

# Arpège

## *cryogenic containers*

User manual



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This manual complies with Directive 93/42/EC concerning medical devices.



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## 1. Identity of manufacturer

The manufacturer of the ARPEGE medical device is Cryopal:

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## 2. Safety information

Before using the *ARPEGE* device, read this manual and the following safety instructions carefully.

### 2.1. General instructions

You are only authorised to operate and use the equipment mentioned in this document if you have read through this entire manual and all safety instructions and have been trained in the risks associated with handling cryogenic fluids.

It is recommended that a back-up liquid nitrogen tank is available at all times so that samples may be transferred in the event of a malfunction.

The device described in this manual is designed exclusively for use by qualified personnel. Maintenance operations should only be carried out by qualified personnel authorised by the manufacturer. To ensure the safe and correct use of the device during service and maintenance, it is essential that all personnel observe standard safety procedures.

In the event the cryogenic equipment does not seem to function correctly under normal usage conditions, only someone who has been fully trained by the manufacturer is allowed to work on the cryogenic device and its peripheral components. Users must not take action themselves due to the health and/or safety risks. In order to avoid the loss of too much cold, the time until the maintenance technician performs servicing must be as short as possible.

The installation of remote monitoring options or devices will improve the safety of the cryogenic system. Regular inspections must also take place.

**Important / User information** \*\* When storing biological samples classified as sensitive by the user, Cryopal recommends using the *ARPEGE* product range equipped with the temperature and liquid nitrogen level monitoring system called *Cryomemo*, with the alarm transferred to a remote video surveillance central device.

For *ARPEGE* devices not equipped with the *Cryomemo* regulation system, Cryopal recommends the liquid nitrogen level in the device be checked continuously. The test described in section 8.2 is used to confirm that the equipment's thermal performance is still within the manufacturer's recommended parameters.

## 2.2. General precautions for use

Wear personal protective equipment (PPE) when handling the device:



Protective cryogenic gloves are compulsory



Fire-resistant protective overalls (long sleeves) are recommended



Protective goggles are compulsory



Foot protection is recommended

---

/

Oxygen meter

---

### Protection

The general precautions for use are the same for all cryogenic tanks:



Liquid nitrogen is extremely cold (-196°C). The parts of the tanks that have been in contact with liquid nitrogen, especially while filling the tanks, may cause cold burns if they come into contact with the skin.

#### **Cold burns and/or frostbite**

- On the neck and cap, after opening or while filling.
- By liquid nitrogen splash when opening or removing fittings.
- On the lock, during or immediately after filling
- On the neck and the cap after opening
- Liquid nitrogen may spill out of the device when handling accessories and fittings.

To avoid burns, it is recommended to never touch the cold parts of the equipment (neck, cap, tube, etc.), to prevent liquid spills by always keeping the device in an upright position, and to always wear the personal protective equipment listed in the safety instructions.



### **Trapping**

- By the cap when closing the device.

### **Crushed feet**

- By the casters, and the cryogenic device when handling.
- 



Regular checks of the evaporation rate provide assurances that the product has retained its original characteristics (see section 8.2)

Check there is no frost on the neck or outer casing of the device on a daily basis. If there is, stop using the cryogenic device and immediately contact your distributor responsible for maintenance.

Check the condition of the cap (deterioration of the polystyrene, uncoupling of the cover). If there is substantial wear and tear, replace the cap to help maintain the device's performance.

---



If liquid nitrogen drips onto the pump check valve, it may no longer be leaktight. If this occurs, check that all traces of frost have disappeared from the neck after 24 hours. Contact your maintenance team in the event of spillage on the valve.

---

It is recommended to use the device on a flat, even surface to ensure it remains stable.

---



The liquid nitrogen used in the storage containers evaporates in the air: 1 litre of liquid nitrogen releases around 700 litres of gaseous nitrogen. Nitrogen is an inert, non-toxic gas, but displaces oxygen when released into the atmosphere. Once the atmospheric oxygen content falls below 19% the human body is at risk.

All rooms and areas that house storage tanks containing liquid nitrogen should be well ventilated at all times and equipped with at least one oxygen gauge. All personnel should be informed of the risks associated with the use of nitrogen. Refer to current guidelines and contact your distributor.

---



The device must be filled with cryogenic liquid nitrogen in a well-ventilated area (outside) or in a room equipped with a constant ventilation system adapted to the size of the room. The room must also be equipped with an oxygen monitoring system with a display located outside the room, and the user must be equipped with a portable oxygen monitoring system. The necessary safety conditions and the provision of safety systems for operating a cryogenic room are the responsibility of the operator.

---



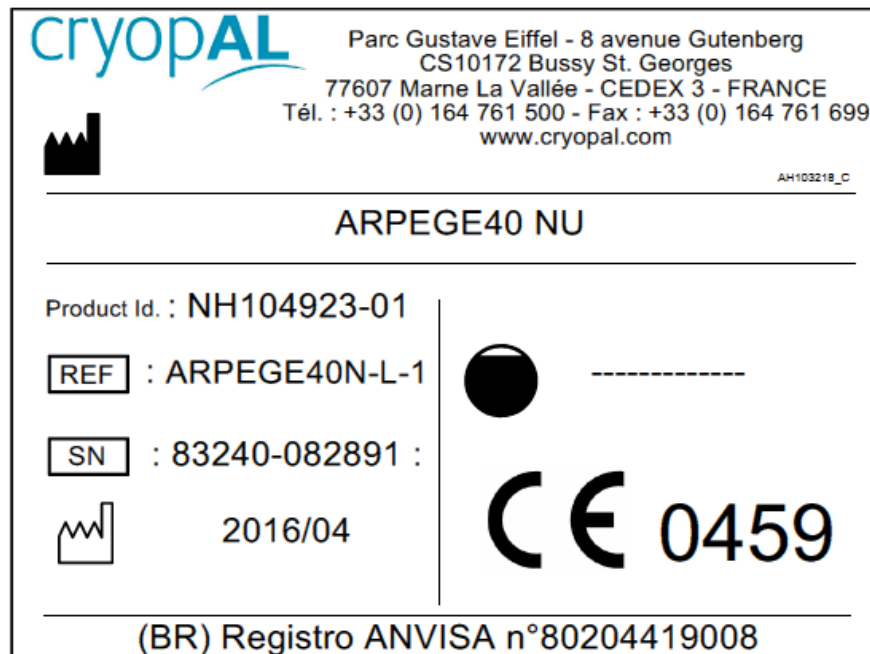
### 2.3. Precautions in the event of faults

Full safety cannot be guaranteed in the following cases:

- The container is visibly damaged.
- After prolonged storage in unsuitable conditions.
- After severe damage sustained during transit.
- The container loses its thermal performance (see section 8.1)













If you suspect that the container is no longer safe (for example as a result of damage sustained during transit or during use), it should be withdrawn from service. Make sure that the withdrawn equipment cannot be accidentally used by others. The apparatus should be handed over to authorised technicians for inspection.

### 2.4. Description of labels



Labels found on the ARPEGE device

## 2.5. Key to symbols

	Manufacturer		Important: Low temperature
	Refer to the instruction manual		Gloves must be worn
	Goggles must be worn		Ventilate the room
	Do not touch frosted parts		Product reference code
	CE marking, complies with Directive 93/42/EC		Serial number
	Date of manufacture		Capacity in litres

## 3. ARPEGE device

### 3.1. Device overview

The devices in the *ARPEGE* product range are unpressurised cryogenic tanks used to store and preserve biological specimens that have been previously frozen in liquid or gaseous nitrogen at  $-196^{\circ}\text{C}$  (liquid/gaseous nitrogen is a cryogenic fluid).



