

The climatic excellence

EXCAL

Hot Cold
Hot Cold Humidity
Environmental stress screening



Climats



Environmental Simulation

Manufacturing high quality chambers is our job

For more than 30 years, **Climats** has been developing climatic chambers enabling accurate and reproducible environments to be simulated.



Today, the climatic chamber **Excal** achieves to be a real concentrate of our knowledge and our expertise.

Strongly implanted in the sector of the embedded electronics, **Excal** benefits of numerous years of development in domains as varied as the automotive, the defence, the aeronautics, the space and the telecommunications.

Stemming from these dynamic environments, **Excal** is particularly dedicated to perform tests according to standards such as DIN, ISO, MIL or IEC.

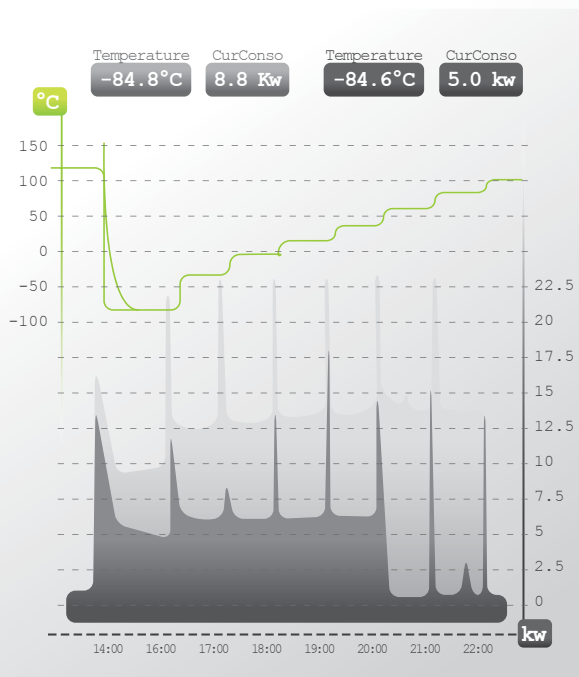
Excal enables you to optimize your productivity while guaranteeing an outstanding level of performance and reliability.

As our new intuitive interface, **Spirale 3** allows you to approach the world of the environmental simulation as an "evidence".

Climats, creator and inspirer of progress, especially in piloting, opens you the doors of our brand new system : Endowed with cutting edge solutions (Real-time Intelligent Regulation), an amplified ergonomics (tactile piloting), multi-purpose and powerful utilities (User friendly, Easy Service, Full Communication) :

Spirale 3 naturally stands out as the reference piloting system.

The new Excal chambers work in «Energy Saving» mode



Regarding energy management, this new mode is a significant technological advance which results, for our customers, in a checked reduction of energy costs.

The electrical consumption, during a typical cycle, is reduced by 40% and more.

Spirale 3 constantly watches and optimizes the electrical consumption. By a simple click, you can know the energy consumption during an operation in progress or for the whole test.

Our environmental test chamber control and the **Spirale 3** data-processing power enable us as well to associate with the «Energy Saving» mode a reduction of the stress of the different components involved in the refrigeration production (solenoid valves, compressors, fans).

to enhance your efficiency.

Excel : standard equipments

ERGONOMY

- Adjustable height touch-screen
- 5 panes glass window
- Internal lighting
- Shelves and holders
- 2 technical portholes Ø 80 mm with supple silicone bung
- Casters
- Centralized supplies connections

TECHNICAL EXPERTISE

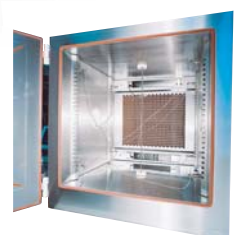
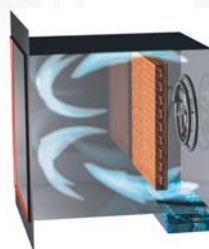
- Double air flow ventilation
- Adjustable air flow flaps
- Optimized homogeneity on load
- Optimized cooling unit
- Humidity trap
- Water or air condensing
- 9 probes for caracterisation, 7 setpoints in dry mode, 9 setpoints in humid mode

