VOYAGEUR 2 – 5 –12 and PLUS

USER & MAINTENANCE GUIDE

AIR LIQUIDE - DMC

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AIR LIQUIDE reserves the right to modify the characteristics given in this document without notice.

Only personnel who have read this notice in full and the safety instructions in document NH78380 are authorised to manipulate and use the devices described in this document.

Like all equipment, your device may suffer an electrical or electronic fault. The manufacturer cannot be held liable for stored products of any nature which might be lost as a result of this fault, even during the warranty period.

1 GENERAL

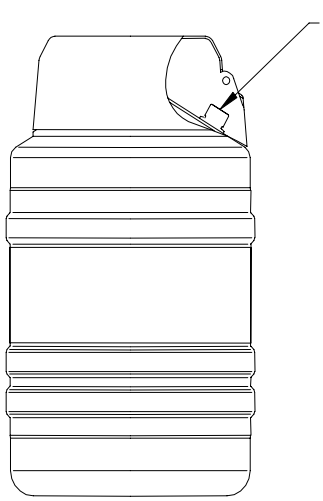
1.1 THE APPARATUS

VOYAGEUR 2 – 5 – 12 and PLUS are used to transport and keep previously frozen biological elements at very low temperature in the gas phase.

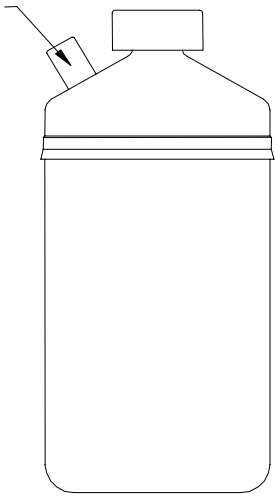
The device must be used with liquid nitrogen exclusively. No other gases shall be used.

The inner medical apparatus is filled with a material that absorbs liquid nitrogen.

Nitrogen does not spill if the apparatus is tipped over. Therefore the contents of the canisters are in a cold gaseous environment (down to – 196°C).



Voyageur 5 et 12



Voyageur 2 et
Voyageur +

1.2 THE PERSONNEL

Only persons who have read this guide in full and the safety instructions are authorised to manipulate and use the cryogenic apparatus.

Only the distributor or a fully trained person is authorised to do any work on the medical apparatus if the cryogenic apparatus appears to be malfunctioning under normal usage conditions. The user must not do any work on the system himself because this could be harmful to his or her health and/or safety.

1.3 REMINDER ABOUT UNPACKING INSTRUCTIONS

Take safety precautions by respecting safety rules and using individual protection equipment and tools adapted to unpacking.

At least two persons are necessary for unpacking, depending on the medical apparatus.

Unpack the medical apparatus as close as possible to its usage location, to avoid the need for handling over an excessively long distance.

A. Check the condition of the packing on delivery.
B. Cut the straps
C. Remove the cover
D. Remove the apparatus from the box gently **(two persons** depending on the medical apparatus). Then put it into place.

1.4 THE INSTALLATION/ENVIRONMENT

1.4.1 Limiting environment conditions

Technical characteristics and correct operation of the apparatus are valid for the following conditions

During operation:

Ambient temperature ..... $20°C^{\pm 2°C}$ (sheltered from direct sunlight)

Relative humidity..... from 30% to 65% without condensation

Storage: (In its original packaging)

Ambient temperature ..... from 5°C to 40°C

Relative humidity..... from 10% to 65%

1.4.2 The installation

The operator of the apparatus is responsible for assuring that the room complies with regulations, safety standards in force and the following recommendations.

Installation CHECK-LIST

	Yes DONE	NO NOT DONE
Check the general condition of the apparatus.	☐	☐
Are users trained?	☐	☐
Does the room satisfy safety regulations and standards in force?	☐	☐
Is access to the room limited to persons entitled to enter it?	☐	☐
Are safety instructions and risks related to liquid nitrogen posted?	☐	☐
Are instructions accompanying the medical apparatus available/accessible close to it?	☐	☐
Is individual protection equipment available/accessible in the room?	☐	☐
Is the room equipped with a permanent ventilation system adapted to the size of the room?	☐	☐
Is the room equipped with an oxygen content checking system (display outside the room)?	☐	☐
Are safety distances respected (at least 0.5 m around the apparatus)?	☐	☐
Is the 220V-24V power supply fixed to the wall?	☐	☐
Are fittings on the apparatus in position (if applicable)?	☐	☐
Has the apparatus being blown through (to eliminate all traces of humidity)?	☐	☐

1.4.3 Filling instructions

All the steps in the previous chapter should be validated before starting up an apparatus.

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

It is recommended that the tare of the medical apparatus should be measured when weighing empty (before starting filling) so that the filling level can be controlled precisely.

Apparatus cannot be filled in one step, due to the presence of absorbent material. Therefore proceed as follows:

- Fill the medical apparatus up to the middle of the neck.
- Wait until liquid nitrogen is absorbed (about ¼ hour).

Repeat these operations several times, 3 to 4 times will be sufficient.

