TECHNICAL DATA

CLIMATIC CHAMBER FOR THE GROW AND ACCELERATE AGING OF PLANTS, CULTURE TISSUES, CELL CULTURES, SEEDS, AND ENTOMOLOGY IN THE LABORATORY WITH HUMIDITY AND LIGHT CONTROL

MODEL: ERIS 1345 INOX HR 3L LED
RANGE: ERIS Eco

GROSS CAPACITY IN LITERS	1400
NET CAPACITY IN LITERS	1200
SHELVES NO.	3+3 / 3+3
SHELVES DIMENSIONS IN MM*	490 x 678
SURFACE SHELVES IN M2*	0,332 / 1,99
INTERNAL DIMENSIONS IN MM*	1234 x 688 x 1388
EXTERNAL DIMENSIONS IN MM*	1385 x 856 x 1955

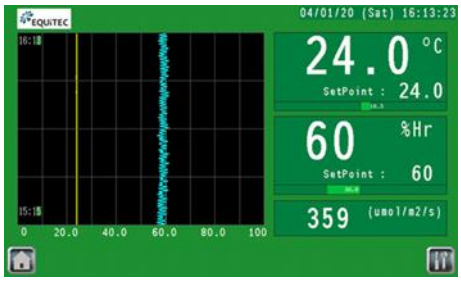
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GENERAL SPECIFICATIONS

- ✓ Designed for the study of seed growth.
- ✓ Temperature **ranges from +5 ºC to +50ºC,** with **lights on**
- ✓ Temperature **ranges from -5 ºC to +50ºC**, with **lights off**
- ✓ **Humidity control: Working range from 30% to 95% R.H (+/- 2% RH),** in a temperature range +20ºC to +45ºC.
- ✓ **Control Panel with 7.0" TFT Touch Keyboard**
- ✓ Electronic data logger with graphical representation of data with USB output for downloading stored data.
- ✓ Temperature and/or humidity control with capacitive probe.
- ✓ **Water spray ultrasonic humidifier** system with microprocessor.
- ✓ Probe with an accuracy of 0. 1ºC.
- ✓ Adjustment accuracy 0.1ºC in temperature and 0.1% RH.
- ✓ **Homogeneity of +/-1.0 and +/- 2% RH inside the chamber.**
- ✓ **Stability in the chamber +/-0.7ºC.**
- ✓ Microprocessor for the control and programming of parameters with PID system.
- ✓ 1 x 40mm access port.
- ✓ **Uniform airflow on shelves approx. 0.2 m/s**

TECHNICAL AND CONTROL SPECIFICATIONS

- ✓ Digital temperature control and parameters with graphic display (programmable day/night temperature).
- ✓ **PLC : PID microprocessor** for parameter control, ensures temperature and humidity stability in the chamber.
- ✓ Electronic probe for measuring humidity (4-20 mA) with accuracy/stability of +/- 3%.
- ✓ **Moisture ultrasonic humidifier,** generate
- ✓ **Independent audible and visual alarms with battery backup for maximum and minimum temperatures.**
- ✓ **Safety thermostat Individual** thermostat should be included for maximum and minimum temperature with sound alarm and heat source interruption in case of alarm.
- ✓ Homogeneity of +/-1.0º C in the chamber at +40º C.

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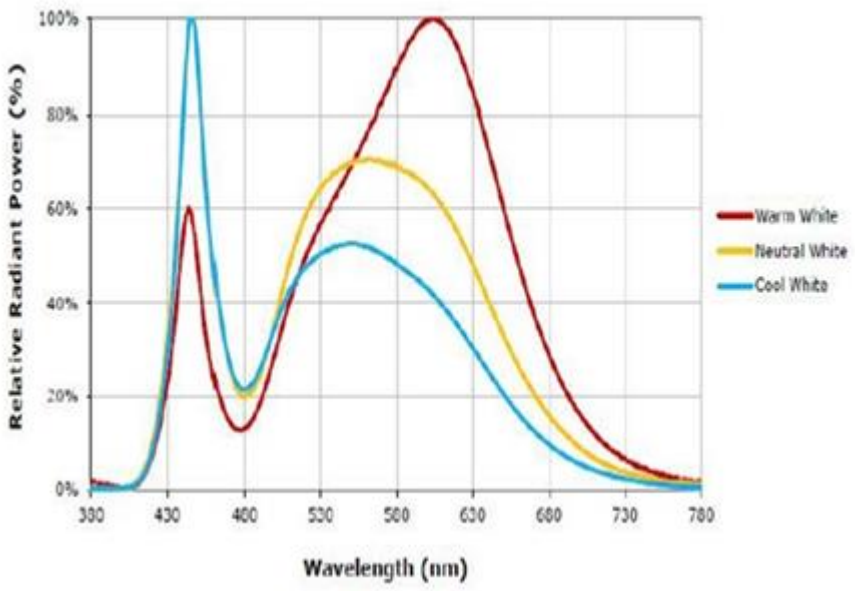
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microscopic droplets inside the chamber at room temperature.

- ✓ Probe, for temperature control with a resolution of 0.1ºC.
- ✓ **Air renewal range: 100 m3/H - 150 m3/H**
- ✓ Possibility of locking the control system and alarms by means of a numerical password.
- ✓ Main power switch locked by key (on/off).
- ✓ **Horizontal air recirculation system**, ensures greater homogeneity inside the chamber.

