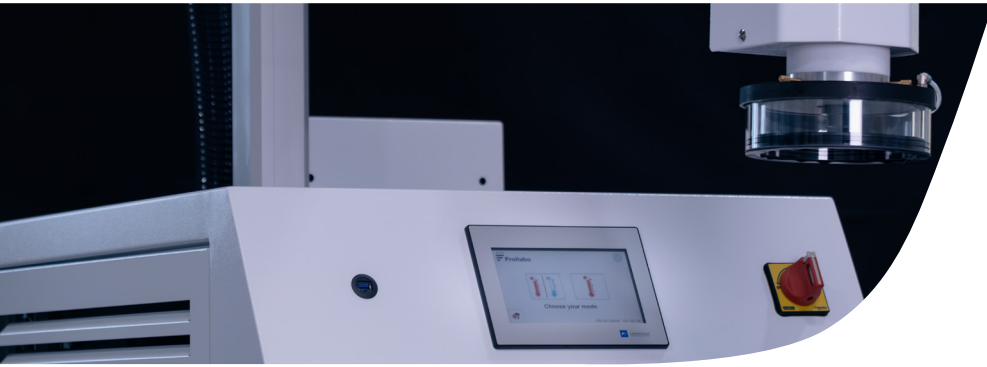


TEMPERATURE FORCING SYSTEM
DRAGON

 **Froilabo**





PRECISE AND VERSATILE DRAGON

Our temperature forcing system offers precise and accurate thermal testing, with a temperature range from -70°C to $+250^{\circ}\text{C}$. With an adjustable air flow and fast ramping, the Dragon is the perfect solution for rapid heating and cooling of samples.

This versatile product is perfect for a wide range of applications, including heating electronic components, sensors aircraft engineering, and any other industry which requires testing of resistance, reliability, and performance.

100 years of experience in temperature control products

Achieve the highest performance whilst adhering to the European norm in force: EN60068-3-11

7 s
from -55°C
to $+125^{\circ}\text{C}$

-70°C
Coldest
Temperature

$\lt\pm 0.5^{\circ}\text{C}$
Thermal
stability

24
h/7d

THE DRAGON FOR A WIDE VARIETY OF APPLICATIONS

Our temperature forcing system offers precise and accurate thermal testing and is the perfect solution for reliable thermal analysis in your laboratory.

Who is the Dragon suitable for?

The Dragon is designed for a wide range of applications which includes:



Heating and cooling electronic components



Heating printed circuit boards



Performing climatic simulations



Electronic characterization



Temperature cycling and targeted freezing applications

The Dragon is currently used in industries such as:



Aerospace and defence



Photo-electronics material suppliers



Semiconductor device testing



Chips and PCB makers



EQUIPMENT FEATURES



Easy plug and play technology

Contains a guide handle and wheels for easy maneuvering into your desired location to perform testing.



Excellent temperature stability

Ensure precision at every step of your testing, with a temperature range of -70oC to +250°C.



Rapid temperature changes

Go from -55°C to +125°C in a matter of seconds, with high precision and accuracy at all temperatures .



Adjustable air flow

Adaptable to your needs, with an adjustable air flow between 2.2 l/sec and 8.4 l/sec.



