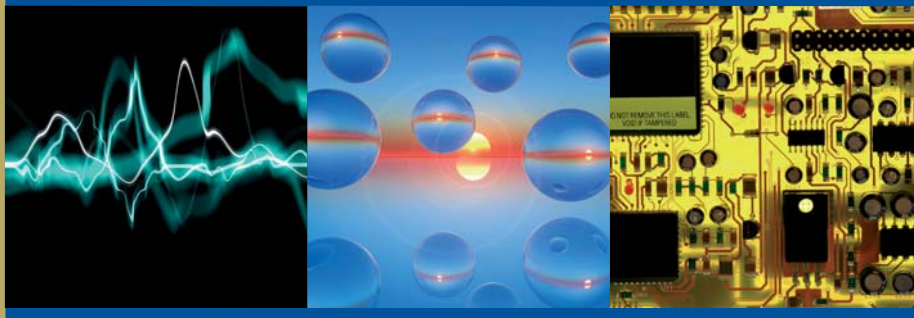
Angelantoni INDUSTRIE

MORE THAN TECHNOLOGY

Battery Test Chambers



ACS

The technological challenge

The storage of electrical energy has always posed a technological challenge. Even though there have been significant developments over the past decade, the challenge is still on, with the goalposts being moved continuously by the new needs emerging in various application sectors, such as the necessity for increasingly compact, lightweight batteries for electronic devices and for storing in limited spaces the large quantity of energy required by electric traction.

The most recent ideas have come, in fact, from the automobile sector and the research being carried on for the development of electric and hybrid cars, with the aim of reducing CO2 emissions and recovering braking energy.

Among the various solutions identified, lithium batteries have proved to be the most suitable instrument for achieving this aim, even if further experimentation will be necessary to consolidate such a technology.

Your partner for research

Thanks to our experience in the testing sector and our vast production program, we are able to offer both standard and customized solutions for verifying the quality of batteries and electric vehicles, mainly based on the following products:

- Vibration test chambers
- Thermal shock test chambers
- Stress screening test chambers

Thermal shock test chambers

Stress screening test chambers

Vibration test chambers

Walk-in climatic chambers for corrosion tests on complete vehicles turned-on

Test safety

Tests on batteries can generate potentially dangerous situations, since they are carried out by simulating the limit conditions that may occur when there is a transfer of energy from the battery to the electric motor or during the battery's fast recharge phase.
These situations, in fact, may generate strong overheating or the formation of dangerous atmospheres.
To handle and solve these problems, our chambers are equipped with all the instruments necessary for monitoring potentially dangerous parameters and the following main devices which are activated to eliminate any risk conditions:

- Smoke sensors
- Dangerous gas (H2; O2; CO; CO2;…) sensors
- Inerting system
- Flame extinguishing system

For a careful consideration of these issues and further specific needs, we always suggest a meeting with our specialists.

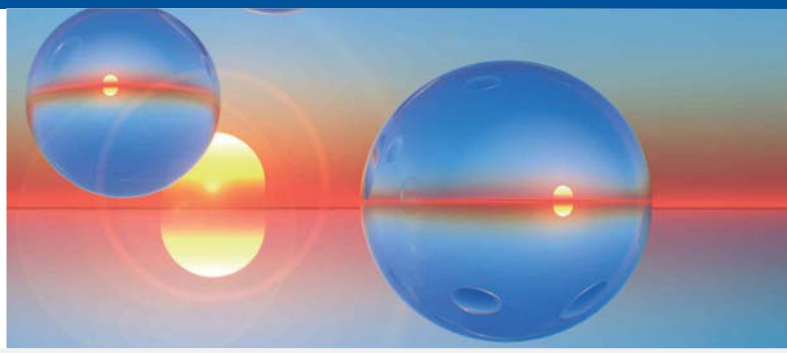
Electrically Isolated Test Enclosure

An electrically isolated and perforated mounting shelf is also included; the specifically designed perforated shelf ensures both electrical isolation and consistent airflow around the test item.

Complete Software and Control System

The new battery test chamber range from ACS incorporates CAN bus interfacing to the battery ECU as a standard option , the chamber software and control system is also designed to interface with Industry standard loading and unloading systems.

Optional customer defined isolated power and signal connections for external electrical loading of customer test items within the chamber are available.



