



# BIO

## FITOCLIMA

## WALK-IN PL / PLH

MULTI-TIER PLANT GROWTH CHAMBERS  
CONTROLLED ENVIRONMENT GROWTH ROOMS



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**aralab**





**ARALAB** is a company specialized in designing, developing, manufacturing and servicing of high quality climatic chambers and controlled environment rooms.

Since 1985 we have been perfecting ways to create and control temperature, humidity, light, air flow and many other environmental conditions.

Only the highest quality components are used to manufacture our chambers so customers can have the best equipment for their research and testing purposes.

**Control the environment, your own climate.**



**Aralab research chambers provide the control and flexibility to meet the evolving needs of researchers and research requirements through time.**

#### COMMON APPLICATIONS INCLUDE

- PLANT GROWTH
- TISSUE CULTURE / IN-VITRO
- ARABIDOPSIS
- GERMINATION
- ALGAE RESEARCH
- ENTOMOLOGY
- INSECT REARING
- OTHER LIFE SCIENCES APPLICATIONS



Certified ISO:9001 for its Quality Management System

#### KEY FEATURES

- Temperature, Humidity, Light intensity and Air Flow controlled with consistent precision through the years
- Adaptive future proof design with easily removable trays and height adjustable shelves
- Lighting options to suite multiple research requirements and stages of plant development
- All environmental conditions easily programmable with the new ClimaPlus® multicolour touchscreen interface
- Stainless steel shelves for maximum resistance, durability and easy cleaning
- Research protection features, with configurable high/low temperature and humidity alarms and automatic remote notifications

## TECHNICAL SPECIFICATIONS

### ● ● ● ● FITOCIMA MULTI-TIER 'WALK-IN' GROWTH ROOMS

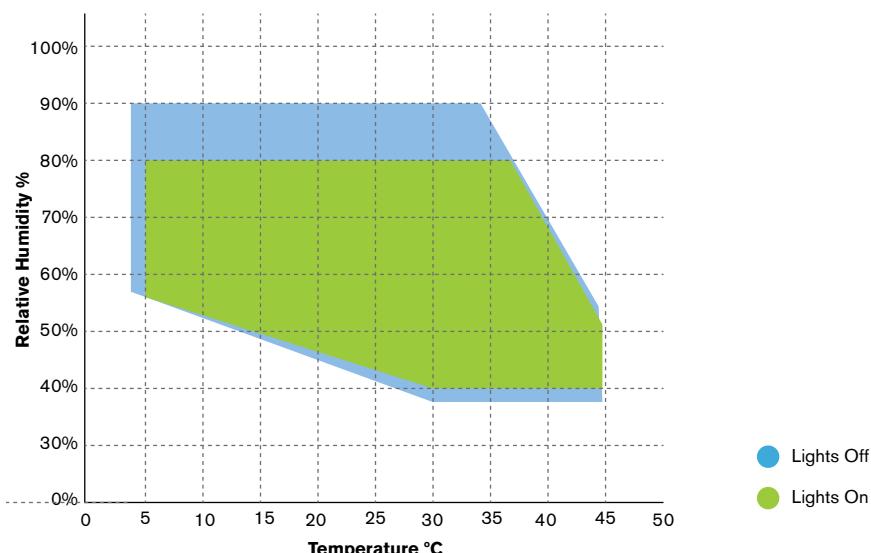
TEMPERATURE RANGE <sup>[1]</sup>		LIGHTS ON: +5°C to +45°C LIGHTS OFF: 0 °C to +45°C						
TEMPERATURE PRECISION		± 0,5°C						
TEMPERATURE UNIFORMITY		± 1,0°C						
HUMIDITY RANGE <sup>[1]</sup> (PLH Models)		LIGHTS ON: 40 to 80% rH LIGHTS OFF: 40 to 90% rH						
HUMIDITY PRECISION		± 1% rH						
HUMIDITY UNIFORMITY		± 2 % rH						
TIERS / SHELVES / LIGHT BANKS		Flexible interior configuration, allowing from 2 to 3 tiers on each side of the chamber. Number of shelves and light banks dependent on chamber size and tiers						
STANDARD GROWTH AREA <sup>[2]</sup>		0.75m <sup>2</sup> per shelf (1.500mm x 500mm) 4,5 m <sup>2</sup> 4,5 m <sup>2</sup> 9 m <sup>2</sup> 13,5 m <sup>2</sup> 18 m <sup>2</sup>						
GROWTH HEIGHT		Approximately 45cm per shelf / tier with the 3 tier configuration. More or less growth height can be configured in 4,5cm increments.						
LIGHT TYPE AND INTENSITY <sup>[3]</sup>		<p><b>Light Type</b></p> <table border="1"> <tr> <td>Cool-White Fluorescent (4 or 8 tubes)</td> <td>240 µmoles /m<sup>2</sup>s (+17.000 Lux) 480 µmoles /m<sup>2</sup>s (+ 34.000 Lux)</td> </tr> <tr> <td>LED modules in White (4 or 8 tubes)</td> <td>+300 µmoles /m<sup>2</sup>s (+ 21.500 Lux) +600 µmoles /m<sup>2</sup>s (+ 43.000 Lux)</td> </tr> <tr> <td>LED modules in Blue, Green, Red or Far Red</td> <td>Intensity is spectra dependent</td> </tr> </table>	Cool-White Fluorescent (4 or 8 tubes)	240 µmoles /m <sup>2</sup> s (+17.000 Lux) 480 µmoles /m <sup>2</sup> s (+ 34.000 Lux)	LED modules in White (4 or 8 tubes)	+300 µmoles /m <sup>2</sup> s (+ 21.500 Lux) +600 µmoles /m <sup>2</sup> s (+ 43.000 Lux)	LED modules in Blue, Green, Red or Far Red	Intensity is spectra dependent
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AIRFLOW SPEED		Between 0,3 to 1 meter per second. Adjustable by set point % at the touch screen controller						

