

Espace *cryogenic containers*

User manual



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Document code: NH78455– Revision A

November 2016 edition

English version.

Year of obtaining CE marking: 07/07/2005

Notified body: LNE GMED



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



Cryopal

Parc Gustave Eiffel

8 Avenue Gutenberg

CS 10172 Bussy Saint Georges

F - 77607 Marne la Vallée Cedex 3

Phone: +33 (0)1 64 76 15 00

Fax: +33 (0)1 64 76 16 99

Email: sales.cryopal@airliquide.com or maintenance.cryopal@airliquide.com

Website: <http://www.cryopal.com>

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1. Identity of manufacturer

The manufacturer of the ESPACE medical device is Cryopal:

Cryopal

Parc Gustave Eiffel

8 Avenue Gutenberg

CS 10172 Bussy Saint Georges

F - 77607 Marne la Vallée Cedex 3

Phone: +33 (0)1 64 76 15 00

Fax: +33 (0)1 64 76 16 99

Email: sales.cryopal@airliquide.com or maintenance.cryopal@airliquide.com

Website: <http://www.cryopal.com>

2. Safety information

Before using the *ESPACE* 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 *ESPACE* 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 *ESPACE* 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. You must never touch objects that have been in contact with liquid nitrogen with your bare hands.



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.) 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 castors, and the cryogenic device when handling.
-



Regular checks of the evaporation rate provide assurances that the product has retained its original characteristics (see section 8.3)

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:

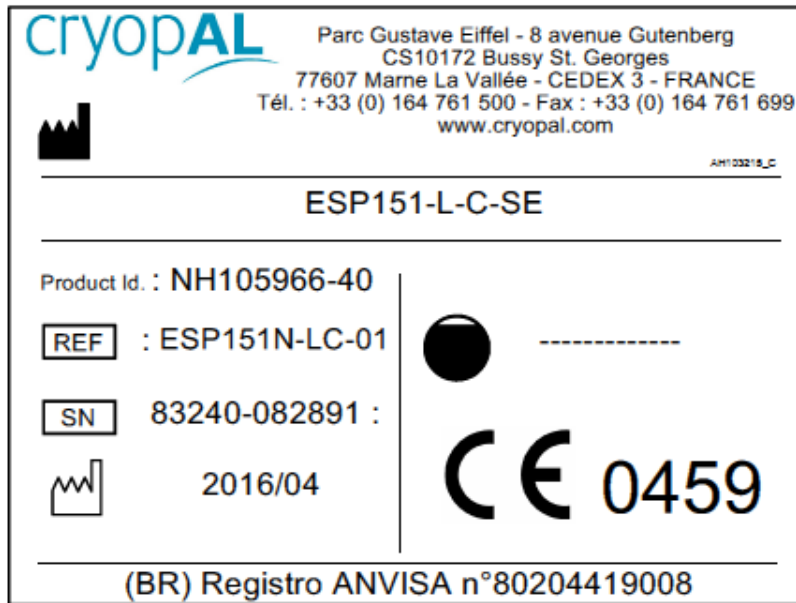
- The container is visibly damaged.
- After prolonged storage in unsuitable conditions.
- After severe damage sustained during transit.
- The container loses its thermal performance (see section 8.1)

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 ESPACE 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. *ESPACE* device

3.1. Device overview

The devices in the *ESPACE* 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°C (liquid/gaseous nitrogen is a cryogenic fluid).



The main features of the *ESPACE* tank family are:

- *ESPACE* tanks are particularly well-suited to preserving large quantities of biological samples over long periods.
- All devices in the *ESPACE* range are designed for gaseous or liquid phase storage.

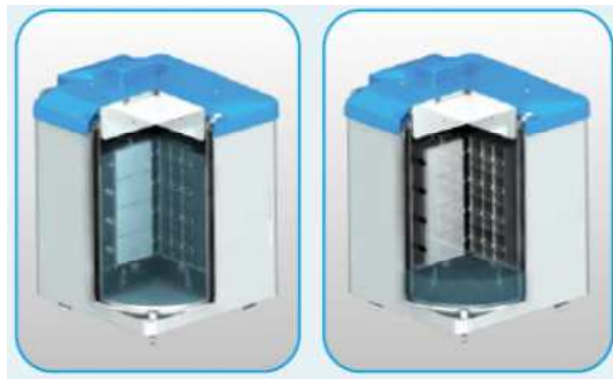


Figure 3-1: Cross-section of the *ESPACE* liquid/gas tanks



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

- *ESPACE* 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.
- Cap with assisted lifting, easy to handle (option).
- Option to close with a standard key lock.
- A special step (optional) is required to ensure correct usage of the *ESPACE 661*.
- The devices are equipped with revolving baskets at the neck to make it easier to access samples.

	Phase
Cryogenic device	Revolving basket
<i>ESPACE 151</i>	
<i>ESPACE 331</i>	■
<i>ESPACE 661</i>	■

- Availability of a collar to quickly change the storage type (switch to gaseous or liquid phase if the model accepts it).
- 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.



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

Description:



Figure 3-2: General view of an ESPACE 151 (left) and 331 or 661 (right) cryogenic tank.

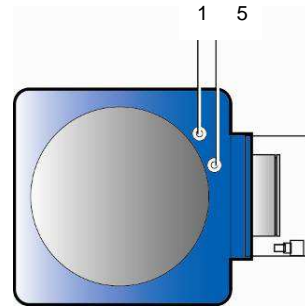


Figure 3-3: Blowing the level gauge wells (F) and filling safety wells (E).

The items available to the user are identical for all models and are detailed below.

No.	Part	Function
1.	Filling safety sensor well	Location of the sensor that prevents nitrogen overflow. (Designed for the <i>Cryomemo</i> configuration)
2.	Key lock	Locking the cap (with assisted caps only).
3.	Assisted cap lid	Closes off the top opening in the tank using an integrated mechanical device at the rear that bears some of the cap's weight and makes it easier to open and close.
4.	Lifting handle	Available only on the <i>ESPACE</i> 331 and <i>ESPACE</i> 661, makes it easier to handle the lid (3).
5.	Level gauge well	Location of the capacitive sensor for measuring liquid nitrogen levels. (Designed for the <i>Cryomemo</i> configuration)