The main features of the *ARPEGE* range of devices are:

- There are two ranges of *ARPEGE* tank:
  - 7 tanks for liquid phase storage: Narrow neck (40-70-110-140-170L) and wide neck (55-75L)
  - 4 tanks for gaseous phase storage: (70-110-140-170L)



Cryogenic device	Phase	
	Gaseous	Liquid
<i>ARPEGE 40</i>		■
<i>ARPEGE 55-75</i>		■
<i>ARPEGE 70-110-140-170</i>	■	■



*Cryomemo* equipment is recommended for use with the device in gaseous phase.

- *ARPEGE* devices are available with user accessories as described in section 11.

- The devices are equipped with a support interface for mounting the *Cryomemo* regulation and automatic filling system, although they can also be equipped with the T° TRACKER temperature monitoring and recording system. The latter is recommended for ARPEGE devices that will not be equipped with the *Cryomemo* system.
- The devices are equipped with caps designed with a concentric hole, intended for use with a temperature probe such as the T° TRACKER. If no probe is used, the hole is plugged using the supplied push rivet, in order to maintain the device's performance.
- Option to close with a standard padlock, except the ARPEGE 55-75 (locking option available).
- Light alloy construction, for reduced weight and longer holding time.
- Availability of varied storage systems adapted to vials, tubes, straws, bags, etc.



The devices must only be used for storing products in liquid or gaseous nitrogen, depending on the type of device, and not for freezing. Any other gas is prohibited.

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If preserving the products in a cryogenic device is identical whether it is in gaseous or liquid state, the state is chosen according to the following medical considerations:

Reason for selection	Cryogenic device in	
	Gaseous phase	Liquid phase
Frozen products in contact with liquid nitrogen	No	Yes

The use of gaseous nitrogen as opposed to liquid nitrogen:

- Minimises the risks of cross-contamination
- Increases user safety by preventing splashes when handling
- Reduces the weight of the racks when handling

For safety reasons, gaseous phase storage may require an automatic filling system. The container needs to be connected to a liquid nitrogen source.

---

### 3.2. Technical specifications

Tanks	CRYOPAL Series - ARPEGE						
Name	ARPEGE 40	ARPEGE 70	ARPEGE 110	ARPEGE 140	ARPEGE 170	ARPEGE 55	ARPEGE 75
<b>Purpose</b>	Unpressurised containers intended for the storage and preservation, at a very low temperature in a liquid or gaseous state, of previously frozen biological samples.						
<b>Contraindications</b>	Do not use outside of the temperature/humidity ranges stated in the notice, do not fill the tank with anything other than liquid nitrogen.						
<b>Performance</b>	Maintain a cryogenic temperature to preserve biological samples						
<b>Operational lifetime</b>	10 years						
<b>Material held</b>	Liquid nitrogen						
<b>Tank material</b>	Aluminium alloy, epoxy fibreglass composite (neck)						
<b>Total capacity (L)</b>	40	72	116	144	172	55	72
<b>Diameter of neck (mm)</b>	120	215	215	215	215	378	378
<b>Diameter (mm)</b>	467	586	586	683	683	468	468
<b>Weight when empty (kg)</b>	25	33	40	40	56	31	37
<b>Full weight (kg)</b>	57	91	134	156	195	75	95
<b>Total height (mm)</b>	735	738	962	911	1028	850	1015
<b>Evaporation (in L/day of liquid)</b>	0.29	0.6	0.65	0.65	0.75	2.4	2.5
<b>Holding time (days)</b>	140	130	178	222	229	23	29
<b>Materials in direct or indirect contact with the user</b>	Aluminium alloy, epoxy fibreglass composite (neck), polycarbonate and expanded polystyrene for the cap.						

### 3.3. Overview of the product range

References	Product description
ARPEGE40N-L-1	ARPEGE 40 Liquid
ARPEGE70N-L-1	ARPEGE 70 Liquid
ARPEGE110N-L-1	ARPEGE 110 Liquid

**ARPEGE140N-L-1**

ARPEGE 140 Liquid

**ARPEGE170N-L-1**

ARPEGE 170 Liquid

**ARPEGE55N-L-1**

ARPEGE 55 Liquid

**ARPEGE75N-L-1**

ARPEGE 75 Liquid

The devices designed for use with the gaseous phase are only available in *Cryomemo* versions.

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## 4. Usage instructions

### 4.1. Intended use

Tanks in the *ARPEGE* range are designed for use in laboratories or hospital settings for the preservation and storage of biological samples.

Samples could be cord blood, blood bags, cells...

### 4.2. Expected performance

The expected performance of this device is that it maintains a cryogenic temperature for preserving biological samples.

The -150°C temperature is guaranteed if the lid is closed, with normal filling conditions.

### 4.3. Device service life

The vacuum of the *ARPEGE* devices is guaranteed for 6 years. The service life of the *ARPEGE* device is 10 years under normal usage conditions.

The device's service life can only be maintained if all of the recommendations made in this manual are followed.

### 4.4. Contraindications

*ARPEGE* tanks must only be used within the temperature and humidity ranges specified in the user manual, and only with liquid phase nitrogen (see section 6).

### 4.5. Potential adverse effects

#### 4.5.1. User

There are two major adverse effects linked to the use of liquid nitrogen:

1. Cold burns or cryogenic burns
2. Anoxia

In order to avoid these adverse effects, follow the safety instructions provided in this manual.

#### 4.5.2. Device

There are two major adverse effects linked to the use of liquid nitrogen:



1. Deterioration of the cap: Wear and tear to the foam of the cap, linked to friction during repeated opening and closing of the cap, or loosening of the cap foam.



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It is recommended you have a back-up cap to use as a replacement upon the first signs of wear and tear.

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2. Leakage from the pump check valve: If liquid nitrogen drips onto the pump check valve, it may no longer be leaktight.



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If liquid nitrogen spills over onto the valve, check that all traces of frost have disappeared from the neck within 24 hours, and conduct a thermal performance inspection of the device by following the nitrogen level inspection protocol (see section 8.2).

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Figure 4-1: Example location of the pump check valve on ARPEGE170

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## 5. Materials used

<b>Materials in direct or indirect contact with the user</b>	Aluminium alloy, epoxy fibreglass composite (neck), polycarbonate and expanded polystyrene for the cap.
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## 6. Storage and handling conditions

There are several conditions and safeguards to follow so that *ARPEGE* devices can be used in complete safety.

### 6.1. Storage

- The premises in which the equipment is stored must be equipped with personal protective equipment (PPE).
- There must be minimum safety distance of 0.5 m around the device.
- Do not store the equipment near heat sources.
- Temperature and humidity ranges during storage (in the device's original packaging):
  - Ambient temperature: -30°C to 60°C
  - Relative humidity: 0% to 85% without condensation
  - Atmospheric pressure: 500 hPa to 1150 hPa
- Ensure that there is sufficient ventilation in areas where liquid nitrogen is stored or used, because liquid nitrogen evaporates and produces large quantities of nitrogen gas, which can reduce the amount of oxygen in the surrounding air in confined spaces and lead to a risk of anoxia. A reduction in atmospheric oxygen levels is unnoticeable when breathing in, so anoxia results in a loss of consciousness then death without any warning signs.
- An oxygen meter, linked to a powerful audio and visual indicator, must be installed near any storage or extraction site.
- The device must not be stored in a small, enclosed space (such as a cabinet or closet).
- The devices must be kept upright at all times.

*This list is not exhaustive.*

### 6.2. Handling

- Temperature and humidity ranges during operation:
  - Ambient temperature: 20°C ±5°C, away from direct sunlight
  - Relative humidity: 30% to 65% without condensation
- Avoid impact and sudden movements.

- Samples (tubes, bags, cases, etc.) must be protected before being placed in the device.

*This list is not exhaustive.*

---

## 7. Moving the device

The device may be handled by forklift, in accordance with trade practices, only when it is within its packaging.

