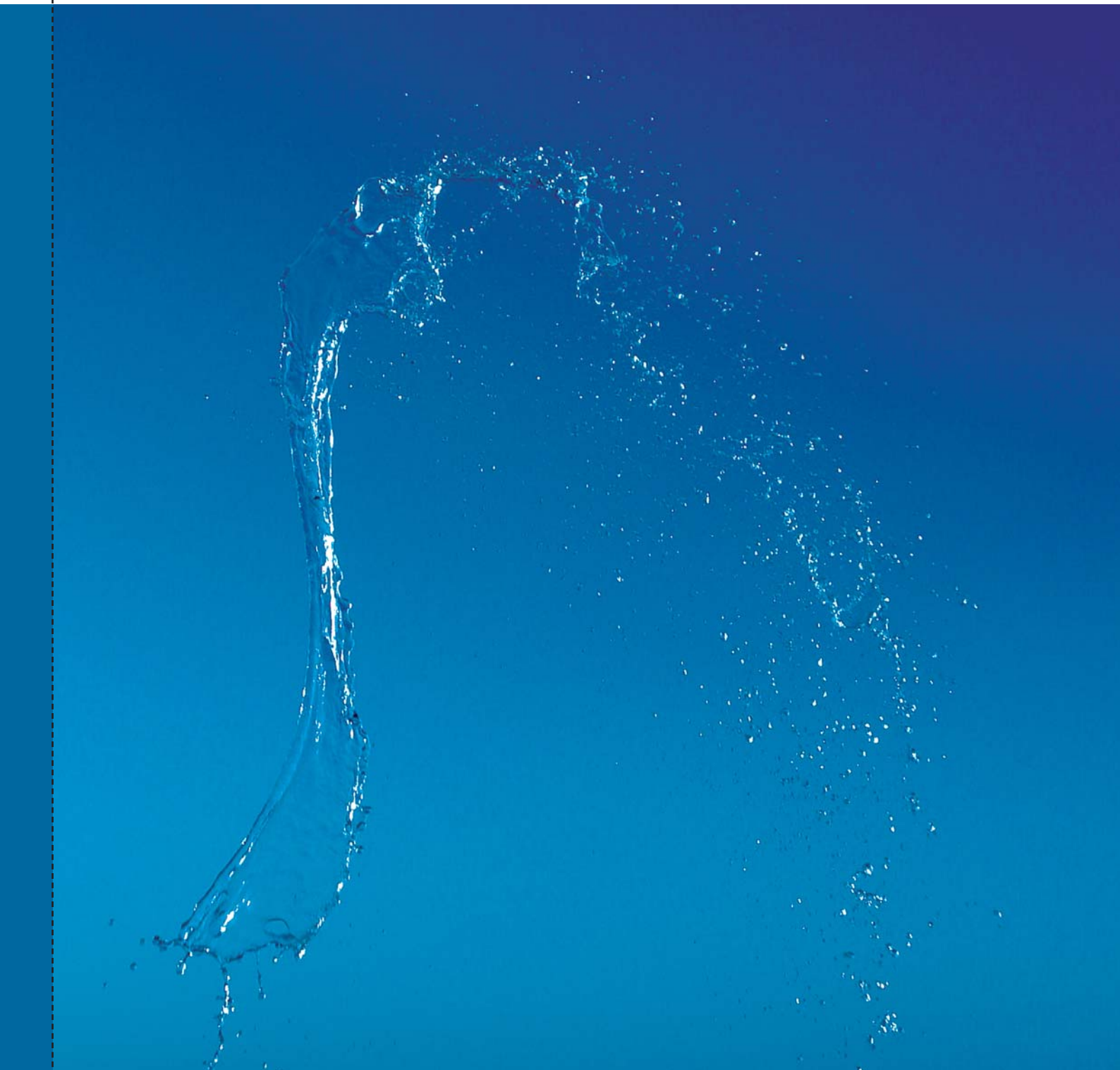


Cryogenics



Content



AGIL



TR / TP



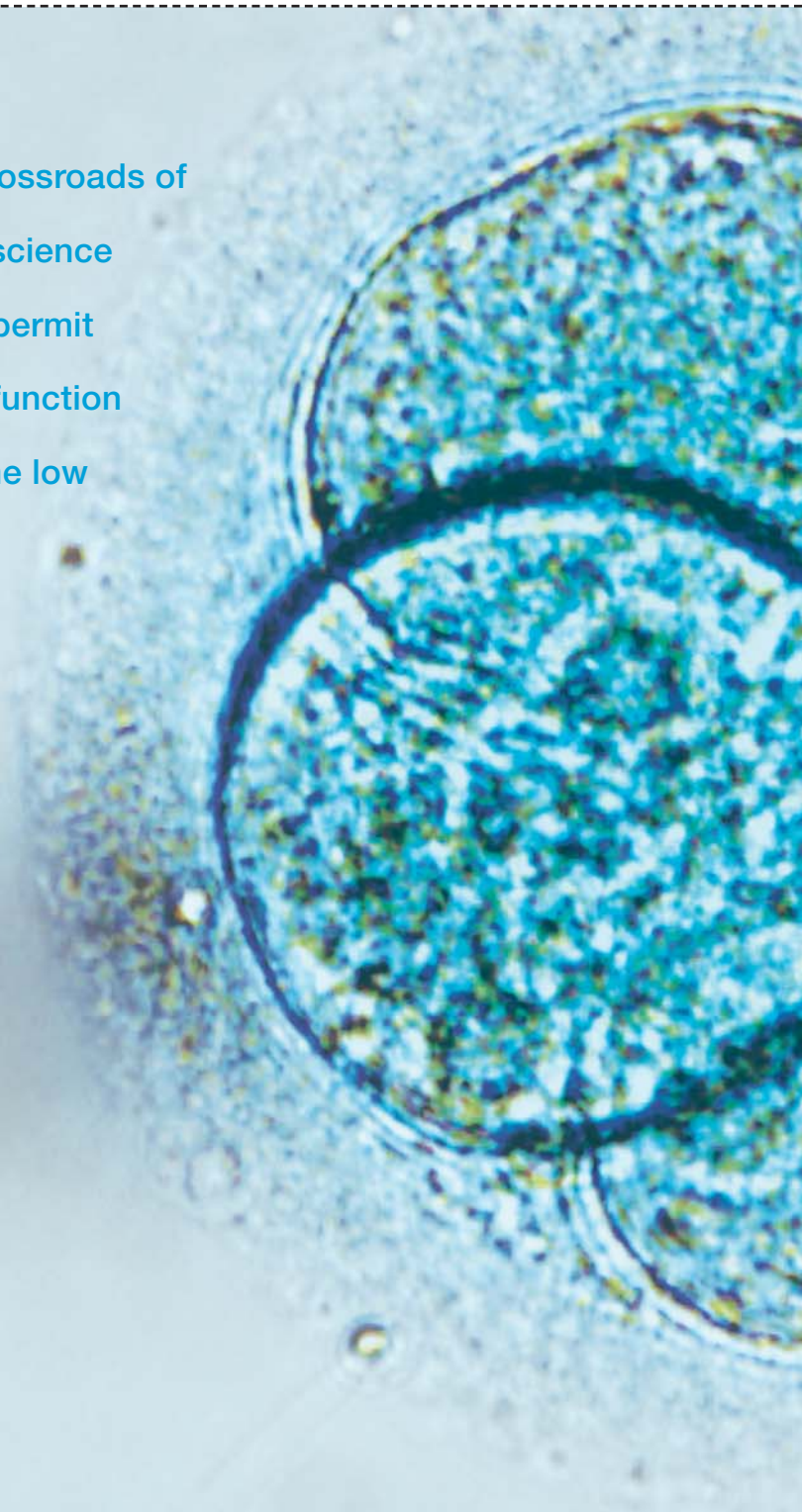
FREEZAL



GT

The science of cryobiology is at the crossroads of physics and biology. It is the precise science that determines the conditions which permit the preservation of life and biological function of a variety of living systems at extreme low temperatures, e.g. -196°C .

CRYOPAL develops, manufactures and commercializes a comprehensive line of cryogenic freezers and equipment dedicated to the transportation and storage of biological products in nitrogen.





ARPEGE



ESPACE / RCB



VOYAGEUR



RH

04_Safety accessories

- › Oxygen detector
- › Security glasses and visor
- › Cryogenic gloves
- › Protection accessories

08_Storing and transporting liquid nitrogen

- › AGIL / TR / TP

14_Freezing biological samples

- › FREEZAL

16_Storing biological samples

- › GT (medical human, veterinary)
- › ARPEGE
- › ESPACE / RCB

48_Transporting and shipping biological samples

- › VOYAGEUR

52_Traceability and information management

- › Temperature – level – regulation indicators
- › Interface for tele-monitoring
- › T°TRACKER
- › COOLBASE
- › CRYOMEMO

56_Using liquid nitrogen in dermatology

- › GT DERMATO / CRYALJET

58_Transferring cryogenic liquids

- › Flexible / Flexible BBO / Cryogenic vacuum lines

66_Storing and transporting liquid helium

- › RH

Safety accessories

Preventing and reducing risks
in the work place



Working with cryogenic liquids, and liquid nitrogen in particular (-196°C), requires strict rules to be followed. These rules are designed to prevent or reduce two major hazards: anoxia and cryogenic burns caused by contact with liquid nitrogen.