Tanks	Cryopal							
Name	ESPACE 151		ESPACE 331				ESPACE 661	
Purpose	Unpressurised containers intended for the storage and preservation, at a very low temperature in a liquid or steam state, of previously frozen biological samples.							
Contraindications	Do not use outside of the temperature/humidity ranges stated in the notice. Do not fill the tank with anything other than liquid nitrogen.							
Performance	Maintain a cryogenic temperature to preserve biological samples							
Operational lifetime	10 years							
Revolving basket	Without revolving basket		Without revolving basket		With revolving basket		With revolving basket	
Material held	Liquid nitrogen	Gaseous nitrogen	Liquid nitrogen	Gaseous nitrogen	Liquid nitrogen	Gaseous nitrogen	Liquid nitrogen	Gaseous nitrogen
Tank material	Stainless steel, aluminium alloy (basket)							
Total capacity (L)	200	33	386	68	390	68	786	222
Diameter of neck (mm)	538	538	777	777	740	740	1003	1003
Diameter (mm)	NK	NK	NK	NK	NK	NK	NK	NK
Weight when empty (kg)	165	165	230 streamlined/190 non-streamlined	230 streamlined/190 non-streamlined	231 streamlined/190 non-streamlined	232 streamlined/190 non-streamlined	275	275
Full weight (kg)	326	192	545 streamli	285 stream	546 stream	286 streamli	890	435

			ned/505 non- streamli ned	lined/2 45 non- stream lined	lined/5 05 non- stream lined	ned/245 non- streamli ned		
Access height (mm)	1205	1205	1172	1172	1172	1172	1355	1355
Total height (mm)	1350	1350	1310	1310	1310	1310	1505	1505
Length (mm)	NK	NK	NK	NK	NK	NK	NK	NK
Width (mm)	NK	NK	NK	NK	NK	NK	NK	NK
Evaporation (in L/day of liquid)	6	6	9	9	9	9	11.5	11.5
Holding time (days)	33	5.5	43	7	43	7	66	17
Materials in direct or indirect contact with the user	Stainless steel, aluminium alloy, brass, copper, polycarbonate							

Work area volume:

The table and figure below show the space needed depending on the type of cryogenic tank.

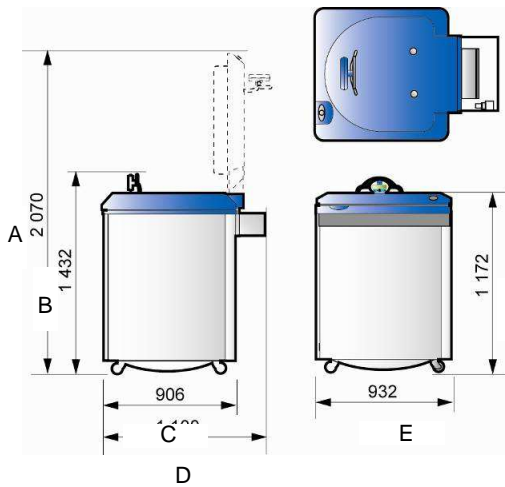


Figure 3-4: Peripheral volumes required - streamlined version.

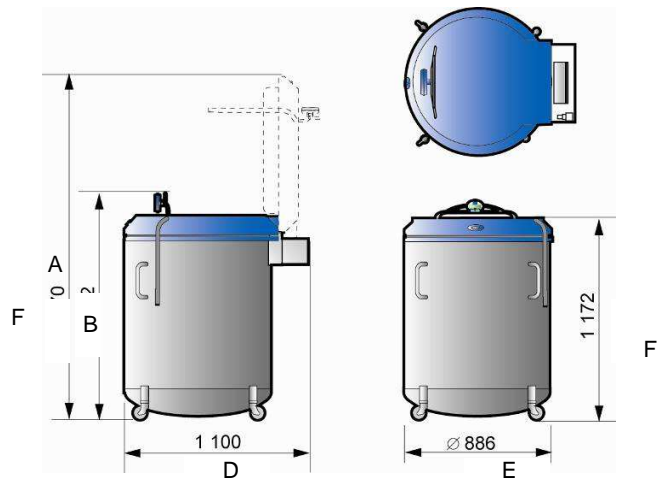


Figure 3-5: Peripheral volumes required - non-streamlined version.

	ESPACE 151	ESPACE 331		ESPACE 661
Streamlining	With streamlining	With streamlining	Without streamlining	Without streamlining
A	1855 mm	2070 mm	2070 mm	2520 mm
B	1465 mm	1432 mm	1432 mm	1615 mm
C	670 mm	906 mm	/	/
D	940 mm	1100 mm	1100 mm	1375 mm
E	650 mm	932 mm	886 mm	1150 mm
F	1205 mm	1172 mm	1172 mm	1355 mm

3.3. Overview of the product range

References	Product description
ESP151N-LC-01	ESPACE 151 Liquid streamlined without equipment
ESP331N-LC-01	ESPACE 331 Liquid streamlined without equipment
ESP331N-LNC-01	ESPACE 331 Liquid non-streamlined without equipment
ESP661N-LNC-01	ESPACE 661 Liquid non-streamlined without equipment

4. Usage instructions

4.1. Intended use

Tanks in the *ESPACE* 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 *ESPACE* devices is guaranteed for 6 years. The service life of the *ESPACE* 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

ESPACE 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: Damage to the cap foam over time and risk of the cap's plastic shell cracking.
2. Leakage from the pump check valve: If liquid nitrogen drips onto the pump check valve, it may no longer be leaktight.



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).

5. Materials used

Materials in direct or indirect contact with the user	Stainless steel, aluminium alloy, brass, copper, polycarbonate
--	--

6. Storage and handling conditions

There are several conditions and safeguards to follow so that *ESPACE* 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

- Once the cryogenic tank has been brought on site, it must be placed in the desired location and the castors immobilised using the in-built brake.

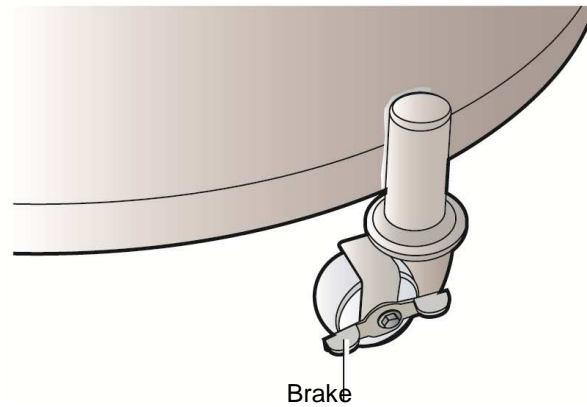


Figure 6-1: The brake on a castor.

- Temperature and humidity ranges during operation:
 - Ambient temperature: $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$, 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 rolling on its castors instead.

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.

Cryogenic devices are not approved for storage in outdoor environments.

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

8. Using the ESPACE device

8.1. Filling the device

When filling the device for the first time, refer to the Maintenance Manual NH78456. 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 EN 12484 standard) connected to either a storage tank or a transfer line.

For storage in gaseous nitrogen, the maximum liquid level must be 145 mm for the ESPACE 151 and 331, and 117 mm for the ESPACE 661 (to be checked 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.

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

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



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

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.
- 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 0).

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.)

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.

8.3. Filling levels

The following acronyms are used:

Acronym	Meaning
NS	Maximum liquid nitrogen filling level.
NI	Minimum liquid nitrogen filling level.
NI-NS	NI-NS is the adjustable minimum difference (10%) between high and low levels

Table 1: The alarm thresholds listed are the default values (factory settings).