Never use a forklift truck to handle the device when it is not in its packaging, always move it by:

- Carrying it by its handles
- Rolling it on its roller base.

This movement is only possible and safe over very short distances (tens of centimetres) in order to access the rear of the device during maintenance.

If the cryogenic container has already been used and must be moved to another location, it must be transported empty and in its original packing, complying with the requirements set by current national and international regulations.



It is forbidden to move a cryogenic device when it is full of liquid nitrogen and contains samples.

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Cryogenic devices are not approved for storage in outdoor environments.

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Special care must be given to the valve when moving the device to avoid any mechanical shocks.

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## 8. Using the ARPEGE device

### 8.1. Filling the device

When filling the device for the first time, refer to the Maintenance Manual NH78452. The first filling must be carried out by a trained and approved member of staff.

The tank must be filled while empty and the samples will only be inserted after the device is loaded with liquid nitrogen.

The medical device is filled by directly pouring liquid nitrogen through the neck using the flexible transfer hose (suitable for cryogenic applications and compliant with the EN12434 standard) connected to either a storage tank or a transfer line.

For storage in gaseous nitrogen, the maximum liquid level must be 100 mm (check using a level gauge).

If the device to be filled is hot, it must not be all filled up at once to avoid the risk of splashes. It must be first be filled  $\frac{3}{4}$  of the way, and then left to cool for several minutes before filling it up to the top.

If the device being filled already contains some liquid nitrogen, it can be filled entirely in a single operation.



If the medical device is hot at first, the insulation will not be fully efficient until after 48 hours.

Liquid nitrogen losses will be high in the first hours and will generally be above the specifications for the first two days. If you are looking for maximum holding time, it is a good idea to top up the liquid nitrogen two or three days after filling.

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During filling and transfer operations, make sure to use appropriate equipment and follow procedures which guarantee safety (hoses, vacuum valve).

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We recommend that at least one person should be present at all times to monitor filling until completion.



In order to avoid the risk of splashes when filling the device, Cryopal recommends the use of a transfer pipe with anti-splash nozzle.

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Special care must be given to the valve when filling the device to preserve the cold.

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## 8.2. Nitrogen level check

To check the level of liquid nitrogen remaining, follow the procedure below:

- Remove the cap
- Push the plastic level gauge down to the bottom for 3 or 4 seconds (be careful of any protrusions caused by the canister distributor)
- Remove it and shake it in the ambient air

The level of condensation of moisture in the air will indicate the level of liquid remaining in your device.



There may be a difference between the measurements taken using the level indicator and readings taken with a ruler, depending on the reference points used for the measurements.

---

To guarantee monitoring and maintenance of the device's performance, regular inspections of the evaporation rate are recommended depending on their respective holding times (see section 3.2).

The results of these measurements can be recorded in a control chart to track the device's parameters (number of fills, daily consumption, evaporation rate, etc.)

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The device naturally empties by evaporation, and must therefore be topped up regularly to ensure samples are preserved effectively.

If the evaporation rate is abnormally high in normal usage conditions, this means there is a problem with the vacuum. This also manifests as transpiration and the formation of frost on the outer casing. All necessary measures must be taken to protect the contents of the refrigerator. If these problems persist, contact the manufacturer.

