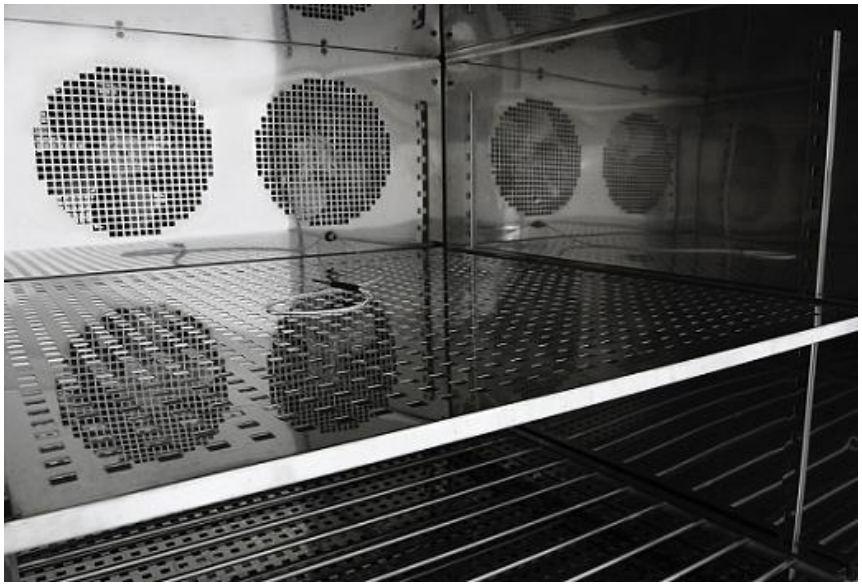
aralab

TESTING

FITOTERM
FITOCLIMA

TEMPERATURE / HUMIDITY CONTROL

‘REACH-IN’ ENVIRONMENTAL CHAMBERS FOR CLIMATE AND TEMPERATURE TESTING



FitoTerm & **FitoClima** temperature and humidity **testing** chambers offer highly precise and reproducible conditions for climatic and temperature testing in many industries. **Common applications include**:

Environmental Testing
Electronics, Automotive, Aerospace, Building materials, Military equipment, Materials in general
Research
Quality Control
Production facilities

ARALAB

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

Since 1985 it has developed and perfected ways to create and control temperature, humidity, light, pressure, wind and many other environmental conditions so customers and partners worldwide can have access to the best equipment for their research and testing purposes.

Aralab. Your own climate.

Aralab is ISO:9001 certified for Quality Management

FEATURES

The most advanced technology in climate control

Internal aerodynamic optimization to ensure uniformity of climatic conditions

Time saving features with easily configurable testing programs that can run, start and stop automatically

Highly resistant stainless steel interior for maximum durability and easy cleaning

Flexible interior with height adjustable and removable stainless steel shelves

Nonpolluting construction and cooling system

Compliant with international standards and requirements EN, IEC, DIN, ISO, NP and UNE

TEMPERATURE AND HUMIDITY CONTROL RANGES

FITOTERM Chambers – Temperature only

FITOTERM CHAMBERS	TEMPERATURE RANGE	HUMIDITY RANGE
FitoTerm E20	-20ºC to +180ºC	N/A
FitoTerm E45	-45ºC to +180ºC	N/A
FitoTerm E75	-75ºC to +180ºC	N/A

FITOCLIMA Chambers – Temperature and Humidity

FITOCLIMA CHAMBERS	TEMPERATURE RANGE	HUMIDITY RANGE
FitoClima EP, EC & ECP 20	-20ºC to +180ºC	10 to 98% RH
FitoClima EP, EC & ECP 45	-45ºC to +180ºC	10 to 98% RH
FitoClima EP, EC & ECP 75	-75ºC to +180ºC	10 to 98% RH

* EP, EC & ECP refer to the humidity sensors. EP = Electronic Psychrometric; EC = Electronic Capacitive; ECP = Electronic Capacitive + Psychrometric

TECHNICAL DATA

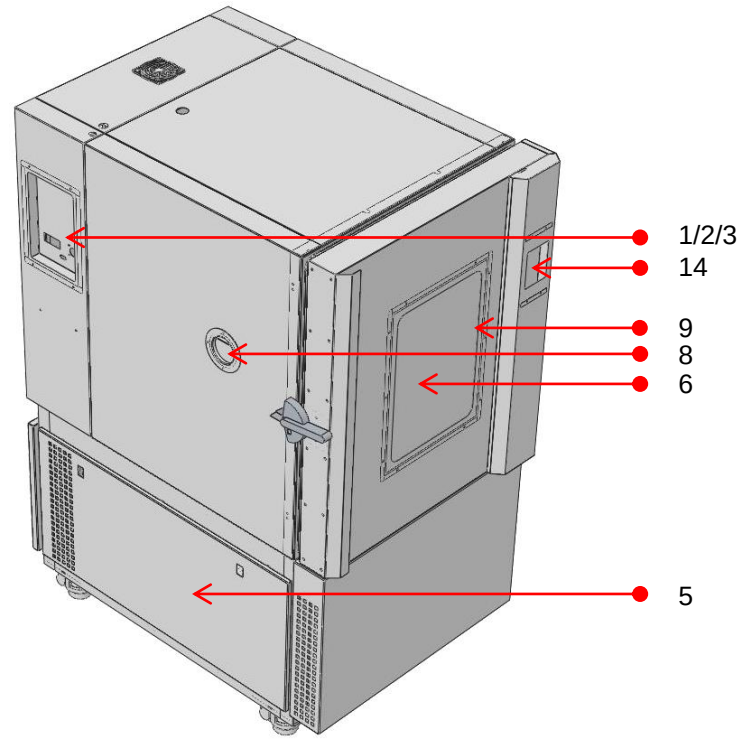
FITOCLIMA AND FITOTERM TESTING CHAMBERS	
Performance in CLIMATIC testing range | only FITOCLIMA chambers	
TEMPERATURE RANGE	10ºC to 90ºC
TEMPERATURE UNIFORMITY (1a)	± 0,1ºC to ± 1,0ºC (1b)
TEMPERATURE FLUCTUATION (1a)	± 0,1ºC to ± 0,3ºC (1b)
HUMIDITY RANGE	10% RH to 98% RH
HUMIDITY FLUCTUATION (1a)	± 0,5% RH to ± 3% RH
Performance in TEMPERATURE testing | FITOTERM and FITOCLIMA chambers	
TEMPERATURE RANGE (1a)	-75ºC, -45ºC or -20ºC up to 180 ºC
TEMPERATURE UNIFORMITY (1a)	± 0,5ºC to ± 1,5ºC
TEMPERATURE FLUCTUATION (1b)	± 0,1ºC to ± 0,5ºC
TEMPERATURE RATE OF CHANGE **HEATING** (2a) (2b)	From 2,5ºC to 4,5ºC / minute
TEMPERATURE RATE OF CHANGE **COOLING** (2a) (2b)	From 2ºC to 4ºC / minute
Other technical data	
NOISE LEVEL	55 to 64 dBA
ELECTRICAL CONNECTION	3/N/PE AC 400V ± 10% 50Hz