[1] Temperature / Humidity range extension available. Humidity range/performance is affected by light intensity and temperature set-point

[2] Other shelf dimensions available. Standard configuration assumes 3 tiers on both sides with controlled light intensity

[3] Measurements at 150mm from light source at 25°C. Other lighting combinations available.

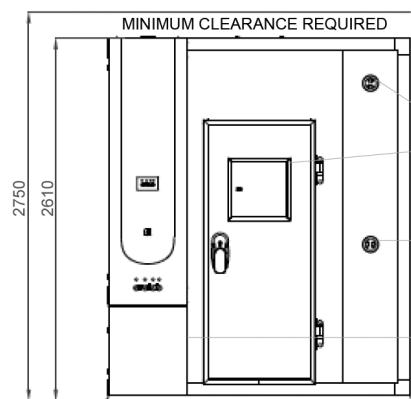
### ● ● ● ● TEMPERATURE & HUMIDITY WORKING RANGE



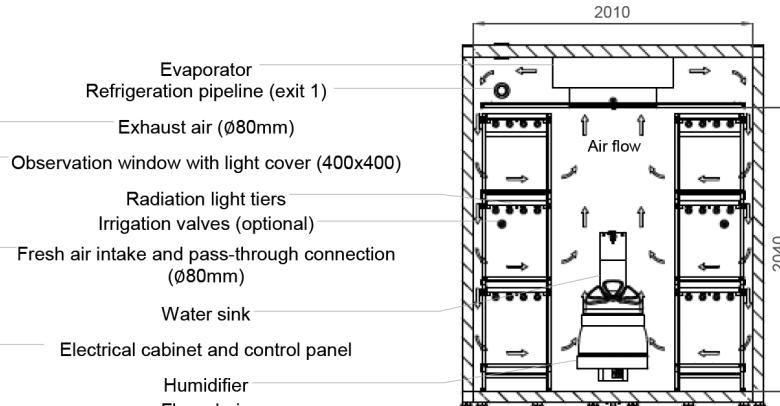
## DIMENSIONS AND DRAWINGS

### • • • • FITOCIMA 5.000

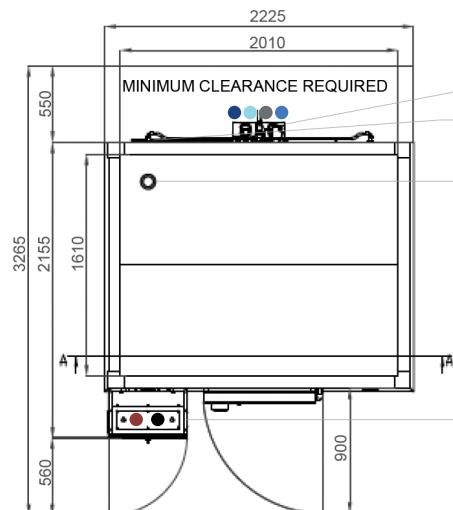
EXTERNAL DIMENSIONS (HxWxD) (mm)	 2.610 x 2.225 x 3.265
INTERNAL DIMENSIONS (HxWxD) (mm)	 2.040 x 2.010 x 1.610