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## 8.3. Filling levels



**Important:** The cap must not be floating.

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### 8.3.1. ARPEGE 40

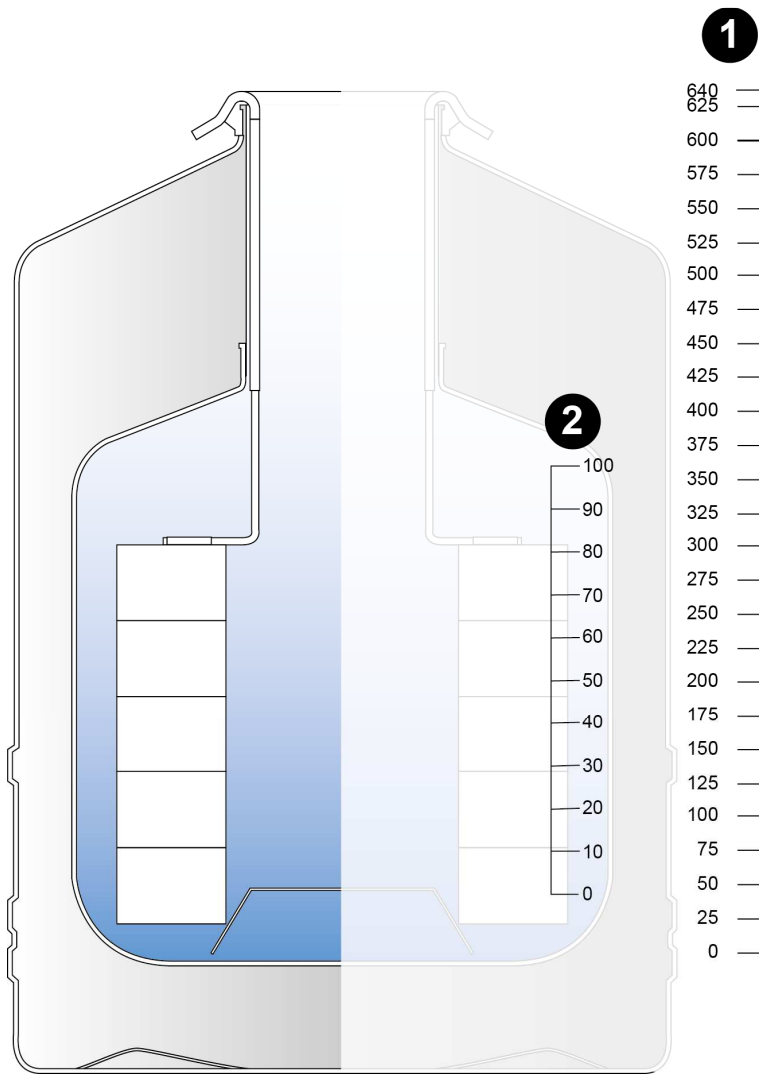


Figure 8-1: ARPEGE 40 – Liquid phase – measurement scale

ARPEGE 40	
Gaseous phase (cm)	25
Liquid phase (cm)	275

- 1 Recorded heights (mm)
- 2 Level in % of measurement range



### 8.3.2. ARPEGE 55

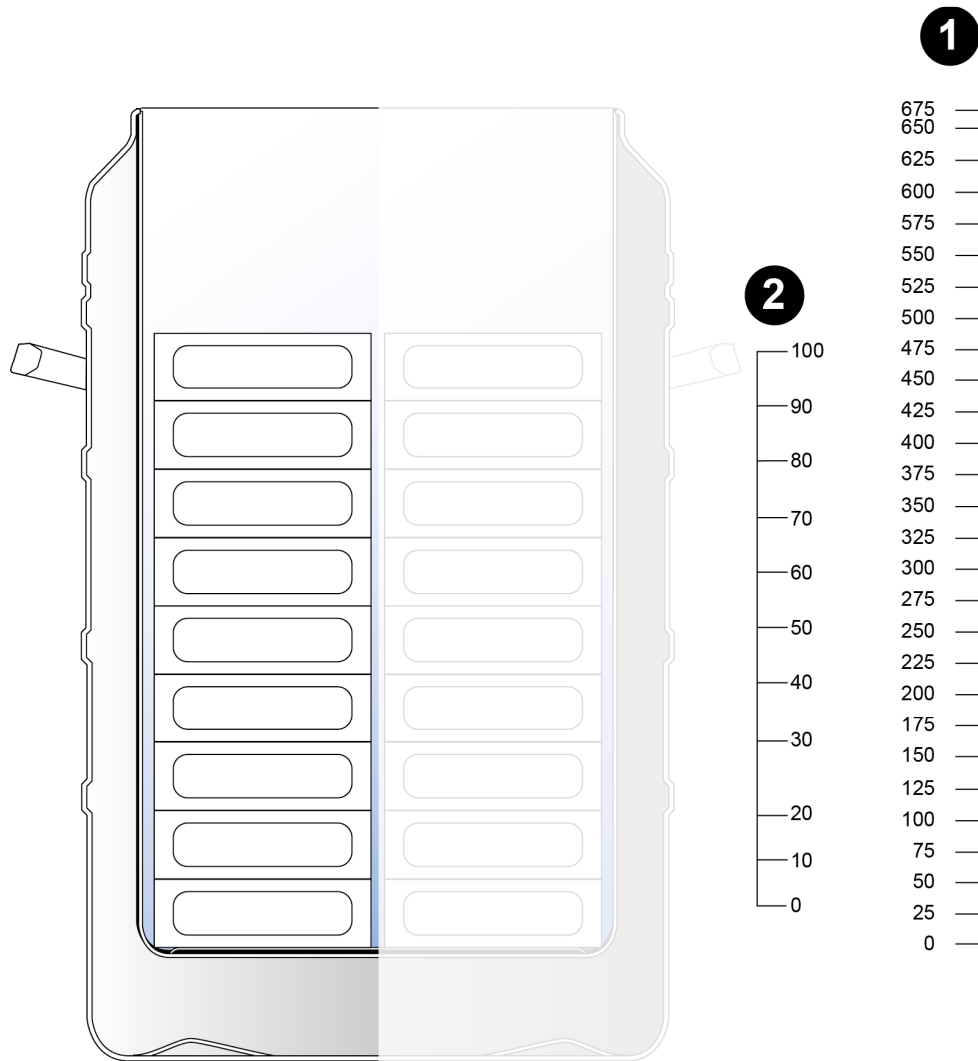


Figure 8-2: ARPEGE 55 – Liquid phase – measurement scale

ARPEGE 55	
Gaseous phase (cm)	75
Liquid phase (cm)	425

- 1** Recorded heights (mm)
- 2** Level in % of measurement range

### 8.3.3. ARPEGE 75

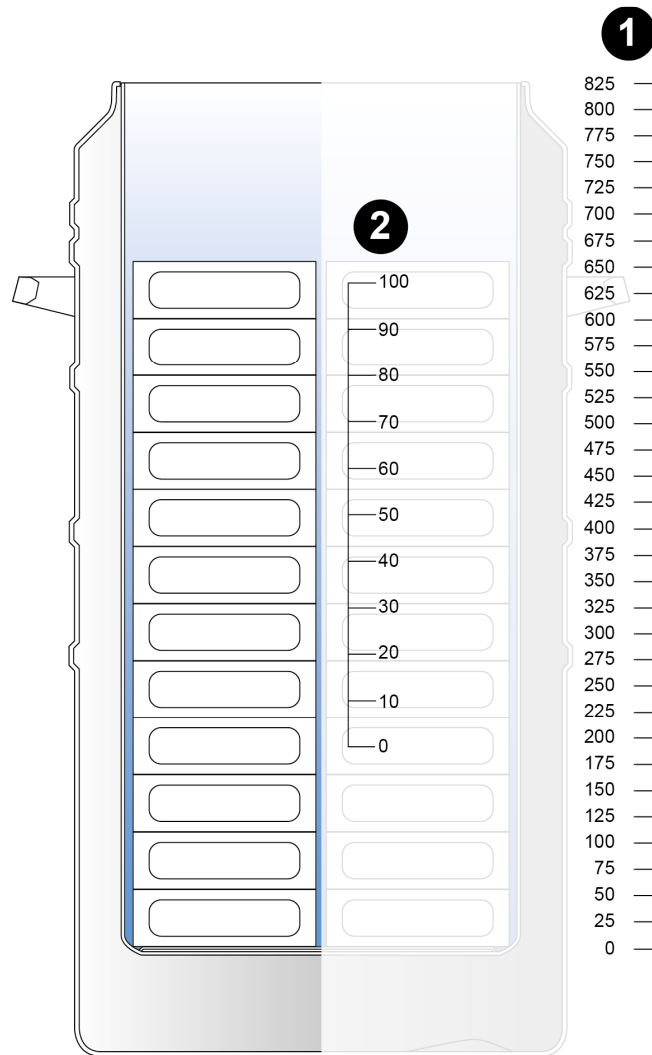


Figure 8-3: ARPEGE 75 – Liquid phase – measurement scale

	ARPEGE 75
Gaseous phase (cm)	235
Liquid phase (cm)	585

- 1 Recorded heights (mm)
- 2 Level in % of measurement range

### 8.3.4. ARPEGE 70

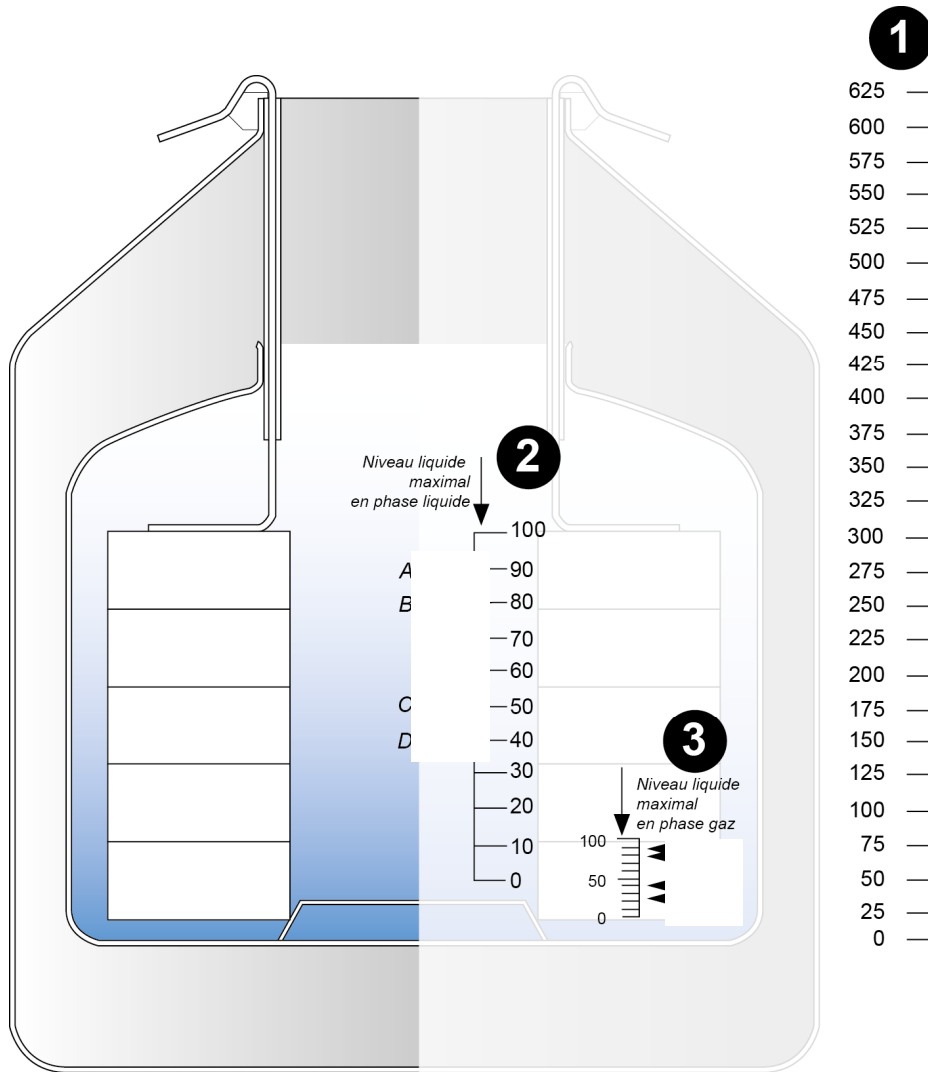


Figure 8-4: ARPEGE 70 – Liquid phase – measurement scale

ARPEGE 70	
Gaseous phase (cm)	62
Liquid phase (cm)	300

- 1 Recorded heights (mm)
- 2 Level in % of measurement range in liquid phase
- 3 Level in % of measurement range in gaseous phase