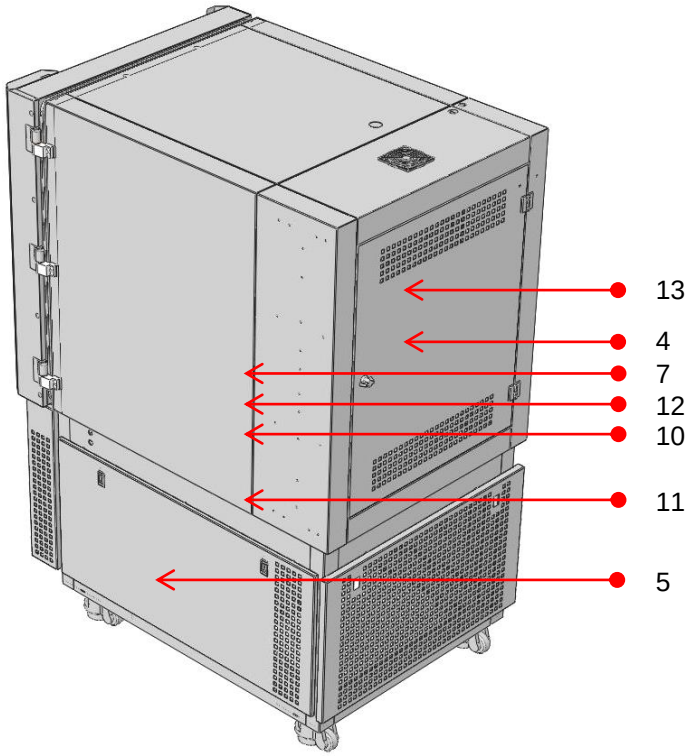
Performances measured in factory with ambient temperatures between 20ºC and 25ºC

(1a) Measurements at center of test space, with empty chamber and no optional accessories; (1b) in temperature range up to 150ºC;
(2a) According to IEC/EN 60068-3-5. Values will vary with FitoClima/FitoTerm model, internal volume, compressor type and condenser cooling system. Temperature rate of change can be adjusted to comply with the needed heating / cooling speed requirements. Optional accessories are available for more demanding heating and cooling temperature change rates.
(2b) The FitoClima 300 -20ºC model is a monophasic chamber with a standard temperature rate of change of 1,9ºC/minute for heating and 1,8ºC/minute for cooling

DRAWINGS AND DIMENSIONS

SYSTEM STRUCTURE



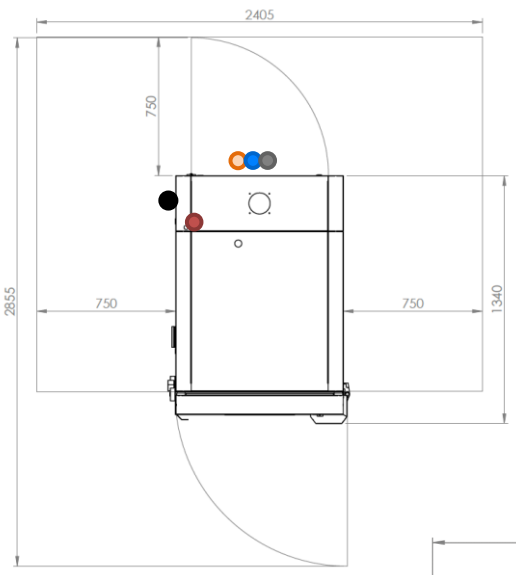


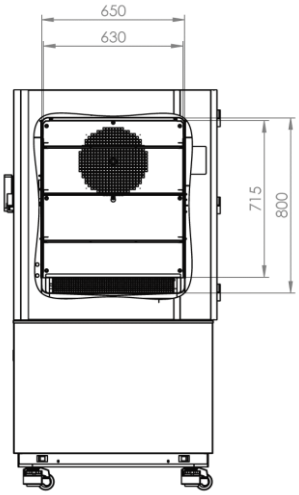
1	Main switch
2	DB9 connector
3	Safety thermostat
4	Powerhouse
5	Machinery compartment
6	Test chamber
7	Sensors
8	Entry points
9	Interior Light
10	Evaporator
11	Dew point bath
12	Heater
13	Ventilation
14	Controller

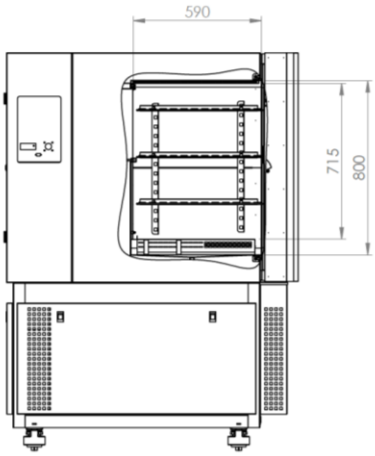
FITOTERM / FITOCLIMA 300

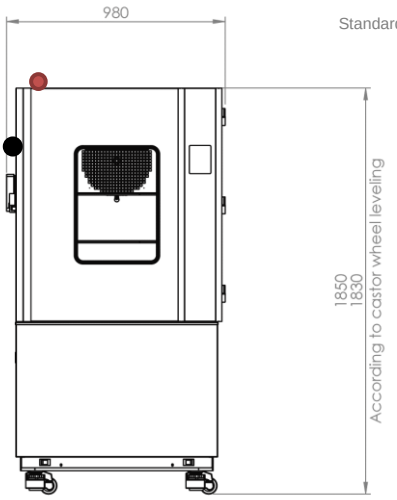
EXTERIOR DIMENSIONS (H x W x D) (mm)	1.830 x 980 x 1.340
INTERIOR DIMENSIONS (H x W x D) (mm)	715 x 630 x 590