Anoxia

Oxygen is an essential element in maintaining life. Therefore, it is necessary to assure that the air one works in has an adequate level of oxygen. Anoxia, caused by insufficient levels of oxygen, is a real risk in all areas of cryogenic activities and applications, e.g. bio-repositories and cryogenic laboratories.



The response of an organism to under-oxygenation in the air is highly variable from one individual



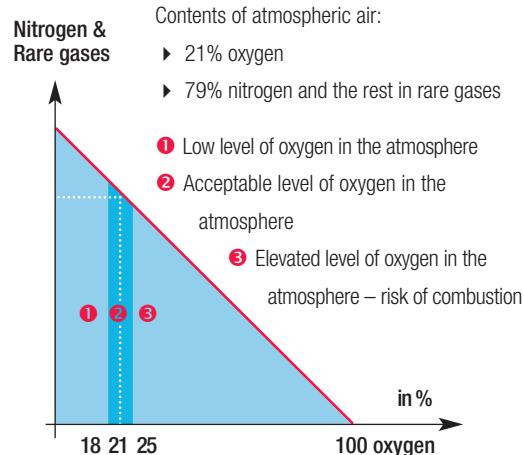
to the next. In addition, human sensory organs are incapable of



detecting the dangers of low oxygen levels in the air.

The cause of anoxia: a lack of oxygen in the air

The air we breathe is made up of 21% oxygen, 79% nitrogen and very small amounts of rare gases. At normal atmospheric pressure, liquid nitrogen will vaporize above -196°C . A decrease in oxygen levels, caused by an increase in the nitrogen levels in the air, can easily occur in any cryogenic area or room during routine activities and procedures, e.g. loading and unloading samples in cryogenic freezers and using vessels that store liquid nitrogen. In fact, the manipulation of liquid nitrogen will result in its vaporization and at normal atmospheric pressure 1 liter of liquid nitrogen will produce 691 liters of gas when warmed up to an ambient room temperature.





Anoxia



Detecting under – oxygenation **WARNING!**

Most of the gases used in cryogenic applications are undetectable by humans

Best method and practices for measuring oxygen levels:

A continuous method of measurement is necessary for areas and rooms where the concentration of oxygen may be dangerously altered during routine activities and procedures, e.g. loading and unloading samples in cryogenic freezers and using vessels that store liquid nitrogen.

A non-continuous method of measurement may be used if the time-lapse between two readings and analyses of the oxygen levels in the air are realized in a short enough time frame to signal an alarm if the oxygen levels are too low.

Preventing anoxia: some precautions to take

A small amount of nitrogen gas in liquid phase has the potential to create a much larger volume in an atmospheric phase. Consequently, a liquid nitrogen leak or spill in a confined or inadequately ventilated space can very quickly result in a dangerously low level of atmospheric oxygen. To eliminate this risk, the user needs to make sure

that where the nitrogen liquid or gas is present, both in the work and storage spaces, that there is sufficient ventilation and if needed permanent or portable oxygen detectors and for emergency situations portable individual respirators should be made easily accessible.



Safety accessories

Burns caused from splashing
or contact



Handling products stored in liquid nitrogen or working with cryogenic fluids create an extremely high risk factor for cryogenic burns.



These burns can have serious consequences, especially when the eyes or face are involved.

Therefore, it is imperative to reduce the risks of burns from splashing or contact with liquid nitrogen.

Recommendations and pictograms to use when working with liquid nitrogen



Warning signs:
extreme low temperature



Mandatory:
to read the user's manual



Mandatory:
protection of hands by using correctly adapted cryogenic protective gloves or related equipment.



Mandatory:
protection of the face and eyes by using correctly adapted cryogenic protective glasses, visor or related equipment.



Mandatory:
make sure that all cryogenic work and storage rooms are correctly ventilated and have the appropriate oxygen level detectors and alarms and Anoxia safety masks



Not allowed:
do not touch directly, at any time, items that have been in contact with liquid nitrogen



Safety in the workplace



Wear safety glasses or a visor, gloves and protective accessories, e.g. cryo apron and gaiters.

A portable oxygen detector is also recommended for detecting dangerous levels of:

- ▶ carbon-monoxide
- ▶ hydrogen sulphide, oxygen
- ▶ nitrogen oxide
- ▶ sulphur dioxide

⚠ Prescription eye glasses are not protective.

⚠ The unprotected hand should never manipulate any items that have been in contact with liquid or gaseous nitrogen.

⚠ The hands, even when wearing the cryo-gloves, should never be submerged in a cryogenic liquid.

Safety accessories

		References
A: Visor		ACC-SECU-1
B: Protective glasses		ACC-SECU-2
C: Cryogenic gloves	size 8	ACC-SECU-15
	size 9	ACC-SECU-16
	size 10	ACC-SECU-17
	size 11	ACC-SECU-18
D: Gaiters	size M (38-42) ¹⁾	ACC-SECU-12
	size L (42-46) ²⁾	ACC-SECU-13
E: Portable oxygen detector		ACC-SECU-102
F: Cryo-apron	unique size	ACC-SECU-19

1) M = diameter of calves 46.5 up to 48.5 cm.

2) L = diameter of calves 47.5 up to 49.5 cm.

The line of dewars designed for easy use of small volumes of liquid nitrogen



- ▶ The AGIL line includes 6 models with capacities from 0.5 up to 6 litres
- ▶ Stainless steel, vacuum insulated
- ▶ Pouring handles
- ▶ Cork lids (optional)
- ▶ Use for temperatures ranging from - 200 °C /+ 200 °C



Freezing embryos: the AGIL 3 is perfect for cooling down the seeding bar



Easy transportation of sample for short distances

Using AGIL

- ▶ For transportation of biological samples in liquid nitrogen in the laboratory
- *  ▶ For cooling down a manual seeding bar for freezing applications like FREEZAL
- ▶ For holding small volumes of liquid nitrogen needed on a daily basis in a laboratory



Areas of use and applications include:
Scientific, medical and pharmaceutical
laboratories...

AGIL		AGIL 0.5	AGIL 1	AGIL 1/L	AGIL 2	AGIL 3	AGIL 6
FEATURES							
Volume capacity	l	0.5	1	1	2	3	6
Interior diameter	mm	65	85	100	100	185	185
Daily evaporation at 20°C without lid	l/d ¹⁾	1	0.9	1.6	1.1	3.1	2.9
Static autonomy at 20°C with out lid	h ¹⁾	12	26	15	43	23	49
External diameter	mm	87	107	122	122	200	200
Weight empty	kg	0.56	0.95	0.80	1.35	1.78	2.40
Total height	mm	203	231	177	312	190	300
PRODUCT REFERENCES							
AGIL (without cork lid)		AGIL05-2	AGIL1-2	AGIL1L-2	AGIL2-2	AGIL3-2	AGIL6-2
PRODUCT ACCESSORIES							
A: Cork Lid		ACC-AGIL-1	ACC-AGIL-2	ACC-AGIL-3		ACC-AGIL-4	
B: Protective eye glasses		ACC-SECU-2					
C: Protective gloves (size 8)		ACC-SECU-15					
Protective gloves (size 9)		ACC-SECU-16					
Protective gloves (size 10)		ACC-SECU-17					
Protective gloves (size 11)		ACC-SECU-18					

1) Daily evaporation rate and static autonomy are based on 20°C working environment, 1013 mb, the dewar being stationary and with a lid. These values can vary depending on the working environment and condition of the dewar.

2) AIR LIQUIDE reserves the right to change the information in this document without prior notice.



Main features

Quality / Functionality

- Made in stainless steel for greater durability
- Ability to work with temperatures ranging from - 200 °C /+ 200 °C. The use of liquid oxygen is not permitted

Easy to use

- Pouring handles
- Compact dewars easy to use and perfectly designed for use in laboratories



The AGIL can be filled using a TR

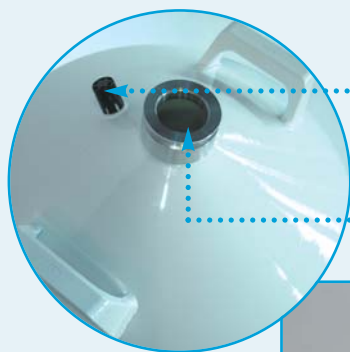
Non-pressurized vessels designed for the storage and transportation of liquid nitrogen



- Capacity of 7 to 100 litres
- Static holding time up to 180 days
- 6 year guarantee on the vacuum



Insulated lid



Vacuum valve

Neck diameter 50 mm

Main characteristics include

Various dispensing systems can be fitted to the TR

- Tipping handle **C**
- Tipping stand **E**
- The DL3 pressurized decanting system **D**

Quality

- Made out of aluminum and composite materials provides for low consumption and light weight
- High quality polyurethane paint for long life
- Standard neck diameter of Ø 50 mm
- Vacuum valve

Tipping handle **C**





Filling a TR using
a TP

Application areas include:
Industrial, laboratories, life sciences,
medical, ...