### 8.3.5. ARPEGE 110

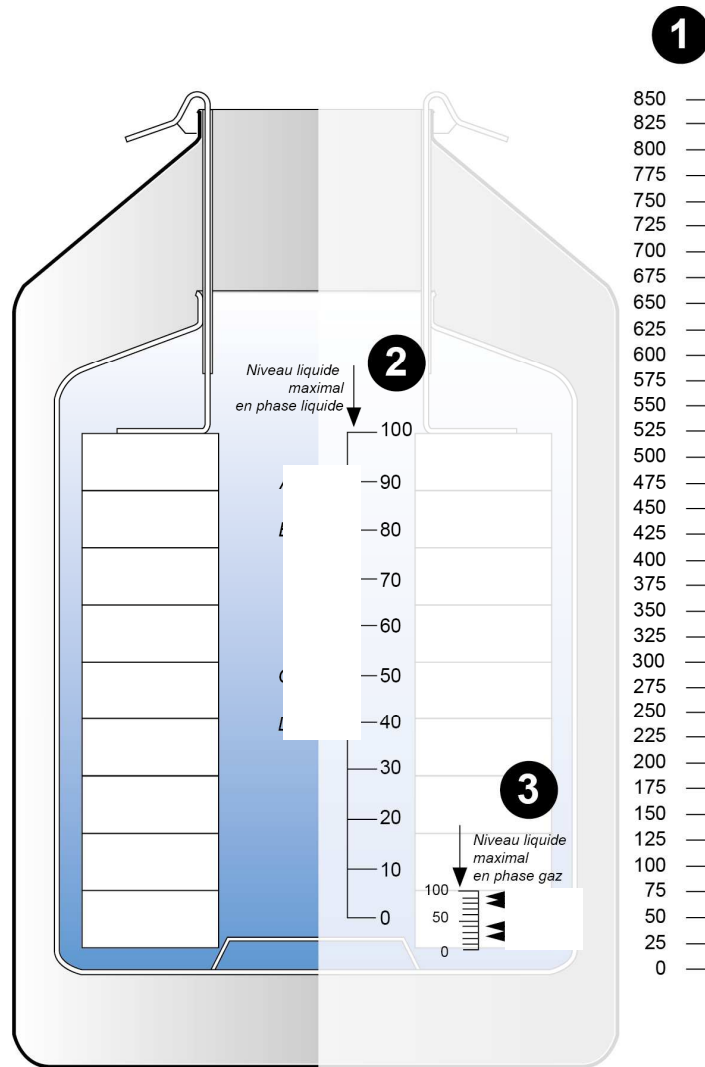


Figure 8-5: ARPEGE 110 – Liquid phase – measurement scale

ARPEGE 110	
Gaseous phase (cm)	50
Liquid phase (cm)	500

- 1 Recorded heights (mm)
- 2 Level in % of measurement range in liquid phase
- 3 Level in % of measurement range in gaseous phase

### 8.3.6. ARPEGE 140

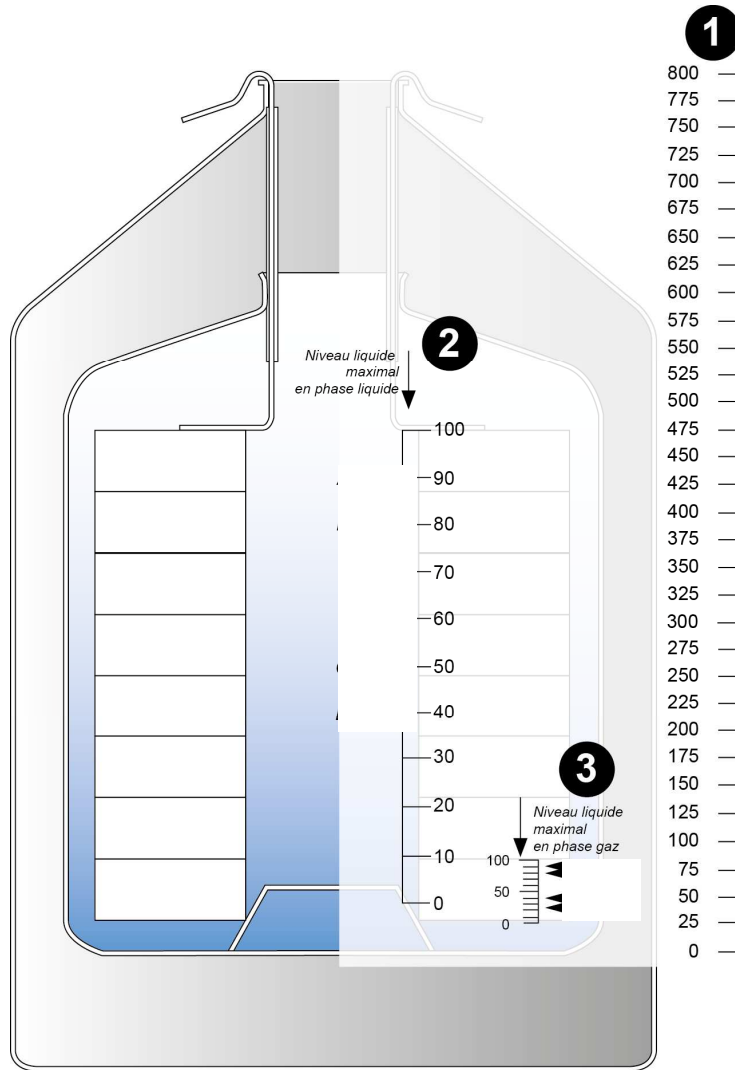


Figure 8-6: ARPEGE 140 – Liquid phase – measurement scale

ARPEGE 140	
Gaseous phase (cm)	25
Liquid phase (cm)	400

- ① Recorded heights (mm)
- ② Level in % of measurement range in liquid phase
- ③ Level in % of measurement range in gaseous phase