8.3.1. ESPACE 151

Products can be stored in liquid or gaseous state.

Additional information (ESPACE 151)

Liquid quantity	Liquid phase	Gaseous phase
Useful liquid volume (litres)	193	27

*Relationship between the measurement scale and liquid quantity remaining
(values can vary slightly)*

Measurement scale	Liquid phase	Gaseous phase
Stationary tank	5	5
0%	5	5
20%	43	9
40%	80	14
80%	155	23
100%	193	27

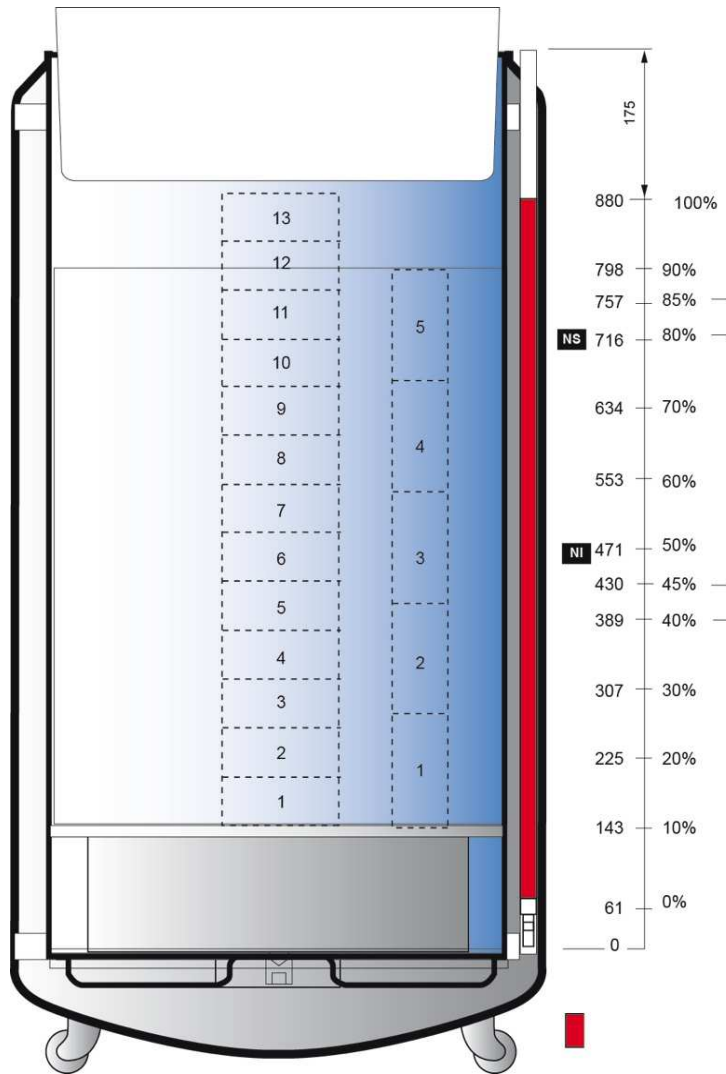


Figure 8-1: ESPACE 151 - liquid phase - measurement scale.

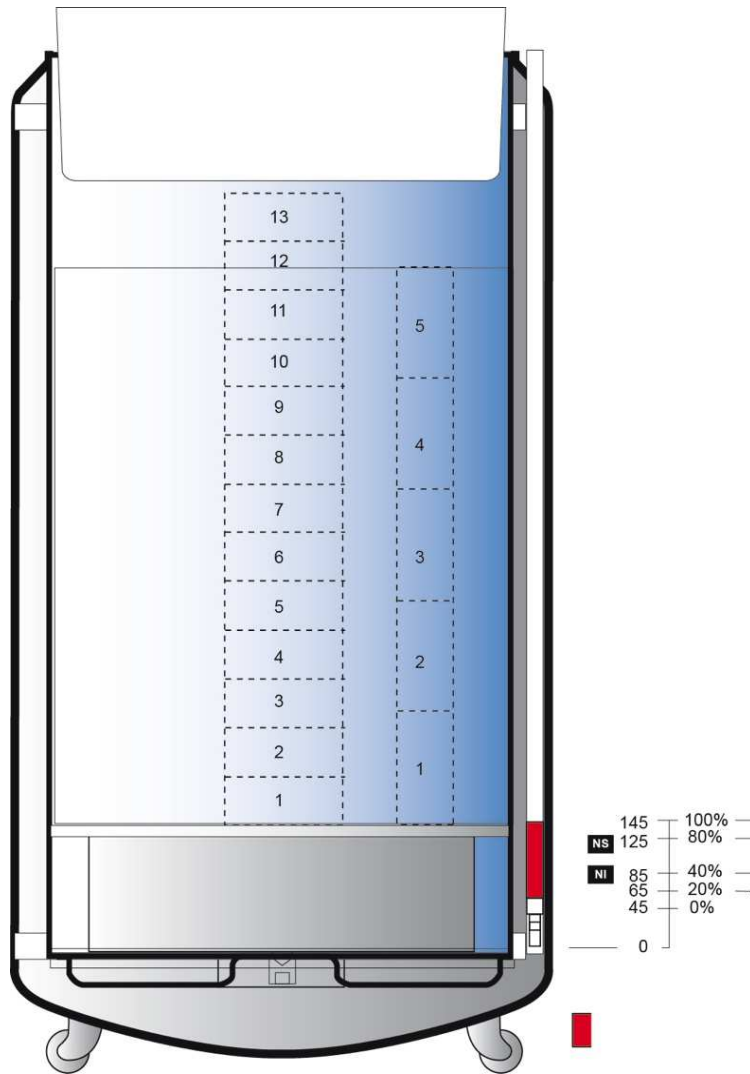


Figure 8-2: ESPACE 151 - gaseous phase - measurement scale.

8.3.2. ESPACE 331

Products can be stored in liquid or gaseous state.