Smoke sensors

Dangerous gas (H2; O2; CO; CO2;…) sensors

Inerting system

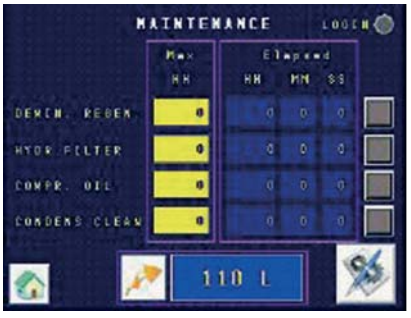
Flame extinguishing system

Control system and user interface

KeyKratos Plus

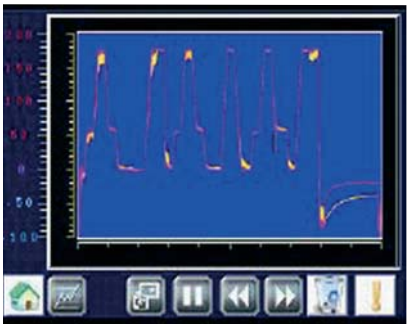
Main window

KeyKratos Plus



Maintenance activities

KeyKratos Plus



Trend chart

KeyKratos Plus

Hardware

- 4096 colours with STN tecnology
- Faster control
- 3 types of memory support for storing cycles, recordings, and alarms
- Compact Flash, Pendrive (USB key style), Internal memory

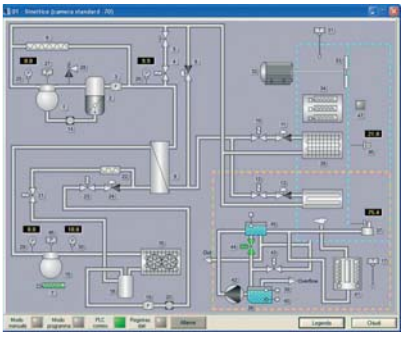
Software

- Touch menu with related pop up screens where necessary
- Memory capacity to 1000 cycles with 350 segments each (on compact flash)
- Real time recording of temperature and humidity versus time (LOG on compact flash)
- USB interface on front panel for stick or printer
- Recordings in CSV format (Comma Separated Value) for easy export to Excel®, program files are easily convertible into graphic format
- A trend chart for recorded variables available with a scale from -100/+200
- Four traces: temperature set point, actual temperature, humidity set point, and actual humidity
- User friendly data input during editing, check and administration of cycle
- Synoptic graphs for the chamber, humidity, low stage refrigeration and high stage refrigeration
- Messages on scheduled maintenance activities
- The system is available in 6 languages: ITALIAN, ENGLISH, GERMAN, SPANISH, FRENCH, DUTCH

PC WinKratos software

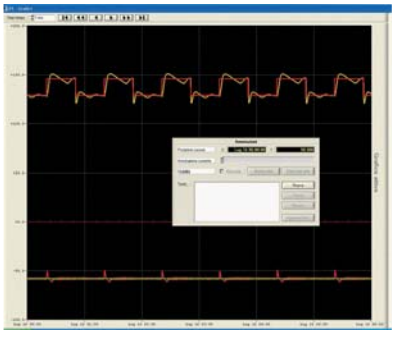
- Ability to add notes on the graphs
- Delayed start of the tests
- Optimized view of synoptic graphs
- Two editing modes: "entry-level" and "advanced"

