



TESTA 'WALK-IN' BT

ENVIRONMENTAL CHAMBERS FOR
BATTERY & ENERGY STORAGE TESTING




aralab





ARALAB is a company specialised 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.



As advances in technology drive the proliferation of portable devices and electric vehicles, the need for high-performing and reliable batteries has never been more crucial.

Our environmental chambers provide a controlled environment, emulating the diverse temperature and humidity conditions that batteries may encounter throughout their lifecycle. As such, Aralab offers an optimized range of battery testing solutions in line with the EUCAR hazard levels, ensuring safe, reliable, and sophisticated testing for energy storage systems.

We provide both standard and tailor-made solutions, putting an emphasis on planning and creating individual systems that adhere to your specific application needs. Each chamber can be equipped with a variety of safety measures based on your internal hazard analysis, complying with the EUCAR Hazard Level classifications.



RECHARGEABLE LITHIUM BATTERIES

AUTOMOTIVE - COMPUTER - TELECOMMUNICATIONS - DEFENSE - CONSUMER - ALTERNATIVE-ENERGY



Rechargeable Lithium Batteries became the choice energy storage for portable electronic devices, appliances, electric bicycles, vehicles, military equipment, etc. Reliability and safety become crucial. The batteries must perform well in hot and cold conditions, while not posing a hazard due to leaking or exploding.

Published standards by IEC, SAE, UL, and UN specify environmental tests like temperature cycling, heat resistance, thermal abuse and short circuit while hot.

Because failure during testing can produce hazardous results, these test chambers will require proper safety features and considerations.

THE MOST COMMON TEST STANDARDS FOR LITHIUM ION BATTERY

IEC 62660-2	Abuse testing of automotive batteries
SAE J2464	Automotive rechargeable batteries
IEC 60086-4	Safety of lithium batteries
UL 1642	Lithium ion batteries
UN/DOT 38.3	Testing lithium ion batteries
IEC 61960	Portable battery cells
UL 2054	Consumer and commercial batteries
IEEE 1625	Laptop rechargeable batteries
IEEE 1725	Phone rechargeable batteries

During the thermal tests, battery malfunctions may occur that can lead to the destruction of the batteries. For this reason, safety in the laboratory and protection of the staff during such tests must have the highest priority.

Aralab TESTA chambers for Battery Testing can offer safety systems / devices which comply with the EUCAR Hazard Levels. The Hazard Levels safety equipment can be adapted according to customer specifications. Based on your own testing needs and safety requirements, Aralab can help with the required safety options to create a comprehensive security system.



EUCAR HAZARD LEVELS AND DESCRIPTION

EUCAR assigns the hazard levels shown in Table below to an electrical energy storage systems technology based on that technology's response to abuse conditions. Manufacturers and integrators may find it useful to consider these EUCAR Hazard Levels when evaluating the abuse response.

HAZARD LEVEL	DESCRIPTION	CLASSIFICATION CRITERIA / EFFECT
1	Passive protection activated	No defect; no leakage; no venting, fire or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. Cell reversibly damaged. Repair of protection device needed.
2	Defect Damage	No leakage; no venting, fire or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. Cell irreversibly damaged. Repair needed.
3	Leakage - mass < 50%	No venting, fire or flame; no rupture; no explosion. Weight loss < 50% of electrolyte weight (electrolyte = solvent + salt).
4	Leakage - mass > 50%	No fire or flame; no rupture; no explosion. Weight loss 50% of electrolyte weight (electrolyte = solvent + salt).
5	Fire or Flame	No rupture; no explosion (i.e. no flying parts).
6	Rupture	No explosion, but flying parts of the active mass.
7	Explosion	Explosion (i.e. disintegration of the cell).

EXTENSIVE IN BASIC SETUP AND ACCESSORIES. FLEXIBILITY FOR SPECIALIZED MODIFICATIONS.

When conducting tests on electrical storage devices, the optimal choice for superior protection of individuals, test specimens, test equipment, and the laboratory environment is Aralab's range of trusted climatic and temperature chambers. These chambers are easy to operate and available in a range of test space volumes, with a broad selection of standard accessories to choose from.