Additional information (ESPACE 331 with or without revolving basket)

Liquid quantity	Liquid phase	Gaseous phase
Useful liquid volume (litres)	380	70

Relationship between the measurement scale and liquid quantity remaining

(values can vary slightly)

Measurement scale	Liquid phase	Gaseous phase
Stationary tank	23	23
0%	23	23
20%	94	32
40%	166	42
80%	309	61
100%	380	70

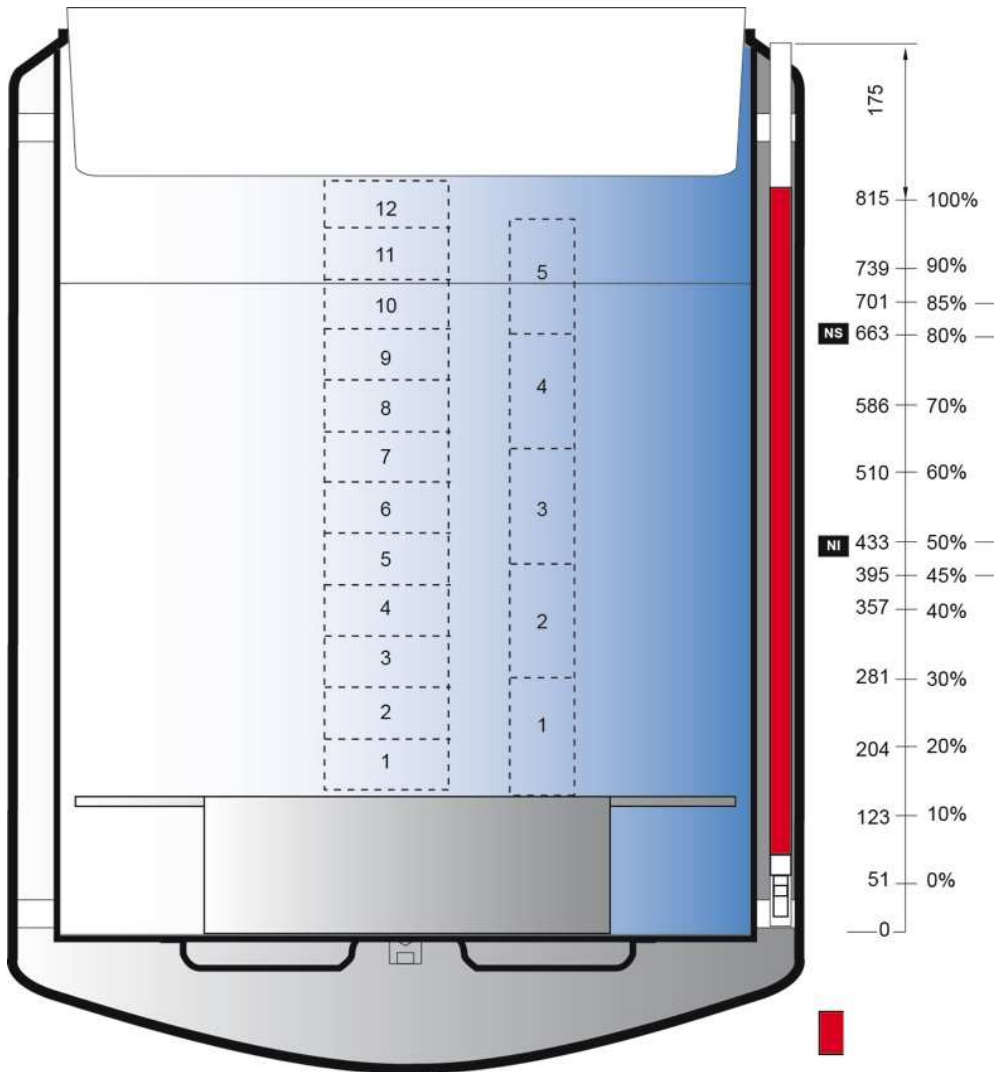


Figure 8-3: ESPACE 331 - liquid phase without revolving basket - measurement scale.

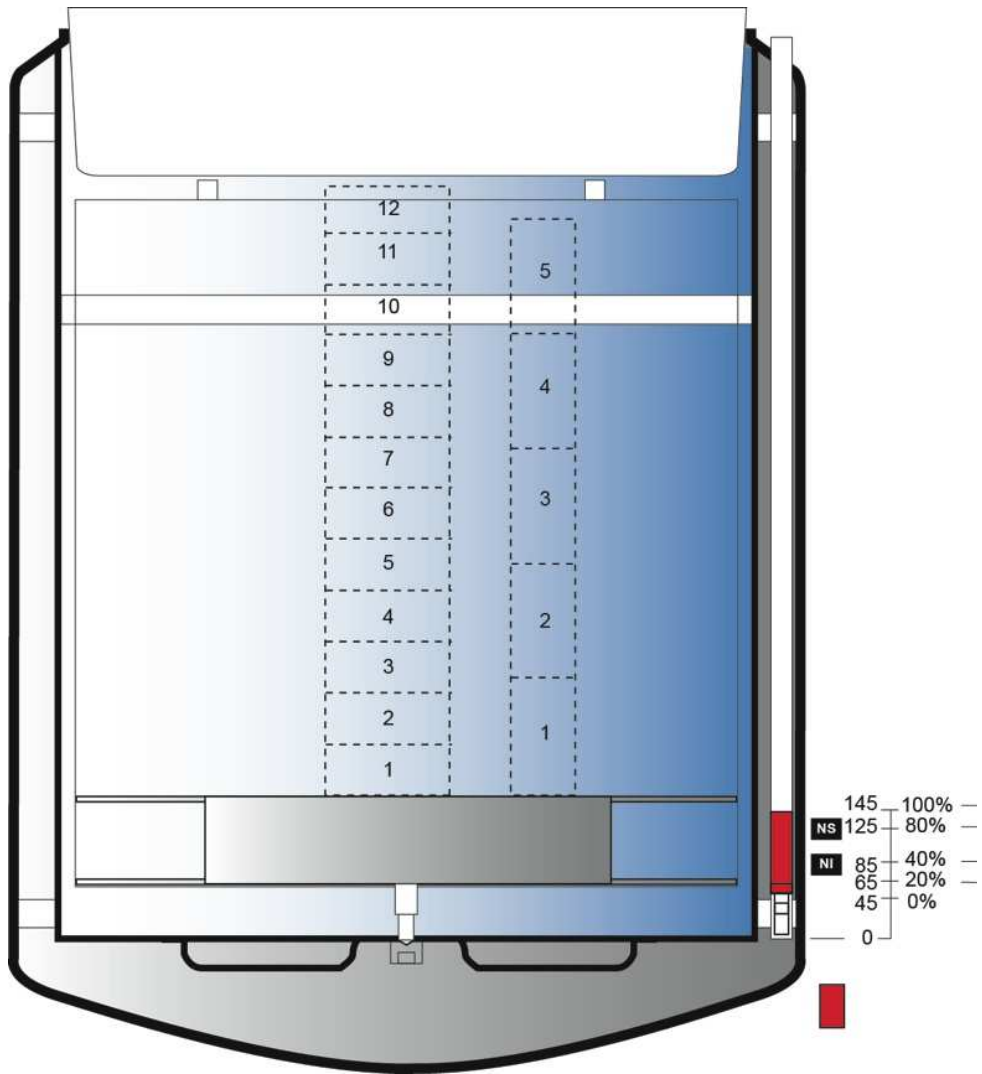


Figure 8-4: ESPACE 331 - gaseous phase with revolving basket - measurement scale.

