

ULT FREEZERS

EVOLUTION

 **Froilabo**



DEVELOPMENT GUIDED BY THE USER

100 years of experience and taking on board customer feedback have led our R&D team to offer you a range of ultra performance ULT Freezers. Safety, innovation and performance have been at the heart of our strategy of development and design of our devices.



100 years of
experience
and
know-how



Sample security

The preservation of the sample has been the key to any other consideration in our product development.



ULT freezer performance

Priority has been given to fast temperature recovery without compromising the power consumption.



Product innovation

Customer feedback has led the development of our freezers with several innovations being patented.



Simplicity of maintenance & diagnosis

12 LED sensors anticipate and simplify maintenance, allowing the freezer's downtime to be minimised when maintenance is necessary.

2 models
available,
-45°C and
-86°C with
space for
up to 48,000
cryotubes

European manufacturing

The results of several years of research and development, Froilabo ULT Freezers have been conceived and designed in France and manufactured in Europe.

A scalable range

Feedback from our customers has guided the development of the Evolution, culminating in 2 models to suit your requirements, -45°C and -86°C. Both are fully F-Gas compliant and are optimised for daily use including frequent door opening.



MET Marking



ISO 9001 and ISO 13485
certified production site



F-Gas Approved

SAMPLES

Protected & secure

CO₂ and
LN₂ backup
options
available

Secure samples

Equipped with several safety devices, Froilabo ULT freezers guarantee the long term preservation of your samples.



BoSS system (Board Substitution System)

Ensures the compressors remain operational in the event of electronic board failure. Up to 30 hours regulation on batteries, allowing time to arrange repair or maintenance.



Ergonomic intelligent handle

The ergonomically designed handle aligns the user force with the required action of unlocking or opening/closing the door. A sensor in the handle confirms door closure/locking.



Visual and audible alarms

A variety of alarms alert the user to system issues, such as temperature increase, door opening, power supply and more. The alarm events may be recorded and can be customised.



Access control

Freezer settings, such as temperature, are protected by user password. Additionally the door may be locked to restrict access to the contents within the freezer.

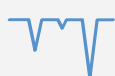


Powerful compressors

Essential for a rapid return to the set temperature after opening the door (cascade compressors for -86°C ULTs).

Secure their environment

Froilabo ULT Freezers ensure optimal operation for the safety of your samples in all circumstances.



Micro-cuts power protection

The electronic board will accept power micro-cuts. It will minimise the number of compressor reboots and will reduce potential maintenance. In the event of power failure, the back-up battery ensures that alarm and freezer information can be displayed.



Adjustable delay

After a mains power outage, each ULT Freezer can adjust the time delay for re-start to avoid a simultaneous peak demand on the facility power supply.

EQUIPMENT FEATURES

Innovative & ergonomic



External dimensions

Froilabo is the only manufacturer of ULT freezers to offer a useful volume of 690 L (24,3 cu.ft.) or 48000 2ml tubes with a device measuring less than 90cm (35.4") wide allowing it to fit through a standard doorway.



Robust Construction

An interior tank and shelves fully designed in stainless steel for intensive use and maximum life.



Easy access to samples

Pull-out shelves are anti-tipping and ease the access to sample and specimen. (Available as an option, 2 shelves maximum for the 690l model).



Heated pressure release valve

A bidirectional heated valve ensures balance between pressure and allows reopening of the door very quickly after closing.



Reduction of frost formation

The flatness of the door and the flat heated door seal help to minimize frost formation.



Removable accessories

Filter, internal doors and shelves are removable for easy maintenance and defrosting.



Easy tank cleaning

Round corners ease the cleaning and disinfection of the internal compartment.

5 second filter replacement and tool-free internal door panel extraction



PERFORMANCES

Temperature & homogeneity

Cooling power and temperature homogeneity

Rapid cooling and temperature homogeneity inside the freezer are critical for sample preservation.



Rapid temperature pull down

Unrivalled temperature pull down allows rapid temperature recovery after door openings and restarts.

+/-4 hours
Pull down
to -86°C

(empty 690 L
model - 22°C
ambient
temperature)



Delayed temperature rise

60 years of experience with designing insulation for ULT Freezers and the use of cryo-accumulator plates (option) retains the low temperature during door opening and power failures. +/-3 hours to go from -80°C to -60°C without cryo-accumulator and +/-6 hours with cryo-accumulator.



Rapid recovery of the set temperature

Our powerful compressors allow a return to setpoint in less than 45 minutes. This parameter is essential for optimal sample preservation.



Temperature homogeneity

The excellent temperature homogeneity inside the bowl allows energy saving for a same high temperature limit. +/-5°C at -80°C

Optimal Thermodynamic Performance

Powerful and economic compressors combined with efficient insulation deliver the best performance/power consumption ratio.