ESPECIFICACIONES TÉCNICAS Y DE CONTROL DE LAS LUCES

- ✓ **Lights on internal sides (doors and rear) with LED tubes, for tests with light 30,000 lux (400 µMol/m² x s PAR).**
- ✓ LED light intensity regulation from 10% to 100% background scale.
- ✓ **Light intensity control 20 to 400 µMol/m² x s PAR,** measured at 150 mm from the main shelf, with different freely programmable light intensity levels, with daylight or growth with the same spectrum as sunlight. In the temperature range from +4º to 45ºC.
- ✓ **Automatic time-based irrigation via controller (Irrigation valve must be included).**
- ✓ **Photoperiod free control, on / off**
- ✓ Lighting scheme **with special LED light** for plant growth., (sources 400 and 700 nm), **daylight white 4000 K.**
- ✓ Day white LED lighting system, placed on the independent shelves. The lights can be placed according to the needs of the client and after personalized studies.
- ✓ The 3 x 3 x 20 W LED light tubes per door are built in the photosynthetically active range of 400 to 760 nm, located in the 3-sided inner chamber.
- ✓ **Horizontal air flow at plant level. The controller must be able to control the air flow.**



CONTROL

4500 ***Series controller***, with graphical display of temperature and/or humidity, intuitive and simple user control:

The controller controls and has the ability to execute fixed or variable temperature, humidity, and radiation programs over time. It incorporates programs by segments of free choice, where you can set the temperature of each cycle in each segment, the duration of each segment, the radiation levels, if the program is done by ramps, or at maximum power, repetition of segments,

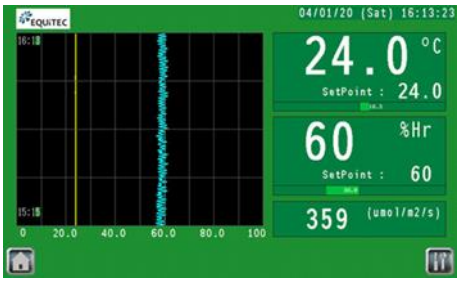
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and repetition of programs, as well as variation of ventilation, as well as control and regulation of the level of CO2 inside the chamber.

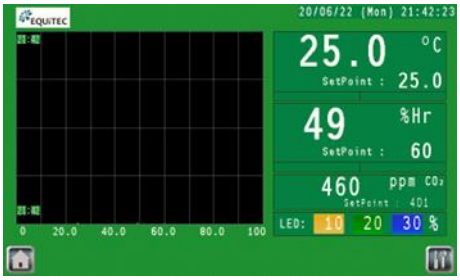
Automatic time-based irrigation via controller (Irrigation valve must be included).

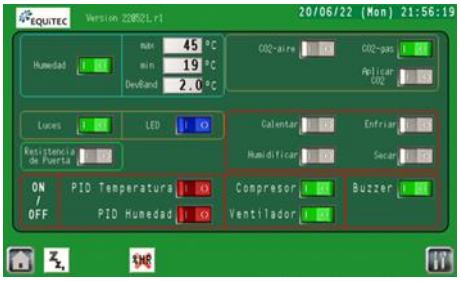
Dewing control automatically.



- ✓ **7.0" TFT backlit graphic display**.
- ✓ Controller with **microprocessor.**
- ✓ Intuitive and simple user control.
- ✓ **Back-up battery**, with automatic recharge, guaranteeing autonomy for 48 or 72 hours (optionally), in case of power failure. Graphic indication of the battery charge level on the display.
- ✓ **Temperature and humidity graph on the screen.**
- ✓ Resolution / Accuracy: **+/-0.1 ºC.**
- ✓ **7 days programming**
- ✓ **Power failure control system (program continued after restoring power), adjustable start delay function (from 1min to 99hr),**
- ✓ **Adjustable hold at set point time for temperature, humidity, and lighting from 1 min to 999hr or continuous operating,**
- ✓ **Recording of min average and max temperature and humidity value for each segment.**

INTEGRADO:





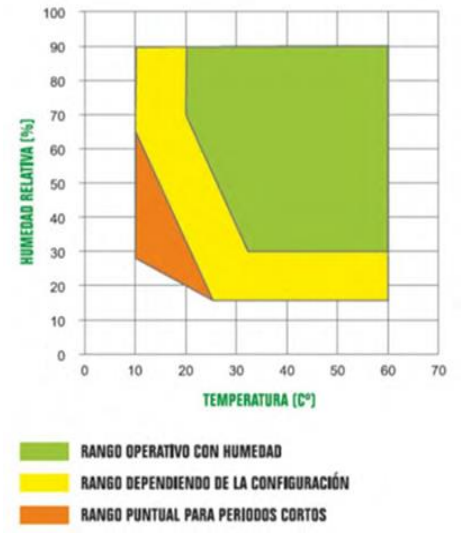
- ✓ 3 levels of protection by numerical password (user, supervisor, technical service), with reprogrammable PIN codes for greater security against unauthorized personnel.
- ✓ The camera integrates a control system where the iteration with the user will be through a 7" color touch screen
- ✓ The controller performs fixed or variable temperature, humidity, and radiation programs over time.
- ✓ Carry out programs by segments, you can set the temperature of each cycle in each segment, the duration of each segment, the radiation levels, if the program is done by ramps, or at maximum power, repetition of segments, and repetition of programs, and variation of ventilation.
- ✓ The controller allows to check the situation of the following parameters: open door, minimum and maximum water tank level, humidifier failure, humidifier air valve status, ventilation, defrost and status of the light banks.
- ✓ It includes a screen where the actual temperature of the camera appears, information of the program that is running, status of the compressor, information if the camera is in stand-by to check if it is working or is waiting for some action.
- ✓ Maximum, minimum, and band temperature alarms can be set. In addition, you can set the maximum and minimum temperature by which the camera cuts the energy if these values are exceeded. It will show if there is an active alarm, the date when it occurs, and the time.
- ✓ To ensure that the camera can be calibrated correctly, the controller will have the possibility to modify the off-set values of the temperature at different discrete

