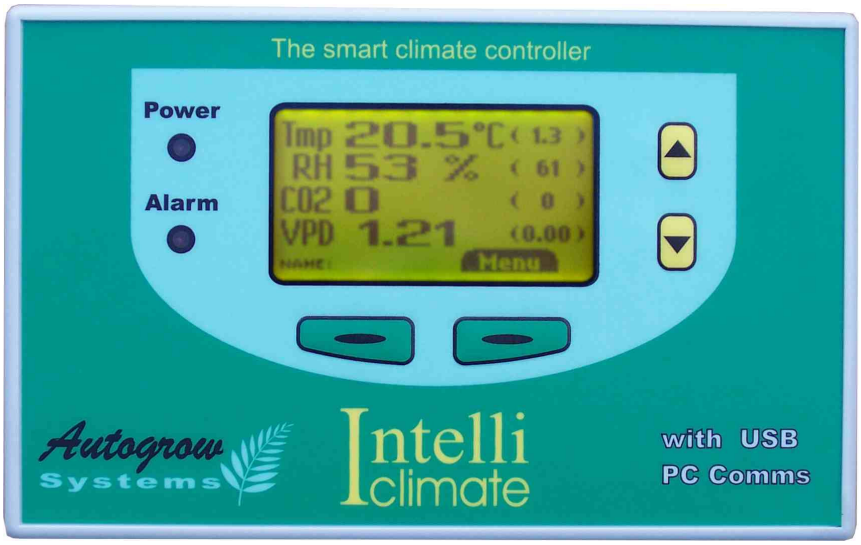
IntelliClimate™

The smart growroom climate controller with USB interface



The IntelliClimate is the ideal climate controller for all sizes of grow chamber. It controls temperature, humidity, lights and CO_2 in a unified way to obtain the best possible growing climate. It does all this whilst minimising wastage of CO_2 and electricity.

A standard feature of the IntelliClimate is the USB connection to a PC. This provides a new level of user friendliness and allows the grower to easily view and change settings, view readings and look back to see what growing conditions were like during periods when the grow room was unattended. The PC also provides for remote alarms and even telephone alarms to a pager or mobile phone are possible. With remote access software you can see readings, change setting and access all functions over the internet or phone connection.
Note that the controller will operate fully without a PC connection with the exception of the scheduling feature and telephone alarms.

If you want to achieve the best possible growth rates and have the ability to “steer” the crop to a perfect outcome, the IntelliClimate is the grow room controller for you.

With the IntelliClimate you can start small and gradually add to your equipment until you have the most sophisticated system possible, if that is what you desire. If growing in difficult climatic conditions (very hot or very cold) then you will need to start with more sophistication than if you are in a more temperate area.

The following equipment may be connected to the IntelliClimate:-
The outputs from the controller are 24V DC. In order to control mains powered equipment relay boxes are required. Three twin relay boxes (10Amps total per box) are provided as standard and additional relays or higher power relays are available on request.

Fan 1
Fan 2 OR AirCon
Light bank 1
Light bank 2
Humidifier
Dehumidifier
CO_2 injection
Heater

Even though you have the ability to connect a wide range of equipment you will only see settings and readings for items that you have. This keeps the user interface extremely simple and uncluttered even if you are starting with a very simple system. Yes, even very simple systems will benefit significantly from the integrated and fail safe control provided by the IntelliClimate and you can always expand your system in the future if you wish.

The perfect grow room

A good grow room will have good temperature and humidity control with different settings for day and night and a gradual change over in between. Night temperatures should be about 5^{o}C below day temperatures whereas night humidity should be below that of day time. An exception to this may be during the mid vegetative stage when a smaller night temperature drop may be used to stop the plants stretching too much. In this case the night humidity drop should also be small.

Good interaction between CO_2 enrichment and ventilation is vital to ensure that no precious CO_2 is wasted. The system must be easy to use and provide simple data logging to show you what the temperature, humidity, CO_2 and light levels have been doing while you weren't there.

Good fail safes are essential. What happens if the air-con fails (the fans must take over), what if the dehumidifier fails? (again either the aircon or fans must take over), or if the power fails when the lights are on? (when power resumes we need to bring the lights back on methodically, taking into account minimum cooling periods and time delays between banks switching on in order to avoid power surges). An alarm system that will phone you if something goes wrong or if an intruder is detected. All of these things and more come to mind.