Optimized insulation

Vacuum Insulation Panel (VIP, VACUPOR™ type) combined with high density polyurethane foam offer optimal insulation. In case of power outage, the temperature rise is significantly slowed down.



Homogeneity and stability of temperature

The use of rounded corners within the tank improved heat exchange by 15%, which also contributes to energy savings.



New generation of compressors

More compact and offering improved energy performance, our new generation of compressors allow significant energy savings.

CONSUMPTION

Optimized & controlled

Energy consumption

The energy consumption of a ULT Freezer is influenced by many factors, including the performance of the freezer and the way it is used. Froilabo provides users with all available information to help reduce power consumption of their equipment.



No one uses an empty freezer

Beware of manufacture performance and economy claims measured with empty freezers in low temperature environments. Froilabo ULT Freezers operate and are measured in the real world with large numbers of samples and realistic ambient temperatures.



ULT Freezer in use

This is the only significant measure of the real power consumption of a ULT Freezer. It is greatly influenced by the set temperature, the frequency of door opening, the ambient temperature, the filter cleanliness, the power supply stability, and many more factors.

Reducing Energy Consumption

The user can significantly reduce energy consumption by optimising operating conditions, environment and paying attention to the equipment and settings.



Eco Mode

Ability to minimise the power consumption of the freezer outside usual working hours.



Proximity sensor

Proximity sensor will only activate the screen when a user is present to conserve power.



Energy performances indicator

A colored indicator gives in real time the energetical comfort zone of the device. Green, yellow or red, the user is informed of the freezer's energy performance.



Best practices tutorial

Recommendations and tips to guide users influencing power consumption: ambient T°, cleanliness of the filter, door opening frequency, etc.

Up to 20%
energy saving
when using
eco mode

MANAGEMENT INTERFACE

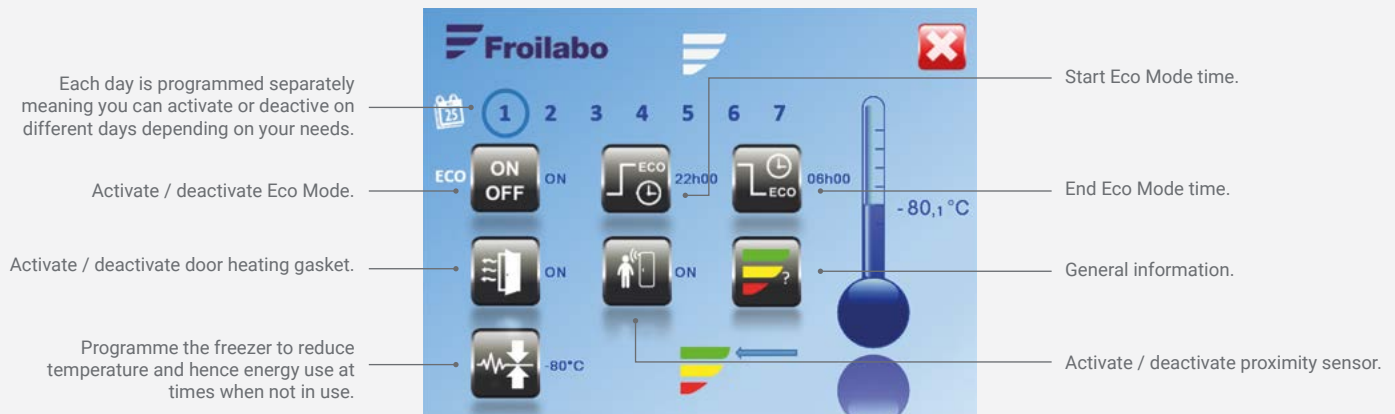
Intuitive & secure



Eco Mode fundamentals

Customisable and effective, Eco Mode will help you reduce your energy consumption.

Eco Mode menu screen



Traceability of events in any circumstances

Track the temperature and other events.



Collection of data with USB port

A USB port is available for data collection. Temperature profile and alarm events are recorded and may be downloaded (CSV file).



History of events

View the temperature profile and alarm events from the last 10 hours on the intuitive touch screen.

Record
10 hours of
temperature
profile and
alarm events

MAINTENANCE

Preventive & simplified

Self-diagnosis and predictive maintenance

ULT Freezers provide a self-diagnosis that allows users to anticipate maintenance by reporting any reduction in performance.



"Diagnosis" menu

It gives a preview in real time of the operation of the device. It identifies drifts of parameters (pressure, consumption, T ° of exchange, etc.) and the status of critical components (battery, power relay contacts, etc.).