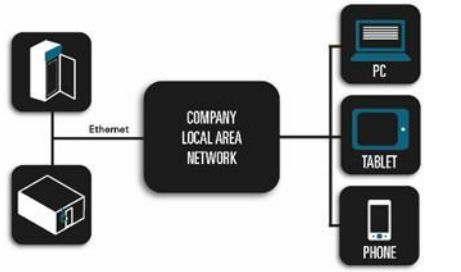
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points of the working range (fine adjustment), or in the entire range depending on the type of calibration that the user wishes to do. To comply with the above, the possibility of introducing a compensation (off-set) in the entire temperature range (a fixed value for the entire range) for calibration will be integrated into the controller, and in addition, it will also be possible to enter off-set in discrete temperature values within the working range of the camera for a finer adjustment.

- ✓ Visual and acoustic alarm (with automatic reset) for:
- ✓ High or low temperature and/or humidity, with limits programmable by the user through the menu.
- ✓ Alarm delay time, programmable via menu.
- ✓ Voltage failure / Probe failure.
- ✓ Low battery level.
- ✓ Independent probe for evaporator control.
- ✓ Automatic cycle in case of probe failure.
- ✓ Self. Self-diagnosis for the calculation of energy consumed.
- ✓ Current voltage level indication display.
- ✓ Battery level indication.
- ✓ Text available in 6 different languages.
- ✓ Acoustic alarms, with continuous warning indication on the screen and with automatic call return in case the alarm situation persists. Programmable alarm return time via menu.
- ✓ **Dewing control automatically.**
- ✓ Battery charge status function.
- ✓ Alarm history for the last 30 alarm conditions (not suppressable), with the possibility to check on the screen - the alarm condition and all related information (start time, end time, temperature peaks and high / low humidity alacanzados).
- ✓ History of frost of the last 30 days (not deleted), with the possibility to verify the type of defrost, start time and duration.
- ✓ Lock code - access to the control system.
- ✓ USB port for downloading the recorded data.
- ✓ Software update via USB port.
- ✓ Potential free output for remote alarm.
- ✓ Day/night economy function, minimizes power consumption.
- ✓ Integrated data logger, with readings every 30 seconds, allows readings of up to 1.5 years.
- ✓ MODBUS TCP/IP for Ethernet connection.
- ✓ Incorporates VNC communication to access control from any remote point
- ✓ Possibility of multimedia tutorials for technical service users.
- ✓ **USB port for downloading the recorded data.**
- ✓ **Software update via USB port.**
- ✓ **Chamber design software which can be connected to an external pc or laptop and can have remote monitoring capabilities.**
- ✓ **50 programs. Graphical logging, alarms, and external events should be shown.**

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- ✓ **Automatic time-based irrigation included.**

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CONSTRUCTION

Outside

- ✓ Exterior structure in stainless steel AISI304.
- ✓ **Optional:** Support system with 4 wheels for easy movement, 2 with brakes.
- ✓ 4 feet adjustable in height.

Inside

- ✓ **Internal structure in stainless steel AISI304.**
- ✓ Rounded corners for easy cleaning.
- ✓ Drainage inside the chamber.
- ✓ **1x Access port for calibration probes Ø 40 mm.**

Door

- ✓ Blind door with large handle and security lock with keys.
- ✓ Optional: Internal thermal glass door (6 mm) and handle with large closure.
- ✓ Door light 568 x 1280mm.
- ✓ Perimeter joint in the interior door, ensures the closing of the door and the tightness of the inner chamber.
- ✓ Thermal exterior door with magnetic gasket and large handle.
- ✓ Alternative possibility of opening the door to the right or left (factory setting, indicate to order).

Power

- ✓ **220-240 /1 F/ 50 Hz**
- ✓ **Optional:** 220-240 /1F/ 60 Hz | 110-115 /1F/ 60 Hz
- ✓ 1.5 m cable with Shuko connector.

Isolation

1. Insulation of 60 mm. (Optional 75mm)
2. CFC-free high pressure injected polyurethane insulation with a density of 40 kg/m3.
- ✓ No ODP and low GWP.

Shelves

- ✓ 3+3 Perforated stainless steel shelves, with height-adjustable guides.
- ✓ Dimensions: 490 x 678 mm mm. Unit area 0.332 m2 x 6 . Total area 1,99 m2.
- ✓ Adjustable in height, max. load of 100 kg/m'.
- ✓ Easily removable guides and grills for cleaning.
- ✓ Maxial capacity of trays: 50
- ✓ Distance between trays 38 mm (1,5")