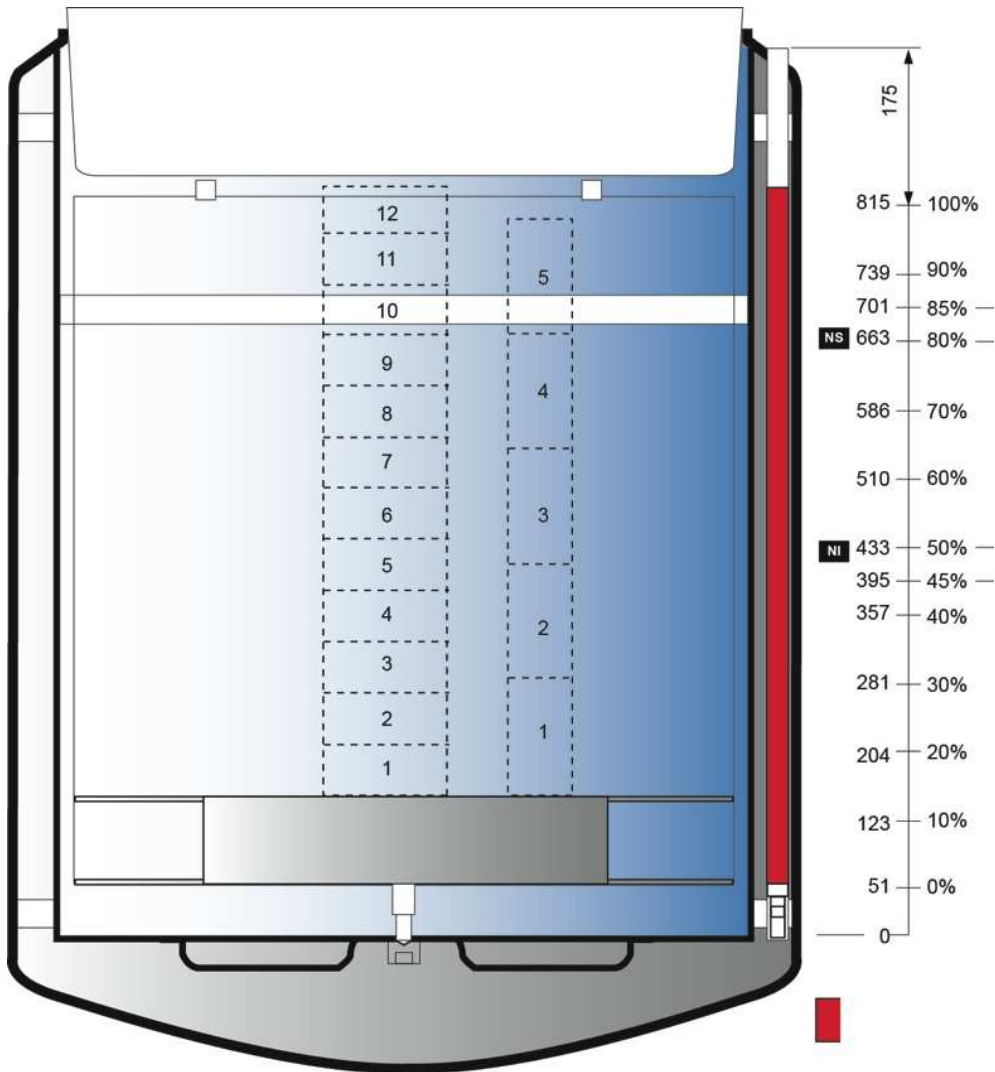


Figure 8-5: ESPACE 331 - liquid phase with revolving basket - measurement scale.

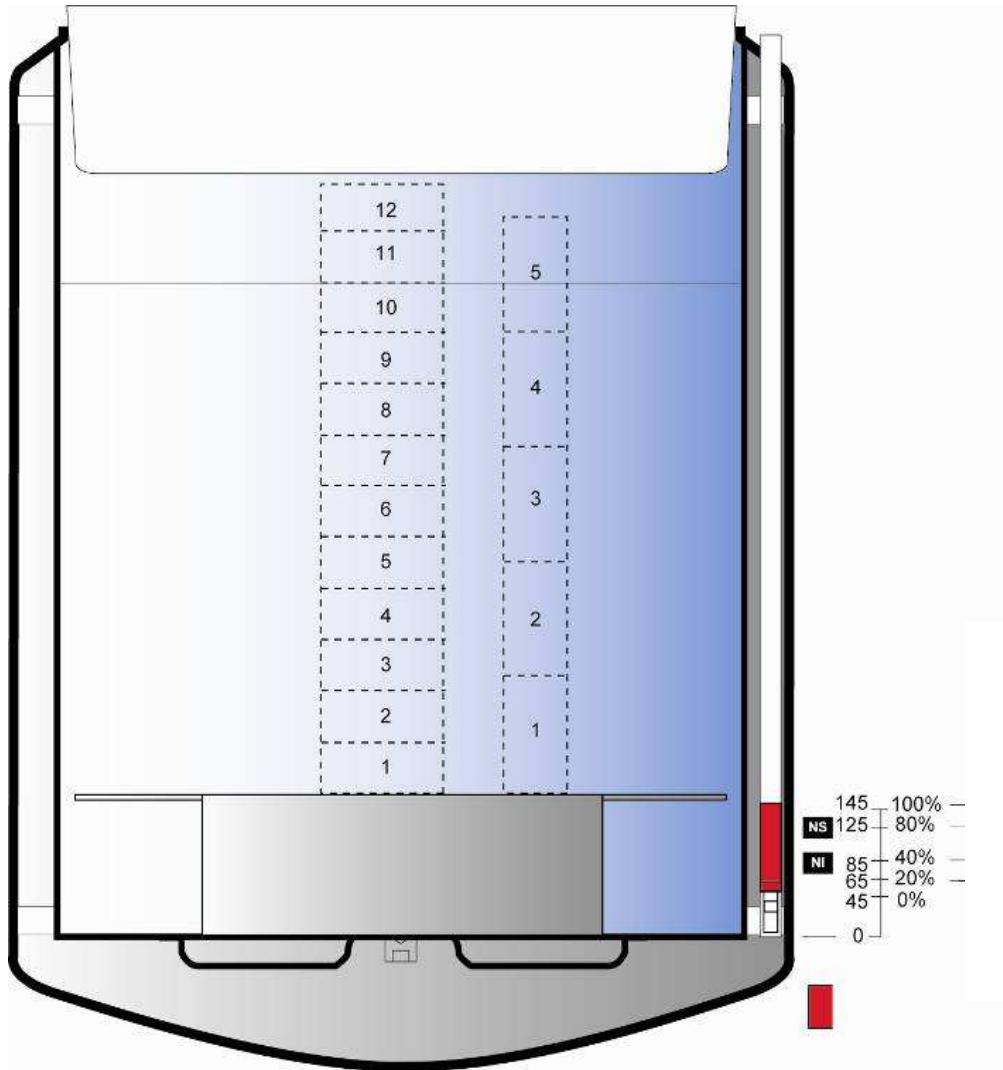


Figure 8-6: ESPACE 331 - gaseous phase without revolving basket - measurement scale.