PERFORMANCES

- Environmental stress screening
- Accuracy and reliability
- Homogeneity and stability
- Reproductibility
- Auto-test
- Integrated maintenance management system
- Temperature regulation on product probe

PILOTING AND COMMUNICATION **Spirale3**

- 15" touch-screen
- Spirale3 software
- Industrial computer
- Network connection
- USB port
- RS 232
- Programmable logical inputs/outputs
- Safety socket
- Printer output



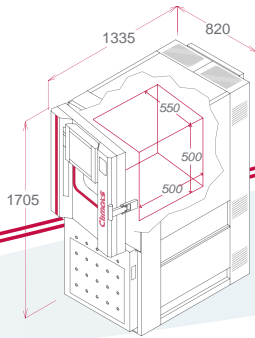


Perfectly sized, Excal offers :

- Extreme Temperature Range (T model) :
from -90°C to +200°C
- Climatic test (H model) :
Relative Humidity from 10 % to 98 %
- The widest Standard Temperature variation rate :
from 2°C/min to 20°C/min

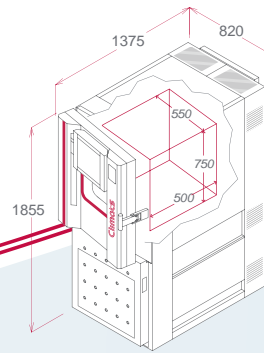
Excal

8 standard test volumes



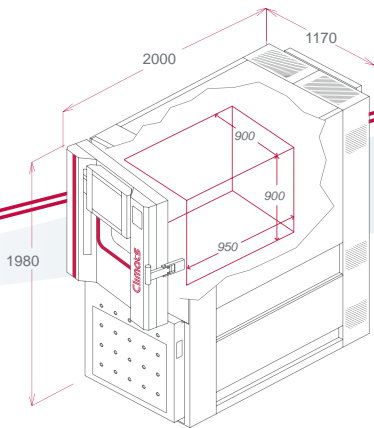
Excal 140
Easy moving
138 litres

Ref. Machine	Minimum Working Temp (°C) ⁽¹⁾	Rate Down (K/min) ⁽¹⁾	Rate Up (K/min) ⁽¹⁾	Admissible dissipation kW ⁽²⁾
1421-T/H ⁽⁶⁾	-70	5	7	1,5
Environmental Stress Screening				
1411-T/H ⁽⁴⁾	-40	6	7	1,5
1413-T/H ⁽⁴⁾	-45	10	17	2,5
1423-T/H ⁽⁶⁾	-80	10	17	2,5



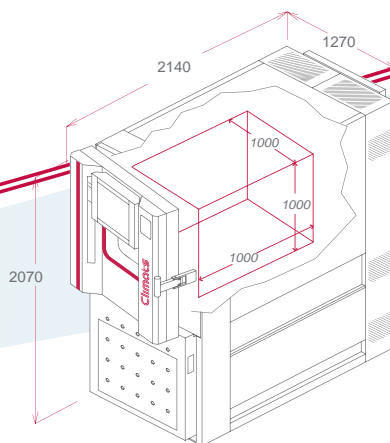
Excal 220
Small footprint
206 litres

Ref. Machine	Minimum Working Temp (°C) ⁽¹⁾	Rate Down (K/min) ⁽¹⁾	Rate Up (K/min) ⁽¹⁾	Admissible dissipation kW ⁽²⁾
2211-T/H ⁽⁶⁾	-30	5	6	1,5
2221-T/H ⁽⁶⁾	-70	5	6	1,5
Environmental Stress Screening				
2213-T/H ⁽⁶⁾	-45	9	15	2,5
2214-T/H ⁽⁶⁾	-50	13	15	3
2223-T/H ⁽⁶⁾	-80	10	15	2,5
2224-T/H ⁽⁶⁾	-80	12	15	4