Just before shipment, empty the liquid nitrogen overflow into the pit used for canisters.

The filling level is checked by weighing the apparatus. The mass of absorbed liquid nitrogen when the apparatus is full is given in the following table. Intermediate volumes of liquid nitrogen can be calculated when the weight of liquid nitrogen contained in the apparatus is known, knowing that one litre of liquid nitrogen weighs about 0.808 kg (Do not forget to add the tare determined before the beginning of filling to obtain the total weight of the filled apparatus when a precise measurement is required).

	VOYAGEUR 2	VOYAGEUR 5	VOYAGEUR 12	VOYAGEUR PLUS
Total volume in litres (1)	1.75	6.5	15	18.3
Liquid weight in kg	1.41	5.25	12.1	14.6
Total weight of apparatus (3)	3.8	12.8	24.2	28.3
Absorbed volume in litres (2)	1.35	4.8	10.5	7.3
Liquid weight in kg	1.09	3.88	8.5	5.9
Total weight of apparatus	3.5	11.5	20.6	19.6

(1) Volume including absorbed liquid nitrogen and nitrogen contained in the canisters.
(2) Liquid nitrogen volume absorbed after emptying the excess
(3) Theoretical weight: calculated by adding the theoretical weight of the empty apparatus.

1.5 USE

1.5.1 Open the lid

The lid is fitted with a handling handle. Always manipulate it using the handle.

Note: The lid is fitted with a safety system. We recommend that you should leave your apparatus locked and never leave the key in the lock.

2 CONTAINER CHARACTERISTICS

2.1 PARTICULAR SAFETY INSTRUCTIONS

Precautions to be taken for the person during the work:

- ✓ Cold burns
  - On the neck and the lid after opening
  - By splashing of liquid nitrogen during filling
- ✓ Trapping
  - By the lid when closing the medical apparatus
- ✓ Crushing
  - By the medical apparatus when handling it

2.2 RECOMMENDATIONS

We recommend that you should always wear your individual protection equipment whenever you use the apparatus.

2.3 MATERIALS IN DIRECT OR INDIRECT CONTACT WITH THE USER

- × Stainless steel
- × Aluminium alloy
- × Brass
- × Copper
- × Cadmium plated steel
- × Polycarbonate
- × Polyurethane foam
- × Klegecell

2.4 KEEPING SAMPLES

Samples contained in canisters are in a cold gaseous environment. Temperatures at the ends of the canisters are given in the following table for each apparatus. These values remain constant regardless of the remaining liquid nitrogen level.

	VOYAGEUR 2	VOYAGEUR 5	VOYAGEUR 12	VOYAGEUR PLUS
Temperature at the bottom of canister	- 196°C	- 196°C	196°C	- 196°C
Temperature at the top of canister	- 175°C	- 188°C	- 190°C	- 185°C

These values are given for apparatuses tested without any internal equipment. They are given for guidance and are arbitrary, and valid for generally observed usage conditions. They can vary depending on manufacturing tolerances and local atmospheric conditions.

2.5 CHARACTERISTICS

	VOYAGEUR 2	VOYAGEUR 5	VOYAGEUR 12	VOYAGEUR PLUS
Useful capacity	1.75	6.5	15	20.6
Weight empty (KG)	2.4	7.5	11.6	14.2
Weight full (KG)	3.5	11.3	20	20
Daily evaporation (L/d) (1)	0.1	0.13	0.24	0.8
Dynamic endurance (day) (1)	8	23	28	6
Neck diameter (mm)	30	50	80	215

(1) *These values are given for apparatuses tested without any internal equipment. They are given for guidance and are arbitrary, and valid for generally observed usage conditions. They can vary depending on manufacturing tolerances and local atmospheric conditions.*

3 TRANSPORT AND HANDLING INSTRUCTIONS

The apparatus may be handled by forklift truck according to standard practice, **only** when it is in its packaging.

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

- Carrying it with the handle or the strap, or
- Rolling it on its bottom plate fitted with rollers (See). The bottom plate with rollers can only be used over short distances.

A porous material absorbs liquid nitrogen and conserves samples in the gaseous phase. Transport is done in complete safety because there is no risk of liquid splashes when tipping over.

Specifications imposed by national and international regulations in force (particularly the ADR instruction P203) and the recommendations given below must always be respected when transporting "dry containers":

- Never stack different apparatuses.
- Before transport, each medical apparatus must be inspected to detect any defects and to assure that they are working correctly.
- Due to the potential risk of the oxygen content being modified, persons and apparatuses must be transported separately whenever an elevator or a hoist stops for a certain time between two floors, unless appropriate safety precautions have been taken.
- During transport and regardless of the type of transport, always keep devices immobile in the vertical position, and do not apply shocks to them or drop them. The outside enclosure or the suspension system of the inside apparatus could be damaged, degrading the insulation properties and causing permanent damage.
- Forbidding the transport with non dedicated vehicle:

  A non dedicated vehicle is defined as a vehicle which satisfies at least one of the following specification.