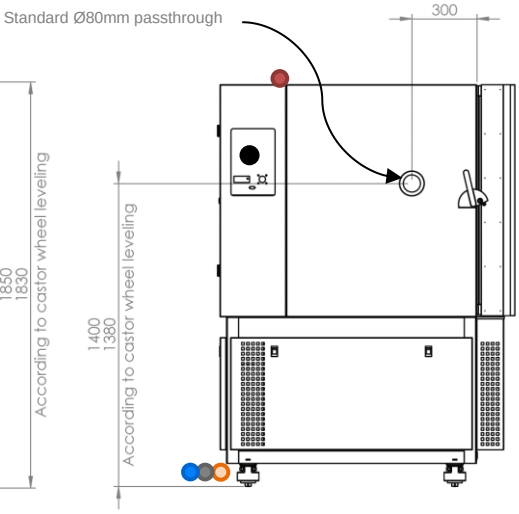
MINIMUM CLEARANCE REQUIRED









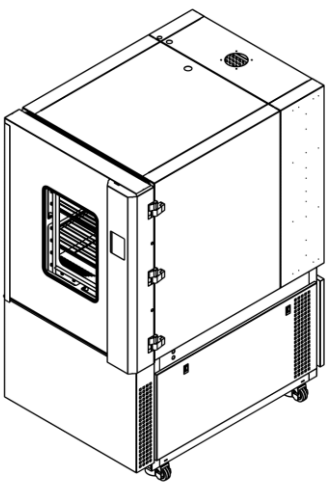


1. Standard refrigeration system is air cooled
2. Services hub installation needs:
   - ½" demineralized water supply
   - 50mm water drain at floor level
3. Electrical cabinet installation needs:
   Supply power ECP20:
   230VAC, 50Hz, 16A / Single Phase + Neutral + Ground
   Electrical protection: Circuit breaker 16A + N with 300mA differential
   Single Phase electrical cable RV-K 3G2.5 on the top

   Supply power ECP45:
   400VAC, 50Hz, 16A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 16A + N with 300mA differential
   3-Phase electrical cable RV-K 5G4 on the top

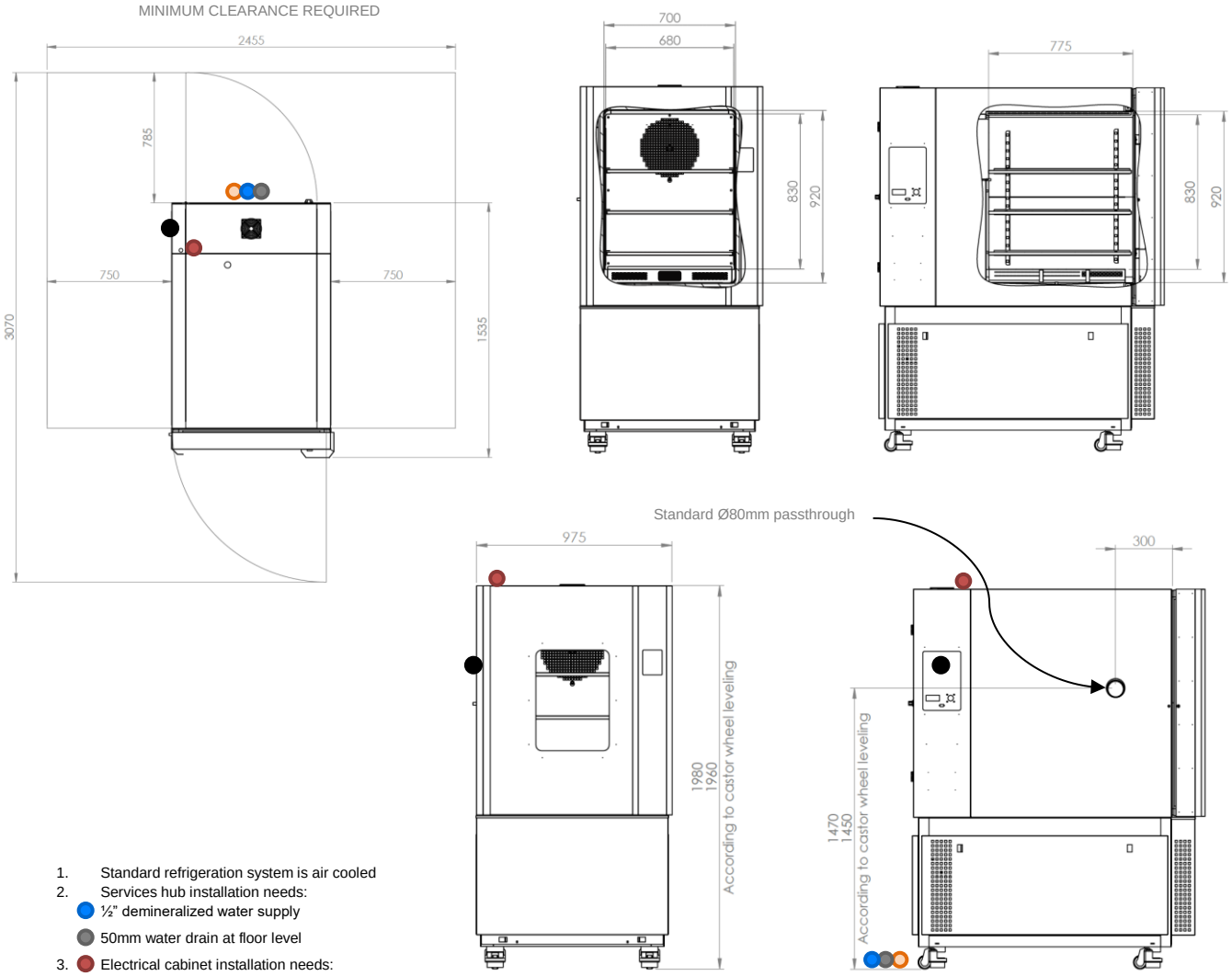
   Supply power ECP75:
   400VAC, 50Hz, 50A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 63A + N with 300mA differential
   3-Phase electrical cable RV-K 5G10 on the top

   - RS232 or RJ45 communications port
4. Water cooled option:
   Water flow: up to 2000 litres/hour (at 25 ºC)
   Intake pressure: 2 to 5 bar
   Water entry and exit pipe: 1" or 28mm
   Differential pressure between entry and exit: ≥ 2,5 bars
   Maximum temperature of water entry: 26 ºC
   Minimum temperature of water entry: 16 ºC
   Recommended temperature of water entry: 18 ºC



FITOTERM / FITOCLIMA 500

EXTERIOR DIMENSIONS (H x W x D) (mm)	1.850 x 1.000 x 1.500
INTERIOR DIMENSIONS (H x W x D) (mm)	830 x 680 x 775