Gamme TR

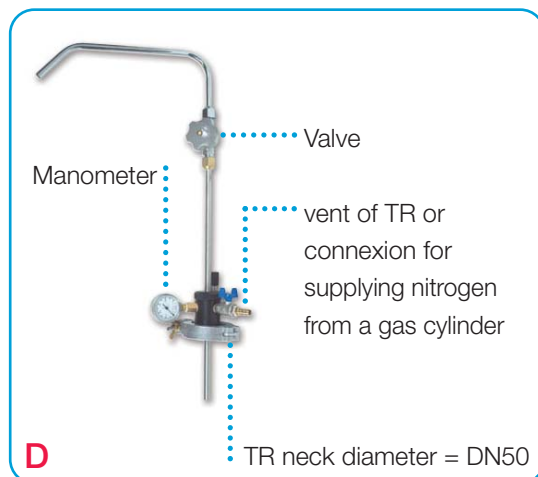
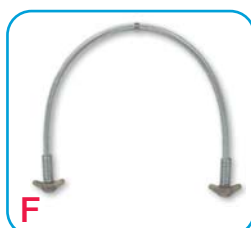
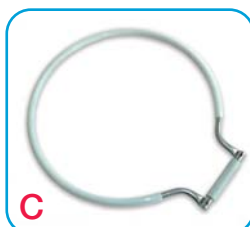
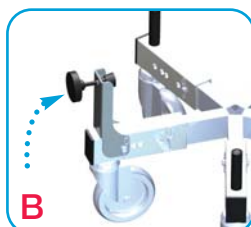
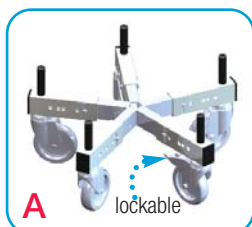
		TR11	TR21	TR26	TR35	TR60	TR100
CHARACTERISTICS							
Liquid capacity	l	12.2	21.5	26	33.6	60	99
Diameter of neck	mm	50	50	50	50	50	50
Static holding time	d ¹⁾	67	119	130	140	150	180
Daily evaporation rate	l/d ¹⁾	0.18	0.18	0.2	0.24	0.4	0.55
Weight empty	kg	7.5	11.0	13.5	15.8	21.5	29.5
Weight full	kg	17.3	28.3	34.6	43	70	110
External diameter	mm	308	388	388	468	468	510
Total height	mm	584	605	669	655	869	986
Total interior height	mm	530	535	612	580	800	933
PRODUCT REFERENCES							
References to order		TR11-1	TR21-1	TR26-1	TR35-1	TR60-1	TR100-1
MAIN ACCESSORY REFERENCES							
A: Roller base		ACC-ALU-29					
B: Fixation kit for the roller base (3 parts)		ACC-ALU-32					
C: Tipping handle		ACC-TR-15	ACC-TR-16	ACC-TR-16	–	–	–
D: DL3 pressurized decanting system		ACC-TR-5					
E: Tipping stand		–	ACC-TR-17	ACC-TR-17	ACC-TR-18	–	–
F: Flexible transfer hose (DN10) ²⁾	1.1 m	ACC-FL180180NL-11					
Flexible avec canne de transfert (DN10) ^{3) 4) 5)}		F + G1 ou F + G2					
G1: Transfer cane with anti-splash nozzle		ACC-FLTC-2					
G2: Transfer cane without anti-splash nozzle		ACC-FLTC-1					

1) Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed.

These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

2) The flexible hoses are available in different lengths: 1.5, 2, 3 and 4 meters. If the length = 1.5 m the commercial reference = NL-15.

If the length = 2 m the commercial reference = NL-20. If the length = 3 m the commercial reference = NL-30. If the length = 4 m the commercial reference = NL-40.



Self-pressurized (0.5 bar) liquid nitrogen storage and dispensing vessels.



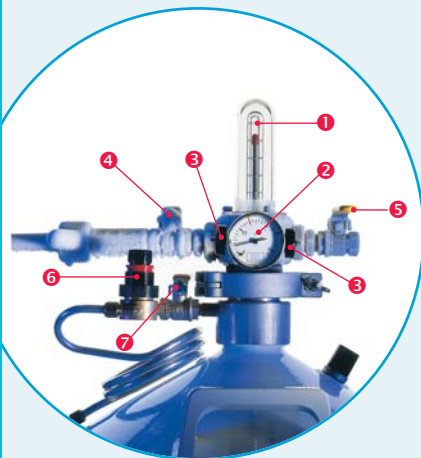
- ▶ Capacity of 35 to 100 litres
- ▶ Self-pressurized vessel
- ▶ Delivered with or without the operating head*
- ▶ Static holding time up to 75 days
- ▶ 6 year guarantee on the vacuum

* Operating head is removable

- 1 Float-type level indicator
- 2 Manometer
- 3 2 safety valves for 0.5 bar
- 4 Dispensing / liquid use valve
- 5 Venting valve

Self-pressurizing system

- 6 Pressure gauge
- 7 Pressurizing valve



Main characteristics include

Easy to use

- ▶ Direct liquid nitrogen supply with the decanting valve
- ▶ The TP35 can fit easily under a laboratory bench or workstation
- ▶ A hand rail can be easily attached to protect the operating head and make it easier to move the vessel

Easy to dispense liquid nitrogen

- ▶ Double valve option for liquid use



Quality

- ▶ Made out of aluminum and composite materials provides for low consumption and light weight
- ▶ High quality polyurethane paint for long life



Hand rail 

Flexible hose with dispensing cane 

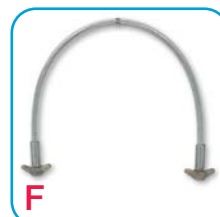
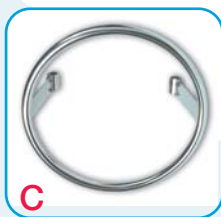
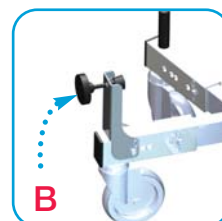
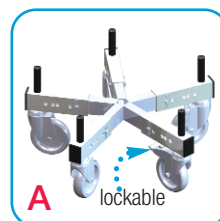
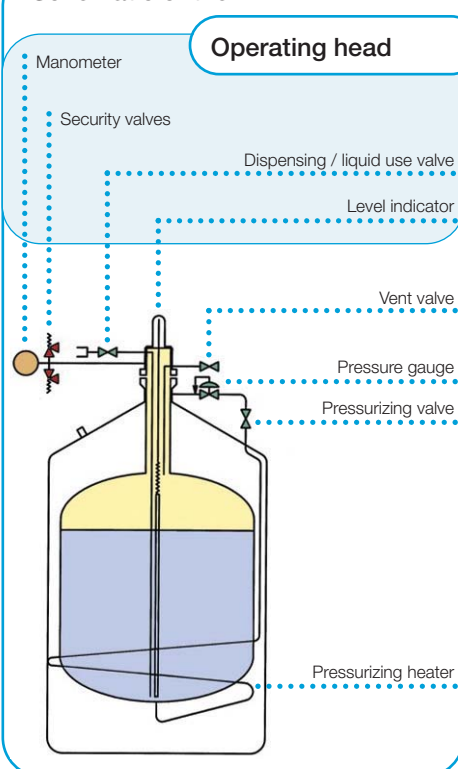
Application areas include:
Industrial, laboratories, life sciences,
medical, ...

TP		TP35	TP60	TP100
CHARACTERISTICS				
Liquid capacity	l	35	60	98
Diameter of neck	mm	50	50	50
Static holding time	d ¹⁾	35	60	75
Daily evaporation rate	l/d ¹⁾	1	1	1,3
Weight empty with operating head	kg	19.8	26.4	33.5
Weight full with operating head	kg	48	74.5	113.5
External diameter	mm	468	468	510
Total height with operating head	mm	853	1,080	1,213
Total interior height	mm	580	815	945
Maximum operating pressure in standard bars	bar	0.5	0.5	0.5
Maximum flow rate	l/mn ²⁾	2.4 (P=0.5b)	3.5 (P=0.5b)	5.2 (P=0.5b)

PRODUCT REFERENCES			
TP with operating head and pressure regulator	TP35-1	TP60-1	TP100-1
TP without operating head (pressure regulator included)	TP35-2	TP60-2	TP100-2

MAIN ACCESSORY REFERENCES	
A1: Roller base (height: 220 mm)	ACC-ALU-29
A1: Non magnetic roller base (height: 205 mm)	ACC-ALU-31
B: Fixation kit for the roller base (3 parts)	ACC-ALU-32
C: Hand rail	ACC-ALU-21
D: Withdrawal device with double valve	ACC-TP-21
E: Dispensing system with anti-splash nozzle	ACC-TP-17
F: Flexible transfer hose with (DN10) ⁴⁾ 1.1 m	ACC-FL180180NL-11
Flexible transfer hose with cane (DN10) ^{3) 4) 5)}	F + G1 ou F + G2
G1: Transfer cane with anti-splash nozzle	ACC-FLTC-2
G2: Transfer cane without anti-splash nozzle	ACC-FLTC-1

Schematic of the TP



1) Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed. These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

2) Indicative value that can vary greatly in accordance with the filling time of the vessel.

3) For dispensing liquid nitrogen in Voyageur, GT, Agil, or Arpege vessels – small volumes of nitrogen in non-pressurized vessels

4) The flexible hoses are available in different lengths: 1.5, 2, 3 and 4 meters. If the length = 1.5 m the commercial reference = NL-15. If the length = 2 m the commercial reference = NL-20. If the length = 3 m the commercial reference = NL-30. If the length = 4 m the commercial reference = NL-40.