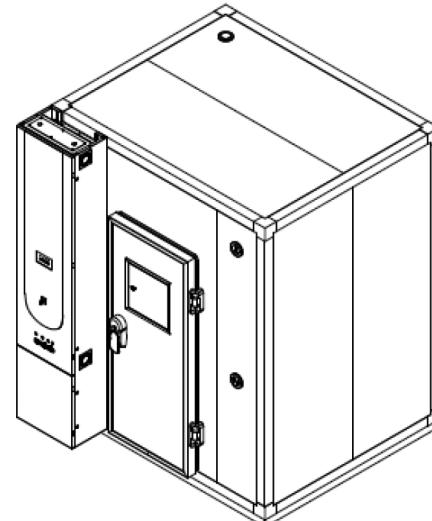
FRONT VIEW



SECTION A-A

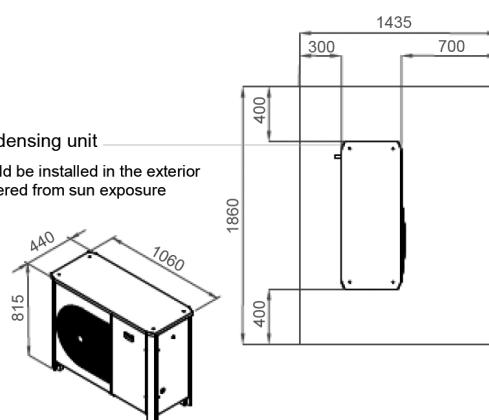


PLANT VIEW



1. Standard refrigeration system is air cooled
2. Services hub installation needs:
  - 1/2" demineralized water supply  
Conductivity: <40µS/CM  
Pressure: 1-5 BAR
  - 50mm water drain at floor level
  - 1/2" tap water supply
  - 1/2" irrigation valve system