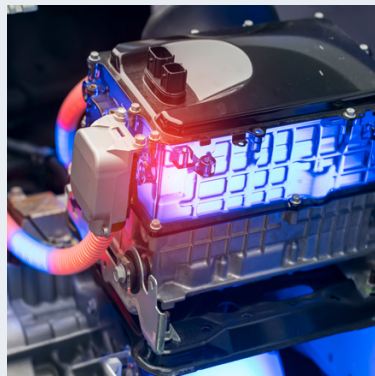
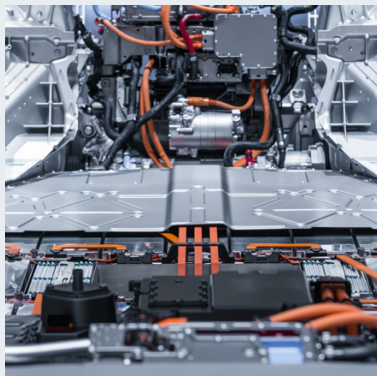
HAZARD LEVELS SAFETY EQUIPMENT

LEVELS	COMPONENTS
LEVEL 0-3	Status Indicator
	Security Door Lock
	Emergency Stop
LEVEL 4	Mechanical Door Lock
	Reversible Pressure Relief
LEVEL 5	Fire Detection/Extinguisher (Activated by Temperature or Manually) (could be activated by CO, check accessories list)
	Gas Measurement (4 gases - As standard CO, H ₂ , HC e O ₂) (more available as accessories)
LEVEL 6	Explosion Pressure Relief Window
	Inertization with N ₂ including O ₂ sensor (Cylinder not included)



EUCAR HAZARD LEVEL PROTECTIONS

HAZARD LEVEL 0-3	HAZARD LEVEL 4	HAZARD LEVEL 5	HAZARD LEVEL 6
			
Status indicator	Mechanical Door Lock	Fire extinguishing	Permanent gas inertization with nitrogen or argon. O ₂ measurement
			
Emergency Stop	Reversible pressure release	Fire detection w/ CO Sensor	Gas Measurement CO, H ₂ , H ₂ S) (more available)
			
Security Door lock	Special entry-ports	ATEX Extration / renovation	Explosion Pressure relief



TESTA 'WALK-IN' BT ENVIRONMENTAL TEST CHAMBERS



KEY FEATURES

- Temperature range: -40°C or -60°C to $+150^{\circ}\text{C}$
- Humidity range (CT models): 10–95 % rH
- Reference volumes: 8 000 L and 12 000 L (other custom sizes available)
- Compatible with EUCAR hazard levels 1–6 (mix & match safety configuration)
- ClimaPlus® HMI controller + FitoLog® software suite
- Supports testing according to UN 38.3, IEC 62660, SAE J2464, ISO 12405



CONSTRUCTION & DESIGN

- Monobloc construction: fully-welded AISI 304 stainless-steel interior
- Exterior: galvanized steel with epoxy coating
- Insulation: high-density rockwool
- Floor: reinforced stainless-steel anti-slip treadplate ($\geq 1000 \text{ kg/m}^2$)
- Door: reinforced, mechanical safety lock; optional observation window
- Cooling unit: water-cooled condenser (standard); air-cooled option available (except -60°C)
- Ventilation: continuous fresh-air flushing for safety and pressure equalization
- Pass-throughs: customizable entry ports ($\text{Ø}100 / \text{Ø}150 / \text{Ø}300 \text{ mm}$)



MODELS AVAILABLE

- TESTA Walk-in BT 8 000 L
- TESTA Walk-in BT 12 000 L
- Custom volumes and features on request



CLIMATIC PERFORMANCE

Model	Volume	Temp. Range	Climatic Range (CT)	Humidity Range (CT)	Heating Rate*	Cooling Rate*
Walk-in BT -40 (TT/CT)	8 000 /	-40 °C to +150 °C	10 °C to 95 °C	10-95 % rH	Up to 5 K/min	Up to 5 K/min
Walk-in BT -60 (TT/CT)	12 000 L	-60 °C to +150 °C				

Heating and cooling rates can be adjusted to meet user requirements.



SAFETY & EUCAR PROTECTION OPTIONS

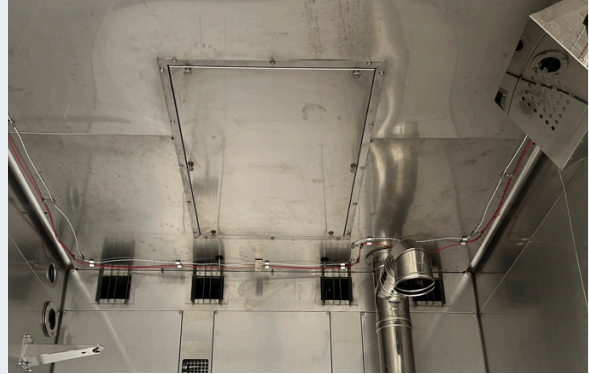
Base safety configuration ensures compliance with EUCAR Level 1. Optional modules are available to cover Levels 2-6, allowing customers to combine protections according to their risk profile and test protocols.