5) Available in length from 1.1 – 4 m and for connecting to pressurized vessels or vacuum lines with a maximum of 3 bar.

FREEZAL

“Freezing for Life” Controlled Rate Freezer for all kinds of biological samples



- ▶ For straws, vials and bags
- ▶ Compliant to MDD 93/42/CEE and 21CFR part 11
- ▶ Easy to create and save protocols
- ▶ Print freezing graphs with USB commercial printers
- ▶ Intuitive programming (MS Windows XP™)

Key characteristics

- ▶ Integrated industrial PC and industrial touch screen for reliability and safety
- ▶ Connection for a 2nd viewer screen for remote monitoring
- ▶ Language options: 7 languages available (EN, FR, DE, ES, PO, IT and NE), other available upon request
- ▶ Multi-programmable “seeding:” manual, semi-automatic and automatic
- ▶ Data is stored in the computer
- ▶ 3 USB ports
- ▶ Compact and light system



FREEZAL connection to the TP



Liquid nitrogen supply: self-pressurizing TP vessel

Accessories



Different freezing racks for different types of samples...

The FREEZAL is a programmable cryogenic freezer designed to freeze all kinds of sensitive biological samples. The FREEZAL has been designed by CRYOPAL's research and development team to meet the evolving demands of our global customers.

Technical characteristics

SAMPLE CAPACITY PER FREEZING CYCLE		A: vertical rack	B: horizontal rack
Straws 0.5ml (CBS™)	pc.	196	28
Straws 1ml (CBS™)	pc.	169	20
D: Vials 2ml / 5ml	pc.	100	
E: Vials 2ml / 5ml	pc.	595 / 298	
G: Bags (up to 700ml)	pc.	10 + 1 (testimonial bag)	
Electricity consumption	W	800	
Electricity supply	V/Hz	220/50	
Measurement accuracy	°C	± 0.1	

DIMENSIONS OF THE FREEZING CHAMBER

L x W x H	mm	210 x 210 x 320
Temperature range	°C	40 à -180
Cooling speed	°C/min	0.1 à 25

EXTERNAL DIMENSIONS

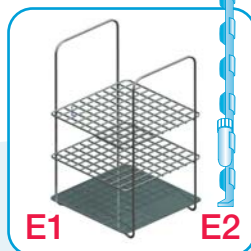
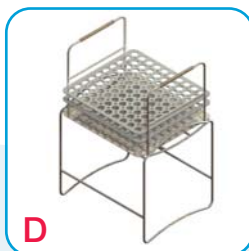
L x W x H	mm	534 x 536 x 467
Weight	kg	30

FREEZAL references

	Description
FREEZAL-1	Nicool Freezal (220V)*
A: ACC-FREEZAL-4	Vertical freezing rack for straws
B: ACC-FREEZAL-3	Horizontal freezing rack for straws
C: ACC-FREEZAL-5	Seeding bar
D: ACC-FREEZAL-30	Freezing rack for 100 2 ml / 5 ml vials
E1: ACC-FREEZAL-2	Freezing rack for 2ml / 5ml vials on canes
E2: ACC-BOXTUBE-411	Batch of 10 freezing canes for vials
G: ACC-FREEZAL-1	Freezing rack for bags (up to 700ml)

* Included with the FREEZAL:

- ▶ Protective casing
- ▶ Integrated PC with software
- ▶ Electrical supply cable
- ▶ Stylets for the PC's touch screen
- ▶ Replacement fuses kit
- ▶ Maintenance kit (1 x solenoid valve + 2 x T° probes + 1 x TP connector)
- ▶ Multiple language CD user's manual
- ▶ Customized FREEZAL cryogenic flexible connector hose **H**



Vessels designed for long term storage of biological samples in straws or cryo-vials (medical – human)



GT line for extended holding time (Ø neck ≤ 50 mm)



Main characteristics include

- ▶ Aluminum vessels for both the long holding time and large capacity GT lines:
 - Long holding time (Ø neck ≤ 50 mm)
 - large capacity (Ø neck ≥ 80 mm)
- ▶ Light weight and resistant
- ▶ High quality polyurethane paint
- ▶ 14 different models

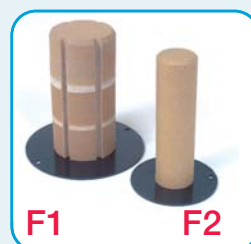
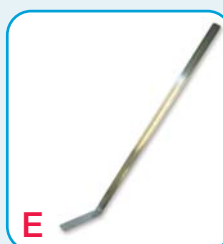
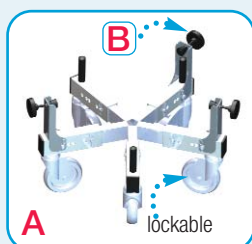
Carrying strap for GT2



- ▶ Maximum storage – 16,400 straws or 1,200 cryo-vials
- ▶ Vessels comply with the EC Medical Directive 93/42 EEC
- ▶ Level and temperature indicators on the NATAL 40
- ▶ Static holding time up to 350 days
- ▶ Plastic or stainless steel canisters
- ▶ Anti-float system for straws stored in plastic canisters
- ▶ Plastic level rod for measuring the liquid nitrogen level
- ▶ 6 year guarantee on the vacuum

Accessories

- A:** Roller base
- B:** Fixation kit for the roller base
- C:** Plastic goblet
- D:** Cryo-vial cane
- E:** Stainless steel lifter for goblets
- F1:** Lid for GTs with stainless steel canisters
- F2:** Lid for GTs with plastic canisters
- G:** Plastic level rod (included with GT except GT2)





Application areas include:
Life sciences, insemination centers,
egg and sperm banks, IVF,
pharmaceutical labs...

GT large capacity (Ø neck ≥ 80 mm)



The NATAL 40 is equipped with
level and temperature indicator
gauges and a RS485 connection
box for traceability of recorded
data.



Canister organization groove system
in the upper part of the GT neck
(canister organization system is
standard on all GT 14 / 6, 18, 26,
38, 40 and NATAL).



The GTs (except the
GT 2) can be closed
with a security lock on
the lid (the security
lock is not included)



Easy to identify number and color
code on the canisters in the long
holding time GT 3, 9, 11, 21
and 35

GT – for Animal Insemination

Vessels designed for storage and shipping of biological samples in straws or cryo-vials (veterinary – animal)



page 54

GT line for extended holding time
(Ø neck ≤ 50 mm)



Main characteristics include

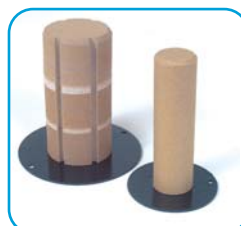
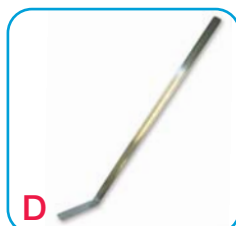
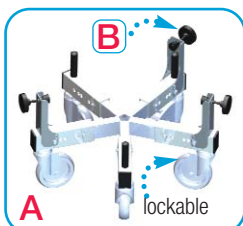
- ▶ Aluminum vessels for both the long holding time and large capacity GT lines:
 - Long holding time (Ø neck ≤ 50 mm)
 - large capacity (Ø neck ≥ 80 mm)
- ▶ Light weight and resistant
- ▶ High quality polyurethane paint
- ▶ 14 different models



- ▶ Maximum storage 16,400 straws
- ▶ The GT line complies to international regulations for the transportation of dangerous materials by land, air, rail and water.
- ▶ Static holding time up to 350 days
- ▶ Plastic or stainless steel canisters with 1 or 2 levels
- ▶ Anti-float system for straws stored in plastic canisters
- ▶ Plastic level rod for measuring the liquid nitrogen level
- ▶ 6 year guarantee on the vacuum

Accessories

- | | |
|--|---|
| A: Roller base | E1: Lid for GTs with stainless steel canisters |
| B: Fixation kit for the roller base | E2: Lid for GTs with plastic canisters |
| C: Plastic goblet | F: Plastic level rod (included with GT / NATAL except GT2) |
| D: Stainless steel lifter for goblets | |





Animal Insemination

GT large capacity ($\varnothing$ neck ≥ 80 mm)



The GTs (except the GT 2) can be closed with a security lock on the lid (the security lock is not included)

Canister organization groove system in the upper part of the GT neck (canister organization system is standard on all GT 14 / 6, 18, 26, 38, 40 and NATAL

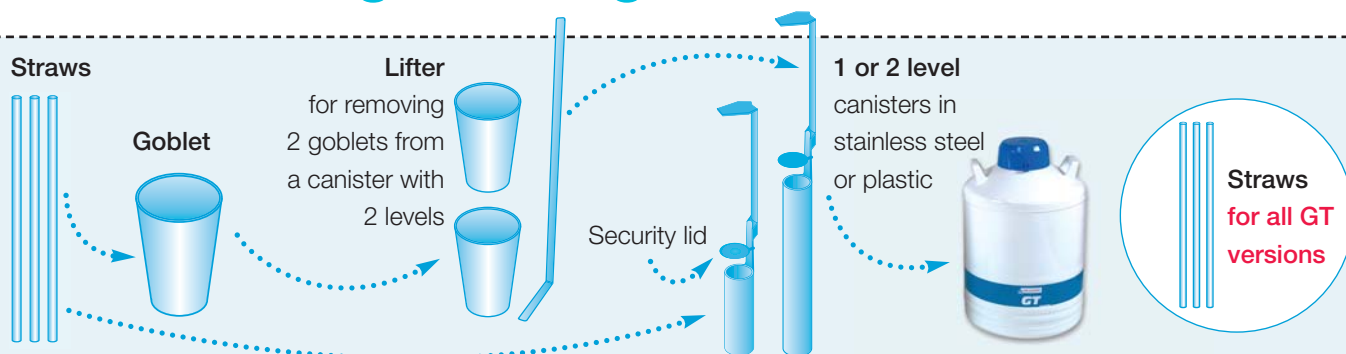


Easy to identify number and color code on the canisters in the long holding time GT 3, 9, 11, 21 et 35