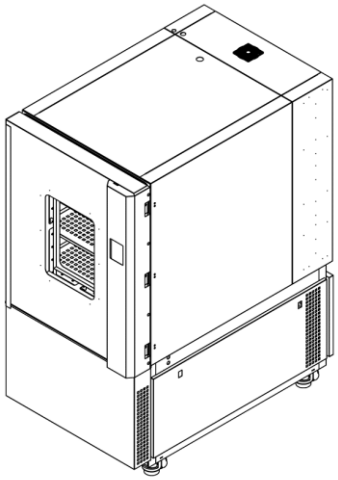
1. Standard refrigeration system is air cooled
2. Services hub installation needs:
   - ½" demineralized water supply
   - 50mm water drain at floor level
3. Electrical cabinet installation needs:

   Supply power ECP20:
   400VAC, 50Hz, 16A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 16A + N with 300mA differential
   Single Phase electrical cable RV-K 5G2,5 on the top

   Supply power ECP45:
   400VAC, 50Hz, 16A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 16A + N with 300mA differential
   3-Phase electrical cable RV-K 5G4 on the top

   Supply power ECP75:
   400VAC, 50Hz, 50A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 63A + N with 300mA differential
   3-Phase electrical cable RV-K 5G10 on the top

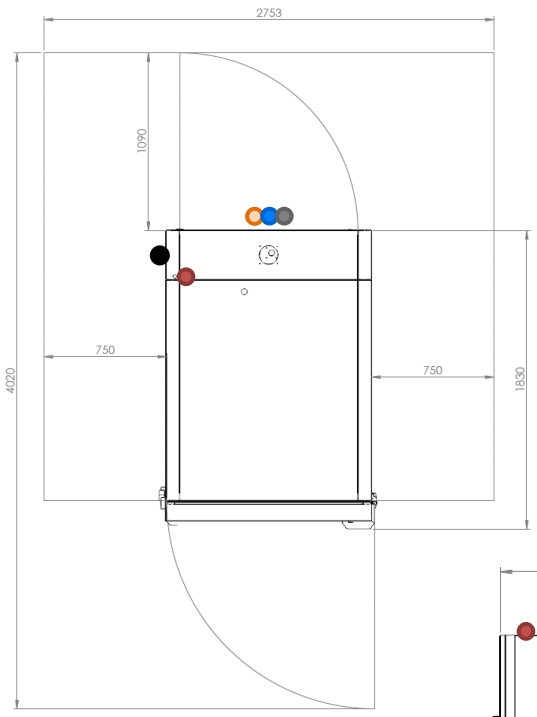
   - RS232 (or RJ45) communications port
4. Water cooled option:
   Water flow: up to 2000 litres/hour (at 25 ºC)
   Intake pressure: 2 to 5 bar
   Water entry and exit pipe: 1" or 28mm
   Differential pressure between entry and exit: ≥ 2,5 bars
   Maximum temperature of water entry: 26 ºC
   Minimum temperature of water entry: 16 ºC
   Recommended temperature of water entry: 18 ºC

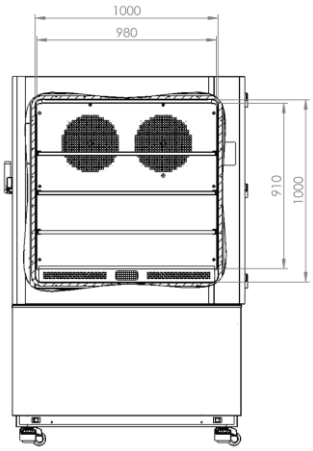


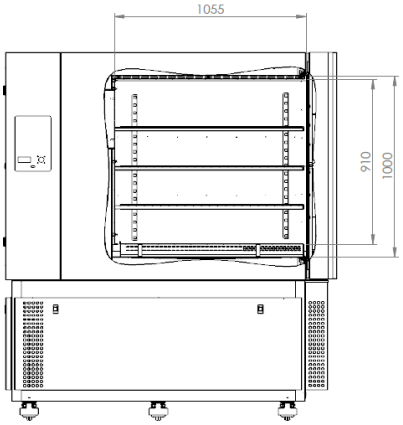
FITOTERM / FITOCLIMA 1.000

EXTERIOR DIMENSIONS (H x W x D) (mm)	2.035 x 1.300 x 1.830
INTERIOR DIMENSIONS (H x W x D) (mm)	910 x 980 x 1.055

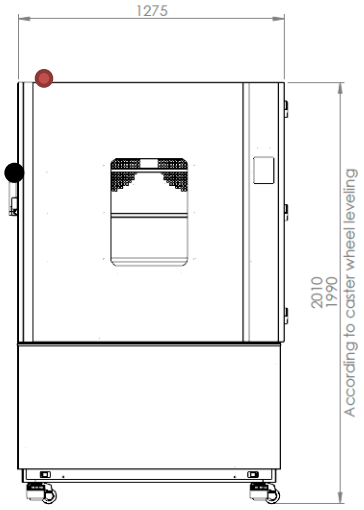
MINIMUM CLEARANCE REQUIRED

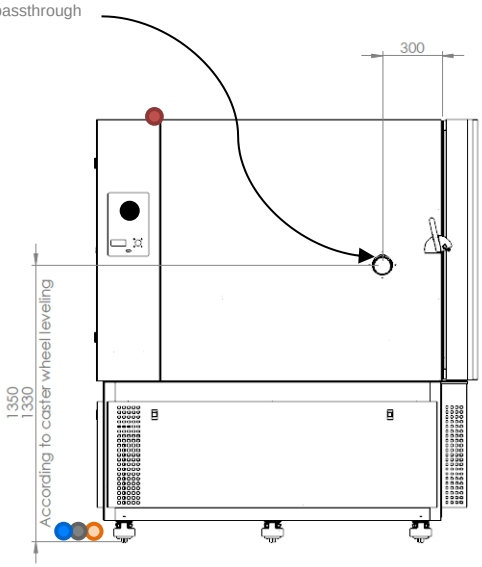






Standard Ø80mm passthrough





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2. Services hub installation needs:
   - ½" demineralized water supply
   - 50mm water drain at floor level
3. Electrical cabinet installation needs:
   Supply power ECP20:
   400VAC, 50Hz, 25A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 25A + N with 300mA differential
   Single Phase electrical cable RV-K 5G4 on the top

   Supply power ECP45:
   400VAC, 50Hz, 32A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 32A + N with 300mA differential
   3-Phase electrical cable RV-K 5G4 on the top