3. Electrical cabinet installation needs:
  - Supply power: 400VAC, 50Hz, 25A / 3-Phase + Neutral + Ground  
Electrical protection: Circuit breaker 3 x 25A + N with 300mA differential  
3-Phase electrical cable RV-K 5G4 on the top
  - RJ45 Ethernet socket communication port on the top

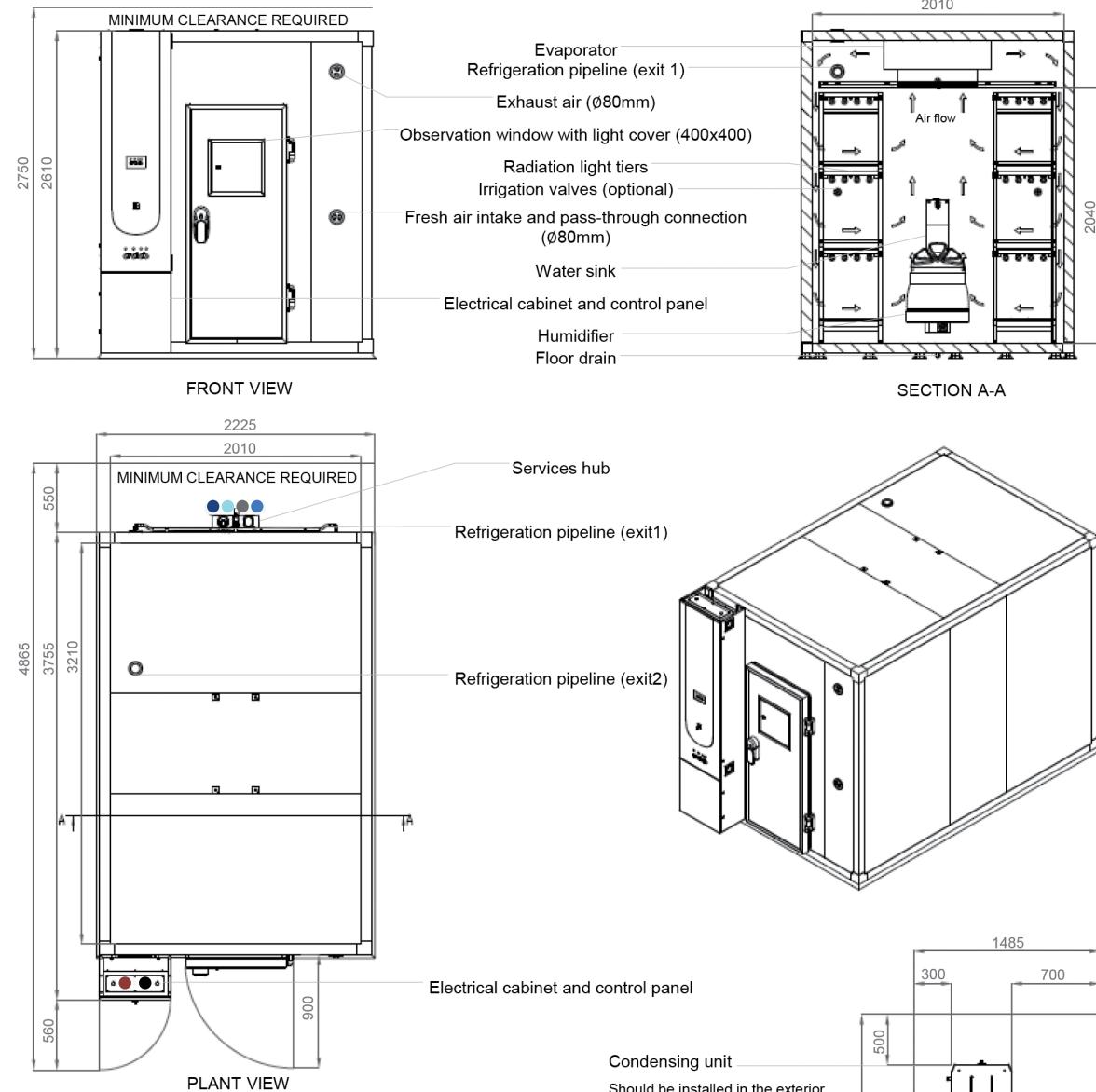
Condensing unit  
Should be installed in the exterior  
sheltered from sun exposure