The security lid is standard on the GT line, for options see accessories; only available for GT 3, 9, 11, 21 and 35

GT 2 – 35 long holding time – straws / vials



Long holding time ($\emptyset$ neck ≤ 50 mm)

		GT 2	GT 3	GT 9	GT 11	GT 21	GT 35
CHARACTERISTICS							
Liquid capacity	l	2	3.7	9.3	12.2	21.5	33.6
Diameter of neck	mm	30	50	50	50	50	50
Weight empty	kg	1.9	4.5	8.2	9.2	13	15
Canisters can be identified and organized from the support on the top of the neck of the GT							
Weight full	kg	3.5	7.5	15.7	19	30.4	43
External diameter	mm	174	248	358	308	388	468
Total height	mm	392	405	450	630	660	660
Daily evaporation rate	l/d ¹⁾	0.08	0.11	0.11	0.09	0.09	0.09
Static holding time	d	25	33	84	130	225	350
Dynamic holding time	d ²⁾	15	21	50	80	140	219
Number of canisters		3	6	6	6	6	6
STORAGE CAPACITY AND TYPE OD CANISTERS							
Plastic		✓	✓	✓	✓	✓	✓
Stainless steel		–	✓	✓	✓	✓	✓
Diameter of canisters	mm	26	38	38	38	38	38
Height of canisters	mm	120	120	120	120 or 280	120 or 280	120 or 280
Number of level of goblets ³⁾		1	1	1	1 or 2	1 or 2	1 or 2
Max. capacity of 0.25 ml straws		330	1,560	1,560	1,560/2,400	1,560/2,400	1,560/2,400
Max. capacity of 0.5 ml straws		150	720	720	720/1,200	720/1,200	720/1,200
Capacity of CBS™ straws (0.3 et 0.5 ml)		100	460	460	460/780	460/780	460/780
CTotal capacity of 2 ml cryo-vials (on canes in canisters with 2 levels)		–	–	–	180	180	180
PRODUCT REFERENCES							
GT with							
canisters – plastic and 1 level		GT2-1	GT3-1	GT9-1	GT11-1	GT21-1	GT35-1
canisters – stainless steel and 1 level		–	GT3-2	GT9-2	GT11-2	GT21-2	GT35-2
canisters – stainless steel 2 levels		–	–	–	GT11-3	GT21-3	GT35-3
canisters – plastic and 2 levels		–	–	–	GT11-4	GT21-4	GT35-4
MAIN ACCESSORY REFERENCES							
A: Roller base		–	–	–	–	ACC-ALU-29	
B: Fixation kit for the roller base (3 parts)		–	–	–	–	ACC-ALU-32	
C: Goblet $\emptyset$ 35 mm (20 per batch)		–	–	–	–	ACC-BOXTUBE-300	
D: Canes for cryo-vials (10 per batch)		–	–	–	–	ACC-BOXTUBE-411	
E: Lifter (for canister with 2 levels)		–	–	–	–	ACC-BOXTUBE-405	
F1: Lid for GTs with stainless steel canisters		–	ACC-GT-2	–	–	ACC-GT-1	
F2: Lid for GTs with plastic canisters		ACC-ALU-18	ACC-GT-4	–	–	ACC-GT-5	
G: Plastic level rod		–	–	–	–	ACC-GT-103	

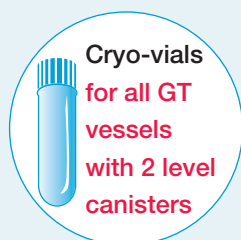
1) Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed. These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

2) Indicative value may vary greatly based on the time the vessel did not have its lid closed.

3) Canister 1 level: number of straws stored loose.

Canister 2 levels: number of straws stored loose in goblet.

GT 14 – 40 large capacity – Straws / Vials



Cryo-vials



Canes¹⁾



Security lid
(only available
on plastic
canisters)

2 level
canisters in
stainless steel
or plastic



GT large capacity (Ø neck ≥ 80 mm)

		GT 14/6	GT 18	GT 26	GT 38	GT 40	NATAL NT
CHARACTERISTICS							
Liquid capacity	l	13.5	17.5	26.7	37	40	40
Diameter of neck	mm	80	80	80	80	120	120
Weight empty	kg	9.5	10.5	14.8	19	24	24
Canisters can be identified and organized from the support grooves in the top of the neck of the GT							
Weight full	kg	20.4	25	36	49	57	57
External diameter	mm	358	308	468	468	468	468
Total height	mm	455	580	460	715	710	710
Daily evaporation rate	l/d ²⁾	0.24	0.26	0.29	0.15	0.29	0.29
Static holding time	d	57	69	90	245	140	140
Dynamic holding time	d ³⁾	36	43	56	153	88	88
Number of canisters (only stainless steel)		6	6	9	6	10	10
STORAGE CAPACITY AND TYPE OD CANISTERS							
Diameter of canister	mm	67	67	67	67	73	73
Height of canister	mm	120	280	110	280	280	280
Number of level of goblets ⁴⁾		1	2	1	2	2	2
Max. capacity of 0.25 ml straws		4,920	9,840	7,380	9,840	16,400	16,400
Max. capacity of 0.5 ml straws		2,190	4,380	3,285	4,380	7,300	7,300
Capacity of CBS™ straws (0.3 et 0.5 ml)		1,350	2,700	2,025	2,700	4,500	4,500
Total capacity of 2 ml cryo-vials (on canes in canisters with 2 levels)		–	612	–	612	1,200	1,200
Total capacity of 5 ml cryo-vials (on canes in canisters with 2 levels)		–	306	–	306	600	600
Capacity level indicator with alarm		–	–	–	–	–	✓
Digital temperature indicator with alarm		–	–	–	–	–	✓
PRODUCT REFERENCES							
GT with							
1 level canister in stainless steel		GT14-1	–	GT26-1	–	–	
2 level canister in stainless steel		–	GT18-1	–	GT38-1	GT40-1	NATAL40-1
MAIN ACCESSORY REFERENCES							
A: Roller base		–			ACC-ALU-29		
B: Fixation kit for the roller base (3 parts)		–			ACC-ALU-32		
C: Goblet Ø 65 mm (20 per batch)					ACC-BOXTUBE-301		
C1: Goblet perce Ø 65 mm with lid (10 per batch)					ACC-BOXTUBE-415		
C2: Goblet "Marguerite" Ø 65 with lid (5 per batch)					ACC-BOXTUBE-302		
D: Canes for cryo-vials (10 per batch)		–	ACC-BOXTUBE-411	–		ACC-BOXTUBE-411	
E: Lifter (for canister with 2 levels)		–	ACC-BOXTUBE-405	–		ACC-BOXTUBE-405	
F1: Lid for GTs with stainless steel canisters		ACC-GT-6		ACC-GT-8	ACC-GT-9	ACC-GT-3	ACC-GT-3
G: Plastic level rod					ACC-GT-103		

1) Max. 6 2 ml cryo-vials per cane. Max. 3 5 ml cryo-vials per cane.

2) Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed.

These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

3) Indicative value may vary greatly based on the time the vessel did not have its lid closed.

4) Canister 1 level: number of straws stored loose.

Canister 2 levels: number of straws stored loose in goblet.

ARPEGE

Vessels of 40 up to 170 litres designed for long term storage of biological samples in straws, cryo-vials and bags.



page 54



Electronic

- ▶ Maximum storage – 6000 cryo-vials
- ▶ Storage in Gas or Liquid phase
- ▶ Vessels comply with the EC Medical Directive 93/42 EEC
- ▶ Static holding time up to 246 days
- ▶ A variety of electronic options on all models
- ▶ Rack or canister storage systems for the samples
- ▶ AIR LIQUIDE patented clip system to secure the sample boxes in the racks
- ▶ 6 year guarantee on the vacuum

Main characteristics include

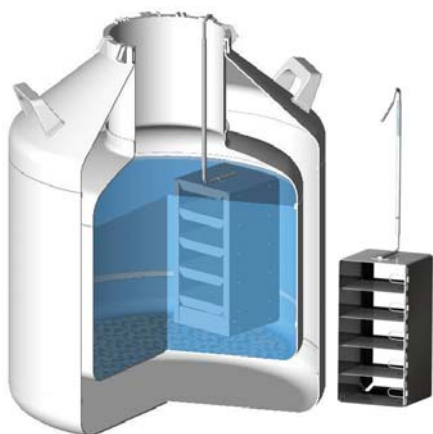
- ▶ Vessels delivered with the racks or canisters inside
- ▶ Option to buy the vessels without any electronic or storage system (see product table)
- ▶ Security lid with a lock point (not available on ARPEGE 55 & 75, lock not included)
- ▶ Made out of aluminum and composite materials provides for light weight and longer holding time





Application areas include:
Life sciences, insemination centers, egg
and sperm banks, IVF, pharmaceutical
labs...