8.3.3. ESPACE 661

Products can be stored in liquid or gaseous state.

Additional information (ESPACE 661 with revolving basket)

Liquid quantity	Liquid phase	Gaseous phase
Useful liquid volume (litres)	795	176

Relationship between the measurement scale and liquid quantity remaining

(values can vary slightly)

Measurement scale	Liquid phase	Gaseous phase
Stationary tank	90	90
0%	90	90
20%	231	107
40%	372	124
80%	654	159
100%	795	176

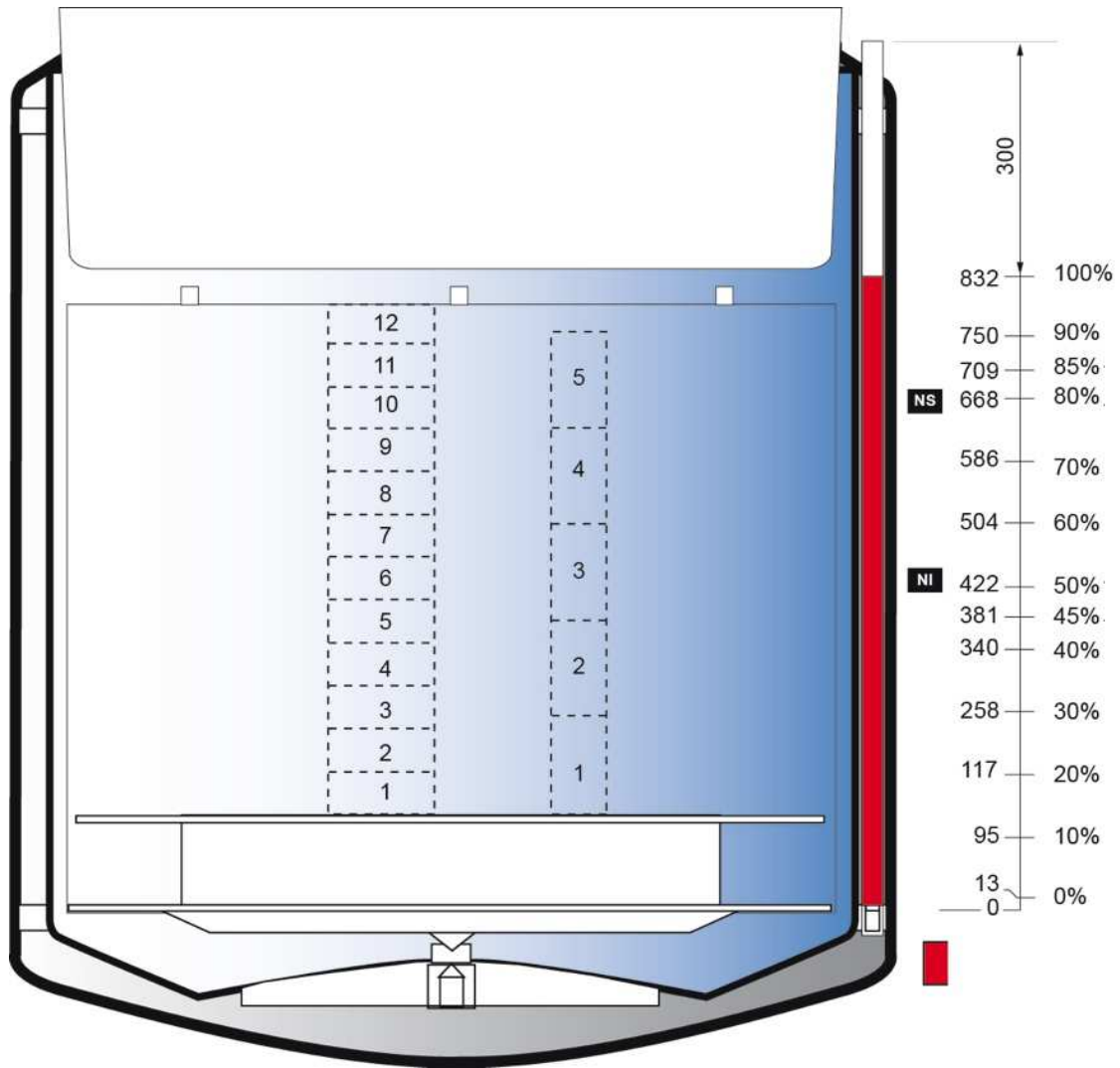


Figure 8-7: ESPACE 661 - liquid phase with revolving basket - measurement scale.