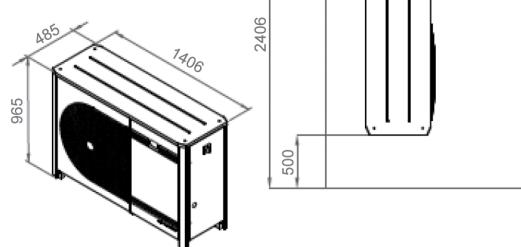
## DIMENSIONS AND DRAWINGS

### ● ● ● ● FITOCIMA 12.000

EXTERNAL DIMENSIONS (HxWxD) (mm)	 2.610 x 2.225 x 4.865
INTERNAL DIMENSIONS (HxWxD) (mm)	 2.040 x 2.010 x 3.210



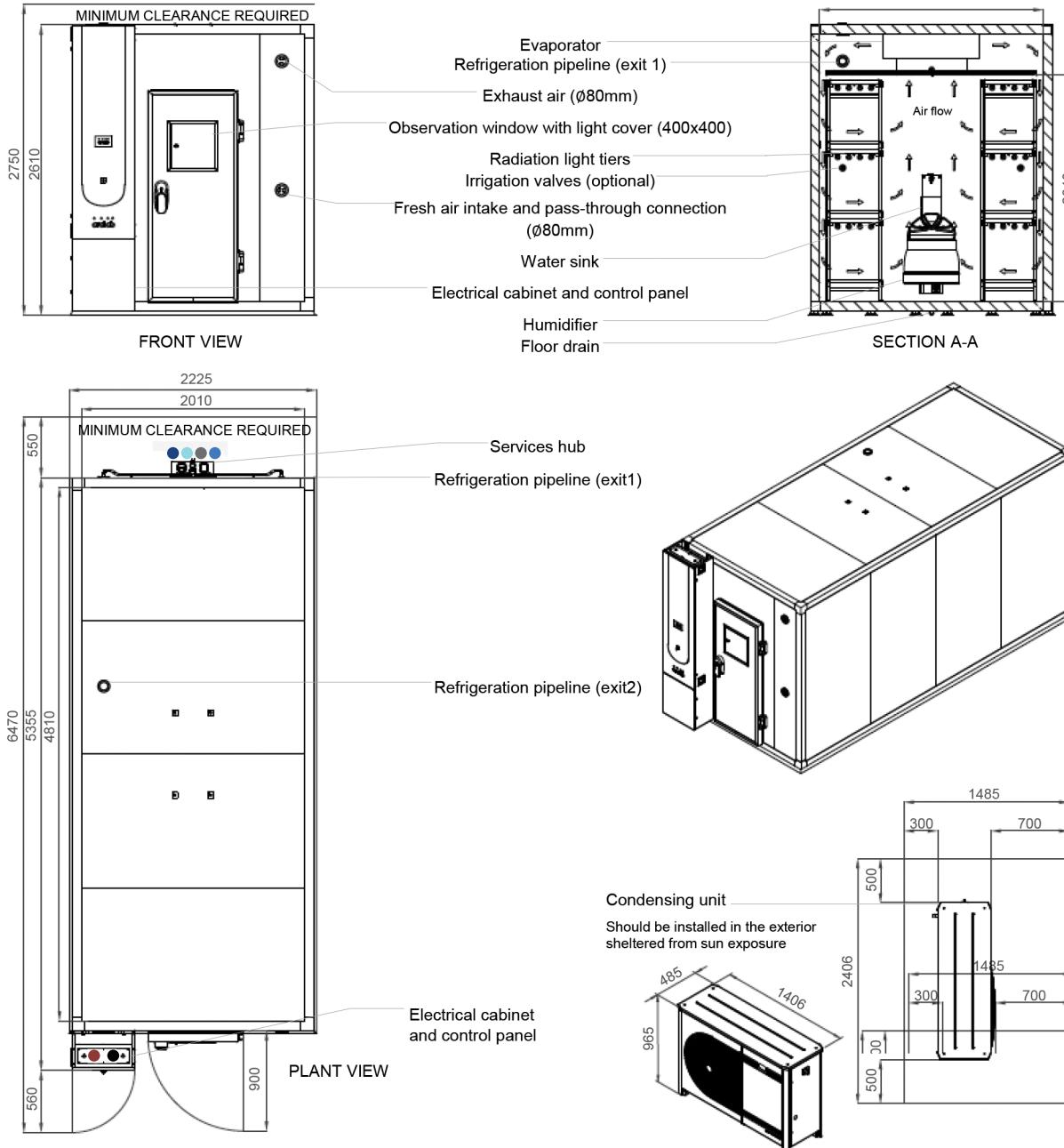
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  - 1/2" irrigation valve system
3. Electrical cabinet installation needs:
  - Supply power: 400VAC, 50Hz, 25A / 3-Phase + Neutral + Ground  
Electrical protection: Circuit breaker 3 x 25A + N with 300mA differential  
3-Phase electrical cable RV-K 5G4 on the top
  - RJ45 Ethernet socket communication port on the top



## DIMENSIONS AND DRAWINGS

### ● ● ● ● FITOCIMA 20.000

EXTERNAL DIMENSIONS (HxWxD) (mm)	 2.610 x 2.225 x 6.470
INTERNAL DIMENSIONS (HxWxD) (mm)	 2.040 x 2.010 x 4.810



1. Standard refrigeration system is air cooled  
 2. Services hub installation needs:

- 1/2" demineralized water supply  
 Conductivity: <40µS/CM  
 Pressure: 1-5 BAR
- 50mm water drain at floor level
- 1/2" tap water supply
- 1/2" irrigation valve system

