Deep freezers

Essential | Evolution | Expert

Be where security makes the difference
Introducing new Froilabo deep freezer
A development guided by the user

Froilabo development of deep freezers has been based on 4 core values:

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

- **Innovation in the use**
  Customer’s comments and suggestions have led the development of those freezers for which several innovations have been patented.

- **Performance of the deep freezer**
  Priority has been given to fast temperature recovery without compromising the power consumption.

- **Simplicity of maintenance**
  Attention has been paid to minimize/simplify the maintenance and reduce the freezer shut down when service is requested (DIAAG: Diagnosis At A Glance).

European manufacturing

Results of several months of research and development, Froilabo freezers are designed and manufactured in Europe.

- **CE marking**
- **UL marking**
- **ISO 9001 and ISO 13485 certified production site**

100 years of experience and know-how

12 month of research and development
A scalable range

Based on the comments and suggestions of users, Froilabo has developed 3 new models of deep freezers responding to 3 types of use:

**ESSENTIAL**
Ideal for the sample long term storage

**EVOLUTION**
Optimal for daily use with regular door opening.

**EXPERT**
Developed for the management and optimization of storage of the samples.

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3 models
72 000 cryo-tubes

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Storage
Functionnal « OK » status

Work
Management interface of the deep freezer

Management
Management interface of the deep freezer and samples
Your samples

Protected and secure
Secure samples with key features

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

**Closed door sensor**
Integrated to an intelligent handle, this sensor ensures user a good closing of the door and thus safety of the samples.

**Access control**
- Key locked,
- Access to operating parameters protected by password.

**Visual and audible alarms**
High and low temperature, high pressure default, door open, power outage, terminal block for remote alarm connection, etc. Temporary switch off of the audible alarm.

**CO² and LN² back-up**
CO² and LN² back-up is an available option in case of power outage.

Optimize deep freezer health

The equipment of Froilabo deep freezers ensures optimal operation for the safety of your samples.

**BoSS system**
In case of incident affecting the regulation of the unit (power supply 220V/24V or regulator), it guarantees the continuous cold production, preserving samples.

**Adjustable delay**
The restart delay of the compressors after power failure is adjustable. It allows a sequenced start of devices and avoids an overload of the power grid.

**Micro-cut power protection**
The electronic card was designed to accept power micro-cuts. It avoids unwanted reboots of compressors and ensures the proper functioning of the freezer over time.

**Powerful compressors**
Essential for a quick return to the set temperature after opening door.

4 hours
Fast cooling from 22°C to -81°C (690L)
The equipment
Innovative and ergonomic
An equipment designed by the user

The development of these deep freezers has been guided by the comments and suggestions of the users about their use.

- **Easy to replace filter cassette**
  With a quick and inexpensive replacement, it participates to the performance of the deep freezer, to the increase in the life expectancy of the appliance and to the safety of the users. Material used for cassette is recycled.

- **Easy cleaning of the bowl**
  The rounded corners of the bowl ease the access to the user for better cleaning.

- **Easy access to samples**
  Pull-out and removable to 50% shelves and are anti-tipping and ease the access to samples and specimens.

- **Intelligent handle**
  Closed door sensor guarantees the user a good closing of the door and thus safety of the samples.

- **No frost formation**
  Thanks to a heating element which also allows a perfect seal of the deep freezer bowl while preserving the flexibility of the gasket.

- **Pressure self-regulation**
  A bi-directional and removable pressure relief valve self-regulates the pressure into the bowl (essential in case of CO² and LN² back-up). Double positioning possible.

- **Removable internal door panels**
  It can be disconnected from the bowl without the need of a tool for simplified cleaning.

- **10 sec**
  Filter replacement

- **0 tools**
  Internal door panels replacement
The performance

Temperature and consumption
Cooling power and uniformity of temperature

Froilabo deep freezers offer performance in temperature to preserve your samples at the right temperature.

Fast temperature pull down
Froilabo deep freezers efficiency allows an unequalled fast temperature pull down.

Delayed temperature rise
An optimal insulation and the use of cryo-reservoir plates (optional) delay the temperature rise during door openings and power failures.

Set temperature recovery speed
It is an essential setting for the optimal preservation of samples. Froilabo deep freezers always show the current temperature in the bowl.

Temperature homogeneity
The excellent temperature homogeneity inside the bowl allows to save energy for a same high temperature limit.

Energy consumption: two approaches
The energy consumption of a deep freezer is influenced by many factors, especially user’s practices.

Empty deep freezer
Given as an indication, it is not representative of the real consumption of a deep freezer in daily use. All energy saving calculation based on this figure is theoretical and necessarily biased.