- Forced exhaust & fresh-air flushing
- Fire detection and suppression (thermal and/or CO-based activation)
- ATEX-compliant ventilation and lighting systems
- Explosion pressure relief (panel or door)
- Gas measurement sensors: H₂, CO, HF, VOCs, O₂, HC (others on request)
- Inertization with N₂ or Ar, with O₂ monitoring (optional)
- Emergency stop, external light/sound alarms, safety interlocks
- Reinforced technical pass-throughs with ATEX-rated port-holes
- Independent Safety PLC with separate logic and inputs

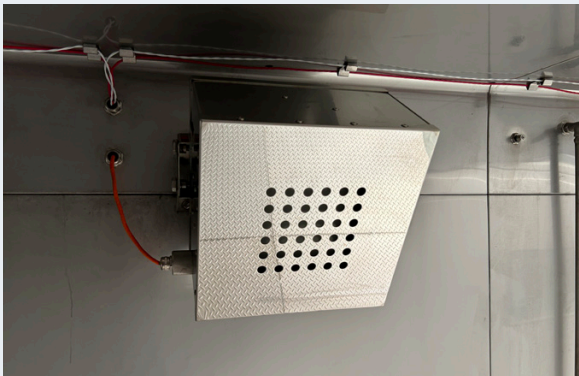




CUSTOM PORT-HOLES



EXPLOSION PRESSURE RELIEF



FIRE DETECTION AND EXTINGUISHER



FLUSHING SYSTEM



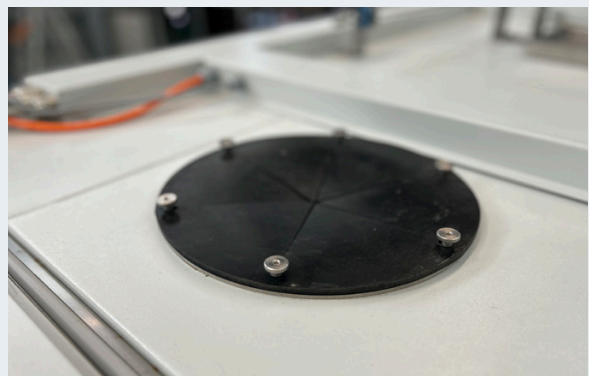
GAS MEASUREMENT



INERTIZATION



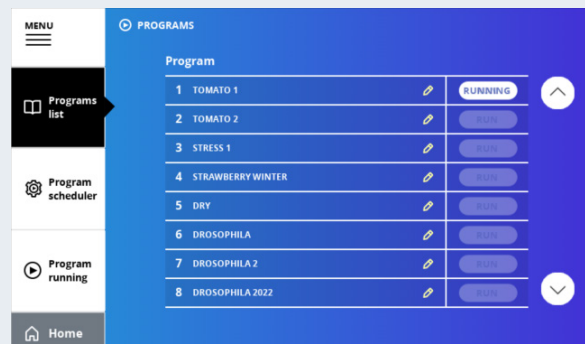
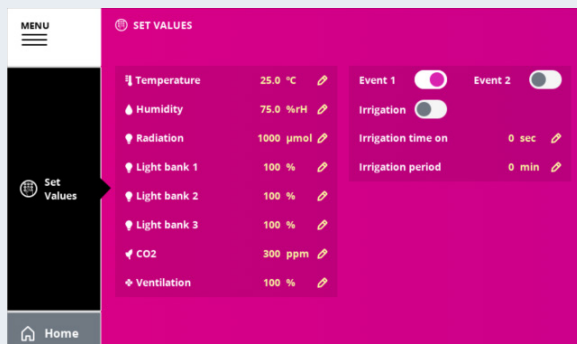
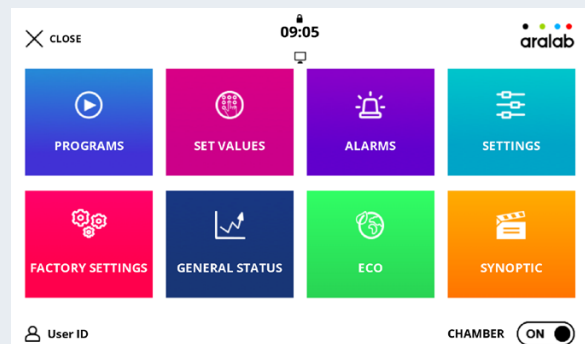
SAFETY CONTROL SYSTEMS PLC