If you are looking for ultimate growth then CO_2 injection must be considered but it does bring with it a further difficulty. When injecting CO_2 you need to keep the growing area closed with fans off. If using ordinary lights, the temperature will quickly rise and soon you will need to switch on fans to cool the room down. This limits the time that you are

able to inject CO_2 and it also increases CO_2 wastage (although the IntelliDose will minimise this by stopping CO_2 injection well before venting is required and also well before lights are turned OFF).

Hint 1. Use air cooled lights if you intend using CO_2 enrichment. This allows longer periods of injection before venting is required.

Even so, the crop under lights and with CO_2 enrichment will be growing vigorously and will transpire heavily. This will raise the humidity and again it will become necessary to turn on the fans to reduce this. A better option is to use a dehumidifier to keep the humidity at an acceptable level without the need for frequent ventilation.
Remember also, that the desired humidity varies depending on the stage of growth starting from a very high level for cuttings/seedlings and reducing considerably when flowering. The automatic scheduling of the IntelliClimate is ideal to change the humidity setting automatically as the crop grows.

Hint 2. Use a dehumidifier to extend the CO_2 injection period to the maximum possible.

Now we're really cooking with gas! Growth rates will be high and we need to ensure that the crop gets adequate lighting for high growth. With two banks of lights you have an ideal situation. During vegetative stage of growth you require a lower intensity of light but for a longer period (say one bank of lights for 18 hours per day). During this period the controller should be set so that only one bank of lights is used at a time and the two banks are switched on alternately day-by-day. This ensures that the crop receives light on both sides. During flowing, more light is required for a shorter period (eg 12 Hours) and for this stage both banks of light will be used. The IntelliClimate can be scheduled to do all of the above automatically. It will even switch banks if the light sensor detects low light (such as for a bulb failure) and will recover lighting correctly after a power failure ensuring that cool down periods are observed. When both banks of lights are programmed to be on together the controller will enforce a minimum gap between each bank switching on to allow the power surge from the first to die down before the second starts.

Hint 3. Use two banks of lights and program them to alternate during vegetative phase and for both to be on together during flowing stage.

In warmer climates and during the warmer months of summer, an air conditioner may be used to keep the room cool and thus allow long CO_2 injection periods. One disadvantage is that air-con tends to dry the air and to correct this some form of humidification may be required.
Low humidity will also be a problem when regular lights are used (ie not air cooled) as the fans will be on most of the time and the combination of heating (from the lights) and fan ventilation is very drying. During the early stages of growth this may inhibit growth. Humidification can be achieved by using either a humidifier or a fogging nozzle. These both need a slightly different control as the humidifier can normally be switched on when the humidity is low and switched off when it is high. Fogging, on the other hand, tends to be more effective and needs to be pulsed on for short bursts to avoid putting too much water into the air. Fogging is the lower cost option if mains water pressure is available together with low pressure fogging nozzles. Ensure the nozzles are classified as foggers rather than misters. Droplet size should be below 80microns.

Of-course, your climate controller must have the intelligence not to humidify the grow room just before the lights turn off as leaving the crop damp and cool will lead to fungal disease problems.
Hint 4. If an air-conditioner or regular lights (non cooled) are used then humidification may be required. Use either a humidifier unit or pulsed fogging nozzles.

Humidity must be carefully controlled especially during flowering as buds are easily attacked by fungus and carbon filters become ineffective at high humidities.
Hint 5. Ensure that humidity is programmed to be about 55% during flowing with an absolute maximum of 70%.

Things do go wrong (bulbs fail, circuit breakers trip, CO_2 runs out, intruders detected) and you need to know about these events as soon as possible. A good control system, such as the IntelliClimate, will have flexible alarms including dial out to a remote telephone or to a mobile phone.
Hint 6. Ensure that you have a good alarm system to warn you if anything should go wrong.

Lighting, CO_2 and humidity all require frequent settings changes during the overall grow period. A controller such as the IntelliClimate allows these changes to be pre-programmed so that you can't forget to do them. Of-course, growth rates are never the same and so the IntelliClimate allows changes to the schedule to be made easily at any time. With a telephone or internet link to your PC you can even make these changes remotely.

Hint 7. You really only have one choice – the IntelliClimate does it all. Couple this with an IntelliDose hydroponic doser and you will have the most advanced system available in the world. And why? Because your plants are worth it! ☺