Excal 770
High-performance
770 litres

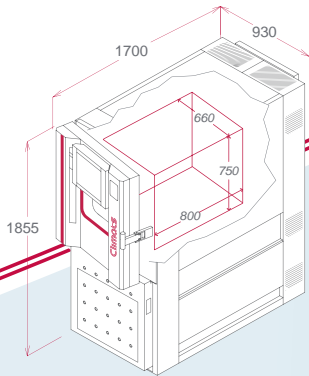
Ref. Machine	Minimum Working Temp (°C) ⁽¹⁾	Rate Down (K/min) ⁽¹⁾	Rate Up (K/min) ⁽¹⁾	Admissible dissipation kW ⁽²⁾
7713-T/H ⁽⁴⁾	-40	4	6	2,5
7723-T/H ⁽⁴⁾	-70	4	6	3
Environmental Stress Screening				
7714-T/H ⁽⁴⁾	-45	8	8	4
7715-T/H ⁽⁴⁾	-50	10	15	6
7717-T/H ⁽⁴⁾	-50	14	15	7
7718-T/H ⁽⁴⁾	-50	17	20	>10
7724-T/H ⁽⁶⁾	-75	7	8	5
7725-T/H ⁽⁶⁾	-80	13	15	7
7727-T/H ⁽⁶⁾	-85	14	15	8
7728-T/H ⁽⁶⁾	-90	18	20	>10



Excal 1000
Universal
1000 litres

Ref. Machine	Minimum Working Temp (°C) ⁽¹⁾	Rate Down (K/min) ⁽¹⁾	Rate Up (K/min) ⁽¹⁾	Admissible dissipation kW ⁽²⁾
10013-T/H ⁽⁴⁾	-35	3	4,5	2,5
10023-T/H ⁽⁶⁾	-70	3	4,5	2,5
10024-T/H ⁽⁶⁾	-75	5,5	6	5
Environmental Stress Screening				
10014-T/H ⁽⁴⁾	-45	6	6	4
10015-T/H ⁽⁴⁾	-45	8	10,5	6
10017-T/H ⁽⁴⁾	-50	10,5	11	7
10018-T/H ⁽⁴⁾	-50	13,5	15	>10
10019-T/H ⁽⁴⁾	-55	15	15	>10
10025-T/H ⁽⁶⁾	-75	9,5	10,5	7
10027-T/H ⁽⁶⁾	-85	10,5	11	8
10028-T/H ⁽⁶⁾	-85	14	15	>10
10029-T/H ⁽⁶⁾	-85	15	15	>10

(1) Temperature rate and minimum temperature are given for water condensing units. Air condensing units performances can be slightly different, please refer to quotation or contact us.
(2) Maximum calorific dissipation for temperature setpoint at +25°C and water temperature at +18°C, at condenser input.

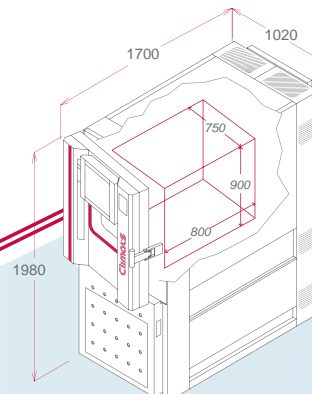


Excal 400 Optimal 400 litres

Ref. Machine	Minimum Working Temp (°C) ⁽³⁾	Rate Down (K/min) ⁽⁵⁾	Rate Up (K/min) ⁽⁶⁾	Admissible dissipation kW ⁽²⁾
4011-T/H ⁽³⁾	-30	4	10	1,5
4021-T/H ⁽⁶⁾	-70	3,5	10	1,5

Environmental Stress Screening

4013-T/H ⁽⁴⁾	-43	6	10	2,5
4014-T/H ⁽⁴⁾	-50	10	12	3,5
4015-T/H ⁽⁴⁾	-50	15	15	5
4023-T/H ⁽⁶⁾	-75	7	10	2,5
4024-T/H ⁽⁶⁾	-80	10	12	4,5
4025-T/H ⁽⁶⁾	-85	15	20	6,5