PRESSURE RELIEF

CLIMAPLUS CONTROLLER HMI

- Programmable Logic Controller exclusively developed by Aralab for FitoClima chambers.
- Multi language (PT, ES, EN, FR) easy to use touch-screen interface.
- 90mm x 155mm (7 inch) multicolor display.
- Controls every environmental variable available for any specific FitoClima model (Temperature, Humidity, Lights, Airflow, CO₂ and connected external devices).
- Friendly program editor, allowing the design of complex and comprehensive climatic simulation programs.
- User access definition (Viewer, User, Admin) with alphanumeric password protection of the controller functions.
- Content and research protection feature, with configurable High, Low and Band 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.
- Secure Remote Access through ClimaPlus VNC Server.
- Ethernet port for connecting logging computer to the chamber controller.
- ClimaPlus controller functions also available at the PC/Laptop with the FitoLog software pack.



Note: Features, options and performances may vary with configuration. Aralab can customize volumes, safety systems and climatic envelopes for specific projects.

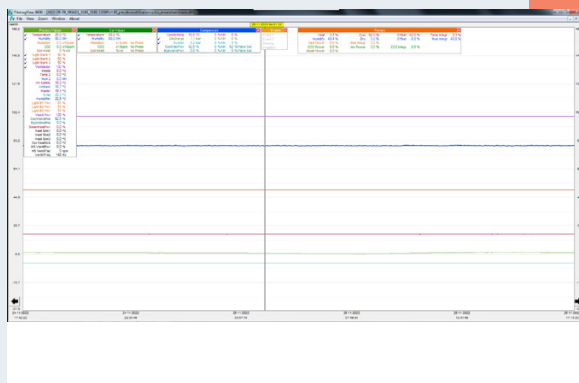
FITOLOG SOFTWARE

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**.



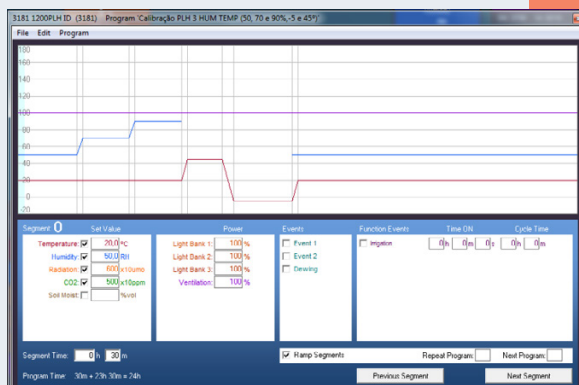
FITOLOG

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 CiimaPlus controller. Up to 50 programs, each with 50 segments, can be designed and linked to create detailed environmental profiles and simulations.

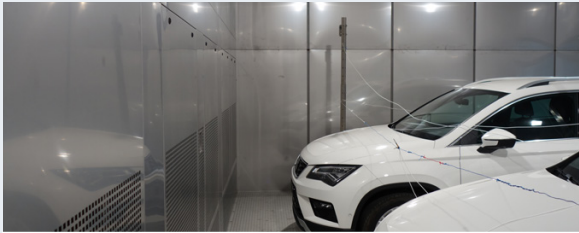
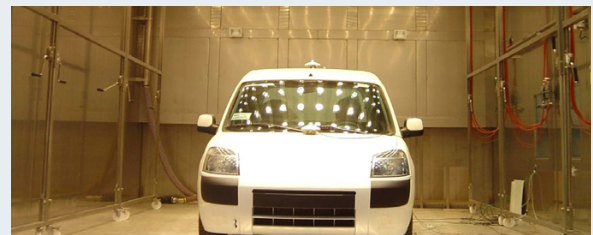
RESEARCH SECURED WITH ALARMS, NOTIFICATIONS, FAST DIAGNOSTICS AND PROMPT TROUBLE-SHOOTING

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.

EXPAND YOUR TESTING CAPABILITIES WITH ARALAB

Whether you need vibration endurance, rapid thermal shock, solar radiation exposure, or combined environmental stress testing, Aralab provides an extensive portfolio of custom testing chambers and integrated systems.

Our engineering team develops complete test environments – from compact reach-in units to large-scale drive-in and multi-axis vibration setups – designed for safety, precision and repeatability.

**DRIVE-IN AUTOMOTIVE TESTING****WALK-IN CLIMATIC TESTING****VIBRATION TESTING****SOLAR AND UV RADIATION CHAMBER****PASSIVE CHAMBERS INTEGRATION****TEMPERATURE SHOCK CHAMBERS****SUN SIMULATOR DRIVE-IN**

Let's meet!

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chamber



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Control the environment

Your own climate