Refrigeration/Heating/Air

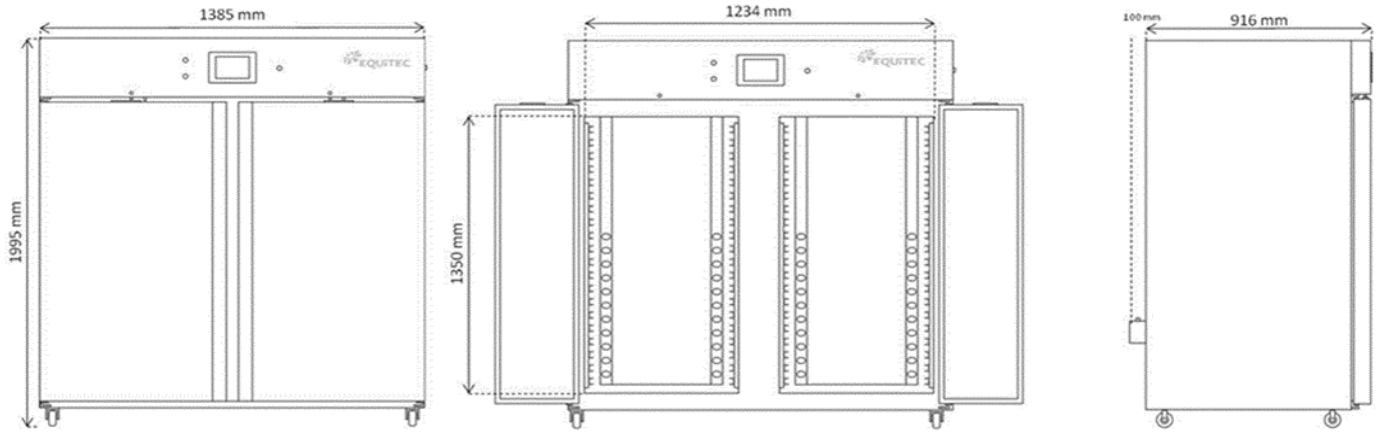
- ✓ Forced air ventilation: with uniform vertical distribution of the air flow, it allows a great homogeneity of the interior temperature.
- ✓ Cold control commanded by solenoid valve.
- ✓ Temperature and defrost regulated by a digital controller.

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- ✓ Automatic evaporator with time-controlled defrost. Includes heated evaporation tray.
- ✓ Climate class +N32.
- ✓ Mechanical air-cooled refrigeration, CFC-free, by hermetic compressor •
- ✓ Very quiet hermetic compressor, mounted on shock absorbers to reduce noise level.
- ✓ R290a refrigerant gas, free of CFCs and HCFCs, biodegradable.
- ✓ Dual heating technology with hot gas bypass and stainless steel finned electric heaters
- ✓ Ultrasonic generator humidification with water level control, optional: automatic self-pasteurization function, preventing damage or malfunction due to poor water quality and biofilm accumulation
- ✓ Condensation dehumidification in the evaporator of the refrigeration system
- ✓ Air renewal through adjustable port holes/side wall passages
- ✓ Tropicalized treatment, allows working with temperature up to +28ºC.
- ✓ Documentation of the chamber's performance with the official IEC 60068-3-5 tests; offered by a coalified independent testing company
- ✓ ISO9001:2015 certificate for the scope of the design and manufacture of Growth Chambers
- ✓ Guaranty 24 months
- ✓ CE Mark
- ✓ Manual, Installation and training

DETAILED EXTERIOR VIEW



TECHNICAL DATA

GENERAL DATA		ELECTRICAL DATA	
HP Compressor	1/2	Degree of protection IP according to EN 60529	
Rated Electrical Current	15.0 (A)	Nominal voltage (±10%) 50 Hz (V)	230
Noise level	54,6 (dB)	Average heat dissipation at +4°C at ambient temperature <+24°C	1850 W
Net/gross weight in kg.	180 / 225	Climate class	4
Packaging dimensions in mm. On wooden pallet in mm	1645 x 1000 x 2150	Cooling capacity (W at -10°C)	382 W

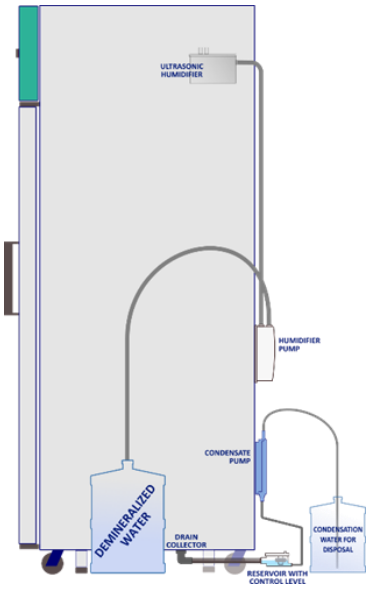
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Gross volume of package in m3	2.8	Freezing power (Kg/24h)	n/d

HUMIFIER WATER FEED SYSTEM

- **Included for equipment with humidity control: 20 liter water tank and pump for water supply and evacuation with 3-meter drainpipe**
- Optionally: Humidification water charging and discharging pump.
- Optionally: Automatic continuous demineralizer.