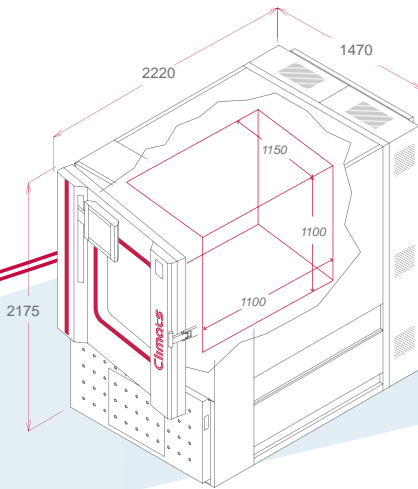


Excal 540 Multipurpose 540 litres

Ref. Machine	Minimum Working Temp (°C) ⁽³⁾	Rate Down (K/min) ⁽⁵⁾	Rate Up (K/min) ⁽⁶⁾	Admissible dissipation kW ⁽²⁾
5411-T/H ⁽³⁾	-30	3	10	1,5
5421-T/H ⁽⁶⁾	-65	2,5	10	1,5
5423-T/H ⁽⁶⁾	-75	5	10	3

Environmental Stress Screening

5413-T/H ⁽⁴⁾	-42	6	10	3
5414-T/H ⁽⁴⁾	-50	10	12	4
5415-T/H ⁽⁴⁾	-50	15	18	6
5417-T/H ⁽⁴⁾	-55	16	18	7
5424-T/H ⁽⁶⁾	-80	8	12	5
5425-T/H ⁽⁶⁾	-85	15	20	7

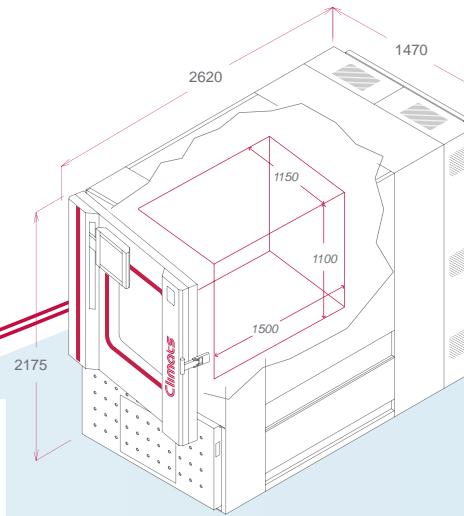


Excal 1400 Powerful 1416 litres

Ref. Machine	Minimum Working Temp (°C) ⁽³⁾	Rate Down (K/min) ⁽⁵⁾	Rate Up (K/min) ⁽⁶⁾	Admissible dissipation kW ⁽²⁾
14013-T/H ⁽³⁾	-35	2	3	2,5
14014-T/H ⁽⁴⁾	-45	4	4	4
14023-T/H ⁽⁶⁾	-70	2	3	2,5
14024-T/H ⁽⁶⁾	-75	4	4	4

Environmental Stress Screening

14015-T/H ⁽⁴⁾	-45	6	6	6
14017-T/H ⁽⁴⁾	-50	7	7	7
14018-T/H ⁽⁴⁾	-50	10	10	>10
14019-T/H ⁽⁴⁾	-55	13	15	>10
14025-T/H ⁽⁶⁾	-75	6	6	7
14027-T/H ⁽⁶⁾	-85	7	7	8
14028-T/H ⁽⁶⁾	-85	10	10	>10
14029-T/H ⁽⁶⁾	-85	12	15	>10



Excal 1800 Industrial 1897 litres

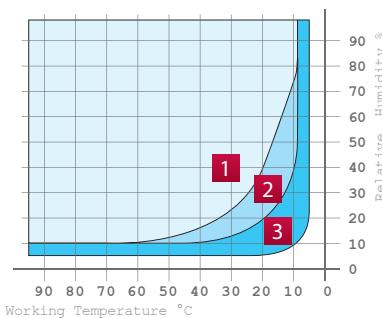
Ref. Machine	Minimum Working Temp (°C) ⁽³⁾	Rate Down (K/min) ⁽⁵⁾	Rate Up (K/min) ⁽⁶⁾	Admissible dissipation kW ⁽²⁾
18014-T/H ⁽⁴⁾	-45	3	3	4
18015-T/H ⁽⁴⁾	-45	4	4	6
18017-T/H ⁽⁴⁾	-50	5	5	7
18023-T/H ⁽⁶⁾	-70	1,5	1,5	2,5
18024-T/H ⁽⁶⁾	-75	3	3	4
18025-T/H ⁽⁶⁾	-75	4	4	7
18027-T/H ⁽⁶⁾	-85	5	5	8