### 8.3.7. ARPEGE 170

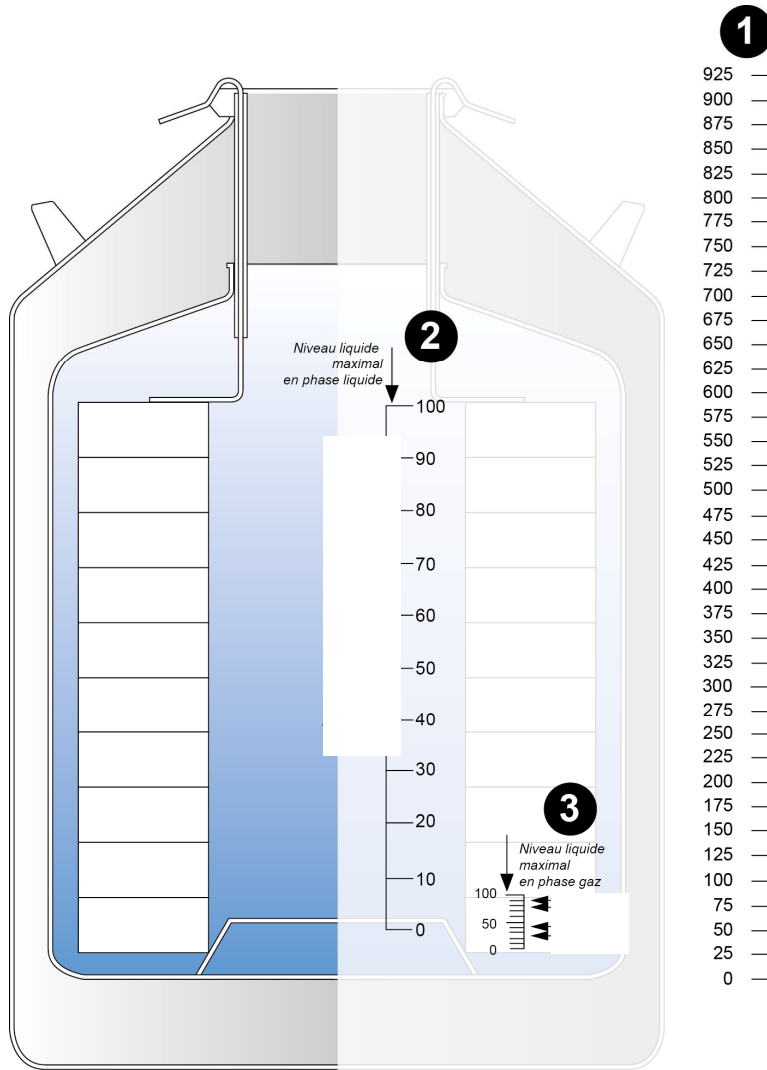


Figure 8-7: ARPEGE 170 – Liquid phase – measurement scale

ARPEGE 170	
Gaseous phase (cm)	20
Liquid phase (cm)	525

- 1 Recorded heights (mm)
- 2 Level in % of measurement range in liquid phase
- 3 Level in % of measurement range in gaseous phase

## 8.4. Using the device

Validate the following step before starting a device:

Action	OK	NOK
Regularly check the liquid nitrogen level using the level gauge provided (see section 8.2).	<input type="checkbox"/>	<input type="checkbox"/>

### Comments relating to use:

- Due to the cryogenic temperatures, ice or water may form. These accumulations will be collected in a controlled way.
- The device must be inspected on a regular basis (external appearance, preserved products, condition of the tank, actual liquid nitrogen level).
- The installation of remote monitoring options or devices will improve the safety of the cryogenic system.
- Check there is no frost on the device's neck on a daily basis. If there is, immediately contact your distributor responsible for maintenance.
- The operator must implement daily monitoring procedures for their installations (alarms, etc.)
- At the end of the usage period, the device must be left to warm up naturally. Thoroughly dry the inside of the cryogenic tank by blowing with dry, de-oiled air to prevent the risk of corrosion.

### 8.4.1. Opening the cap



The person accessing the cryogenic device contents must be trained and authorised to use it.

For optimal functionality, the cap must only be opened when handling equipment.

The cap is fitted with an insulation cover. Always handle the cap using personal protective equipment.

The cap will remain closed as long as possible to avoid loss of cold and ice formation.

The cap is equipped with a safety system (additional accessory for *ARPEGE 55/75*).

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We recommend that you lock your apparatus (with an additional padlock) and never leave the key in the safety system.

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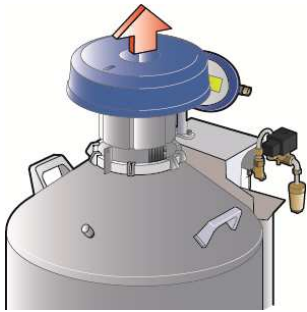


Figure 8-8: Opening or closing the cap

The caps are fitted with a handle. The cap must only ever be operated using this handle.

To open the cap, lift the handle. To close again, reverse the movement. You must ensure the cap is positioned correctly. Close the devices using the appropriate caps.

### 8.5. Inserting or removing samples



It is essential to use the approved individual protective equipment such as gloves, protective clothing, goggles, etc.



Beware of the temperature of frozen products as well as the cold parts of the devices.



Be careful not to damage the neck when inserting or removing the device's racks or canisters.

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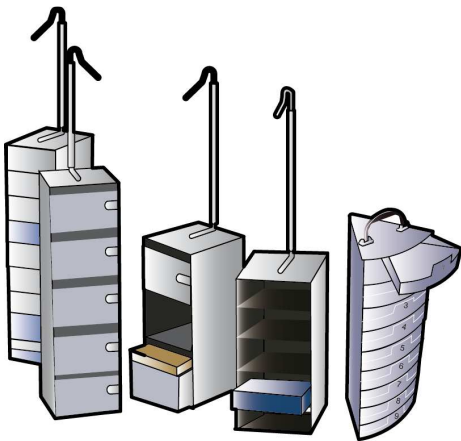


Figure 8-9: Example of racks or canisters.

Samples will only be inserted once the device is loaded with liquid nitrogen.

The samples are generally placed in racks or canisters with goblets. These are then put inside the cryogenic device.

The storage conditions of the samples are the responsibility of the operator.



When handling racks, liquid nitrogen could spill out from the container. Personal protective equipment, such as cryogenic gloves and visors, must be worn.

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Gradually lift the accessories so the liquid nitrogen can flow without splashing up and to

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not damage the accessories.

It is indispensable to place all of the storage units inside the container, even if they are empty. A storage unit that has not been conditioned to the temperature of the container before insertion will cause a significant temperature increase and a safety risk for the user.



It is recommended to use aluminium racks as opposed to stainless steel racks to ensure the temperature is as uniform as possible.

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## 8.6. Storage accessory specifications

### Liquid phase accessories:

	ARPEGE 40	ARPEGE 70	ARPEGE 110	ARPEGE 140	ARPEGE 170	ARPEGE 55	ARPEGE 75
Number of racks	6	4	4	6	6	6	6
Box size (mm)	76 x 76	133 x 133	133 x 133	133 x 133	133 x 133	Cryo- plastic drawers	Cryo- plastic drawers
Number of storage levels (1 or 2 ml tubes)	5	5	9	8	10	9	12
Total capacity 1 or 2 ml tubes	750 (2 ml)	2000	3600	4800	6000	3618 (with 3015 gauge)	4824 (with 4020 gauge)
Number of storage levels (5 ml tubes)	NA	3	5	4	5	1	2
Total capacity 5 ml tubes	NA	972	1620	1944	2430	1071 (on rods)	2142 (on rods)
Straw-holding capacity 0.25 ml in canisters	NA	NA	NA	NA	NA	51660	68880

**Gaseous phase accessories:**

	ARPEGE 40	ARPEGE 70	ARPEGE 110	ARPEGE 140	ARPEGE 170	ARPEGE 55	ARPEGE 75
Number of racks	NA	4	4	6	6	NA	NA
Box size (mm)	NA	133 x 133	133 x 133	133 x 133	133 x 133	NA	NA
Number of storage levels (1 or 2 ml tubes)	NA	4	8	7	9	NA	NA
Total capacity 1 or 2 ml tubes	NA	1600	3200	4200	5400	NA	NA
Number of storage levels (5 ml tubes)	NA	2	4	3	4	NA	NA
Total capacity 5 ml tubes	NA	648	1296	1458	1944	NA	NA
Straw-holding capacity 0.25 ml in canisters	NA	NA	NA	NA	NA	NA	NA

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## 9. Cleaning and maintenance

### 9.1. Emptying the device

Emptying the device is a maintenance operation that must be carried out by trained and authorised personnel.



Remove the frozen samples first and transfer them to another cryogenic device.

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### 9.2. Servicing the device

Servicing is required to ensure the equipment remains in good working order. This is the operator's responsibility.

Cleaning is required to ensure the equipment remains in good working order. This is the operator's responsibility.

The tools used for maintenance operations must be non-abrasive and should have no sharp edges or points that could damage the surfaces.