WATER SUPPLY, GENERAL INFORMATION		WATER SUPPLY DATA	
Connection to the water supply	½”	Water supply Factors Determining Water Used	Demineralized water
Drain from the bottom	Not	Pressure	1-5 bar
Water tank included	20 l	Optional Loading Pump	100 W
Pompe de refoulement en option	80W	Climate class	4

LIGHTING / SYSTEM LED LIGHTS ON SHELVES

- Lights on trays, broad spectrum white LED tubes, including at least the 400 -700nm spectrum of photosynthetically active

  radiation (PAR), with a photosynthetic photon flux density (PPFD) in µmol m − 2 s − 1.
- Intensity of radiation adjustable in intensity den µmol m − 2 s − 1 to the maximum radiation in intervals of at least 10% to 100%

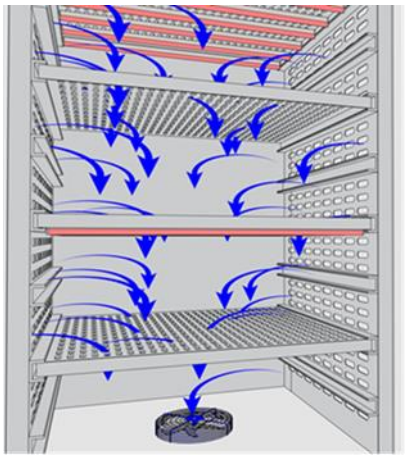
  of the maximum radiation.
- Required light intensity should be reached at approximately 15cm from the light source.
- The regulation is carried out individually at each level of the shelves in the chamber, based on changes in the intensity of the luminaires and not on the partial shutdown of the same.

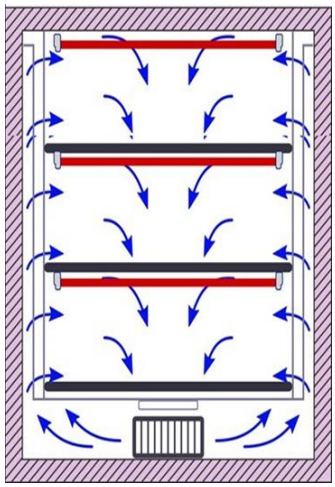


Internal view of lighting

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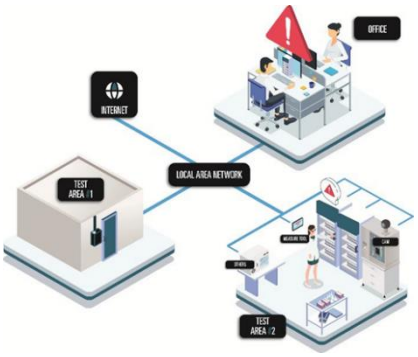
PASS VENTILATION WALLS, included

- Allows air to enter the chamber.
- Waterproof with tilt closure
- 2 ports for adjustable air inlet, included



Software can be connected to an external pc or laptop to remote monitoring, included

- Ethernet output for remote connection via WiFi network and dedicated website, allows reading and changing parameters.
- GPR alarm module over Ethernet LAN.
- Communication software for PC



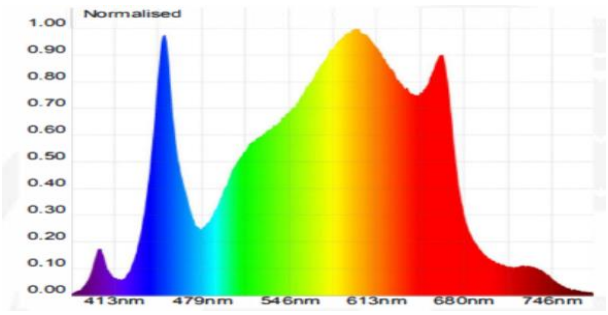
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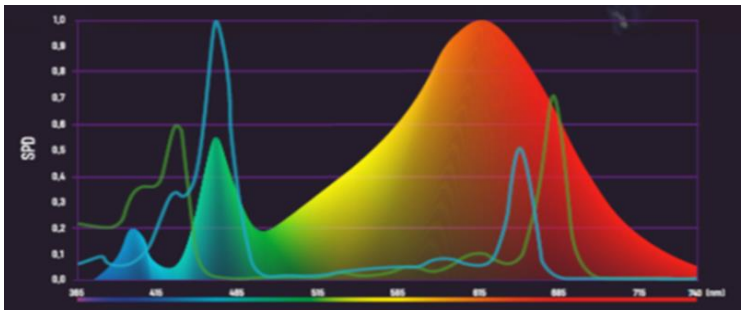
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OPTIONAL ACCESSORIES *(not included in the price)*

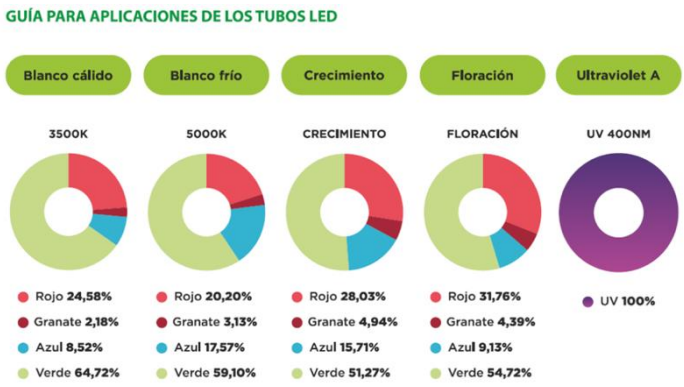
LIGHT RADIATION SYSTEM AND AUTOMATED CONTROL

At the customer's disposal, we will be able to supply the optional spectrum that the client requires.





- LED display with IP65 protection.
- We have different colour spectrums, which can be selected, either by camera, or in each of the different shelves, at the customer's choice.
- This choice can also be selected, as an accessory in the future, since the camera is prepared to admit variations in the configuration of lights in the future.