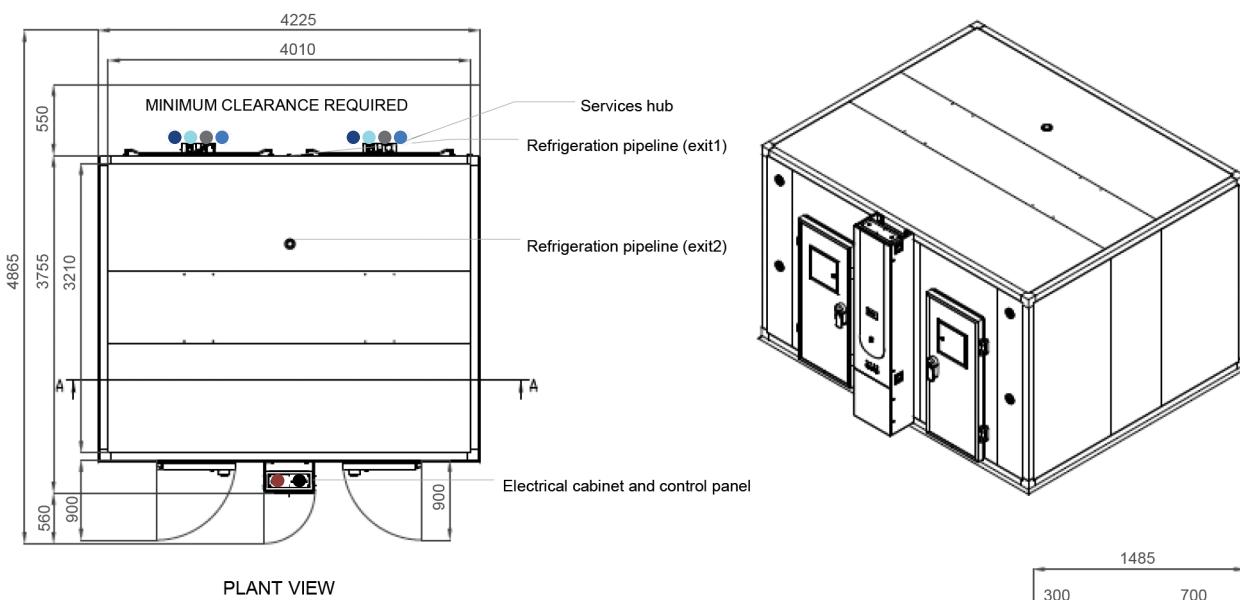
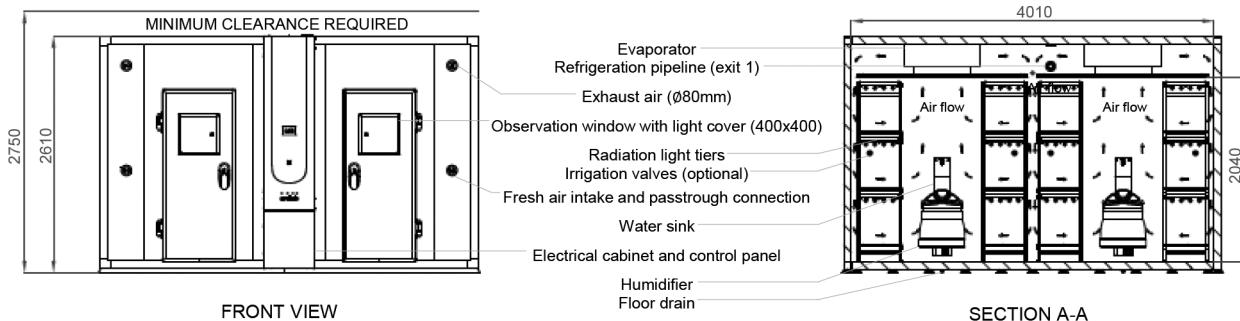
3. Electrical cabinet installation needs:

- Supply power: 400VAC, 50Hz, 25A / 3-Phase + Neutral + Ground
- Electrical protection: Circuit breaker 3 x 25A + N with 300mA differential
- 3-Phase electrical cable RV-K 5G4 on the top
- RJ45 Ethernet socket communication port on the top

## DIMENSIONS AND DRAWINGS

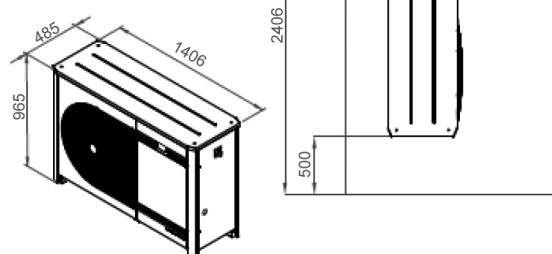
### ● ● ● ● FITOCIMA 25.000

EXTERNAL DIMENSIONS (HxWxD) (mm)		2.610 x 4.225 x 4.865
INTERNAL DIMENSIONS (HxWxD) (mm)		2.040 x 4.010 x 3.210



1. Standard refrigeration system is air cooled
2. Services hub installation needs:
  - 1/2" demineralized water supply  
Conductivity: <40µS/CM  
Pressure: 1-5 BAR
  - 50mm water drain at floor level
  - 1/2" tap water supply
  - 1/2" irrigation valve system
3. Electrical cabinet installation needs:
  - Supply power: 400VAC, 50Hz, 32A / 3-Phase + Neutral + Ground  
Electrical protection: Circuit breaker 3 x 32A + N with 300mA differential  
3-Phase electrical cable RV-K 5G6 on the top
  - RJ45 Ethernet socket communication port on the top

Condensing unit  
Should be installed in the exterior  
sheltered from sun exposure



