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Automated Climate Control the Right Way

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Whether it is a simple past-time or your source of income, indoor gardening requires time and effort in order to achieve worthwhile results! In an enclosed environment in which one hopes to maintain ideal growing conditions at all times, it becomes necessary to manually control the climate; this requires supervision and, therefore, a nearly constant presence in the garden. It is for this reason that automation can be helpful. In addition to reducing the number and frequency of visits to the garden, automated control considerably reduces your work time, and allows you greater flexibility; and the benefits don't stop there! Automating your garden creates much more stable conditions, accurately meeting plant's needs and allowing for considerable energy savings.

Timers: the first step towards automation

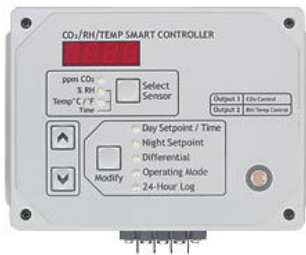
A timer activates or deactivates a device based on time, more specifically, based on the time of day or on cycles. Timers are particularly efficient for setting irrigation and lighting cycles, which are usually constant and minimally influenced by other garden conditions. There are even multi-timers available on the market, which are capable of simultaneously coordinating irrigation, lighting and lamp cooling cycles and offer protection for equipment and plants. Timers are not recommended for controlling equipment used to maintain climatic conditions (temperature, humidity, CO2 concentration). The purpose of devices used for heating, humidification, CO2 enrichment, etc., is to regulate the climate according to specific levels (e.g.: 75°F, 50 per cent relative humidity, 1,200 ppm of CO2). A timer, used for this kind of device is undependable and does not take into account existing garden conditions; the chances of establishing a climate that is stable and adapted to plant needs are, as it were, nil. Fortunately, certain devices have been designed specifically for climate control.

Equipped with a sensor that measures ambient conditions, the controller activates or deactivates a climate-correcting device according to levels set by the user. The given setting is generally accompanied by a differential in order to avoid continuous starting and stopping of the climate-correcting device in a short lapse of time. Take for example a controller connected to a CO2 generator set to 1,200 parts per million (ppm), with differentials high and low set at 200 ppm. The sensor regularly measures the concentration of CO2 in the garden. When the concentration drops below 1,000 ppm, the controller activates the CO2 generator. When the concentration exceeds 1,400 ppm, the CO2 generator is stopped by the controller.

This kind of control is very efficient at maintaining stable and precise garden conditions. There are at least three categories of controllers: specific, integrated and coordinated modulars.

The specific controller

The specific controller manages a single climate parameter and a single device at a time. A specific temperature controller, or thermostat, can control either a heater or an air-conditioner, but not both. The same goes for all other parameters. This type of controller, though inexpensive, yields results that are proportionate to the invested sum.



Integrated controllers offer stable and precise climatic conditions to better meet plants' needs.

Thinking they are saving money, some people choose to manage several climatic parameters by means of specific controllers. This requires as many specific controllers as there are devices to control. Often disadvantageous on a financial level, such a choice is also unwise on a management level. It is very difficult to coordinate the levels and differentials of the various devices to avoid opposite actions. For example, if one were using a thermostat to cool and another to heat, it would be necessary to set the levels and the differentials to sufficiently different temperatures to prevent the two devices from running at the same time. And even then, nothing is guaranteed, seeing as other factors, such as the calibration of sensors, can complicate things.

In some situations, it is even impossible to avoid opposite actions. This is the case when cooling the garden using an air exhaust fan, and enriching CO2 levels with the help of a bottle or a generator, where each device is being controlled by a separate controller. Each controller starts up the device under its control as needed, regardless of whether the other device is functioning at the same time. It is, therefore, very likely that the exhaust fan will activate at the same time as the CO2 generator, which will lead to the loss of CO2 to the outside environment. What a waste! Specific controllers are better than nothing, but fortunately, more sophisticated controllers exist.

The integrated controller

Why use several controllers when one will suffice in assuring optimal management of your garden's climate? Multifunctional, the integrated controller allows for the management of several climatic parameters at once. Whether you need to heat, cool, humidify, dehumidify or enrich the environment with CO2, the controller prioritizes its actions according to a logical sequence, which takes into account all parameters being controlled. Opposite or incompatible actions are therefore 100 per cent avoided, and this, without any effort from the user.

In addition, the stable and precise climatic conditions obtained thanks to this type of control offer plants a narrow comfort zone that better meets their needs. On a financial level, the purchase of just one integrated controller is often more advantageous than the purchase of several specific controllers.

Coordinated modular controllers - the height of automation

What if we were able to gradually equip ourselves with specific controllers capable of intercommunicating? In the near future, coordinated modular controllers will be able to do even better than that. Each individual coordinated modular controller will be able to manage one climatic parameter, such as temperature, humidity or CO₂. As opposed to a specific controller, a modular controller will be able to manage several aspects of a single parameter; in the case of a modular temperature controller, this will mean heating, cooling and venting control with the use of a single controller. Together, these controllers will be able to exchange information, and as such, intelligently manage several climate parameters at once. It will therefore become possible to gradually build a system that is both complete and intelligent.

*"The [integrated] controller
prioritizes its actions
according to a logistical
sequence."*

Choosing the right controller

Faced with the range of control devices available on the market, it is a challenge to decide on one particular model that would be efficient. An informative decision rests first on a precise evaluation of your needs and priorities, which are established according to the type of garden in question as well as the species of plants being cultivated. Here are a few key questions to help guide your decision:

- Which climatic parameters do I wish to control in my garden? The temperature? The humidity? The CO₂ concentration? A combination of two or three of these parameters?
- Which devices will be used to regulate the climate and control air-conditioning, heat, humidity, dehumidification, CO₂ generation, etc.)?
- Do I want to equip myself gradually or proceed directly to purchasing a complete controller? What's my budget?

Once these questions have been answered, the type of controller required is usually obvious. Automated climate control in an indoor garden calls for a bit of time and money at first, but the gains will be worth it. Plants that are cultivated in an environment that is stable and ideal for growth will thank you with quality and abundant yields. And that's not even counting the hours of work you'll save and be able to dedicate to your life outside your garden. Will you step into the age of automation?