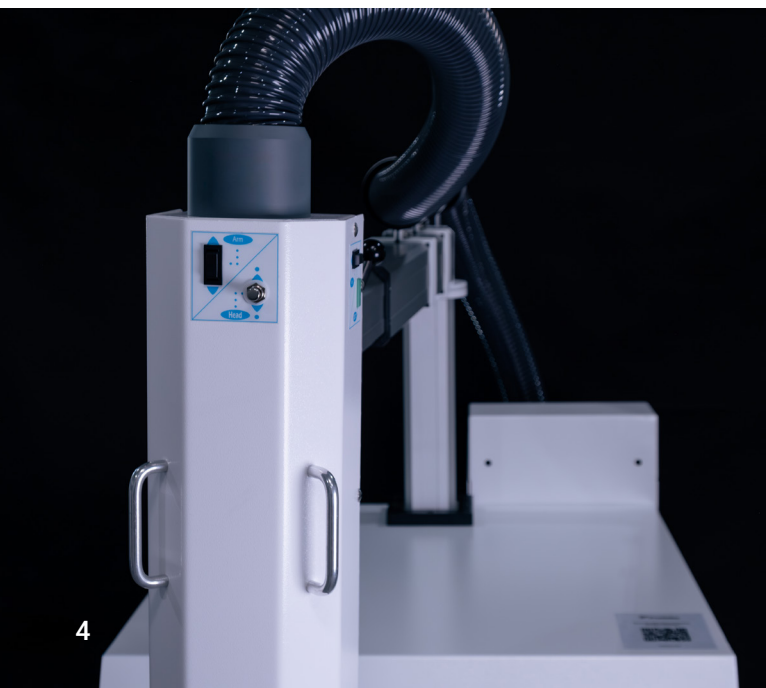
Digital connections

Connect your computer to your dragon for simple method creation and run monitoring.



Compliance at every step

Achieve the highest performance whilst adhering to the European norm in force: EN60068-3-11.



USER FRIENDLY OPERATION

Additional Features

Our Dragon is compliant with European low voltage and CE standards, and is equipped with the various features for increased user safety and ease of use.

- Password protected touch screen to ensure only authorized personal can operate the dragon.
- Various alarms which include over-temperature, high temperature, no air supply, CP1 and CP2 overpressure, DUT and AIR failure, air pressure monitoring and communication failure.
- Contains minimum and maximum temperature thresholds to ensure the dragon operates within its parameters.
- Displays a real-time diagnostic menu, for quick and efficient resolution of any issues that arises.
- Ensures user safety by blowing dry air onto the test area at the end of test, to ensure that the operator can safely access their testing materials.

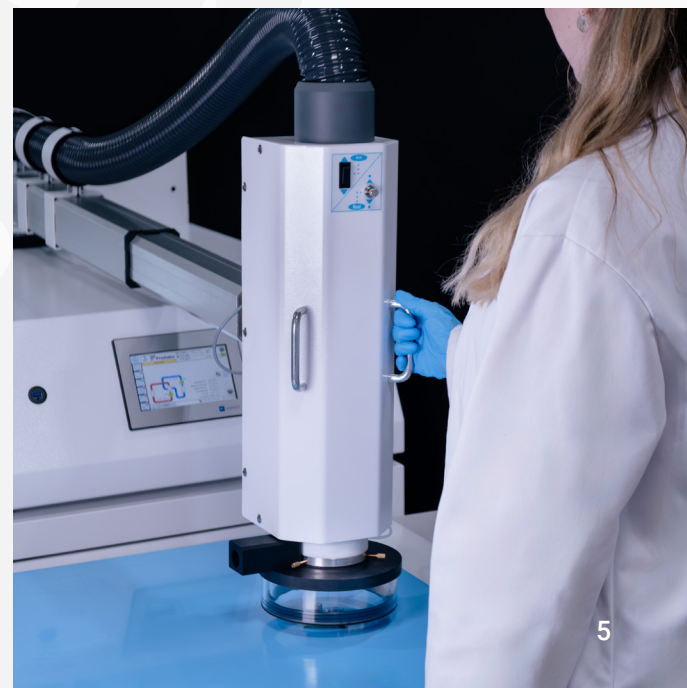


CUSTOMIZATION

Designed to fit your needs

The Dragon can be customized on request with the following and other specifications.

- Borosilicate Bell - to enable the user to see the test in progress and to resist temperature change.
- GPIB - to enable integration with other devices.
- Footswitch (IEEE) - to increase adaptability.
- ESD Kit - to avoid electric discharge.
- Nozzle - to adapt to the test sample.
- Different thermocouples - for DUT or air.
- Bespoke box designs - for special applications.



