

Evaporative Cooling Control (ECC-1)

Automatically controls sprinkler solenoids, water pumps, and fans for direct or indirect evaporative cooling systems

Phason's ECC-1 Evaporative Cooling Control monitors temperatures and efficiently and effectively controls evaporative cooling cycles according to user-programmed settings.

Designed with versatility and usability in mind, the ECC-1 has two main modes of operation: 'Soaker Mode' for direct evaporative cooling or 'Mister/Fogger Mode' for indirect cooling. With optional humidity monitoring, you can expand the control's capabilities even more.

The ECC-1 has six relays, which can be programmed to control a combination of sprinkler solenoids, pumps, and/or single-speed fans. The ECC-1 is ideal for many applications, including dairy, swine, poultry, and greenhouse. All this from one powerful, efficient, and easy-to-use control!

Features

- ◆ Time-of-day and temperature-based duty cycle operation
- ◆ Two automatic operation modes—'Soaker Mode' or 'Mister/Fogger Mode'
- ◆ Manual control mode—for testing relays and equipment
- ◆ Six relay stages
- ◆ One alarm relay—indicates power failures, probe damage, or high/low temperatures
- ◆ Thirty-foot temperature probe, extendable to 500 feet
- ◆ Sixteen-character, two-line backlit LCD display
- ◆ Information logging and display—high and low temperatures for the current and previous day, as well as total sprinkler relay ON durations for the current day and previous day
- ◆ Rugged enclosure (corrosion resistant, water resistant, and fire retardant)
- ◆ Real-time clock with power-failure memory protection
- ◆ Status LEDs
- ◆ Four-button keypad
- ◆ CSA approval
- ◆ Two-year limited warranty



Electrical ratings

- ◆ **Input:** 120/230 VAC, 50/60 Hz
- ◆ **Input fuse:** 250 V, 1 A fast-acting glass
- ◆ **Relays 1 to 6:** 10 A at 120/230 VAC, general-purpose (resistive)
1/3 HP at 120 VAC, 1/2 HP at 230 VAC
360 W tungsten at 120 VAC
250 VA at 120 VAC for pilot-duty use
- ◆ **Alarm relay:** 0.4 A at 125 VAC ; 2 A at 30 VDC, resistive load
0.2 A at 125 VAC; 1 A at 30 VDC, inductive load

Available options

- ◆ Humidity sensor—for monitoring humidity
- ◆ Temperature probe—a second probe for controlling fans independently of cycles or zones

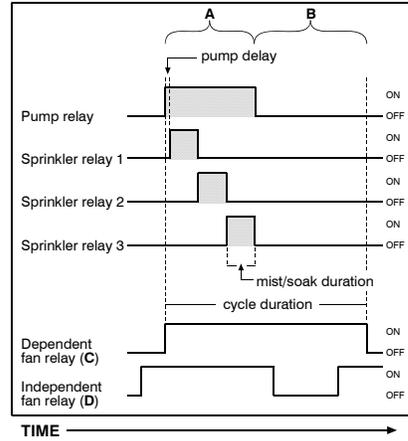
What is evaporative cooling?

There are two types of evaporative cooling: *direct* and *indirect*. Both methods can be used in either mechanically or naturally-ventilated facilities. A typical evaporative cooling system contains three main components: sprinklers (or misters/foggers), fans (mechanically-ventilated systems), and a control system.

The process of operating the sprinklers (soakers or misters/foggers) is called a *soak duration* or *mist duration*, depending on the mode being used. The process of operating all the sprinklers in sequence for their soak/mist durations and then evaporating the moisture, either naturally or mechanically, is called a *cycle*.

Direct evaporative cooling is achieved by evaporating water from the surface of an object, such as the hide of an animal. Using dairy or swine as an example, sprinklers shower the animals for a short duration (long enough to wet the hides). Air being drawn across the backs of the animals causes evaporation. The energy/heat required to evaporate the water cools the animals.

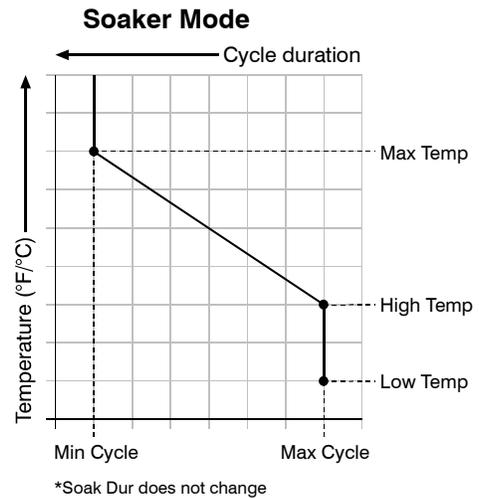
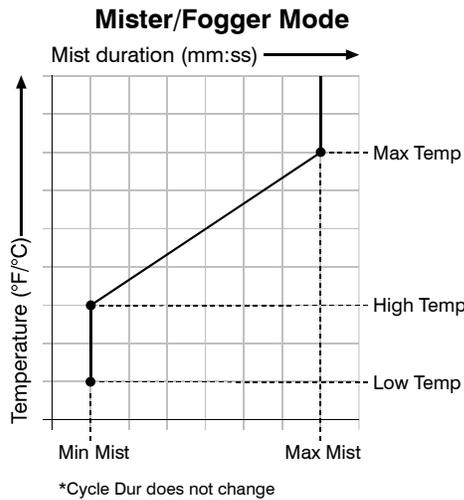
Indirect evaporative cooling is achieved by evaporating water vapor in the air. Water vapor is placed in the air by misters or foggers. As the tiny water droplets evaporate, they remove heat from the air. Indirect evaporative cooling is commonly used in greenhouses, but can also be used in livestock buildings or poultry houses.



- A This is the 'soaking' or 'misting' portion of the cooling cycle. During this portion, the pump and/or sprinklers are operating.
- B This is the 'evaporative' portion of the cooling cycle. During this portion, the pump and sprinklers are OFF. Any dependent fans are ON.
- C A dependent fan relay operates according to the cooling cycle, not according to a temperature set point. The fan is ON when the cooling cycle is active.
- D An independent fan relay operates according to its temperature set point, not according to a cooling cycle. The fan is ON when the temperature is above its set point.

Two modes of operation: *Mister/Fogger Mode* and *Soaker Mode*

In *Mister/Fogger Mode*, the cycle duration stays the same, but the mist duration automatically changes according to temperature. In other words, as the temperature increases from High Temp to Max Temp, the mist duration increases proportionally from Min Mist to Max Mist.



In *Soaker Mode*, the soak duration stays the same, but the cycle duration automatically changes according to temperature. In other words, as the temperature increases from High Temp to Max Temp, the *cycle duration decreases* proportionally from Max Cycle to Min Cycle. As the cycle duration decreases, *soaking frequency increases* and soaking occurs more often.

With the ECC-1's active time settings, you can program sprinkling to occur only during a certain time of day. With an optional humidity sensor, you can program the ECC-1 to bypass the soaking or misting portion of the cycle when humidity levels are too high.