Environmental Stress Screening

18018-T/H ⁽⁴⁾	-50	8	8	>10
18019-T/H ⁽⁴⁾	-55	10	10	>10
18028-T/H ⁽⁶⁾	-85	8	8	>10
18029-T/H ⁽⁴⁾	-85	10	10	>10

Standard Range **1**

Standard Range for short time tests **2**



1 + 2 + 3 Standard range with air dryer

Measurement accuracy allows to reach very high regulation stability : from +/-0,1°C to +/-0,3°C.

Homogeneity in test space, according to IEC EN 60068-3-5, is from +/- 0,5°C to +/- 1,8°C .

Hygrometry produced with water bath regulated at dew point temperature : No maintenance, Reliability, Accuracy, Regulation Stability between +/- 1% to +/- 3%.

Relative Humidity from 10% to 98% in temperature range from +10°C to +90°C

Nominal tests conditions : empty chamber without options. Water condensing type («HE» or «TE»), clean cooling water at temperature of +18°C with a flow and pressure rate (2,5 bars mini) matching the technical specifications of the chamber.

Main power supply of 400V triphase 50 Hz.

Temperature rates are given at +/- 2°C from the setpoint.

Useful dimensions do not include the thickness of shelves rack (25mm on each side).

T Model : Hot Cold

H Model : Hot Cold Humidity

Customize your system by combining our multiple options

Spirale 3 :

→ EQUIPMENT

- Technical portholes from 80 to 200 mm with silicone bungs
- Cabinet side notched porthole
- Reinforced shelves
- Customer painting colour
- Right or left Hinges
- Gloves port door

→ PERFORMANCES EXTENSION

- PT100 sensor for product temperature regulation onboard and controlled air dryer system
- N2 inerting with or without flowmeter
- Minimum temperature extension to -90°C with LN2 injection
- Maximum temperature to +200°C
- Air flow variator

→ ADDITIONAL ACQUISITION SYSTEM

- Remote Industrial Computer
- Humidity capacitive sensor for measurement or regulation
- Additional measurement channels card (24 sensors PT100 / 16 thermocouples / data acquisition system HP 20 channels, 16 input/output contacts)
- Digital communication IEEE 488 type
- Digital communication RS422/485 type
- Supervision

→ SAFETIES

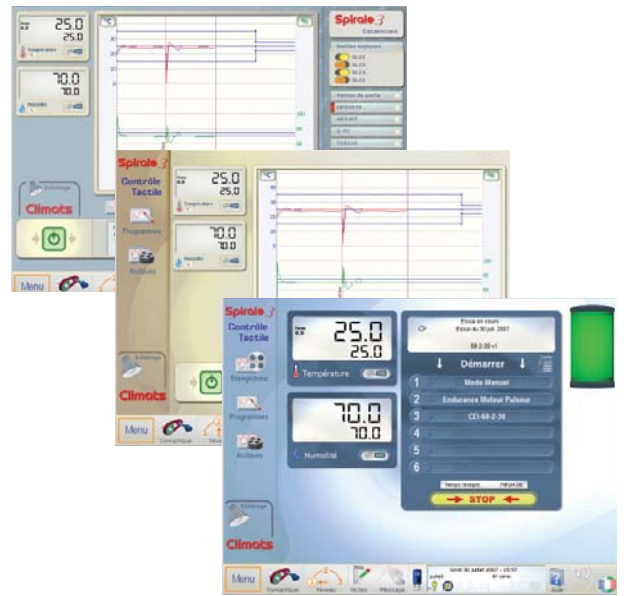
- Emergency stop
- Additional thermal fuse
- Door opening alarm
- Safety socket 220 mono 10/16 A
- Min/Max temperature electronical safety independent of regulation