12 LED indicators

LED indicators give quick alarms identification (BoSS engaged, low battery, T° alarm, ...). It eases the diagnosis.



Info menu

Key figures related to conditions of use: number of door openings and times, starts of compressors, power consumption, ambient T °, etc.



Remote hotline

Thanks to the diagnosis menu, with a simple call, our technicians are able to determine the problem encountered before even intervening.

Quick and simple service

Critical elements can be replaced rapidly, minimising downtime and significantly reducing maintenance and service cost.



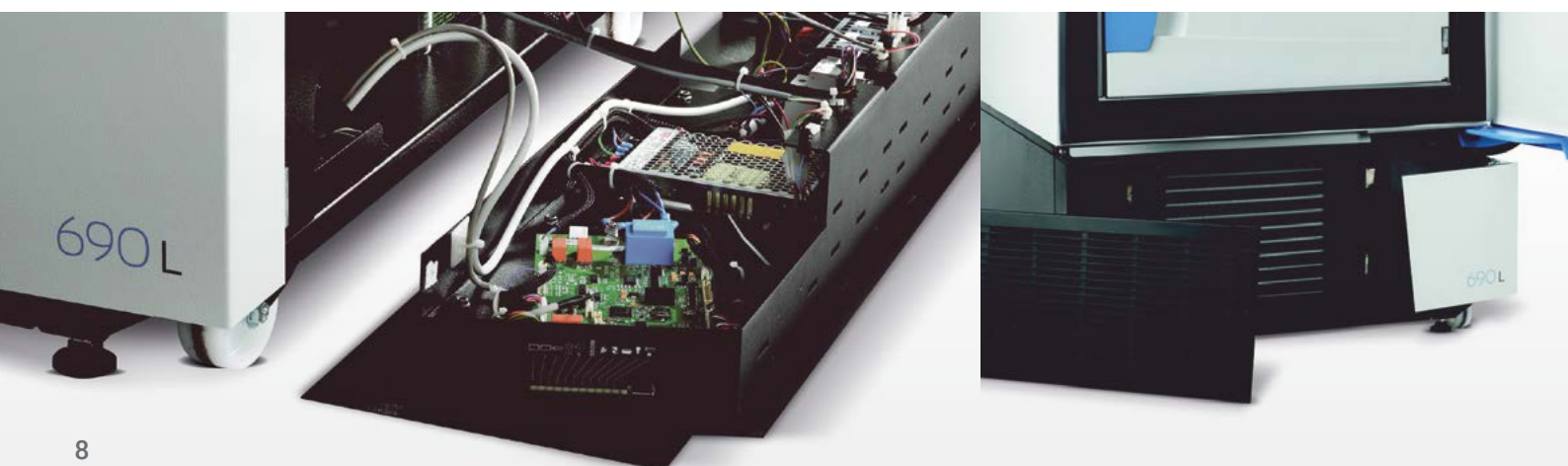
"Plug & Play" electronics

The electronics and display contained in the module are easily removable and can be rapidly switched without any specialised tools.



Removable cooling system

The cooling unit is mounted on a removable tray. This allows immediate cooling system replacement, avoiding the need to return the unit to the workshop.



SPECIFICATIONS

| VOLUME | COMPARTMENTS | CAPACITY (2ML CRYO-TUBES) | EXTERNAL DIMENSIONS HxLxW MM (INCHES) | INNER DIMENSIONS HxLxW MM (INCHES) | NET WEIGHT (KG AND LB.) | POWER SUPPLY |
|----------------------|--------------|---------------------------------|--|---|----------------------------|-------------------------------------|
| 340 L 12.0 cu.ft. | 2 | 24,000 | 1280 x 970 x 875 (50.4 x 38.2 x 34.5) | 716 x 752 x 630 (28.2 x 29.6 x 24.8) | 223 kg 492 lb. | 230V/50Hz 110V/50Hz 110V/60Hz |
| 515 L 18.1 cu.ft. | 3 | 36,000 | 1640 x 970 x 875 (64.6 x 38.2 x 34.5) | 1076 x 752 x 630 (42.4 x 29.6 x 24.8) | 267 kg 589 lb. | |
| 690 L 24.3 cu.ft. | 4 | 48,000 | 1998 x 970 x 875 (78.4 x 38.2 x 34.5) | 1436 x 752 x 630 (56.6 x 29.6 x 24.8) | 330 kg 728 lb. | |



