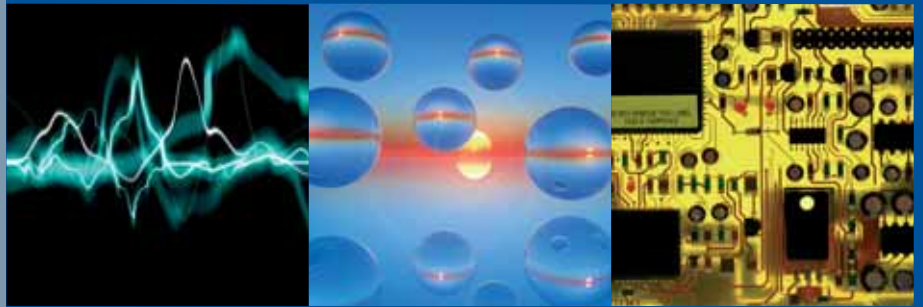


Vacuum chambers





High Reliability: a must for avionics testing

Purpose



Angelantoni Test Technologies is proud to present its new and innovative range of altitude chambers for testing components for the aviation market.

These technologies require the utmost reliability of the components and systems on board, since human lives are often entrusted to them. It is therefore necessary to conduct life tests, including simulations of operating conditions, in both ordinary procedure and at the Quality Control and Production levels.

Generally speaking, when conducting tests having to do with the civil and military aviation industry, it is necessary to guarantee effective combined temperature and pressure control in the test chamber, the latter in order to simulate the altitude above sea level. In some cases, humidity control is also necessary.



We have put to fruition more than 75 years of know-how and experience gained through constant feedback from customers and agents, with the aim of optimizing all the devices as best as possible and thus ensuring a wide variety of possible tests.

Since 1953 ATT has been designing and developing a complete series of standard chambers for vacuum tests up to 1 mbar. These chambers are available in standard 150, 500, and 1,000 liter capacities with a parallelepiped shape. A special wall thermoregulation system (optional) guarantees the best functioning below 300 mbar, thermoregulating the test environment by radiation.

This range of altitude chambers is also available in both thermostatic (temperature and pressure control) and climatic (temperature, pressure, and humidity control) versions. The new "ES" models now have even more environmental performance, whilst maintaining the same footprint and volume of the lower specification versions. They have been designed for Environmental Stress (ESS) and are ideal for reliability growth processes where temperature rates of change of 5°C/min are prerequisite.





Features and advantages

- Excellent solidity of the test chamber
- Top-of-sector performance, in terms of both the breadth of the regulation field and the speed of the temperature and pressure variation
- Optimized system for the thermoregulation of the walls of the test chamber in both the heating and cooling phase, even for pressures close to the minimum value (optional)
- Touchscreen control with KeyKratos Plus, developed entirely by Angelantoni Test Technologies
- Industrialization of the control, cooling, humidification, and pumping devices, in order to guarantee maximum quality and reliability as well as ease of access to the various maintenance points



MAIN STANDARD

DEF STAN 0035 3-11 (HIGH TEMPERATURES, LOW PRESSURES)

DEF STAN 0035 3-12 (LOW TEMPERATURES, LOW PRESSURES)

DEF STAN 0035 3-13 (LOW TEMPERATURES AND PRESSURES, HIGH HUMIDITY)

MIL-STD-810G METHOD 500.5 PART I

MIL-STD-810G METHOD 500.5 PART II

MIL-STD-810G METHOD 500.5 PART III*

RTCA/DO-160C

*chamber equipped with special options



Standard models and...



...customized solutions

Special altitude chambers

A wide range of solutions are available for any kind of requirements thanks to our experience in supplying equipment to worldwide customers.



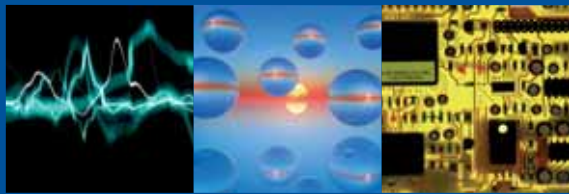
2000 l capacity vacuum chamber equipped with thermoregulated air blowing system.



1000 l capacity vacuum chamber to be combined with vibrating system. Vibration, temperature and altitude can be simulated at the same time.



24 cu.mt chamber for temperature, humidity and altitude tests, characterized by fast depressurization from ambient down to 45 mbar in 1 min. Special standard requested: DEF STAN 00-35 CL9 severities B C Y E.