→ COMPLEMENTARY SERVICES

- Water chiller
- Demineralized water tank
- Remote Air condenser with fan variator
- Remote control through internet for diagnosis and support
- Installation

Piloting system integrating the reference

Your control panel as well as all the components (tests manager, program editor) benefits from a remarkable ergonomics : new user interface instantaneous multilingual switch, simplicity of use, concern for detail and optimized design for the use of the touch-screen.



3 user levels control board

You choose the most convenient interface : production, laboratory, advanced tests

New Program Editor :

Access and commands management with 8 password protected levels.

Tracking alarm

Alarme suivieuse température

Ce dispositif configurable permet de surveiller la régulation de la température pendant vos essais.

Activer l'alarme suivieuse

Arrivées pleine vitesse sur palier

La limite autorisée est définie par une enveloppe comme figuré ci-dessous :

Durée de stabilisation
10 minutes

Ecart maximum arrivée
± 10.0°C

Ecart maximum stabilisé
± 3.0°C

Déclencher l'alarme si cet écart n'est pas respecté durant :
120 secondes

Contrôle des transitions

Le système contrôle périodiquement l'évolution de la température : celle-ci doit se rapprocher en permanence de sa consigne.

Contrôler l'approche toutes les :
5 minutes

Gestion de l'alarme

Simple avertissement par voyant sur le tableau de bord.

Mise en défaut équipement (interruption de l'essai).

En mode 'stabilisé' (rampes, paliers) l'écart maximum est donné par le paramètre 3.

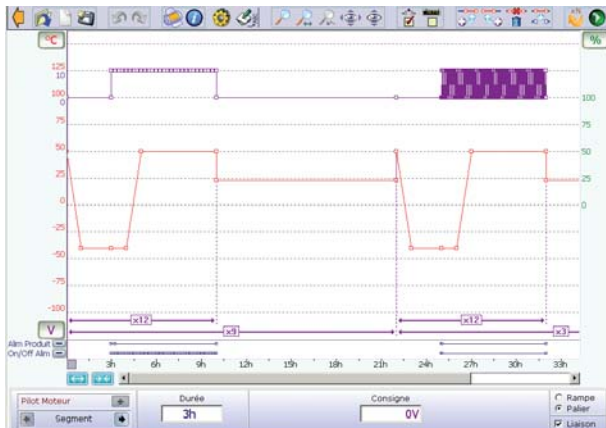
Fermer

beyond the «Energy Saving» mode

Spirale 3 most friendly and complete tests manager offers you an easy and accurate traceability. Editing Statistics, Exporting data, Analysing tests (temperature rate on specific range, stability on stage) become quick and easy applications.

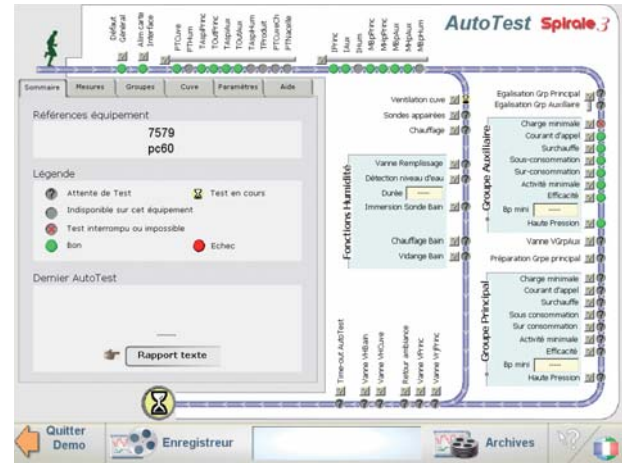


In this new version for **Spirale 3**, our program Editor benefits of numerous improvements, from a modernized user interface, including the touch-screen: «draw your profiles with a finger or with a stylus».