OPTIONS & STORAGE



OPTIONS LIST

| CAT | REF | DESCRIPTION |
|--------------------------------------|-----------|---|
| SHELVES | BM/ES515 | 1 removable shelf for BM515 and BM690 |
| | BM/ES690 | 2 removable shelves for BM690 only |
| | BM/ETA2 | Stainless steel shelf for BM340/BM515/BM690 (597x743 mm) (23.5 x 29.3 in.) |
| SECURITY | BM/CO2T | Liquid CO ₂ injection backup system. Autonomy 15 hours, flexible 3m included |
| | BM/FL1 | Stainless steel connection flexible freezer / bottle or CO ₂ ramp, length 2m |
| | BM/FL2 | Stainless steel connection flexible freezer / bottle or CO ₂ ramp, length 3m |
| | BM/FL3 | Stainless steel connection flexible freezer / bottle or CO ₂ ramp, length 4m |
| | BM/CRY02E | Cryo-accumulators for BM340, (Temperature up time doubled) |
| | BM/CRY03E | Cryo-accumulators for BM515, (Temperature up time doubled) |
| | BM/CRY04E | Cryo-accumulators for BM690, (Temperature up time doubled) |
| | BM/OPT20 | Padlock closure bracket (padlock supply by costumer) |
| | BM/OPT2E | Independent temperature probe PT100 ohms (-100°C to +50°C), connector at back |
| | BM/OPT3E | Independent K thermocouple (-100°C to +50°C), connector at back |
| TEMPERATURE CONTROL & COMMUNICATIONS | BM/OPT4E | Pt 100 ohms x3 (-100°C to +50 °C) probes (DIN connector at the back) |
| | BM/OPT5E | Sensor with 3m cable length for external calibration |
| | BM/OPT6E | Certified temperature probe |
| | BM/OPT7E | Circular diagram temperature recorder 0°C to -100°C (1 revolution for 7 days) |
| | BM/OPT9E | RS 485 port |
| | BM/OPT13E | 4-20mA output |
| | BM/OPT14E | Samples screen mapping |
| | BM/QP | Performances qualification : 9 points temperature mapping, made in Froilabo factory by a certified independent organisation |
| IQ/OQ/PQ | BM/QIQO | Installation and qualification IQ/OQ (without travelling expenses) |

STORAGE ELEMENTS

| CAT | REF | DESCRIPTION | NUMBER OF SHELVES | USABLE HEIGHT MM (INCHES) | CRYOBBOXES CAPACITY (133 X 133 X 51 MM) (5.23 X 5.23 X 2 IN.) | FREEZER RACKS CAPACITY (340 L / 515 L / 690 L) |
|---|--------------|--|--------------------|---------------------------------|---|---|
| RACKS WITH DRAWERS (288x730x343mm) (11.34x28.74x13.5in.) | BM/EL2T690 | Full stainless steel 2 drawers rack | 2 | 164 (6.46) | 60 | 4 / 6 / 8 |
| | BM/EL2T690A | Stainless steel rack with 2 aluminium drawers | | | | |
| | BM/EL3T690 | Full stainless steel 3 drawers rack | 3 | 109 (4.29) | 60 | |
| | BM/EL3T690A | Stainless steel rack with 3 aluminium drawers | | | | |
| | BM/EL4T690 | Full stainless steel 4 drawers rack | 4 | 80 (3.15) | 40 | |
| | BM/EL4T690A | Stainless steel rack with 4 aluminium drawers | | | | |
| | BM/EL5T690 | Full stainless steel 5 drawers rack | 5 | 63 (2.48) | 50 | |
| | BM/EL5T690A | Stainless steel rack with 5 aluminium drawers | | | | |
| RACKS WITH FIXED SHELVES (140x730x343mm) (5.51x28.74x13.5in.) | BM/EL6T690 | Full stainless steel 6 drawers rack | 6 | 53 (2.08) | 60 | 8 / 12 / 16 |
| | BM/EL6T690A | Stainless steel rack with 6 aluminium drawers | | | | |
| | BM/EL3E690AC | Aluminium rack, 15 compartments | 3 | 109 (4.29) | 30 | |
| | BM/EL4E690AC | Aluminium rack, 20 compartments | 4 | 80 (3.15) | 20 | |
| OTHER STORAGE ELEMENTS | BM/EL5E690AC | Aluminium rack, 25 compartments | 5 | 63 (2.48) | 25 | 8 / 12 / 16 |
| | | Aluminium rack, 30 compartments | 6 | 54 (2.12) | 30 | |
| OTHER STORAGE ELEMENTS | BM/ELE690 | Stainless steel rack, 5 columns, up to 30 compartments, removables shelves. | Between 1 and 6 | Between 54 and 109 | 160 micro-plates 96 wells 30 compartments | 8 / 12 / 16 |
| BASKETS | BM/TIR | Stainless steel storage drawer (142x740x330 mm) (5.6 x 29.2 x 13 in.) | 1 | 330 | – | 8 / 12 / 16 |



TECHCOMP GROUP

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



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STG08 / 05.22