Deep freezer in use
Only representative measure of the real consumption of a deep freezer, it is greatly influenced by the set temperature, frequency of door opening, ambient temperature, etc.

Froilabo offers the user all the information allowing to really influence the consumption of its equipment.
The consumption
Optimized and controlled
Guide the user in the control of energy consumption

The user will have an impact on energy consumption by optimizing operating conditions and depending on the level of security desired for samples.

*“Eco” mode*
Possibility to minimize the power consumption of the device by setting operating ranges in “eco” mode (between 8pm and 6am for example).

*Energy performance indicator*
A colored indicator gives the energetical comfort zone of the device. Green, yellow or red, the user follows the operating of its deep freezer.

*Proximity sensor*
Possibility to temporarily activate the screen with a proximity sensor, influencing power consumption. Adjustable screen brightness too.

*Best practices tutorial*
It guides the user to permit him to influence the parameters that allow to change power consumption: ambient T °, cleanliness of the filter, door opening frequency, etc.

Optimal thermodynamics performances

The mix of compressors with performant insulation significantly reduce the power consumption of the appliance in operation.

*Insulation and preservation of cold*
The association of a polyurethane foam of high density with vacuum insulation panel (VIP, type VACUPOR™) offers an optimal insulation. The rise in temperature is a maximum slowed in case of power failure.

*Homogeneity and stability of temperature*
The use of a bowl with rounded corners improved by 15% heat exchange. This ensures maximized homogeneity and stability of temperature in the deep freezer.

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

12,5 kWh /24h
Power consumption (empty 690L model - 22°C ambient temperature)
The management interface
Intuitive and secure
Optimal follow-up of samples

Samples registration and research is greatly eased by the presence of a unique management software.

Configuration of the deep freezer
The software allows to manage the different types of racks and their location in the freezer.

Bar-code scanner
Scanner is integrated in the intelligent handle of the deep freezer for the reading of the sample identification bar-code. Automatic storage of logins (Expert model).

Management of inputs and outputs
Entry of samples references to be stored or located on the touch screen with an alphanumeric keypad. Validation of the inputs and outputs.

Transfer of data on a back-up
If necessary, immediate recovery by RFID of data storage on PC/tablet to transfer it to an equivalent back-up deep freezer. No re-entry of logins and locations.

Traceability of events in any circumstances

Follow-up of the evolution of the temperature and all events that may potentially affect the samples.

Collection of data with USB port
Available on all models to ensure the collection of data on the evolution of temperature over time and the different alarms.

Historical of events
Display on touch screen of the evolution of the temperature on the last 10 hours, but also the last 10 events and their acquittal.

Samples can be registered with Mapping system
The maintenance

Preventive and simplified
Anticipated diagnosis and maintenance

Deep freezers provide a self-diagnosis which allows the user to anticipate the maintenance by reporting any potential signals of failure of the system.

"Diagnosis" menu
It gives a preview in real-time of the operation of the device. It identifies drifts of parameters (pressure, consumption, T\(^\circ\) of exchange, etc.) and the status of critical components (battery, power relay contacts, etc.).

"Statistics" menu
Key figures related to conditions of use: number of door openings and times, starts of compressors, power consumption, ambient T\(^\circ\), etc.

Filter replacement indicator
A message reminds the user of the need to regularly clean the filter (Evolution model) or indicates that the filter is clogged and ask to be replaced (Expert model).

12 indicators of state LED
The activation of one or more LED allows quick identification of the defect that generated an alarm (BoSS, low battery, T\(^\circ\), alarms, etc.).

Quick and simple intervention
The modular vital elements can be replaced very quickly for a reduced immobilization of the deep freezer and a limited intervention cost.

"Plug & play" electronics
The electric drawer and the display module are easily removable. It can be replaced in a few minutes without special technical skills and specific tools.

Removable cooling system
The cooling system is mounted on a removable tray/chassis. It enables an ease of operation and a standard exchange if necessary.

No oil separator
Simple and efficient pipe architecture avoids oil clot and eliminates potential expensive maintenance.
Specifications & accessories

Versatility and modularity
### Technical specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Volume</th>
<th>Capacity (cryo-tubes)</th>
<th>Compartments</th>
<th>External dimensions (H x P x L)</th>
<th>Inner dimensions (H x P x L)</th>
<th>Net weight</th>
<th>Power supply</th>
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<td>BM ESSENTIAL</td>
<td>340</td>
<td>24,000</td>
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<td>1280 x 970 x 875</td>
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<td>1076 x 630 x 752</td>
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<td>2000 x 970 x 875</td>
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