ARPEGE liquid phase



ARPEGE gas phase

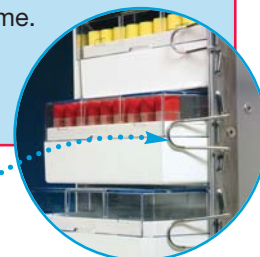


Maximizing security when
handling a rack and the sample
boxes in the rack. Thanks to
AIR LIQUIDE' s patented clip
closure system ®, each level of
the storage rack has its own clip
system to secure and keep the
storage boxes in each level of
the rack allowing the user to
access only one level of
a rack at a time.

Electronic options

- ▶ Level indicator and / or regulation and...
- ▶ Temperature indicator
- ▶ Level indicator – regulation (except ARPEGE 40)

A system designed to
secure and keep each
storage box in its place in
the rack.



		Liquid phase		Gas Phase		liquid						
ARPEGE						liquid and gas						
						40	70	110	140	170	55	75
CHARACTERISTICS												
Liquid capacity	l					40	72	116	144	172	55	72
							15	15	20	20		
Weight empty	kg					57	91	136	166	195	75	95
							50	60	73	77		
Static holding time	d					140	130	193	222	246	23	29
							25	23	30	28		
Diameter of neck	mm					120	215	215	215	215	378	378
Weight empty	kg					25	33	42	50	56	31	37
External diameter	mm					467	586	586	683	683	468	468
Total height	mm					735	738	962	911	1 028	755	930
Daily evaporation rate	l/d ¹⁾					0.29	0.6	0.65	0.65	0.7	2.4	2.5

1) Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed.

These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

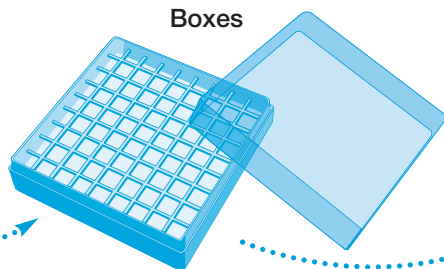
2) Indicative value may vary greatly based on the time the vessel did not have its lid closed.

ARPEGE 40 – 170 – Cryo-vials

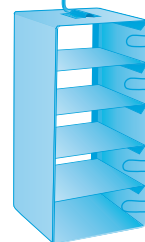
Cryo-vials



Boxes



Rack



Rack clips ®
AIR LIQUIDE



OPTIMAL		Tele-Monitoring	
INITIAL / ESSENTIAL			
SIMPLE	BASIC	CHOICE I:	CHOICE II:
without racks without electronics	including racks without electronics	level indicator N temperature indicator T Automatic filling R	4/20mA box RS485 box



* page 54



Liquid phase



Gas Phase

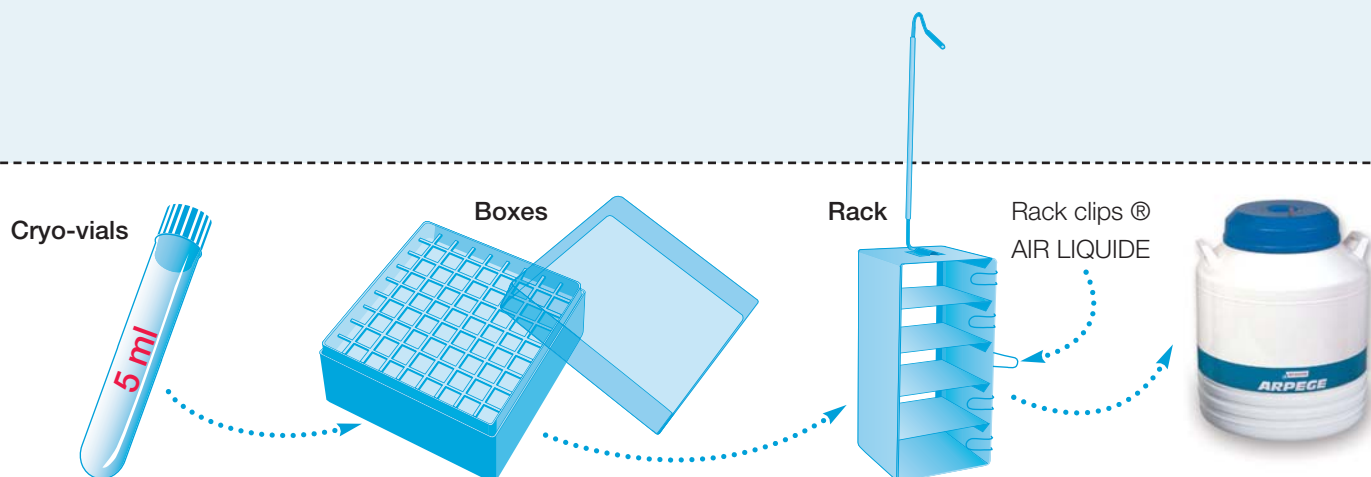
Arpege – Rack for cryo-vials 1.2 / 2ml			40	70	110	140	170
Number of racks			6	4	4	6	6
Number of cryo-vials per box of 25			25	81/100	81/100	81/100	81/100
Number of levels per rack			5	5	9	8	10
			—	4	8	7	9
Number of cryo-vials 1.2 / 2ml			750 ¹⁾	2,000 ²⁾	3,600 ²⁾	4,800 ²⁾	6,000 ²⁾
			—	1,600 ²⁾	3,200 ²⁾	4,200 ²⁾	5,400 ²⁾
SIMPLE without racks, without electronics			ARPEGE40-L-1	ARPEGE70-L-1	ARPEGE110-L-1	ARPEGE140-L-1	ARPEGE170-L-1
			—	ARPEGE70-G-1	ARPEGE110-G-1	ARPEGE140-G-1	ARPEGE170-G-1
BASIC includes: racks cryo-vials 2ml, without electronics			ARPEGE40-L-100	ARPEGE70-L-100	ARPEGE110-L-100	ARPEGE140-L-100	ARPEGE170-L-100
			—	—	—	—	—
INITIAL N + T			ARPEGE40-L-102	ARPEGE70-L-102	ARPEGE110-L-102	ARPEGE140-L-102	ARPEGE170-L-102
			—	—	—	—	—
ESSENTIAL N + T + R			—	ARPEGE70-L-104	ARPEGE110-L-104	ARPEGE140-L-104	ARPEGE170-L-104
			—	ARPEGE70-G-104	ARPEGE110-G-104	ARPEGE140-G-104	ARPEGE170-G-104
OPTIMAL N + T + R + 4/20mA box			—	ARPEGE70-L-107	ARPEGE110-L-107	ARPEGE140-L-107	ARPEGE170-L-107
			—	ARPEGE70-G-107	ARPEGE110-G-107	ARPEGE140-G-107	ARPEGE170-G-107
OPTIMAL N + T + R + RS485 box			—	ARPEGE70-L-108	ARPEGE110-L-108	ARPEGE140-L-108	ARPEGE170-L-108
			—	ARPEGE70-G-108	ARPEGE110-G-108	ARPEGE140-G-108	ARPEGE170-G-108

MAIN ACCESSORY REFERENCES

A1: Roller base (height: 220 mm)	ACC-ALU-29	ACC-ALU-30
A1: Non magnetic roller base (height: 205 mm)	ACC-ALU-31	—
B: Fixation kit for the roller base (3 parts)		ACC-ALU-32
C: Flexible transfer hose with (DN10) – 180/180 for nitrogen length =1.5 m	— ³⁾	ACC-FL180180NL-15
D: Set of boxes	ACC-BOXTUBE-105 ⁴⁾	ACC-BOXTUBE-104 ⁵⁾

1) in boxes 76 x 76 x 51 mm (25) 2) in boxes 133 x 133 x 512 mm (81 or 100) 3) ARPEGE 40: automatic filling is not available

4) set of 8 boxes 76 x 76 x 51 mm (25) 5) set of 10 boxes 133 x 133x 512 mm (81 or 100)



OPTIMAL		Tele-Monitoring	
INITIAL / ESSENTIAL			
SIMPLE	BASIC	CHOICE I:	CHOICE II:
without racks without electronics	including racks without electronics	level indicator N temperature indicator T Automatic filling A	4/20mA box RS485 box

* page 52/53



* page 54

Liquid phase

Gas Phase

Arpege – Rack for cryo-vials 5 ml

			70	110	140	170
Number of	racks		4	4	6	6
Number of	cryo-vials per box		81	81	81	81
Number of	levels per rack		3	5	4	5
			2	4	3	4
Number of	cryo-vials 5 ml		972	1,620	1,944	2,430
			648	1,296	1,458	1,944
SIMPLE	without racks, without electronics		ARPEGE70-L-1	ARPEGE110-L-1	ARPEGE140-L-1	ARPEGE170-L-1
			ARPEGE70-G-1	ARPEGE110-G-1	ARPEGE140-G-1	ARPEGE170-G-1
BASIC	includes: racks for cryo-vials 5 ml without electronics		ARPEGE70-L-200	ARPEGE110-L-200	ARPEGE140-L-200	ARPEGE170-L-200
			–	–	–	–
INITIAL	N + T		ARPEGE70-L-202	ARPEGE110-L-202	ARPEGE140-L-202	ARPEGE170-L-202
			–	–	–	–
ESSENTIAL	N + T + R		ARPEGE70-L-204	ARPEGE110-L-204	ARPEGE140-L-204	ARPEGE170-L-204
			ARPEGE70-G-204	ARPEGE110-G-204	ARPEGE140-G-204	ARPEGE170-G-204
OPTIMAL	N + T + R + 4/20mA box		ARPEGE70-L-207	ARPEGE110-L-207	ARPEGE140-L-207	ARPEGE170-L-207
			ARPEGE70-G-207	ARPEGE110-G-207	ARPEGE140-G-207	ARPEGE170-G-207
OPTIMAL	N + T + R + RS485 box		ARPEGE70-L-208	ARPEGE110-L-208	ARPEGE140-L-208	ARPEGE170-L-208
			ARPEGE70-G-208	ARPEGE110-G-208	ARPEGE140-G-208	ARPEGE170-G-208