- **Defrosting the cap and neck** (twice a month):

Lift and remove the cap from the neck, and use a protective cover on the neck to prevent hot air and moisture entering the cryogenic tank. Let the cap ice melt in free air. Wipe carefully before replacing the cap on the neck.



All ice and/or water must be recovered so that it does not fall into the device.

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- **Check cap integrity** (with each use): If there is substantial wear and tear or the polystyrene foam is coming away, replace the cap.
- **Cleaning the outside of the device** (once a month): Clean the outside of the device only. The use of acetone, solvents or any other highly flammable or liquid chlorine-based product is prohibited.

Wipe plastic parts with a dry cloth and if necessary with a slightly damp non-abrasive sponge (do not use abrasive powder), or with impregnated wipes.

Ordinary domestic cleaning products (slightly abrasive creams containing ammonia) applied with a sponge will be acceptable for the container and aluminium parts. Afterwards, rinse with a damp cloth, then wipe and leave to dry.



Keep the container clean and in good working order.



Disinfecting and cleaning the inside of the medical device is possible if deemed necessary. This must be carried out by someone who is trained and authorised in technical maintenance.

The regularity of these checks is for guidance only, and can be adapted based on how frequently the device is used.

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### 9.3. Preventive maintenance

*Maintenance is required to guarantee that the equipment remains within safety conditions. This is the responsibility of the device operator. The device is not covered by warranty if maintenance has not been carried out in line with the manufacturer's recommendations.*



Preventive maintenance operations must be carried out by technicians who have received appropriate training and certification from the manufacturer.

Like every other device, your equipment may be subject to a mechanical failure. The manufacturer cannot be held responsible for any type of stored products lost as a result of this failure, even during the warranty period.



Only spare parts made by Cryopal may be used for maintenance. The use of non-Cryopal spare parts may affect the safety of this medical device, and releases Cryopal from all liability in the event of an incident. The device will no longer be covered by warranty if non-Cryopal spare parts are used.

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Preventive maintenance of devices should be carried out according to the manufacturer's instructions as given in the maintenance manual and updates (if any).

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## 10. Help

### 10.1. What to do if you are splashed by refrigerated liquid nitrogen

When handling nitrogen to fill the device, there is a possibility it may splash into your eyes and/or on your skin:

#### In the eyes

- Wash the eyes with plenty of water for at least 15 minutes;
- Follow the first aid procedures in place in your workplace;
- See a doctor.

#### On the skin

- Do not rub;
- Remove (if possible) or loosen your clothing;
- Defrost the affected areas by gently and gradually warming them up;
- Do not apply anything to the burnt area;
- Follow the first aid procedures in place in your workplace;
- See a doctor.

*This list is not exhaustive.*

### 10.2. What to do in the event of an accident

- Cordon off the perimeter to prevent any further accidents;
- Act quickly: the first aider must be equipped with personal protective equipment (stand-alone respiratory protection equipment);
- Carry out an emergency evacuation of the victim(s);
- Follow the first aid procedures in place in your workplace;
- Ventilate the area;
- Resolve the cause of the accident.

*This list is not exhaustive.*

### 10.3. Stuck cap

Cause	Solution
Cap frozen onto the neck of the device	If thoroughly stuck, attempt to defrost the cap using a hot air device no warmer than 60°C. The cover can be removed for easier access to the frozen areas. Then continue to defrost the container completely.  Be careful with the plastic parts (cap, outer panels, etc.).



All ice and/or water must be recovered so that it does not fall into the device.

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## 11. Accessories



Only Cryopal accessories are approved for use with our devices. The use of different accessories may affect the safety of this medical device, and releases Cryopal from all liability in the event of an incident. The device will no longer be covered by warranty if different accessories are used.

Product ref.	Description	Function
ACC-ALU-29	Standard roller base for ARPEGE 40/70/170/55/75	Transporting tanks over short distances (maintenance operations)
ACC-ALU-30	Standard roller base for ARPEGE 110/140	
ACC-ALU-32	Tightening kit (3 units)	
ACC-GT-103	Level indicator for ARPEGE	Checking nitrogen levels in the device.
ACC-FLTC-1	Transfer pipe without anti-splash nozzle	Preventing splashes during filling.
ACC-FLTC-2	Transfer pipe with anti-splash nozzle	
TRACKER-1	TRACKER T°	Equipment for measuring the internal temperature of a cryogenic tank or any other container that needs to stay within a temperature range of -200°C to +50°C, using an electric probe.
ACC-TRACKER-1	Tracker temperature probe kit	
ACC-TRACKER-2	Tracker accessory kit (scratch, hook, probe case, Rilsan)	
ACC-TRACKER-3	Tracker power kit (USB cable, mains adapter)	
ACC-TRACKER-4	Tracker support kit	
CALIB-TRACKER-1	Calibration - Battery change - calibration certificate	

ARPEGE devices are sold “bare” with no internal fittings, with the option to add the following accessories:

- Rack and canister storage systems.
- Availability of varied storage systems adapted to vials, tubes, straws, bags, etc.

Product ref.	Description	Function
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Product ref.	Description	Function
ACC-BOXTUBE-411	Metal tube-holder canes for six 2 ml tubes or three 5 ml tubes	Removing/handling canisters in the tank
ACC-BOXTUBE-6	1 ml cryo-tube	Storing samples
ACC-BOXTUBE-11	2 ml cryo-tube	
ACC-BOXTUBE-16	5 ml cryo-tube	
ACC-BOXTUBE-302	“Daisy” goblet 65 mm diameter with cap	Storing tubes and straws
ACC-BOXTUBE-301	Goblet with 65mm diameter	
ACC-BOXTUBE-415	Pierced goblet 65 mm diameter with cap	
ACC-BOXTUBE-409	Rack hook	Removing/handling racks in the tank
ACC-BOXTUBE-3	Sight vial diameter 10	Storing straws
ACC-BOXTUBE-4	Sight vial diameter 12	
ACC-BOXTUBE-5	Sight vial with stopper	
ACC-BOXTUBE-1	Polygon sight vial	
ACC-BOXTUBE-104	Set of 10 cryo-plastic boxes 133x133x51 (100 2ml tubes)	Storing 2 ml tubes
ACC-BOXTUBE-105	Set of 8 cryo-plastic boxes 76x76x51 (25 2ml tubes)	
ACC-BOXTUBE-106	Set of 4 cryo-plastic boxes 133x133x51 (81 2ml tubes)	
ACC-BOXTUBE-107	Set of 4 cryo-plastic boxes 133x133x95 (81 5ml tubes)	
ACC-RACK-11	Rack with 1 level for DF700 bags	Storing 25 ml bags
ACC-RACK-207	4 racks with 3 levels for 25 ml bags	
ACC-RACK-208	Rack with 3 levels for 25 ml bags	
ACC-RACK-209	4 racks with 2 levels for 25 ml bags	
ACC-RACK-210	Rack with 2 levels for 25 ml bags	
ACC-RACK-211	4 racks with 5 levels for 25 ml bags	
ACC-RACK-213	4 racks with 4 levels for 25 ml bags	
ACC-RACK-214	Rack with 4 levels for 25 ml bags	
ACC-RACK-215	6 racks with 5 levels for 25 ml bags	
ACC-RACK-216	Rack with 5 levels for 25 ml bags	
ACC-RACK-217	6 racks with 4 levels for 25 ml bags	
ACC-RACK-218	Rack with 4 levels for 25 ml bags	
ACC-RACK-219	6 racks with 6 levels for 25 ml bags	
ACC-RACK-220	Rack with 6 levels for 25 ml bags	
ACC-RACK-221	6 racks with 5 levels for 25 ml bags	
ACC-RACK-222	Rack with 5 levels for 25 ml bags	