  - Vehicle without a leak-tight separation partition between the driver's cab and the gas transport compartment (s)
  - Vehicle in which the gas transport compartment is not continuously ventilated
  - Vehicle for which the design and compatibility of the materials and equipment used have not been specially designed with regard to the properties of the transported gases.

- Vehicle which does not include a stowage and strapping systems appropriate to each type of gas container intended to be transported.
- .. Vehicle without a fire extinguisher.

4 SERVICING AND MAINTENANCE

We recommend the following preventive/remedial servicing and maintenance operations, based on analyses of maintenance done on our cryogenic apparatuses over several years:

4.1 SERVICING OF THE APPARATUS

This chapter should be read by competent and qualified authorised persons to do servicing work.

Servicing is required to assure that the equipment remains under normal operating conditions. The operator of the apparatus is responsible for it.

These operations must be carried out with non-abrasive, non-cutting and blunt tools so as to avoid damaging the surfaces concerned.

OPERATION	FREQUENCY (*)
DE-ICING THE LID AND THE NECK Eliminate ice that forms on the lid and the neck. You can melt the ice using a hair-dryer. Take care with all plastic parts (lid, outer panels, etc.) All ice and/or water must be recovered so that it cannot fall into the apparatus.	2 WEEKS
CLEANING THE OUTSIDE OF THE APPARATUS Important comment: **Cleaning is limited to the outside parts of the apparatus.** The use of acetone, solvents or any other very inflammable product, or chlorine-based liquid, 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 towelettes. × Routine household products (slightly abrasive ammonia creams) can be applied with a sponge for the store part and for stainless steel parts. Then rinse with a cloth soaked with a small quantity of water, wipe and allow to dry.	5 WEEKS

(*) The frequencies given are for information and must be adjusted by the operator depending on how the apparatus is used

Like every other system, your apparatus 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.

5 WASTE ELIMINATION METHOD

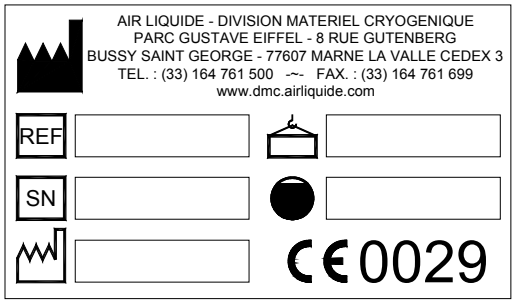
All waste caused by use of the cryogenic apparatus (tubes, packs, etc.) must be eliminated using appropriate waste treatment systems.

Please contact your distributor for further information.

6 METHOD OF ELIMINATING THE CRYOGENIC CONTAINER

Appropriate systems must be used to eliminate the apparatus and to protect the environment. The AIR LIQUIDE Cryogenic Equipment Division must also be informed of the reference and serial number of the eliminated apparatus to maintain traceability imposed by the CE marking.

These data are given on the identity label at the back of the apparatus.



7 SYMBOLS & ABBREVIATIONS

CE 0029	Conforming with directive 93/42/CEE June 14 1993, related to medical apparatuses		WARNING: Low temperature
	Manufacturer's name and address		COMPULSORY: Read the user guide
REF	Reference in the apparatus catalogue		COMPULSORY: Protect your hands using appropriate individual protection equipment
	Apparatus manufacturing date (WW/YY)		COMPULSORY: Protect your face using appropriate individual protection equipment
SN	Apparatus serial number		COMPULSORY: Keep the apparatus in an area that is sufficiently and permanently ventilated
	Net weight of the empty apparatus in kilograms		PROHIBITED: Do not touch parts that have been in contact with liquid nitrogen
	Volume of the device when full, in litres		

Apparatus means the Container + electronic equipment assembly already in your possession.

8 SPARE PARTS AND ACCESSORIES

The list in this chapter contains manufacturer's references for the proposed parts, so that you can write your part orders correctly.

AIR LIQUIDE declines all responsibility following:

- a modification of the apparatus and/or related equipment
- use of accessories/electronic apparatus not approved and referenced by the AIR LIQUID Cryogenic Equipment Division.

8.1 SPARE PARTS

	VOYAGEUR
VOYAGEUR 5 lid	ACC-VOY-4
VOYAGEUR 12 lid	ACC-VOY-5
VOYAGEUR PLUS lid	ACC-VOY-4
Curved handle	ACC-GT-102

8.2 ACCESSORIES/OPTIONS

	VOYAGEUR
Protective outer packaging for the VOYAGEUR2/V2 box	ACC-ALU-1
Protective outer packaging for the V PLUS/VOYAGEUR21 box	ACC-ALU-3
Protective outer packaging for the V5/V12/VOYAGEUR18 box	ACC-ALU-2
Protective Plastic outer packaging for Voyageur 2	ACC-VOY-100
Protective Plastic outer packaging for Voyageur 5	ACC-VOY-101
Protective Plastic outer packaging for Voyageur 12	ACC-VOY-102
Protective Plastic outer packaging for Voyageur PLUS	ACC-VOY-103
Roller base for V PLUS	ACC-VOY-2
Roller base V12	ACC-VOY-1