## EQUIPMENT DESCRIPTION



### CONSTRUCTION

- Exterior: EN 14509 sandwich type high density injected polyurethane foam modular panels, 80 mm thick (other thicknesses available for different specific insulation requirements) with galvanized steel in light gray plastic finish. CFC-free.
- Floor: slip resistant AISI 304 stainless steel floor
- Walls: Galvanized steel with white epoxy paint
- Shelving and trays: highly resistant AISI 304 stainless steel
- 80mm Ø entry-port
- New generation multi-color touch-screen ClimaPlus© controller
- Door with sealing gasket, observation window, key lock and safety opening mechanism from the inside
- Open door alarm with configurable time-out function
- Free slots for connecting and integrating external devices with the ClimaPlus controller (CO2, O2 control, Auto Irrigation, Aeration, Radiometers and other)
- Entomology and Insect rearing rooms have 'flicker-free' ceiling lights and special low-noise blower. In addition to a particulate air filter located on the evaporator inlet, the system is also protected by a phenolic resins coating



### CLIMATIC CONTROL

- Air based, CFC free, mechanical refrigeration by sealed condenser group
- Dual heating technology with hot gas by-pass and stainless steel electric heaters
- Humidification by centrifugal humidifier with very low power consumption and hygienic automatic washing cycles
- Dehumidification by condensation on the cooling system evaporator
- PT100 RTD temperature sensor and capacitive humidity sensor



### AIR FLOW

- Dynamic airflow with EC (variable) blower
- Forced in vertical and downward direction through ceiling plenum
- Horizontal laminar airflow across the shelves to assure uniformity to all growth area
- Air renovation through adjustable port-holes
- Airflow speed adjustable at the ClimaPlus© controller

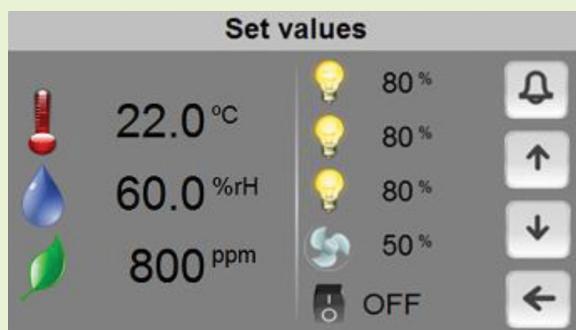


### RESEARCH PROTECTION AND SECURITY

- Independent thermostats for maximum and minimum temperature limits
- Automatic cut-off function, in case of excessive heating or cooling
- Configurable maximum and minimum temperature and humidity limits
- Visual and audible alarms for temperature and humidity band limits

## CLIMAPLUS CONTROLLER

- Programmable Logic Controller exclusively developed by Aralab for FitoClima chambers
- Controls every environmental variable available for any specific FitoClima model (Temperature, Humidity, Lights, Airflow, CO<sub>2</sub>, O<sub>2</sub> and connected external devices)
- Easy to use touch-screen interface with multi-color display
- Friendly program editor for creating 32 programs of 24 segments each, allowing the design of complex and comprehensive climatic simulation programs
- Password protection of the controller functions
- Content and research protection feature, with configurable High and Low Temperature and Humidity alarms and automatic notifications
- Managing, monitoring and recording of all alarms
- Non-volatile memory, allowing the automatic restart of previously defined set-points or on-going programs due to power failure, without losing data
- Real-time monitoring of all the functions and active components of the equipment, allowing for a fast and accurate diagnostic in case of malfunction
- Possibility to control and program events by external commands and with external devices
- Graphical view of programs and climatic variables
- Ethernet and Wi-Fi for connecting computers to the controller
- ClimaPlus controller functions also available at the PC/Laptop with the FitoLog software pack



## FITOLOG SOFTWARE

The FitoLog software pack is a set of applications designed to facilitate the managing, monitoring and recording of programs and data from the FitoClima chambers. It consists of 3 applications: **FitoLog**, **FitoLogView** and **FitoProgram**.



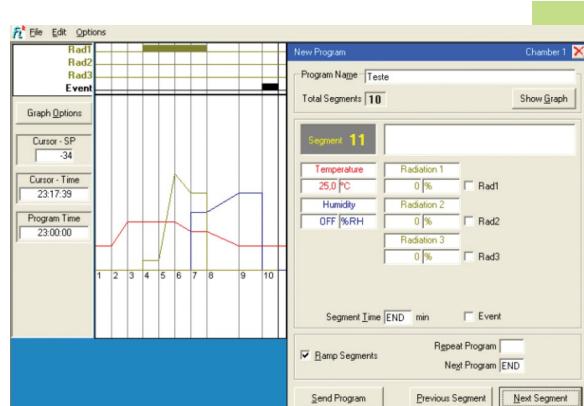
### FITOLOG

Records and displays in real time all data and details related to the set-points, running variables and equipment behaviour. It also retrieves information about the active components of the chamber, running processes, errors, alarms and allows the configuration of periodic or alarm triggered remote notifications (by email or SMS, depending on existing connections and accessories).