AutoTest

Excal offers you this exclusive feature: check / test refrigerating unit components, compressors performances, gas load status, etc... This autotest is possible thanks to the technology of Spirale3 and the numerous sensors installed on the unit.



Reliability

Our refrigerating circuits, simplified thanks to Spirale3, contain less parts subject to wear (solenoid valves) : an excellent advantage to ensure a longer life to your Excal equipments.

Preventive maintenance

Every component is individually watched (electrovalves, compressors) by action or duration counters. A global synthesis table allows to plan the preventive maintenance operations.

Go beyond with Spirale 3

User Script

Script is the basic language of Spirale 3. It manages the numerous functions available with your climatic chamber. This powerful tool offers an integrated help enabling you to write your own development. You can create your own specific automatism, safeties, or make of your climatic chamber a fully integrated test bench.

Communications/Measurements

Your chamber can be connected to data acquisition systems, to RS232/modBus/IEEE488 equipments. We offer a complete range of peripherals and additional inputs/outputs for those applications. Spirale 3 can communicate or can be piloted by TCP/IP or RS232.

Network connection/Internet

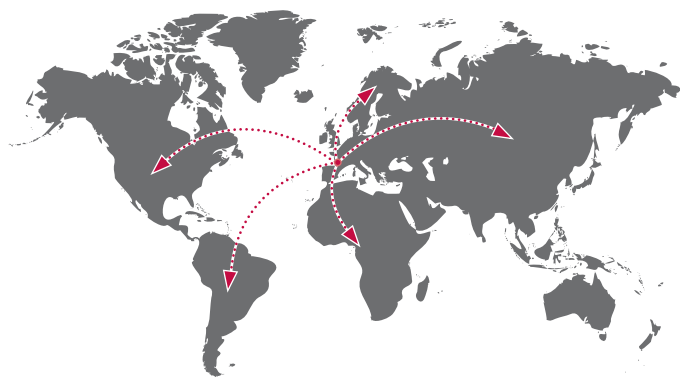
One more exclusive Spirale 3 feature : Excal remote control is as easy as creating a shortcut on Windows desktop. More friendly : You don't need to install any software on your PC to control the chamber. Moreover, an emedded webservice enables to check your equipment state by using any internet browser.

Supervision

Manage all your climatic equipment, new or old, from only one workstation : watching tools, profile edition, test reports edition, sms/emails alarms and many other utilities will be accessible on all your tests chambers.



International network

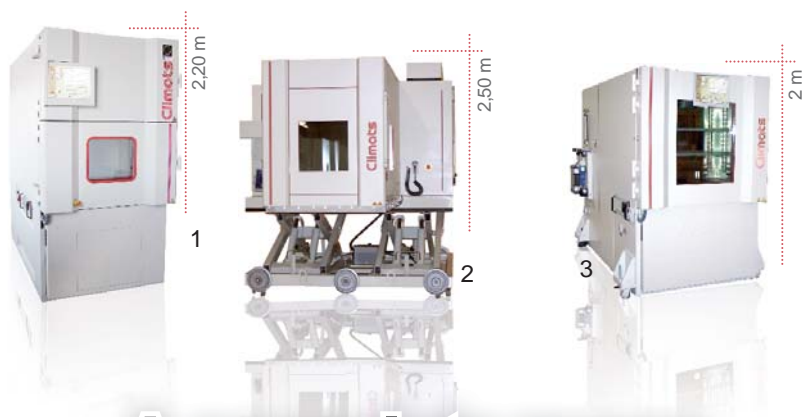


EUROPE ASIA AMERICA AFRICA

As our key development strategy, Export relies on an overseas representatives network. Our partners market and service Climats equipment all over the world ; they are fully skilled in our technology and involved in long term relationship.



Climats



A complete range of climatic test equipments



- 1 - Thermal shocks from 65 to 500 litres
- 2 - Chambers combining climatic and vibrations tests
- 3 - Stress screening chamber
- 4 - Ovens from 25 to 15000 litres
- 5 - Benchtops from 34 to 150 litres
- 6 - Walk-in Chambers
- 7 - Customized equipments upon specifications