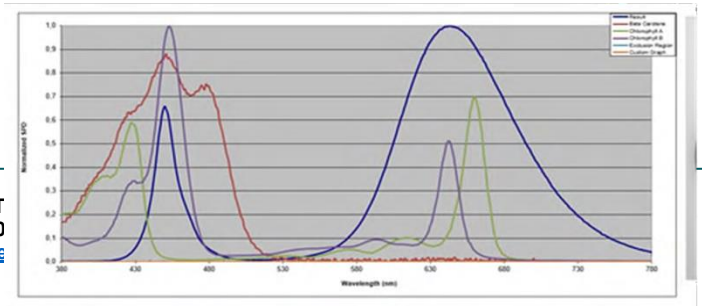




Optional curves and wavelengths, at the customer's request

- We offer at the request of the client, the option of equipping the lighting system in one of the shelves / shelves, indicated by the user, of a variable spectrum configuration of 4 channels, controlled independently.
- That is, in which the user can modify, not only the intensity; but also wavelengths.
- It would be a shelf or level with a configuration of tubes that allow to modify the spectrum of the curves, as in intensity.
- LED display with IP65 protection.
- Example: 4 independent LED light channels with one-to-one dimming:
  - ✓Channel 1 white light (PAR): adjustable from 0-100%.
  - ✓Image containing building, interior, train, large Automatically generated description
  - ✓Channel 3 monochromatic far red light (730 nm): dimmable from 0-100%.

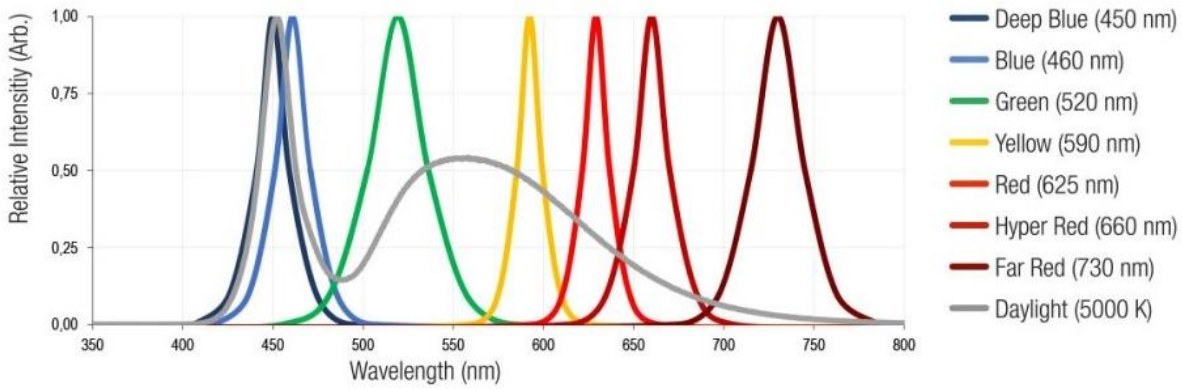




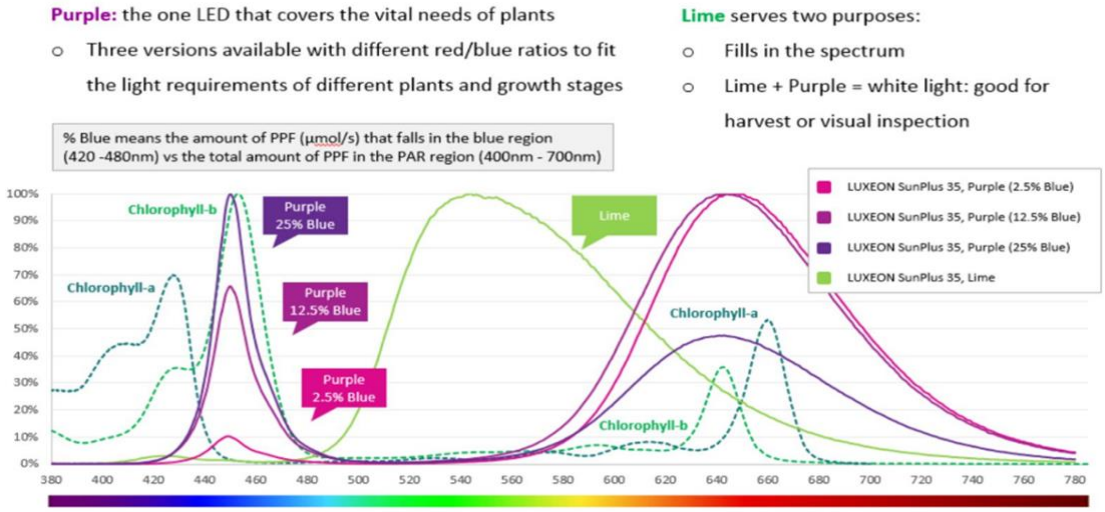
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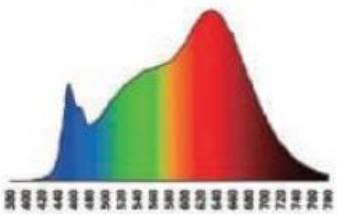
✓Channel 4 blue light: dimmable from 0-100%.

✓Other channels in the table below, at the customer's choice, as a variant.