### FITOLOGVIEW

It is a working tool to process the data recorded by the FitoLog program. One can view, print and export the log contents to other file types, and analyse the data in other data management software (Excel, Star Office, Access or others).



### FITOPROGRAM

This application simplifies the creation of programs and its integration on the chamber ClimaPlus controller. Up to 32 programs, each with 24 segments, can be designed and linked to create detailed environmental profiles and simulations.

## RESEARCH SECURED WITH ALARMS, NOTIFICATIONS, FAST DIAGNOSTICS AND PROMPT TROUBLESHOOTING

With FitoLog it is possible to gather data from each of the chambers systems, which makes it a very useful tool to diagnose any necessary maintenance. This tool works as the "black box" of the equipment, giving Aralab technicians the necessary data to remotely carry out a fast and efficient diagnostic. All that is needed is a FitoLog file.

## FITOCIMA BIO MODELS REFERENCE STANDARD CONTROLLED ENVIRONMENT VARIABLES<sup>[1]</sup>

### ● ● ● ● INSTALLATION REQUIREMENTS

FITOCIMA BIO PL	 	Temperature and Light
FITOCIMA BIO PLH	  	Temperature, Light and Humidity

<sup>[1]</sup> Other climatic and environmental variables can be integrated as an option (CO2, dew, mist, irrigation and more)

## COMMON ACCESSORIES

### PLEASE CONSULT ARALAB FOR OTHER ITEMS

FitoLog® software pack for PC/Laptops, enabling data monitoring, logging and managing operations directly on a computer

CO2 monitor and controlling unit

Light intensity control with internal quantum light meter

LED modules with fixed spectral distribution

LED modules with adjustable spectral distribution

Variable air flow

Dew and Mist simulation

Positive/Negative pressures with HEPA filters

Phenolic coating for Entomology/Insect rearing rooms

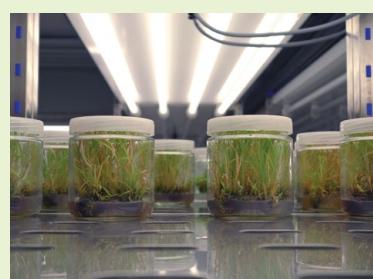
Irrigation function for automated watering and plant nurturing

Aeration kit for Algae Research and Hydroponic cultures

Integrated water tank with electric pump and security valve

Wall mounting conductivity meter, for water quality control, with assembling accessories

Additional internal electrical connection sockets



## MULTI-TIER GROWTH ROOMS - CUSTOMER APPLICATIONS

CUSTOMER SPECIFICATIONS AND ACCESSORIES MAY RESULT IN DIFFERENT PRODUCT IMAGES)



SET OF 7 ENVIRONMENTAL GROWTH ROOMS



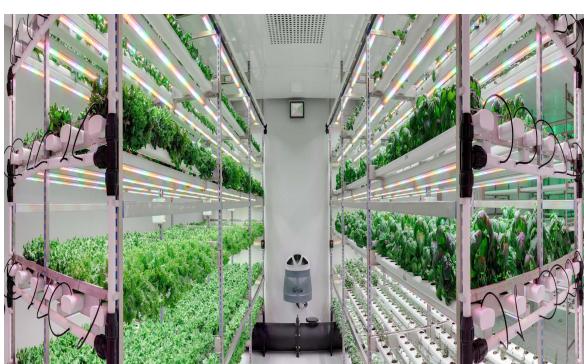
ARABIDOPSIS RESEARCH GROWTH CHAMBERS



LANDSCAPE AND EXOTIC FLORA RESEARCH ROOMS



ALGAE RESEARCH AT MARINE BIOLOGY CENTER



HYDROPONIC CHAMBERS



RADIOMETER SENSOR ( $\mu\text{E}/\text{m}^2\text{s}$ )

Features and specifications are subject to change. Aralab continuously studies ways to further develop its products to achieve better performances and overall product quality. As a result, characteristics and specifications provided in this document may be subject to changes.

Let's meet!  
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**Control the environment**  
Your own climate