   Supply power ECP75:
   400VAC, 50Hz, 50A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 63A + N with 300mA differential
   3-Phase electrical cable RV-K 5G10 on the top
   - RS232 or RJ45 communications port
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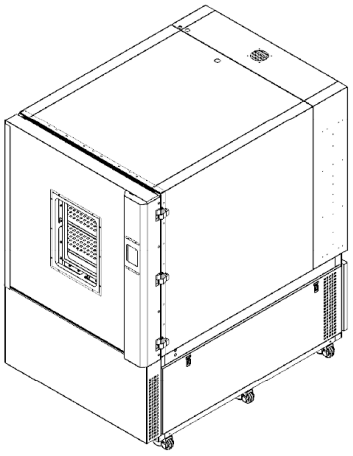
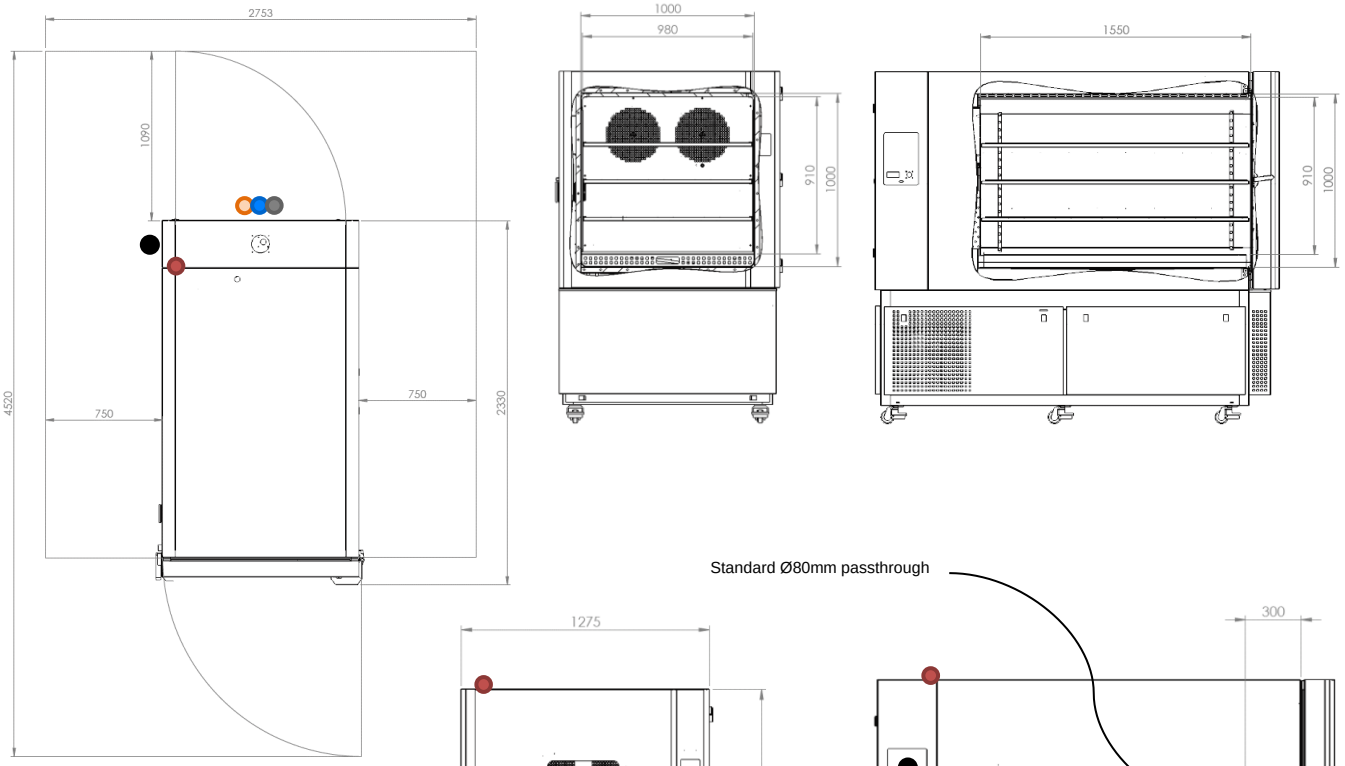
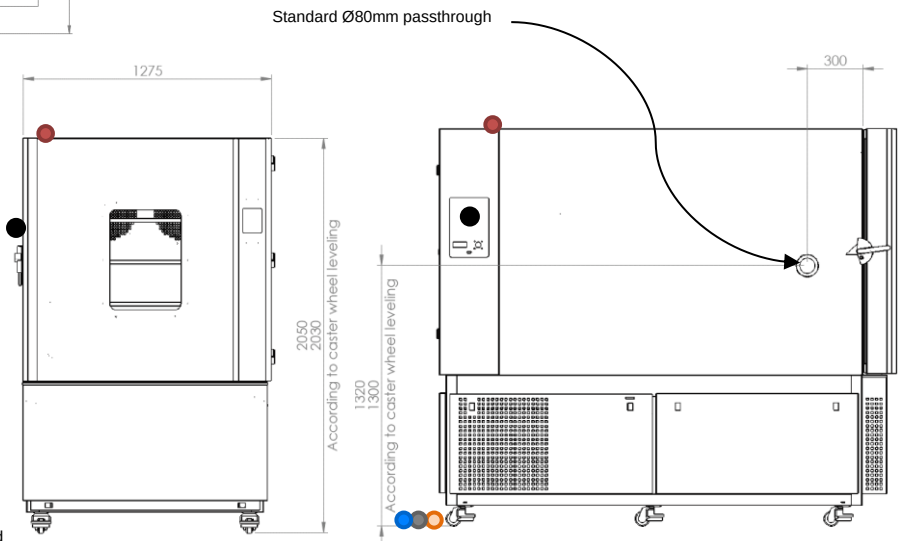


FITOTERM / FITOCLIMA 1.500

EXTERIOR DIMENSIONS (H x W x D) (mm)	2.050 x 1.287 x 2.250
INTERIOR DIMENSIONS (H x W x D) (mm)	910 x 980 x 1.550

MINIMUM CLEARANCE REQUIRED





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   Electrical protection: Circuit breaker 3 x 32A + N with 300mA differential
   3-Phase electrical cable RV-K 5G4 on the top