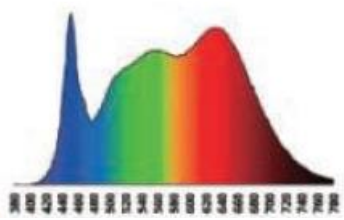
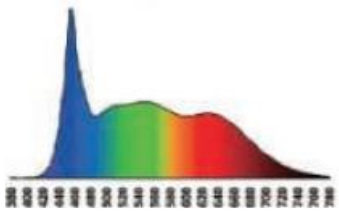
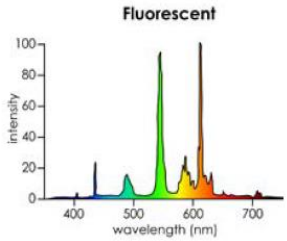
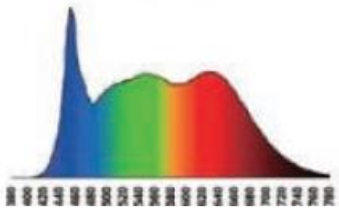
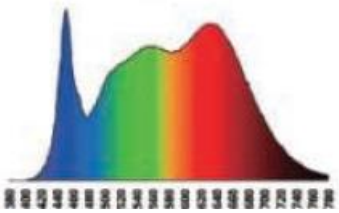
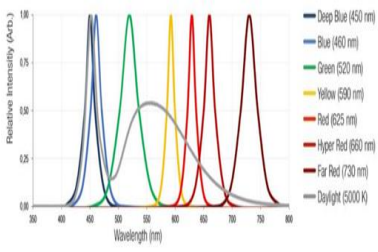
Optional lighting diagram.



Light type	Maximum intensity per shelf or side (+/-10%), measured at 150 mm.	Shelves/trays max. per camera	Standard spectrum diagram
LED Warm White Configuration 3500K	450 µmol/m²/s	3	

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LED configuration white daylight 4000K	450 µmol/m²/s	3	
LED configuration white daylight 4000K	650 µmol/m²/s	2	
LED cold white configuration 6000K	450 µmol/m²/s	3	
Fluorescent cold white configuration 6000K	200 µmol/m²/s	3	
Vertical LED on side walls	300 µmol/m²/s	3	
High performance LED	3.000 µmol/m²/s	1	
LED with variable spectrum up to 8 channels	Depending on the mixture and number of channels, up to 650 µmol/m²/s	To study	

LIGHTING / SYSTEM LED LIGHTS ON SHELVES, Optional

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- Lights on trays, broad spectrum white LED tubes, including at least the 400 - 700nm spectrum of photosynthetically active radiation (PAR), with a photosynthetic photon flux density (PPFD) in µmol m − 2 s − 1.
- Intensity of radiation adjustable in intensity den µmol m − 2 s − 1 to the maximum radiation in intervals of at least 10% to 100% of the maximum radiation.
- Required light intensity should be reached at approximately 15cm from the light source.
- The regulation is carried out individually at each level of the shelves in the chamber, based on changes in the intensity of the luminaires and not on the partial shutdown of the same.



INTERNAL GLASS DOOR, Optional

- Internal glass door
- It allows to visualize the work processes without altering neither temperature, nor humidity, nor / or concentration of CO2
- Door with lock



Puerta de cristal interior para inspección.

INTENSITY AND RADIATION MEASURING SENSORS, Optional

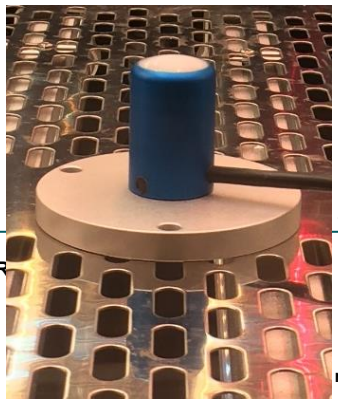
Quatum sensors for measuring the intensity (radiation) of radiation received, PAR type.

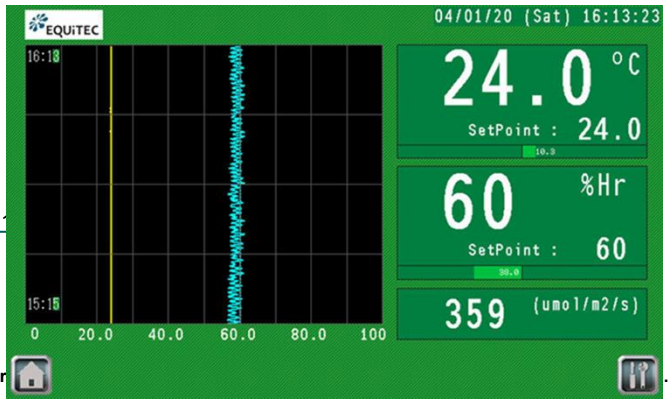
Free installation inside the camera

- Digital quantum light sensor (PAR).
- Sensor pair image result
- It relates proportionally between the number of photons absorbed in the band of 380 to 780 nm and the rate of photosynthesis in plants.
- The angular response of the sensor is corrected with cosine and is suitable for measurements of diffuse radiation or radiation from extended sources.
- Including standard and waterproof chassis.
- Includes base and leveling stand.
- The values will be represented on the main screen in µmolm−2s−1