Product ref.	Description	Function
ACC-RACK-111	4 vertical racks with 2 levels for straws without sight vials	Storing straws
ACC-RACK-112	4 vertical racks with 3 levels for straws without sight vials	
ACC-RACK-113	6 vertical racks with 3 levels for straws without sight vials	
ACC-RACK-114	6 vertical racks with 4 levels for straws without sight vials	
ACC-RACK-14	Rack with 3 levels for straws	
ACC-RACK-23	Vertical rack with 2 levels for straws without sight vials	
ACC-RACK-24	Vertical rack with 3 levels for straws without sight vials	
ACC-RACK-25	Vertical rack with 4 levels for straws without sight vials	
ACC-RACK-100	6 vertical racks with 5 levels for 1.2/2 ml tubes	
ACC-RACK-101	4 vertical racks with 5 levels for 2 ml tubes	
ACC-RACK-102	4 vertical racks with 9 levels for 2 ml tubes	
ACC-RACK-103	6 vertical racks with 8 levels for 2 ml tubes	
ACC-RACK-104	6 vertical racks with 10 levels for 2 ml tubes	
ACC-RACK-109	6 vertical racks with 9 levels for 2 ml tubes	
ACC-RACK-110	6 vertical racks with 12 levels for 2 ml tubes	
ACC-RACK-16	Vertical rack with 5 levels for ARPEGE 40 for 1.2/2 ml tubes	
ACC-RACK-17	Vertical rack with 5 levels for ARPEGE 70 for 1.2/2 ml tubes	
ACC-RACK-18	Vertical rack with 9 levels for ARPEGE 110 for 1.2/2 ml tubes	
ACC-RACK-19	Vertical rack with 8 levels for ARPEGE 140 for 1.2/2 ml tubes	
ACC-RACK-21	Vertical rack with 10 levels for ARPEGE 170 for 1.2/2 ml tubes	
ACC-RACK-26-A	ARPEGE 75 rack with 12 levels for 1.2/2 ml tubes	
ACC-RACK-26-B	ARPEGE 75 rack with 12 levels for 1.2/2 ml tubes	
ACC-RACK-26-C	ARPEGE 75 rack with 12 levels for 1.2/2 ml tubes	

Product ref.	Description	Function
ACC-RACK-26-D	ARPEGE 75 rack with 12 levels for 1.2/2 ml tubes	
ACC-RACK-26-E	ARPEGE 75 rack with 12 levels for 1.2/2 ml tubes	
ACC-RACK-26-F	ARPEGE 75 rack with 12 levels for 1.2/2 ml tubes	
ACC-RACK-27-A	ARPEGE 55 rack with 9 levels for 1.2/2 ml tubes	
ACC-RACK-27-B	ARPEGE 55 rack with 9 levels for 1.2/2 ml tubes	
ACC-RACK-27-C	ARPEGE 55 rack with 9 levels for 1.2/2 ml tubes	
ACC-RACK-27-D	ARPEGE 55 rack with 9 levels for 1.2/2 ml tubes	
ACC-RACK-27-E	ARPEGE 55 rack with 9 levels for 1.2/2 ml tubes	
ACC-RACK-27-F	ARPEGE 55 rack with 9 levels for 1.2/2 ml tubes	
ACC-RACK-310	ARPEGE 70 rack with 4 levels for 2 ml tubes	
ACC-RACK-311	ARPEGE 110 rack with 8 levels for 2 ml tubes	
ACC-RACK-312	ARPEGE 140 rack with 7 levels for 2 ml tubes	
ACC-RACK-314	ARPEGE 170 rack with 9 levels for 2 ml tubes	
ACC-RACK-105	4 vertical racks with 3 levels for 5 ml tubes	
ACC-RACK-106	4 vertical racks with 5 levels for 5 ml tubes	
ACC-RACK-107	6 vertical racks with 4 levels for 5 ml tubes	
ACC-RACK-108	6 vertical racks with 5 levels for 5 ml tubes	
ACC-RACK-12	Rack with 3 levels for 5 ml tubes	
ACC-RACK-13	Rack with 5 levels for 5 ml tubes	
ACC-RACK-20	Vertical rack with 4 levels for 5 ml tubes	
ACC-RACK-22	Vertical rack with 5 levels for 5 ml tubes	
ACC-RACK-304	4 vertical racks with 2 levels for 5 ml tubes	
ACC-RACK-305	4 vertical racks with 4 levels for 5 ml tubes	
ACC-RACK-306	6 vertical racks with 3 levels for 5 ml tubes	
ACC-RACK-307	6 vertical racks with 4 levels for 5 ml tubes	
ACC-RACK-308	Rack with 2 levels for 5 ml tubes	
ACC-RACK-309	Rack with 4 levels for 5 ml tubes	
ACC-RACK-313	Vertical rack with 3 levels for 5 ml tubes	
ACC-RACK-315	Vertical rack with 4 levels for 5 ml tubes	
ACC-RACK-212	Rack with 5 levels for 25 ml bags	Storing bags
ACC-RACK-32	Rack with 2 levels for DF700	
ACC-PLASCAN-2	Plastic canister with 3 levels for straws	Storing straws
ACC-PLASCAN-4	Plastic canister with 4 levels	
ACC-PLASCAN-107	21 canisters + 84 goblets for straws	Storing straws

Product ref.	Description	Function
ACC-PLASCAN-109	21 canisters + 63 goblets for straws	
ACC-PLASCAN-108	21 canisters + 21 goblets for 1.2/2/5 ml tubes	
ACC-PLASCAN-110	21 canisters + 42 goblets for 1.2/2/5 ml tubes	
ACC-PLASCAN-1	Plastic canister with 2 levels for ARP55	
ACC-BOXTUBE-253	Cardboard case (set of 300)	Protecting bags
ACC-BOXTUBE-254	Cardboard case (set of 700)	

Product ref.	Description
ACC-ARPN-18	ARP40 upgrade kit - TLI+RS/420+MEMO
ACC-ARPN-19	ARP55-75 upgrade kit - TLI+RS/420+MEMO
ACC-ARPN-20	ARP55-75 upgrade kit - TLIR+RS/420+MEMO
ACC-ARPN-21	ARP55-75 upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-22	ARP70 Liq upgrade kit - TLI+RS/420+MEMO
ACC-ARPN-23	ARP70 Liq upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-24	ARP70 Liq upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-25	ARP70 Gas upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-26	ARP70 Gas upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-27	ARP110 Liq upgrade kit - TLI+RS/420+MEMO
ACC-ARPN-28	ARP110 Liq upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-29	ARP110 Liq upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-30	ARP110 Gas upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-31	ARP110 Gas upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-32	ARP140 Liq upgrade kit - TLI+RS/420+MEMO
ACC-ARPN-33	ARP140 Liq upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-34	ARP140 Liq upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-35	ARP140 Gas upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-36	ARP140 Gas upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-37	ARP170 Liq upgrade kit - TLI+RS/420+MEMO
ACC-ARPN-38	ARP170 Liq upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-39	ARP170 Liq upgrade kit - TLIR-RS/420+MEMO+BK
ACC-ARPN-40	ARP170 Gas upgrade kit - TLIR-RS/420+MEMO
ACC-ARPN-41	ARP170 Gas upgrade kit - TLIR-RS/420+MEMO+BK

TLI: Temperature and Level Indicator

TLIR: Temperature, Level Indicator and Regulation

BK: Blowdown Kit

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## 12. Disposal

### 12.1. Device

If you wish to dispose of your device, contact the relevant maintenance team who are responsible for its disposal.

### 12.1. Accessories

All waste caused by using the device (tubes, etc.) must be disposed of through the appropriate waste treatment channels.

If you have any questions, contact the maintenance team for your device.

## Note



[www.cryopal.com](http://www.cryopal.com)