   Supply power ECP75:
   400VAC, 50Hz, 50A / 3-Phase + Neutral + Ground
   Electrical protection: Circuit breaker 3 x 63A + N with 300mA differential
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   - RS232 or RJ45 communications port
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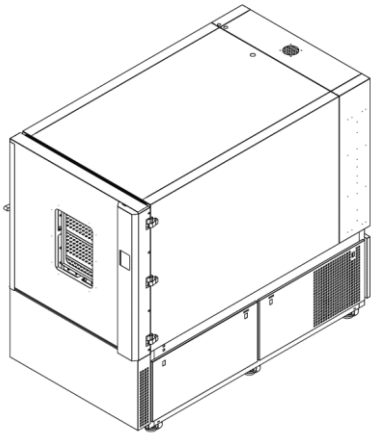
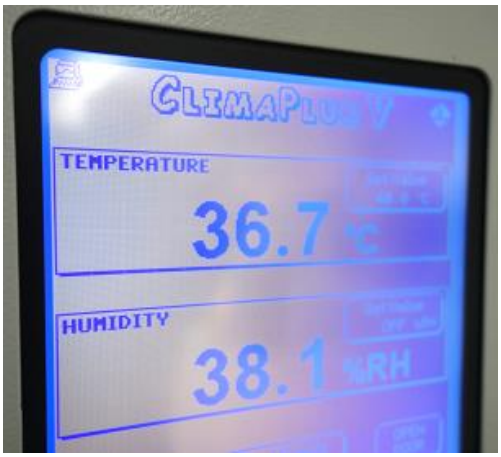


EQUIPMENT DESCRIPTION

Temperature



Temperature control is achieved by the proprietary Aralab PLC ClimaPlus, a high tech PID / temperature and humidity controller, developed by Aralab.

Temperature Precision (in the interior of the chamber, at 5 cm from walls, floor and top)

In Time ≤ ± 0,5º C
In Space ≤ ± 1,5º C

Temperature Sensors

One (1) PT 100 Class A, located in air treatment tunnel
One (1) PT 100 Class A, movable sensors for flexible placing inside chamber

Heating

By tubular stainless steel electric heaters located in the air treatment tunnel

Cooling

Air cooled hermetic scroll compressor group (low noise and high efficiency) with enforced ventilation and without CFC's. Water cooled condensers are also available as standard or as option for models with Temperature cooling rate upgrades.

Thermal security

Safety thermostat with High / Low temperature configuration, with automatic stop of all thermic systems.
High / Low temperature alarms programmed in the controller, with mute function. This function won't stop the chamber and it's only used to record the occurrence and to call the attention of the users with an audible alarm.

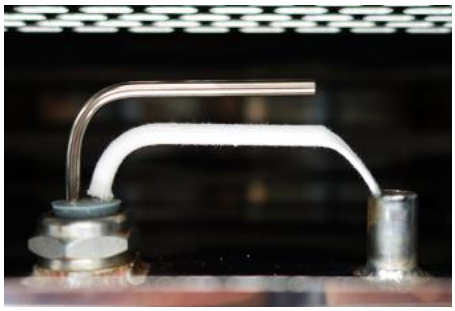
Humidity (FitoClima chambers)

Humidity control is achieved by the proprietary Aralab PLC ClimaPlus, a high tech PID / temperature and humidity controller, developed by Aralab.

Humidity Precision (in the interior of the chamber, at 5 cm from walls, floor and ceiling)

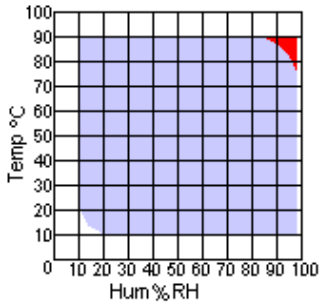
In Time ≤ ± 1,0% RH
In Space ≤ ± 2,5% RH

Humidity Sensors



To measure and control humidity Aralab uses two different sensor technologies: Psychrometric, Capacitive, or both simultaneously. Consult Aralab for technical support on the appropriate selection.

Humidity sensors: Humidity Vs. Temperature ranges graphic



For climatic tests that require humidity and temperature ranges highlighted in red on the graph, a Psychrometric sensor is recommended (EP and ECP models). Please consult Aralab for help on the choice between these two models.

Humidity / Drying

Humidity: Through thermostatic bath with dew point control.

Drying: Through thermostatic bath with dew point control and additional dry coil

Security

Automatic stop function in case of water failure, with indication on the controller; High / Low Temperature alarms; High / Low humidity alarms;

Construction

Interior: AISI 304 hermetical welded, vapor tight, stainless steel

Exterior: Zinc mild steel with epoxy coating finish (color RAL 7035)

Insulation: Rock Wool

Interior illumination: Halogen lamp 12V (only available with optional window)

Door: Double silicone joints and anti-condensation heating frames (optional window)

Air Flow / Ventilation

Air Flow: Forced through 1 or 2 ventilators/fans (300 and 500 liters' models have one ventilator/fan and 1.000 and 1.500 models have two).

Air Renovation: By lateral port, also for compensating pressure.

Cut-off panel, Security and Communications

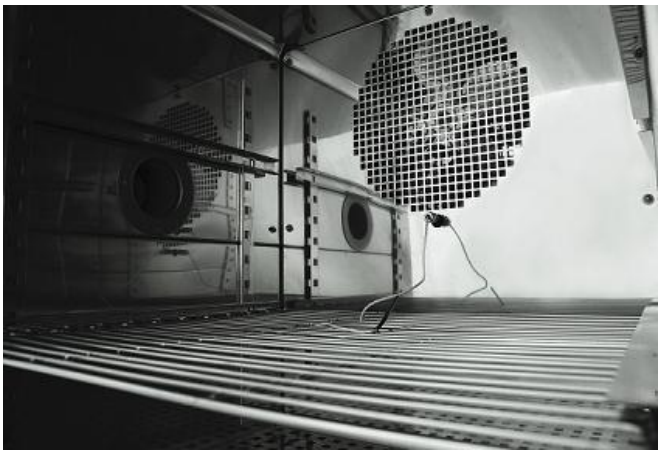
Mounted on left lateral panel of the chamber and equipped with:

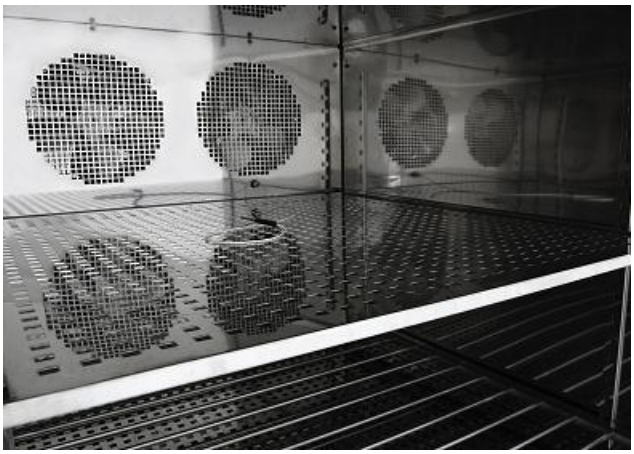
- High / Low safety thermostat
- Main Power switch
- Audible alarms
- RS232 communications port (RJ45 also available)

Inclusions

- 2 Stainless steel shelves
- 1 lateral left panel entry port with Ø 80 mm
- 4 / 6 height leveling casters
- Instructions manual in English (other languages upon request)
- 2 years' warranty

Aralab Environmental Testing chambers





From left to right: interior of FitoClima 300 and 1.500. Visible at the images: highly resistant AISI 304 stainless steel with height adjustable shelves, port-hole and PT100 class A temperature sensor. Fans and perforated trays and interior base allow for uniform circulation and distribution of temperature and humidity inside the chamber.

FitoClima 300 with a chilled mirror dew point hygrometer for calibration inside

Two FitoClima chambers with liquid nitrogen injection, allowing up to 10°C / minute cooling speeds

CONTROLLER

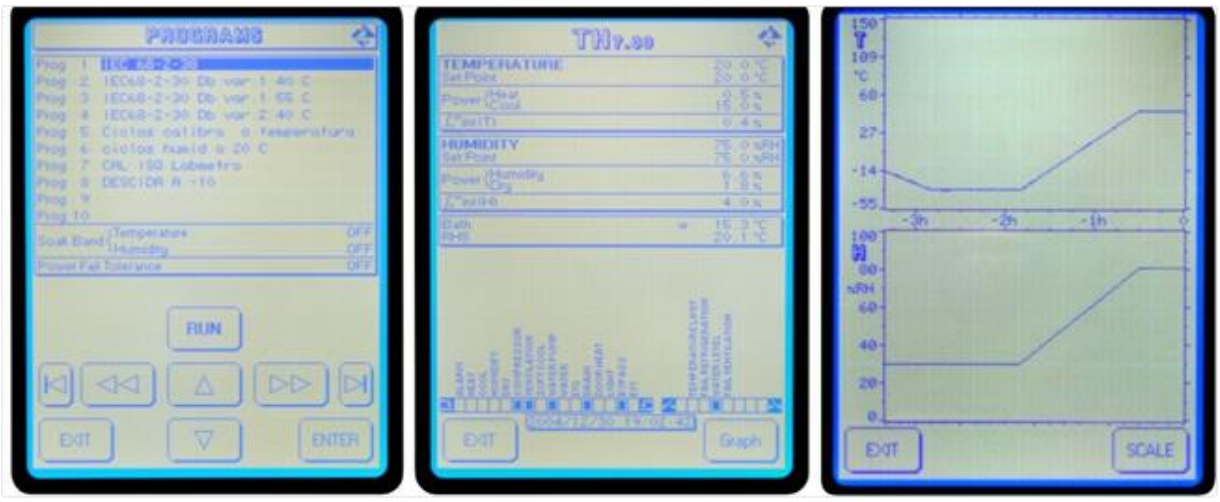
ClimaPlus V

- Programmable PLC exclusively developed for ARALAB chambers
- Programmable easy to use controller with Touch Screen Display (168 x 112mm)
- Resolution of 0.1ºC for Temperature and 0.1% for Relative Humidity
- High performance temperature and humidity control with value correction possibility in all ranges

- Capability for creating 50 programs of 50 segments each
- Non-volatile memory
- Automatic restart of tests due to power failure, without losing data and restarting test where it was interrupted

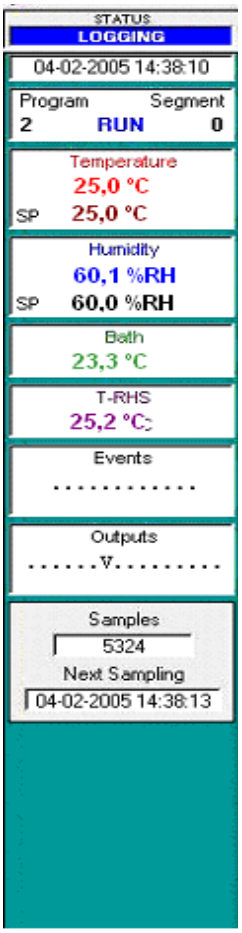
- Real-time monitoring of all functions and control of equipment.
- Send all control settings and system software via RS232 to plant.
- Possibility of programming a delay of the beginning of test
- Monitoring and recording of all alarms

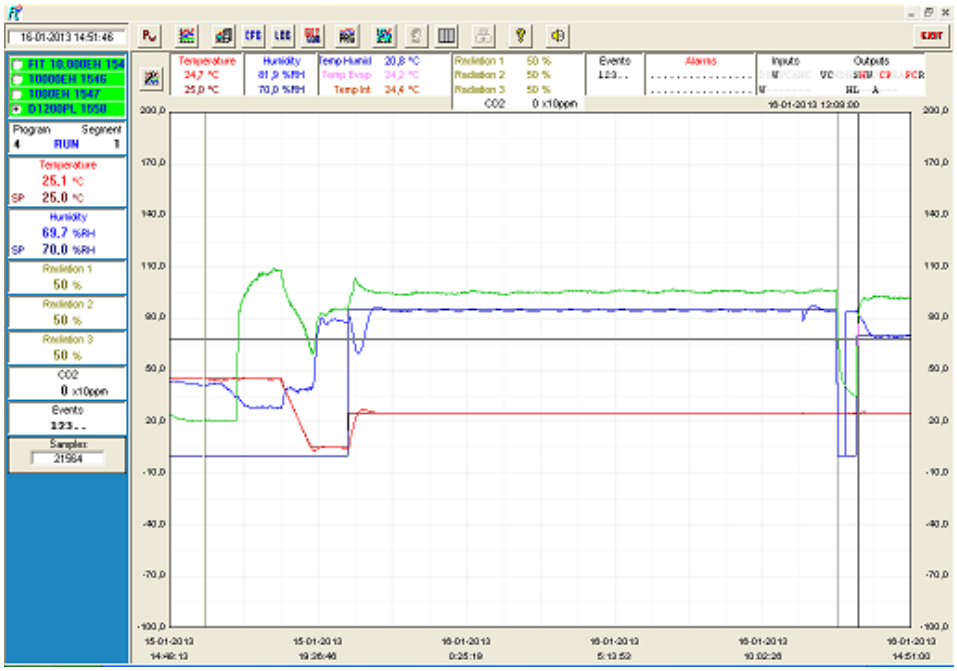
- Possibility of performing events by external commands
- Several outputs for connecting computers or other devices
- Alarms management
- Graphic representation of the tests ran
- Graphical visualization of the test in the controller.
- Possibility of running computer test programs and export them to the controller