MAIN ACCESSORY REFERENCES

A: Roller base lockable (height: 220 mm)	ACC-ALU-30
B: Fixation kit for the roller base (3 parts)	ACC-ALU-32
C: Flexible transfer hose with (DN10) – 180/180 for nitrogen length = 1.5m -1	ACC-FL180180NL-15
D: Set of 4 boxes 133 x 133 x 512 mm ¹⁾	ACC-BOXTUBE-107

1) 81 boxes

ARPEGE 55 and 75

Cryo-vials

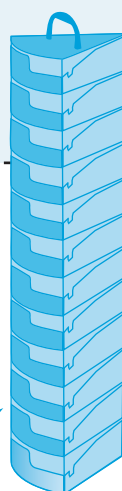
Cryo-vials



Rack type "Camembert"
or pie



Rack



OPTIMAL		Tele-Monitoring	
INITIAL / ESSENTIAL			
SIMPLE	BASIC	CHOICE I:	CHOICE II:
without racks	including racks	level indicator N	4/20mA box
without electronics	without electronics	temperature indicator T	RS 485 box
		Automatic filling A	



* page 54

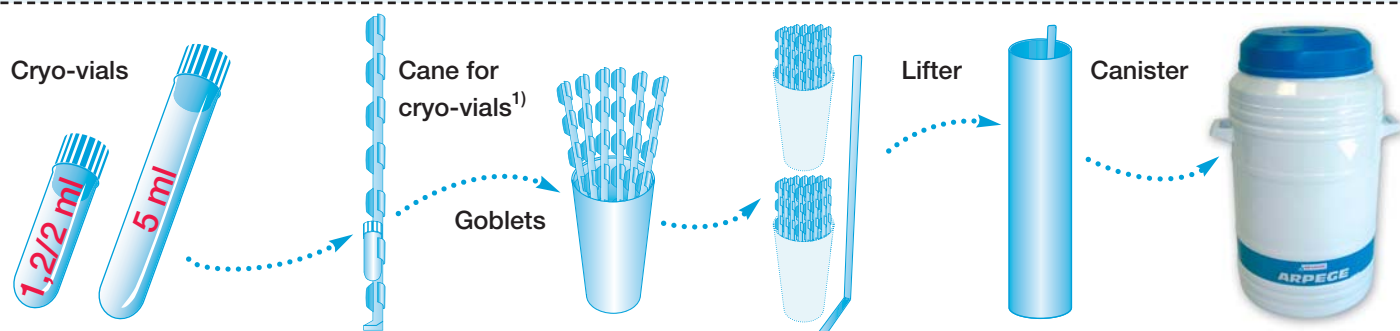
Liquid phase

Arpege – Rack for cryo-vials 1.2 / 2ml			55	75
Number of	racks		6 ¹⁾	6 ¹⁾
Number of	levels per rack		9	12
Number of	cryo-vials per box		67	67
Number of	cryo-vials 1.2 / 2ml		3,618	4,824
SIMPLE	without racks, without electronics		ARPEGE55-L-1	ARPEGE75-L-1
BASIC	includes: racks for cryo-vials 1.2 / 2ml, without electronic		ARPEGE55-L-100	ARPEGE75-L-100
INITIAL	N + T		ARPEGE55-L-102	ARPEGE75-L-102
ESSENTIAL	N + T + R		ARPEGE55-L-104	ARPEGE75-L-104
OPTIMAL	N + T + R + 4/20mA box		ARPEGE55-L-107	ARPEGE75-L-107
OPTIMAL	N + RA + RS485 box		ARPEGE55-L-108	ARPEGE75-L-108

MAIN ACCESSORY REFERENCES

A1: Roller base – lockable (height: 220 mm)	ACC-ALU-29
A1: Non magnetic roller base – lockable (height: 205 mm)	ACC-ALU-31
B: Fixation kit for the roller base (3 parts)	ACC-ALU-32
C: Flexible transfer hose with (DN10) – 180/180 for nitrogen length = 1.5m	ACC-FL180180NL-15

1) with electronic kit and maximum of 5 racks



OPTIMAL		Tele-Monitoring	
INITIAL / ESSENTIAL			
SIMPLE	BASIC	CHOICE I:	CHOICE II:
without racks	including racks	level indicator N	4/20mA box
without electronics	without electronics	temperature indicator T	RS 485 box
		automatic filling R	

* page 52/53



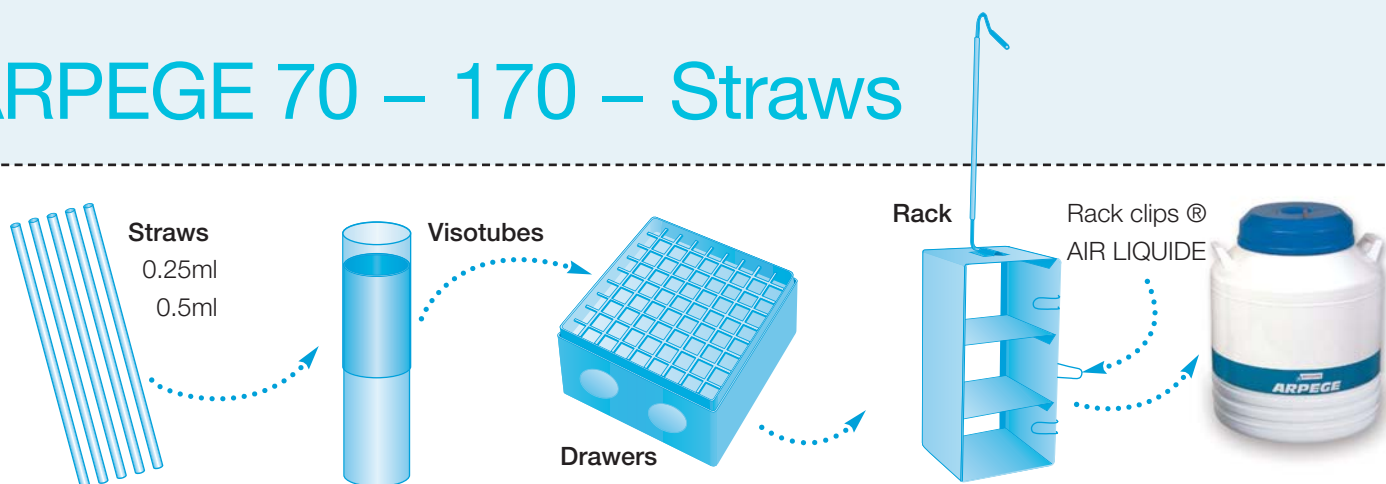
* page 54

Liquid phase

Arpege – Canisters pour cryo-tubes 2 / 5ml & gobelet		55	75
Number of canisters		21	21
Number of goblets per canister		1	2
Number of cryo-vial canes per goblet		17	17
Number of cryo-vials 1.2 / 2ml		2,142	4,284
Number of cryo-vials 5ml		1,071	2,142
BASIC includes. canisters for cryo-vials 2 / 5ml + gobelts + lifter		ARPEGE55-L-200	ARPEGE75-L-200
INITIAL N + T		ARPEGE55-L-202	ARPEGE75-L-202
ESSENTIAL N + T + R		ARPEGE55-L-204	ARPEGE75-L-204
OPTIMAL N + T + R + 4/20mA box		ARPEGE55-L-207	ARPEGE75-L-207
OPTIMAL N + T + R + RS485 box		ARPEGE55-L-208	ARPEGE75-L-208
MAIN ACCESSORY REFERENCES			
A1: Roller base – lockable (height: 220 mm)		ACC-ALU-29	
A2: Non magnetic roller base – lockable (height: 205 mm)		ACC-ALU-31	
B: Fixation kit for the roller base (3 parts)		ACC-ALU-32	
C: Flexible transfer hose with (DN10) – 180/180 for nitrogen length =1.5m		ACC-FL180180NL-15	

1) Maximum 6 cryo-vials 2ml per cane. Maximum 3 cryo-vials 5ml per cane.