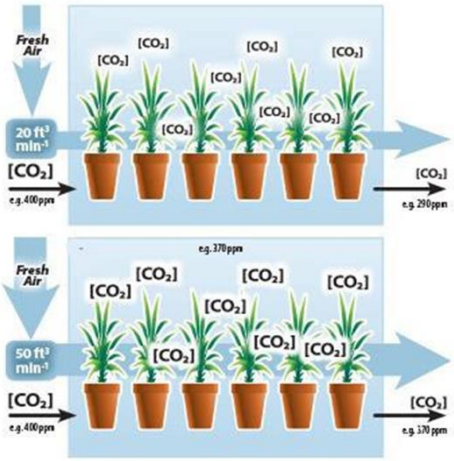




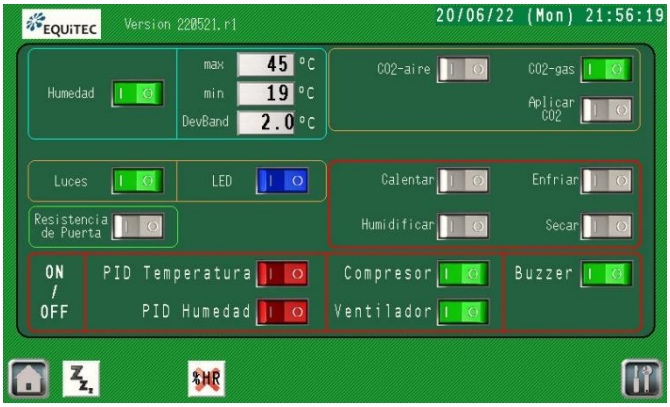




CO2 CONTROL SYSTEM , Optional



- CO2 control input by CO2 bottle (gas), with connection to pressure reducer. With fixed CO2 concentration adjustment valve present by the customer (e.g. 2,000 ppm CO2 +/-50 ppm)
- A gaseous CO2 intake, supplied by the property, will be provided for CO2 control in case of using the chamber with concentrations higher than those of ambient CO2.
- The CO2 feeding system will be carried out by solenoid valves, which will be commanded by the controller and the dedicated IRGA sensor for reading the internal CO2, in the range from 0 to 2000 ppm CO2, optionally
- Range 0 to 2000 ppm
- Control: on the electronic control display with non-volatile memory.
- Stability: +/- 50 ppm and +/- 5% reading.
- Controlled automatically or manually (at the customer's choice).
- The entry and exit of air to and from the outside, will be made from the terrace of the building through ducts.
- Including CO2 bottle pressure reducers
- Does not include the CO2 bottle.
- The values will be represented on the main screen in % CO2.





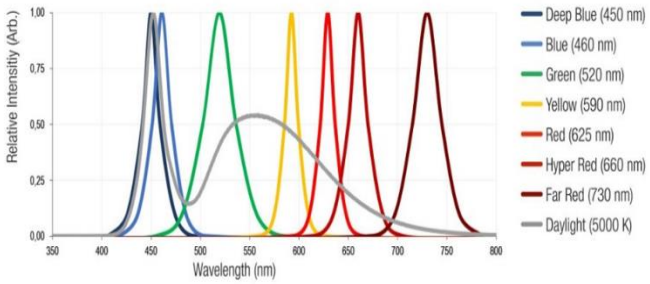
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OTHER OPTIONAL ACCESSORIES *(not included in the price)*

- ✓ Lights in internal trays regulated independently at each level, with the possibility of regulating light intensity, via the microprocessor.
- ✓ Daylight tubes for algae growth.
- ✓ Day growth lights for plant growth.
- ✓ LED lights with different configurations of LED diodes growth day for plant growth according to different applications.
- ✓ Lights on the sides or back of the camera, with protected glass window.
- ✓ LED lights: UV C / UVB / UVA for sterilization and growth
- ✓ Thermal decontamination system at 60 °C
- ✓ Bio-decontamination with hydrogen peroxide: , allows the connection of an H2 O2 atomizer system
- ✓ Optional negative temperatures:
  -5ºC / -10ºC / -20ºC / -30ºC
- ✓ Extended drying capacity up to +10% RH, with additional air dryer.
- ✓ Water-cooled condensing unit
- ✓ CO2 control and monitoring units
- ✓ CO2 scrubber to reduce carbon dioxide below ambient levels
- ✓ Fog or dew simulation
- ✓ Aeration kit for algae research and hydroponic crops
- ✓ Phenolic resin coating for entomology/insect breeding applications
- ✓ 20 litre external water tank with electric pump and safety valve for humidifier feed water.
- ✓ Continuous demineralization system for humidifier feed water.



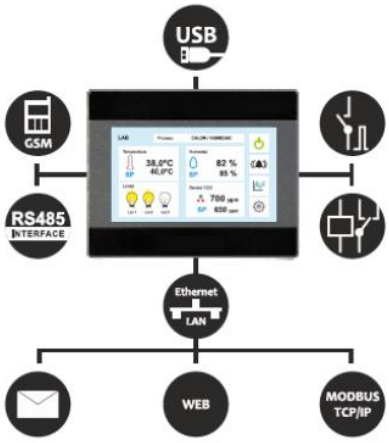




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- ✓ **Digital printer for temperature and/or humidity.**
- ✓ **Potential-free output for remote alarm control (4-20 mA).**
- ✓ **RS485/232 remote communication system.**
- ✓ **Additional cable and tube pass-throughs.**
- ✓ **Internal plugs.**
- ✓ **Ethernet output for remote connection via WiFi network and dedicated website, allows reading and changing parameters.**
- ✓ **GSM alarm module.**
- ✓ **Communication software for PC on request.**
- ✓ **7-day circular temperature/humidity recorder, with independent battery to work even in case of voltage failure. Includes 100 graphs (approx. for 1.5 years).**
- ✓ **Data loggers additional.**
- ✓ **Automatic irrigation valve**



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