A remarkable basic configuration

Configuration and technical data

BASIC CONFIGURATION

- Window: multiple-crystal, heated, with double transparent film, mm 300x300
- Internal lighting
- Feet: height-adjustable
- Closure: mechanical
- No. 1 porthole: diam. 100 mm (right side). For the internal/external connection of electrical, mechanical, or hydraulic systems
- Safety thermostat: digital max/min thermostat with independent sensor
- Preconfiguration for UPS: for powering the microprocessor unit so as to guarantee the maintaining and acquisition of data even during electricity blackouts (optional UPS)
- Water-based condenser

- Ethernet interface: Ethernet port for connection to the remote control system
- RS232 serial interface
- no. 1 auxiliary contact: for the specimen.
- KeyKratos Plus control system

OPTIONAL ACCESSORIES

- WinKratos software: installed on local or remote PC (available on request), Windows XP/Vista/7 operating system
- Multi-chamber remote control: WinKratos multi-chamber software installed on a PC (available on request) and connection kit for controlling more than one chamber (up to a maximum of 16) from the same PC
- Internal shelves: AISI 304 stainless steel
- Additional portholes: 50, 100, and 160mm diam.

- Max temperature extension: limit at +180°C
- Set of no. 4 analog inputs: 0-10V for acquisition of user data (no. 1 set max)
- Set of no. 8 auxiliary contacts (no. 1 set max)
- Min pressure extension: limit at 1 mbar
- Remote air condenser
- Noise insulation
- UPS for PLC
- Special voltages and/or frequencies
- 6-channel microprocessor recorder with no. 1 PT 100 and pressure recording sensor
- Wall cooling (excluding door) with dedicated temperature sensor
- Wall cooling/heating (excluding door) with dedicated temperature sensor

	Model	UD 150 C	UD 500 C	UD 1000 C	UD 500 C ES	UD 1000 C ES
Useful capacity	[l]	151	544	1041	544	1041
Internal dimension (WxDxH)	[mm]	600x500x503	800x800x850	1010x1010x1020	800x800x850	1010x1010x1020
External dimension (WxDxH)	[mm]	960x2640x1900	1200x2885x2490	1430x3455x2290	1200x2885x2490	1430x3435x2290
Temperature Range pressure value >300mbar	[°C]	-70...+100	-70...+100	-70...+100	-70...+100	-70...+100
Temperature fluctuation	[K]	±1	±1	±1	±1	±1
Temperature rate of change HEATING (-70/+100°C*)	[K/min]	1,5	2	2,5	NA	NA
Temperature rate of change COOLING (+100/-70°C*)	[K/min]	2,5	1,5	1,5	NA	NA
Temperature rate of change HEATING (-55/+85°C*)	[K/min]	NA	NA	NA	5	5
Temperature rate of change COOLING (+85/-55°C*)	[K/min]	NA	NA	NA	5	5
R. H. range		20%...95%	20%...95%	20%...95%	20%...95%	20%...95%
R. H. precision		± 3%...±5%	± 3%...±5%	± 3%...±5%	± 3%...±5%	± 3%...±5%
Temperature range with humidity (Dew Point +2°C/+79°C)	[°C]	+20...+80	+20...+80	+20...+80	+20...+80	+20...+80
Min pressure	[mbar]	10	10	10	10	10
Pressure Fall Down Time to 10mbar	[min]	12	20	20	20	20
Max Power ²	[kW]	16/14	20/18	32/28	27/25	38/34
Voltage (VAC)		400V ±10% 50Hz 3+N+G				
Weight (without packing)	[kg]	1600	2000	2800	2100	3000
Noise ***	[dB(A)]	68	66	68	70	80
Max water consumption **	[m ³ /h]	2,5	3,3	3,3	6,3	9,3
Heating/Cooling of the walls* (door excluded) pressure value < 300mbar (probe on the wall)	[°C]	+85...-70	+85...-70	+85...-70	+85...-70	+85...-70

¹ For Temperature only version change the suffix U with T

² Lower value for Thermostatic version

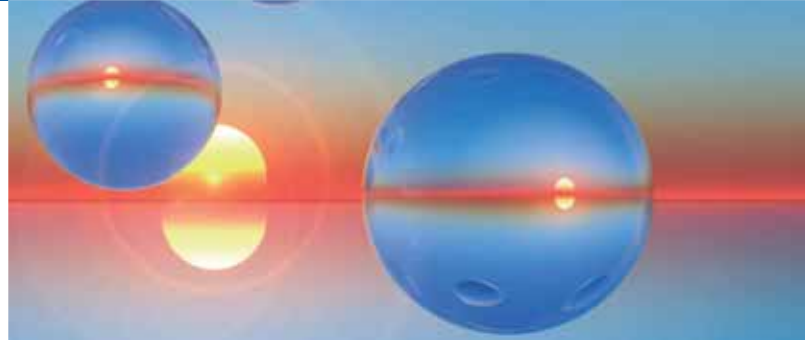
* according to IEC 60068-3-5 and IEC 60068-3-6