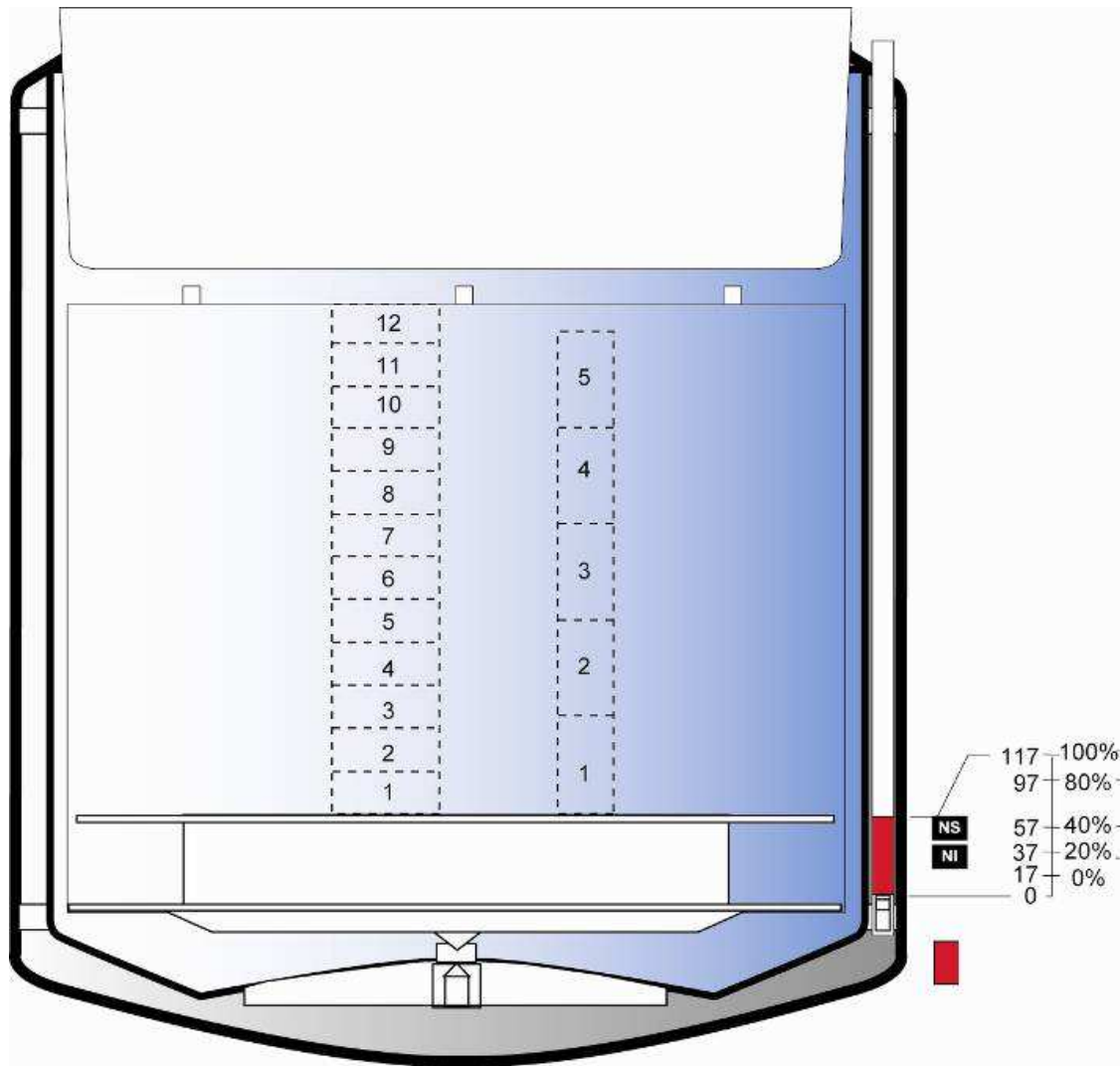


Figure 8-8: ESPACE 661 - gaseous phase with revolving basket - measurement scale.

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.

8.4.1. Opening the cap



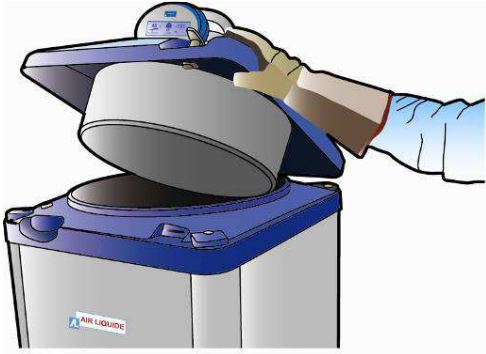
The person accessing the cryogenic device contents must be trained and authorised to use it.

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 assisted cap is equipped with a mechanism to make it easier to open.



To open the assisted cap, lift the hood as far as it will go using the special grooves. To close again, reverse the movement.

Figure 8-9: Opening or closing the assisted cap - ESPACE 151



For the ESPACE 331 and 661, a handle is provided for operating the cap. To open the assisted cap, lift it as far as it will go. To close again, reverse the movement.

Figure 8-10: Opening or closing the assisted cap - ESPACE 331 and 661



It is essential to always operate the assisted cap using the handle and follow the movement until a complete stop.



The assisted cap is equipped with a key lock. It is recommended you leave the cryogenic tank locked and never leave the key in the lock. Even though the cryogenic tank is provided with several keys, you should keep a copy in case of loss.

Opening the cap must be a voluntary action. The protection key, which is not an anti-intrusion lock, allows limited access to authorised personnel; access to the

samples must be subject to other means of protection.

8.5. Inserting or removing samples



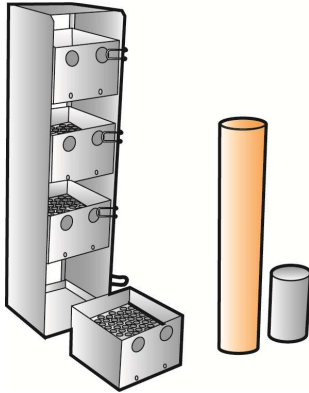
It is essential to use the approved personal protective equipment such as gloves, protective clothing, goggles, etc.



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.



The samples are generally placed in racks. These are then put inside the cryogenic tank.

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

Figure 8-11: Racks, canisters and goblets.



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

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

8.6. Handling the revolving basket



To handle the revolving basket, it is essential to use approved personal protection equipment such as gloves, protective clothing, goggles, etc.



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

Type	Revolving basket	
	Basic	Optional
ESPACE 151		
ESPACE 331		■
ESPACE 661	■	

The cryogenic tank is equipped with a revolving basket to make it easier to access the samples. To operate it, simply turn the basket along the grooves found around it.

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.

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.

- **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 the stainless steel 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.

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.

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

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
The lock is locked	Unlock the lock
The lock is stuck and frozen	De-ice the lock
The lock is stuck and not frozen	Change the lock
Cap frozen onto the neck of the device	<p>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.</p> <p>Be careful with the plastic parts (cap, outer panels, etc.).</p>



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

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.

CRYOPAL REF.	PRODUCT DESCRIPTION
ACC-ESP-3	Full set of CECOS 4-sector partitions for ESPACE 151 (full set of 4)
ACC-BOXTUBE-305	Goblet/straw holder for ESPACE 151
ACC-BOXTUBE-413	CECOS top-down loading tray
ACC-ESP-2	Optional turntable for ESPACE 331
ACC-ESP-341	Step for ESPACE 661
ACC-ESP-344	Cleaning protection cover for ESP/RCB cap
ACC-BOXTUBE-412	Level gauge (manual measurement)

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

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

Product ref.	Description	Function
ACC-ESP-330	Floor raiser for ESPACE 151 Gas	Organising
ACC-ESP-329	Floor raiser for ESPACE 661 Gas	
ACC-ESP-331	Floor raiser for ESPACE 331 Gas without turntable	
ACC-ESP-332	Floor raiser for ESPACE 331 Gas with turntable	
ACC-ESP-3	4-sector partition for Esp 151	