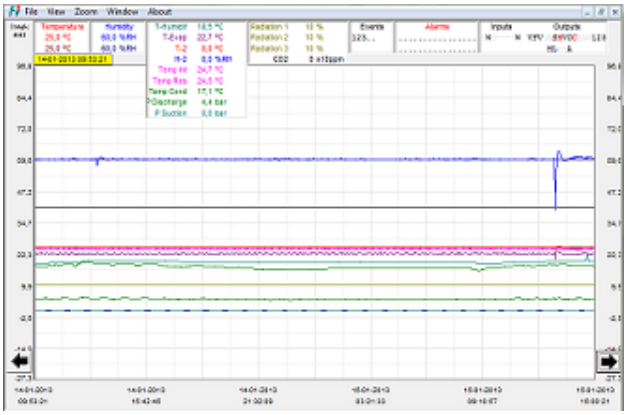
FITOLOG SOFTWARE

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**.

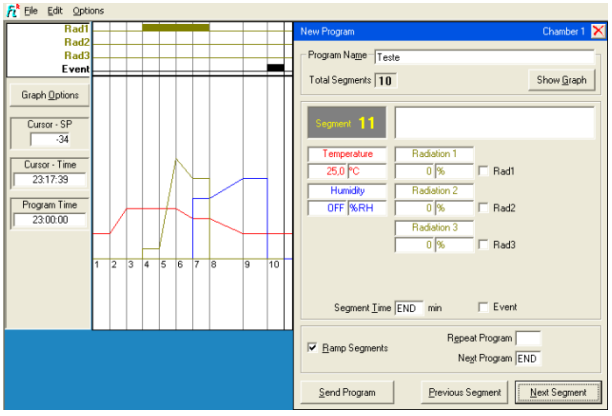




FitoLog: Records and displays in real time all data and details related to the set-points, running variables and equipment behavior. It also retrieves information about the active components of the chamber, running processes, errors, alarms and allows the configuration of periodic or alarm triggered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



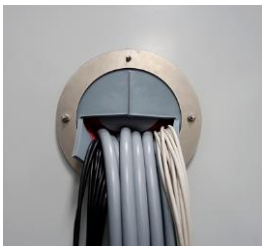
FitoLogView: It is a working tool to process the data recorded by the FitoLog program. One can view, print and export the log contents to other file types, and analyse the data in other data management software (Excel, Star Office, Access or others).



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.

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.

Most common optional accessories

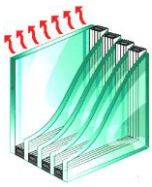


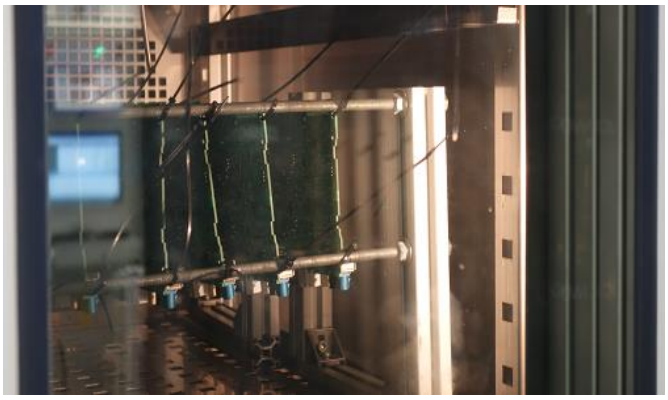
- Software pack FitoLog and FitoLogView
- Observation anti-condensation windows in multi layered glass
- Water demineralizer (for FitoClima Chambers)
- Integrated water tank
- Water conductivity monitor (for FitoClima Chambers)
- Additional entry ports
- Calibration certificate from accredited external laboratory
- Faster heating / cooling temperature change rates

Other accessories are available on request. Please consult Aralab.

Window Option

The observation window is composed of a multilayered glass with optimum levels of thermal insulation. The interior and exterior glasses have a heating system that is activated in cold cycles and damp heat to prevent condensation at the surface.

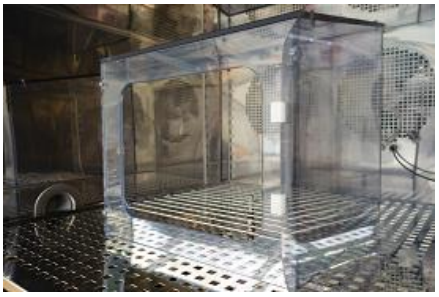




Other Testing Accessories and Devices

Cables/Wires winding accessory for 'Cold bend' testing

Combined climatic and vibration test



DIN 50017 – Condensation water test atmospheres

INSTALLATION REQUIREMENTS

To ensure a correct functioning of the chamber, the following installation conditions are required:

Installation site
The place should be easily accessible, according to equipment dimensions and weight. It should have good air circulation and a room temperature between 10º and 26ºC. The floor should be leveled and a minimum distance of 50cm from the walls and other equipment must be kept.

Electrical supply
Near the equipment with the specified requirements.

Humidification circuit and demineralized water (for FitoClima models)
The humidification circuit works exclusively with distilled or demineralized water. For this circuit, a water admission pressure of 1 to 6 bares and conductivity of ≤ 10µ Siemens is required.

Water circuit for cooling condenser (optional accessory for all models, or specific for models with Temperature/Cooling change rate upgrade)
A cold water circuit is required for the cold system condenser. Technical characteristics:

- Water flow: up to 2000 liters/hour (at 25ºC)
- Intake pressure: 2 to 5 bar
- Water entry and exit pipe: 1” or 28mm
- Differential pressure between entry and exit: > 0,5 bars
- Maximum temperature of water entry: 26ºC
- Minimum temperature of water entry: 16ºC
- Recommended temperature of water entry: 18ºC

Drain
At floor level and near the equipment. The draining of the humidification and cooling systems water is done by gravity. For a correct draining there should be a minimum inclination of 10º in a descending trajectory from the chambers draining pipe until the sewage system.

Let’s meet!
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