Technical Specifications

DRAGON TEMPERATURE FORCING SYSTEM	
☰ REFERENCE	
Function	Rapid, precise and reproducible heating & cooling of samples
Version	3.1
Temperature Range	From -70 °C to +250 °C (with arm length = 1m)
Application	Heating electronic components and circuit boards, performing climatic simulations, electronic characterization, temperature cycling, targeted freezing, aerospace and defense.
☰ GENERAL SPECIFICATIONS	
Frame dimensions (H x W x D)	1040 x 900 x 700 mm (without electrical arm)
Construction	Electrogalvanized steel with epoxy paint
Net weight	250 kg
Standard Equipment	4 swivel casters with lock 2 easy moving handle Glass Thermo Cup (T-Cup) & nozzle n°7 Foam mat Type K thermocouple
Climate class (temperature)	From +18 °C to +30 °C
Relative humidity	< 70%
Indoor / Outdoor use	Indoor use only
Environment	Not designed for use in an explosive atmosphere (ATEX)
Noise level	< 63 dB
Warranty	2 years by FROILABO (during and after warranty period)
⚡ ELECTRICAL ARM AND HEAD	
Positioning	2 electric cylinders for vertical and horizontal positioning of the head
Arm length (deployed / folded)	900 mm / 1400 mm (from pivot to nozzle)
Working height	From 675 mm to 1270 mm
Arm rotation	270°
Head cylinder	Pneumatic for component change (fast up/down)
Head rotation	180°
T-Cup dimensions	Internal diameter : 144 mm / available height : 50 mm
🔧 REFRIGERATION AND THERMAL PRODUCTION	
Refrigeration system	2 cascade-mounted compressors with intermediate plate heat exchanger
Type of regulator	Capillary tube
Refrigerant charge	1st stage: ISCEON89 / 2nd stage: R508B
Thermal production	Electrical heating resistance
🔄 PERFORMANCES (AMBIENT TEMPERATURE +22 °C)	
Temperature range	From -70 °C to +250 °C, display and setting (on air) at +/- 0.1 °C
Air flow	From 2.2 L/s to 8.4 L/s
Controlled ramp	From 0.1°C to 16°C/s
Transition time without control	From -55 °C to +125 °C /s : 7 seconds / from +125 °C to -55 °C/s : 14 seconds
Head stability (AIR regulation)	+/- 0.5 °C

Technical Specifications

DRAGON TEMPERATURE FORCING SYSTEM (continued)

CONTROL AND PROGRAMMING

Controller	Temperature regulator
Interface	7" tactile display (800 x 480) - curve tracking - Languages : French / English
Mode	Hot mode (heating resistance only) / Hot & Cold mode
Data	Data recording on USB key (.csv) Alarms historical
Regulation	Air or component
Operating Mode	Manual : 3 sets of 4 parameters (T °C, q air, ramp, level time) Automatic : 20 programs of 32 steps with settings of : T °C, q air, ramp, level time Loopback : 0 to 999 cycles Automatic programs for tests in appliances with international standards (Program 10: JESD22-A104 – Temperature Cycle / Program 11: MIL-STD-202 Method 107 – Thermal Shock).
Thermal Protection	The head temperature is protected by an independent probe against temperatures above 260 °C
Remote connection	VNC connection via ethernet connection for run status monitoring and method creation.

ELECTRICAL DATA AND CONNECTIONS

Compressed air source	Flow : 12 l/s Supply pressure : from 6 to 10 bars Air temperature : from +15 °C to +25 °C
Types of power supply	230 V +/-10%, 50 Hz, circuit breaker 32 A circuit breaker D curve (motor support) with differential 30 mA
Electrical protection	Protection of power elements by fuse

OPTIONS AND CONFORMITIES

Options	Commands for the machine via RS232 or GPIB communication Board IEEE / 488.1 / GPIB Anti-static equipment (head, nozzle and mat) Specific nozzles and boxes on request Support service for adjusting the regulation parameters on request
Supplied with	Quality control sheet 2 technical notices: <ul style="list-style-type: none"> • Implementation, installation, commissioning, use, preventive maintenance and communication • Refrigeration and electrical diagrams
Certification / Conformity	Comply with the standard NF EN61010-1 Meets CE requirements 2014/35/UE – Low pressure directive 2014/30/UE – EMC directive, class A device 2014/68/UE – Under pressure device

SHIPMENT

Shipment size (H x W x D)	1750 x 1400 x 900 mm
Shipment weight	370 kg
Type of package	Delivered in a wooden case

SYSTEM PROTECTION

The Dragon cooling unit is protected by two pressure sensors which will be activated when the pressure is too high, or the condenser is obstructed with dust particles. To avoid heater (or the DUT) burn-out the system permanently controls the air inlet pressure, and the integrity of the air thermocouple. If the Dragon reaches its limit, the system will stop automatically, and an error message will be shown on the screen. For safety, when the head is raised, the airflow is automatically reduced and the temperature set point is lowered to 20°C until the head is returned to the testing position. To safeguard the environment, the Dragon uses non-flammable gases and without CFC or HCFC.

TECHCOMP GROUP

In addition to Froilabo, Techcomp Europe comprises of the following companies:



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