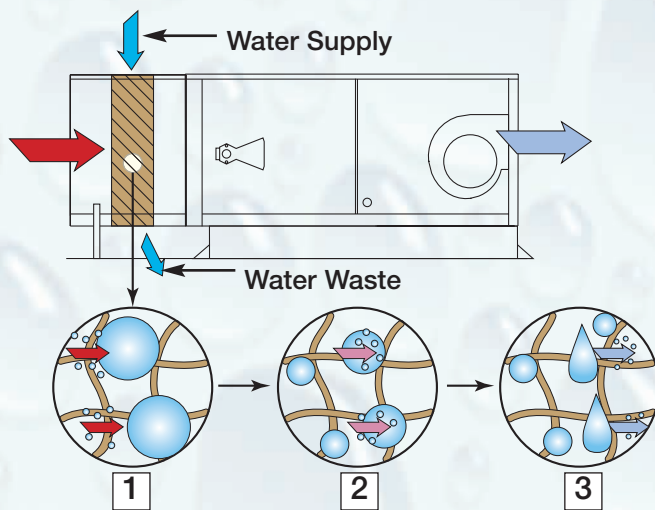
Other Evaporative Optimizers

Without the Water Wizard, you are limited to a dry bulb system. While dry bulb systems adjust the water supply with the outside air temperature, they have one major fault that limits their performance: they don't consider the outside air humidity. This results in many hours of operation where the cooling system is either wasting water or providing less than optimal cooling.

Water Waste

On humid days, the dry bulb system will supply too much water, resulting in water waste and increased operational costs. See point A on graph below.

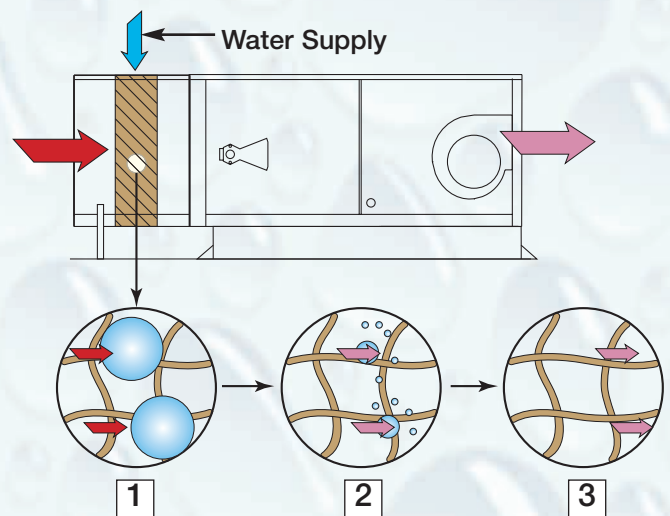
1. Warm, humid air enters the media.
2. Water evaporates and the airstream cools.
3. The water supply provides more water than what is evaporated, water drains from the supersaturated media and is wasted.



Undercooling

On dry days, the dry bulb system will not supply enough water and the media will dry out, resulting in undercooling and reduced media life. See point B on graph below.

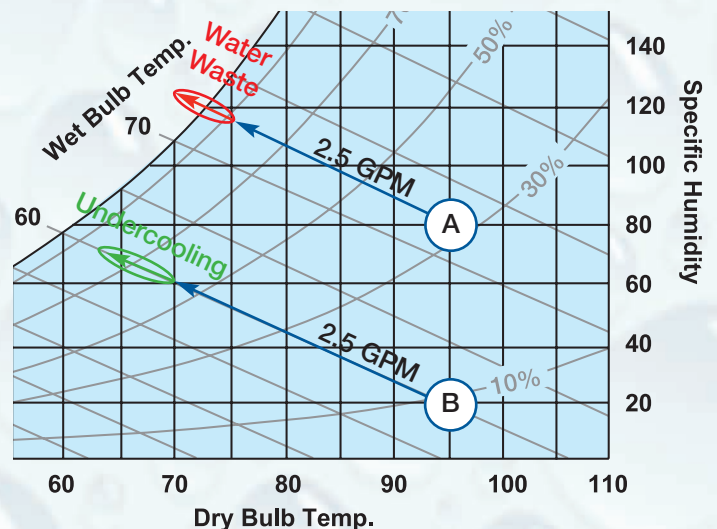
1. Warm, dry air enters the media.
2. Airstream is cooled until all of the water evaporates.
3. Dry media represents missed cooling opportunity.



Cooling with a Dry Bulb System

With a dry bulb system, the water flow rate is adjustable but will typically be set in the field and then left alone. Therefore, with the water supply remaining constant, changes in humidity go unnoticed. Consider the following example where 48,000 cfm is being supplied through a 90% efficient evaporative cooler. The water flow rate of 2.5 GPM was established based on optimization at 67°F T_w .

- On a day with a 73°F T_w , where the humidity level is higher than the 67°F T_w optimization, the dry bulb system will supply 2.5 GPM of water when only 1.9 GPM is required for maximum cooling. This results in a 32% water waste.
- On a day with a 60°F T_w , where the humidity level is lower than the 67°F T_w optimization, the dry bulb system will provide 2.5 GPM of water when 3.0 GPM is required for maximum cooling. This results in a missed opportunity to provide additional cooling for the space.



Operation

The Water Wizard shall control a supply solenoid to adjust the water supply to the evaporative cooler based on the outside air dry bulb and wet bulb temperatures. The Water Wizard shall increase the water supply on days with a high evaporative cooling potential and decrease the water supply on days with a low evaporative cooling potential. The Water Wizard shall respond to a change in both temperature and humidity.

Freeze Protection

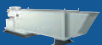
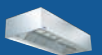
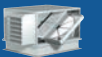
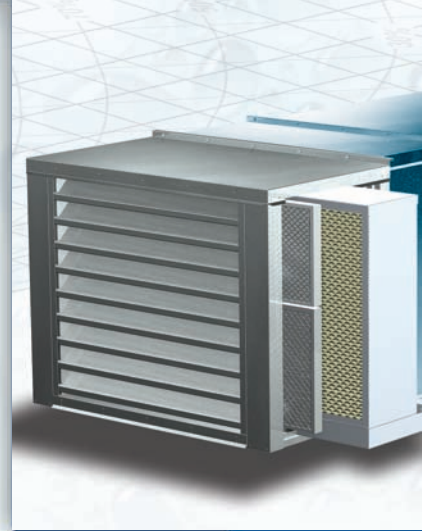
The Water Wizard shall be equipped with a freeze protection function. The freeze protection shall shut off the water supply and drain the supply line if the temperature falls below the field adjustable freeze temperature setting for longer than the field adjustable freeze protection time delay setting.

Programming

The Water Wizard shall be pre-programmed at the factory and have field adjustable set points.

Components

The Water Wizard shall include at least one manual shut-off valve and pressure gauge factory installed in the evaporative cooler. The Water Wizard shall include a four key user interface with three-digit LED display which shall be factory mounted in the control center of the make-up air unit. The Water Wizard shall include temperature sensors for measuring the dry bulb and wet bulb temperatures. The sensors shall be factory mounted when the evaporative cooler ships. Solenoids may be attached to the fan section. Solenoids may be supplied by Greenheck (if selected) or by others. Installation, piping and wiring of the solenoids shall be the responsibility of the contractor.



Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.