** water quality requirement: conductivity <500 µ/cm (reference temperature +20°C); hardness = 8...15°F

*** measured at 1 m from the front in a non reverberating room

Performance data refer to +25°C ambient temperature

Control system and user interface



KEYKRATOS PLUS

Hardware

- TFT touch screen panel, 5,7", 65000 colours
- Faster control
- 3 types of memory support for storing cycles, recordings, and alarms: SD memory card, Pendrive (USB key style), Internal memory

Software

- Touch menu with related pop up screens where necessary
- Memory capacity to 1000 cycles with 260 segments each (on SD memory card)
- User friendly data input during editing, check and administration of cycle
- Delayed start of the tests (hh:mm:ss)
- Real time recording of temperature, humidity and pressure versus time (LOG on SD memory card)
- 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°C (0/1000 for pressure)
- Six traces: temperature set point, actual temperature, pressure set point and actual pressure, humidity set point and actual humidity (the last two only for climatic version)
- System available in 6 languages: Italian, English, German, Spanish, French, Dutch

PC WINKRATOS SOFTWARE (optional)

WinKratos S/W package (running under Windows XP, Vista, 7) offers a powerful and flexible control and management system.

It allows the user to:

- Create test programs
- Refer to and modify previously created test programs
- Delete all test programs that are no longer necessary
- Print any test program in text format

Main features

- Connection to PLC through Ethernet, up to 16 chambers can be connected to the same WinKratos
- Colour printing
- Multiple access password levels

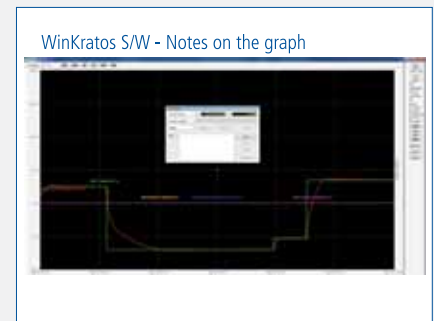
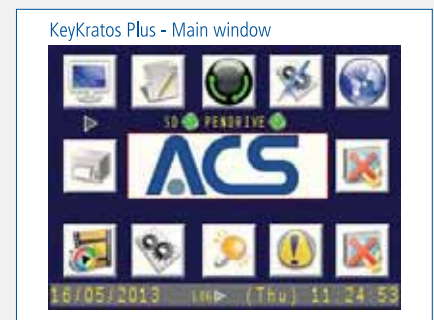
Graphic functions

- Fully-configurable layout of acquired measures charts
- Display of several charts on the monitor
- Several colours to be chosen at one's choice for the display of different parameters' curves
- Enable/disable of chart display and grids
- Real-time update of acquired measures charts

Acquisition functions

- Real-time measurement of test parameters by means of graphic cursors
- Max. flexibility for cycles to be set
- Storage of occurred events such as alarms, commands, etc

WinKratos may be installed on PCs supplied by ACS or belonging to the customer.



NEW

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

Angelantoni Test Technologies (ATT), a company of the Angelantoni Group, is the only company capable of offering a broad range of test solutions for a great variety of applications, thanks to the expertise and technical know-how of its worldwide teams of experts. Three leading test technology brands belong to ATT: **ACS**, world-famous since 1952 for its design and manufacture of a comprehensive range of environmental test chambers, including high-tech test equipment such as high vacuum chambers for aerospace applications and calorimeters. With the acquisition of companies in France, Germany, China, and India, other brands of test chambers are now available on the worldwide market: BIA Climatic, TIRA Umweltsimulation and AMEC.

BIA, providing test benches and crash test systems to major companies, mainly in the automotive and aerospace fields, since 1986. The company philosophy is to provide innovative solutions through close cooperation with the customer in order to guarantee continual improvement of product quality and performance and optimize testing costs.

TIRA, specialized in electrodynamic shakers, material testing equipment, and balancing systems. Internationally renowned automotive manufacturers and suppliers, manufacturers of high-speed rotating components, aviation and aerospace equipment manufacturers, research facilities and institutes, and test centres all benefit from TIRA products and services worldwide.

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