WinKratos S/W

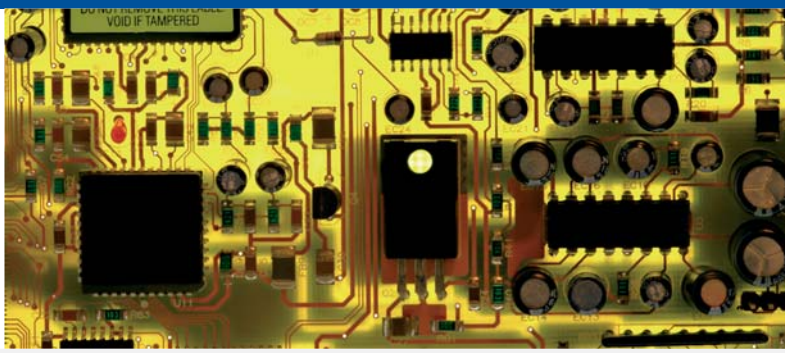


Synoptic graphs

WinKratos S/W



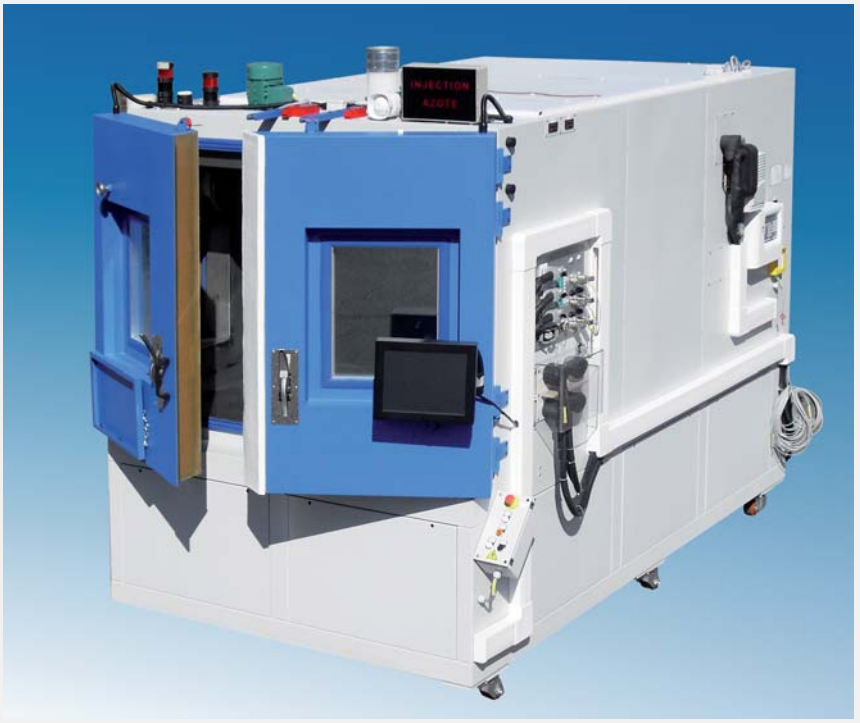
Notes on the graphs



CLIMATIC CHAMBER FOR TESTS ON BATTERIES FOR ELECTRIC CARS, COMPLETE WITH COOLING AIR SIMULATOR

Technical features of the climatic chamber
Useful volume: 4,000 liters
Temperature range: -40°- +180°C
Relative humidity range: 10-98%

Technical features of the air simulator:
Temperature range: 0°-30°C
Air flow rate: 20,500 m3/h
Maximum pressure: 1000 Pa



Angelantoni Industrie headquarters in Massa Martana (Perugia, Italy) extend over an area of 80.000 square metres (more than 16.000 covered square meters).

Massa Martana is located in Umbria, a region rich in art, history and tradition.

No location could be more appropriate; Angelantoni Industrie learns from the past to better understand and anticipate the future.

This, combined with dedication and over growing expertise, is why Angelantoni Industrie has become the most complete and diversified European Group for advanced cold technology and test equipment for industry and research.

Established in 1932, Angelantoni Group has today more than 800 employees working in 8 units (4 in Italy, France, Germany, China, India).

Our core competencies and services for total customer satisfaction:

- Training, both at our facility and at customer site
- Testing and quality checks
- Installation and start up
- Preventive maintenance
- Service
- Calibration using SIT certified instruments
- "Full risk" assistance contracts
- Extended warranties
- Existing chamber validation
- Retrofitting of older chambers, including instrumentation and new environmentally friendly refrigerants
- Exchange and sale of used chambers
- Research and development
- Production and assembly
- Market analysis and advice
- Special applications

ISO 14001

ISO 9001

EMAS

Angelantoni Test Technologies

- environmental test chambers ACS
- test benches for automotive and aerospace BIA
- electrodynamic shakers and balancing equipment TIRA

Angelantoni Industrie SpA
Angelantoni Test Technologies ACS brand
Loc. Cimacolle, 464 - 06056 Massa Martana (Pg) - Italy
Tel. +39 075.89551 (a.r.) Fax +39 075.8955200 - info@angelantoni.it
www.angelantoni.it