Product ref.	Description	Function
ACC-BOXTUBE-6	NL 1 ml cryo-tube, flat-bottomed white	Storing samples
ACC-BOXTUBE-11	NL 2 ml cryo-tube white	
ACC-BOXTUBE-16	NL 5 ml cryo-tube white	
ACC-BOXTUBE-305	Goblet/straw holder	Handling goblets.
ACC-ESP-2	Turntable assembly for Esp 331	Facilitating access to samples
ACC-ESP-341	Step assembly for Esp 661	Facilitates access to the tank neck
ACC-BOXTUBE-302	"Daisy" goblet	Storing straws
ACC-BOXTUBE-301	Versatile goblet, diameter 65 mm	
ACC-BOXTUBE-415	Pierced goblet, diameter 65 mm	
ACC-BOXTUBE-3	Sight vial, diameter 10 mm	Storing straws
ACC-BOXTUBE-4	Sight vial, diameter 12 mm	
ACC-BOXTUBE-5	Sight vial with stopper	
ACC-BOXTUBE-1	Polygon sight vial	
ACC-BOXTUBE-104	133 x 133 x 51 box, 100 2ml tubes	Storing tubes
ACC-BOXTUBE-105	76 x 76 x 51 box, 25 2 ml tubes	
ACC-BOXTUBE-106	133 x 133 x 51 box, 81 2 ml tubes	
ACC-BOXTUBE-107	133 x 133 x 95 box, 81 5 ml tubes	
ACC-RACK-193	Rack of 10 and 80 x 9 x 96 case	Storing and protecting bags
ACC-RACK-194	Rack of 9 and 80 x 9 x 96 case	
ACC-RACK-195	Rack of 8 and 80 x 9 x 96 case	
ACC-RACK-202	Rack of 7 and 80 x 9 x 96 case	
ACC-RACK-203	Rack with 6 levels for 25 ml bags PALL case	Storing bags
ACC-RACK-204	Rack with 7 levels for 25 ml bags PALL case	
ACC-RACK-205	Rack with 8 levels for 25 ml bags PALL case	
ACC-RACK-206	Rack with 9 levels for 25 ml bags PALL case	
ACC-RACK-120	Racks 4 lvls 50 ml Esp 151	Storing straws, tubes and bags
ACC-RACK-128	Set of 41 racks 4 lvls 50 ml	
ACC-RACK-136	Set of 35 racks 4 lvls 50 ml	
ACC-RACK-143	Full set of 71 racks with 4 levels for 5 ml bags for Esp 331 with turntable	
ACC-RACK-10	Module for 50 ml bags	
ACC-RACK-119	Set of 14 racks 7lvls Baxter 50	

Product ref.	Description	Function
ACC-RACK-127	Set of 30 racks 7 lvls Baxter 50	
ACC-RACK-135	Set of 29 racks 7 lvls Baxter 50	
ACC-RACK-142	Set of 56 racks 7 lvls Baxter 50	
ACC-RACK-37	Module for Baxter 50 7 lvls #	
ACC-RACK-32	Module for gamb. DF700 2 lvls #	
ACC-RACK-115	Set of 12 racks 4 lvls DF200	
ACC-RACK-123	Racks 4 lvls DF200	
ACC-RACK-131	Set of 25 racks 4 lvls DF200	
ACC-RACK-138	Full set of 50 racks with 4 levels for DF200 bags for Esp 661	
ACC-RACK-38	Module for gamb. DF200 4 lvls	
ACC-RACK-121	Set of 7 racks 4 lvls Baxter 500	
ACC-RACK-129	Racks 4 lvls Baxter 500	
ACC-RACK-144	Set of 28 racks 4 lvls Baxter 500	
ACC-RACK-34	Module for Baxter 500 #	
ACC-RACK-116	Racks with 2 levels for DF700 green	
ACC-RACK-124	Set of 21 racks 2 lvls DF700 green	
ACC-RACK-132	Racks 2 lvls DF700 green	
ACC-RACK-139	Set of 38 racks 2 lvls DF700 green	
ACC-RACK-174	Set of 8 racks 4 lvls DF700 (case)	
ACC-RACK-175	Set of 18 racks 4 lvls DF700 (case)	
ACC-RACK-176	Set of 16 racks 4 lvls DF700 (case)	
ACC-RACK-177	Set of 32 racks 4 lvls DF700 (case)	
ACC-RACK-36	Module for gamb. DF700 4 lvls	
ACC-RACK-122	Set of 7 racks 4 lvls Baxter 750	
ACC-RACK-130	Set of 13 racks 4 lvls Baxter 750	
ACC-RACK-137	Set of 12 racks 4 lvls Baxter 750	
ACC-RACK-145	Set of 23 racks 4 lvls Baxter 750	
ACC-RACK-35	Module 4 lvls For Baxter 750	
ACC-RACK-1	Module for gamb. DF1000 4 lvls	
ACC-RACK-146	Racks 13 lvls 2 ml tubes Esp 151	
ACC-RACK-148	Racks 12 lvls 2 ml tubes Esp 331fp	
ACC-RACK-150	Racks 12 lvls 2 ml tubes Esp 331pt	
ACC-RACK-152	Racks 12 lvls 2 ml tubes Esp 661	
ACC-RACK-5	Column with 12 lvls 133 x 133 x 51	
ACC-RACK-6	Column with 13 lvls 133 x 133 x 51	

Product ref.	Description	Function
ACC-RACK-8	Column with 12 levels 75 x 75 x 51	
ACC-RACK-9	Column with 13 levels 75 x 75 x 51 #	
ACC-RACK-147	Set of 7 racks 7 lvls box /81 5ml	
ACC-RACK-149	Set of 17 racks 6 lvls 5 ml/81 Esp 331	
ACC-RACK-151	Set of 15 racks 6 lvls 5 ml/81 Esp 331	
ACC-RACK-153	Set of 31 racks 6 lvls 5 ml/81 Esp 661	
ACC-RACK-28	Column with 6 levels 133 x 133 x 95	
ACC-RACK-29	Column with 7 levels 133 x 133 x 95	
ACC-RACK-196	Set of 7 racks 4 lvls pll Esp 151	
ACC-RACK-197	Set of 17 racks 4 lvls pll Esp 331	
ACC-RACK-198	Set of 15 racks 4 lvls pll Esp 331pt	
ACC-RACK-199	Set of 31 racks 4 lvls pll Esp 661	
ACC-RACK-39	Column with 4 levels 134 x 134 x 135	
ACC-PLASCAN-116	Set of 46 can. 5 lvls + 230 gob.	
ACC-PLASCAN-104	Esp 330p equipment 88C5-440G	
ACC-PLASCAN-105	Esp 330 equipment 97C-485G	
ACC-PLASCAN-106	Set of 163 can. 5 lvls + 815 gob.	
ACC-PLASCAN-3	Plast. canister with 5 lvls + lifter	
ACC-BOXTUBE-253	Cardboard case CR750/DF700GSR7000	Protecting bags
ACC-BOXTUBE-254	Cardboard case Pall25	
ACC-BOXTUBE-250	Cardboard case CRY50/GSR1000AU	
ACC-BOXTUBE-200	Baxter 30 ml bag case	
ACC-BOXTUBE-203	Baxter 50 bag case	
ACC-BOXTUBE-204	DF200/Baxter 250 bag case	
ACC-BOXTUBE-205	DF200/B250 bag case	
ACC-BOXTUBE-251	Cardboard case CR250/DF200GSR2000	
ACC-BOXTUBE-201	Bag case for Baxter 500	
ACC-BOXTUBE-202	Baxter 500 bag case	
ACC-BOXTUBE-252	Cardboard case CR500/DF170GSR5000	
ACC-BOXTUBE-206	Bag case for DF700	
ACC-BOXTUBE-207	DF700/Maco 700 bag case	
ACC-BOXTUBE-208	Bag case for DF1000	
ACC-BOXTUBE-255	DF1000 cardboard case	

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



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