ARPEGE 70 – 170 – Straws



OPTIMAL		Tele-Monitoring	
INITIAL / ESSENTIAL			
SIMPLE	BASIC	CHOICE I:	CHOICE II:
without racks	including racks	level indicators N	4/20mA box
without electronics	without electronics	temperature indicator T	RS 485 box
		automatic filling R	

* page 52/53



* page 54

Liquid phase

Gas Phase

Arpege – Racks pour paillettes				70	110	140	170
Number of	racks			4	4	6	6
Number of	levels per rack ¹⁾			2	3	3	4
Number of	visotubes ²⁾ per level			85	85	85	85
Number of	0.25ml straws ¹⁾			15,040	23,460	35,190	46,920
Number of	0.5ml straws ¹⁾			6,120	9,180	13,770	18,360
Number of	CBS™ (0.3ml – 0.5ml) straws ¹⁾			4,080	6,120	9,180	12,240
SIMPLE	without racks, without electronics			ARPEGE70-L-1	ARPEGE110-L-1	ARPEGE140-L-1	ARPEGE170-L-1
				–	–	–	–
BASIC	includes. racks for straws, without electronics			ARPEGE70-L-300	ARPEGE110-L-300	ARPEGE140-L-300	ARPEGE170-L-300
				–	–	–	–
INITIAL	N + T			ARPEGE70-L-302	ARPEGE110-L-302	ARPEGE140-L-302	ARPEGE170-L-302
				–	–	–	–
ESSENTIAL	N + T + R			ARPEGE70-L-304	ARPEGE110-L-304	ARPEGE140-L-304	ARPEGE170-L-304
				ARPEGE70-G-304	ARPEGE110-G-304	ARPEGE140-G-304	ARPEGE170-G-304
OPTIMAL	N + T + R + 4/20mA box			ARPEGE70-L-307	ARPEGE110-L-307	ARPEGE140-L-307	ARPEGE170-L-307
				ARPEGE70-G-307	ARPEGE110-G-307	ARPEGE140-G-307	ARPEGE170-G-307
OPTIMAL	N + T + R + RS485 box			ARPEGE70-L-308	ARPEGE110-L-308	ARPEGE140-L-308	ARPEGE170-L-308
				ARPEGE70-G-308	ARPEGE110-G-308	ARPEGE140-G-308	ARPEGE170-G-308

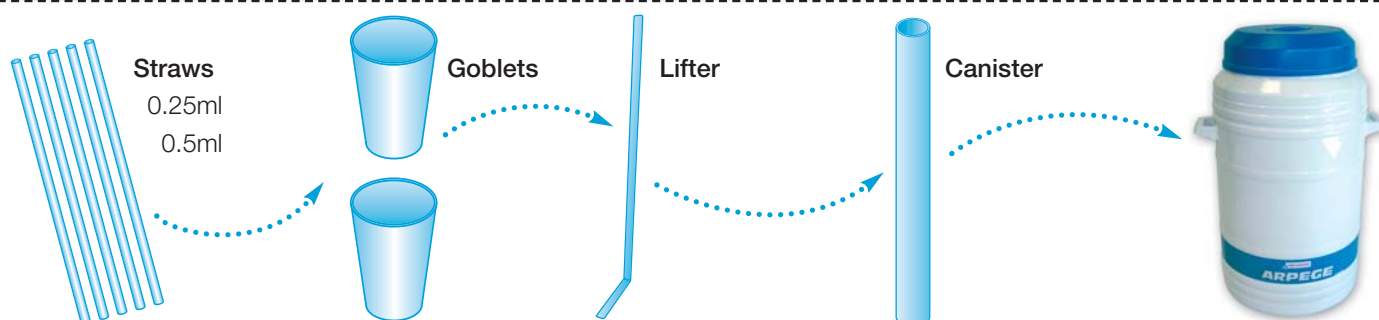
MAIN ACCESSORY REFERENCES

A:	Roller base lockable (height: 220 mm)	ACC-ALU-30
B:	Fixation kit for the roller base (3 parts)	ACC-ALU-32
C:	Flexible transfer hose with (DN10) – 180/180 for nitrogen length = 1.5m	ACC-FL180180NL-15
D:	Batch of 100 Visotubes with lids	ACC-BOXTUBE-5

1) Storage capacity of straws in liquid phase vessels, please contact AL DMC for storage capacity of straws in gas phase vessels.

2) Visotubes ø 12 mm with lid

ARPEGE 55 et 75 – Straws



	OPTIMAL			Tele-Monitoring
	INITIAL / ESSENTIAL			
SIMPLE	BASIC	CHOICE I:		CHOICE II:
without canisters	includes: canisters	level indicator	N	4/20mA box
without electronics	without electronics	temperature indicator	T	RS485 box
		Automatic filling	R	

* page 52/53



* page 54

Liquid phase

Arpege – Canisters pour paillettes & gobelets			
		55	75
Number of	canisters	21	21
Number of	goblets per canister	3	4
Number of	0.25ml straws	51,660	68,880
Number of	0.5ml straws	22,995	30,660
Number of	CBS™ (0.3ml – 0.5ml) straws	14,175	18,900
SIMPLE	without canisters, without electronics	ARPEGE55-L-1	ARPEGE75-L-1
BASIC	includes: canisters for straws + goblets + lifter	ARPEGE55-L-300	ARPEGE75-L-300
INITIAL	N + T	ARPEGE55-L-302	ARPEGE75-L-302
ESSENTIAL	N + T + R	ARPEGE55-L-304	ARPEGE75-L-304
OPTIMAL	N + T + R + 4/20mA box	ARPEGE55-L-307	ARPEGE75-L-307
OPTIMAL	N + T + R + RS485 box	ARPEGE55-L-308	ARPEGE75-L-308

MAIN ACCESSORY REFERENCES

A1: Roller base – lockable (height: 220 mm)	ACC-ALU-29
A2: Non magnetic roller base – lockable (height: 205 mm)	ACC-ALU-31
B: Fixation kit for the roller base (3 parts)	ACC-ALU-32
C: Flexible transfer hose with (DN10) – 180/180 for nitrogen length =1.5m	ACC-FL180180NL-15
D: Grouped (canisters + goblets)	ACC-PLASCAN-109 ¹⁾ ACC-PLASCAN-107 ²⁾
E: Set of 10 marguerite goblets ø 65mm + lids	ACC-BOXTUBE-302

1) ARPEGE 55: 21 canisters + 63 goblets

2) ARPEGE 55: 21 canisters + 84 goblets

ESPACE

ESPACE 151 661 liquid and gas phase



- Large storage capacity for straws, cryo-vials and bags
- MDD 93/42/EEC compliant
- Storage in Gas or Liquid phase
- Easy to use. Immediate access to products and samples thanks to the wide neck opening of the ESPACE
- A variety of electronic options on all models
- 6 year guarantee on the vacuum



liquid phase



gas phase

ESPACE			151	331NC	331C	661
CHARACTERISTICS						
Liquid Nitrogen capacity	l		200	386	386	786
			33	68	68	222
Weight full without racks and samples	kg		326	505	545	920
			192	245	285	465
Static holding time	d		33	37	37	66
			5,5	7,5	7,5	19
Daily evaporation rate	l/d ¹⁾		6	9	9	11,5
Interior diameter	mm		538	771 ¹⁾ /740 ²⁾	771 ¹⁾ /740 ²⁾	1,003
Weight empty	kg		165	190	230	305
Access height	mm		1,205	1,172	1,172	1,355
External height	mm		1,350	1,310	1,310	1,505
External width	mm		650	886	932	1,150
External depth	mm		940	1,100	1,100	1,375

1) without rotating tray

2) with rotating tray PT

^{*)} Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed. These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

Main characteristics include

- Choice of rack storage systems base on product or sample type.
- Specific storage system can also be developed
- ESPACE 331 has the options of being fitted with or without casing and with or without a rotating tray
- Stainless steel construction

*
page 38-41



RCB 500 1001 phase liquid et gas phase

- ▶ Large storage capacity for straws, cryo-vials and bags
- ▶ MDD 93/42/EEC compliant
- ▶ Storage in Gas or Liquid phase
- ▶ Low consumption thanks to the narrow neck and opening design which greatly reduces evaporation of Nitrogen
- ▶ Specifically designed for the long term storage of samples and products
- ▶ A variety of electronic options on all models
- ▶ 6 year guarantee on the vacuum



liquid phase



gas phase

Main characteristics include

- ▶ Choice of rack storage systems based on product or sample type
- ▶ Specific storage system can also be developed
- ▶ The RCB vessels can also be equipped with a compensated lid for easier use

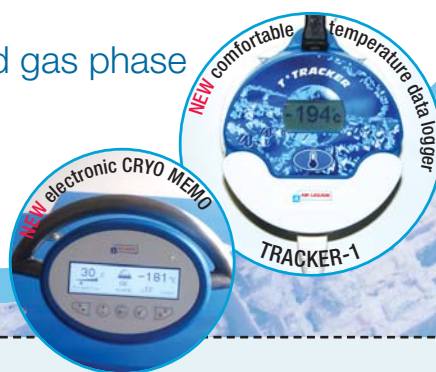
RCB		500	600	1000	1001
CHARACTERISTICS					
Liquid Nitrogen capacity	l	500	575	1 020	1,110
			115		280
Weight full without racks and samples	kg	654	735	1 239	1,641
			337		671
Static holding time	d	111	127	127	138
		—	25	—	35
Daily evaporation rate	l/d ^{*)}	4,5	4,5	8	8
Interior diameter	mm	850	850	1,150	1,150
Weight empty	kg	250	270	415	445
Access height	mm	1,260	1,440	1,300	1,377
External height	mm	1,320	1,500	1,340	1,440
External width	mm	1,100	1,100	1,320	1,320
External depth	mm	1,200	1,200	1,400	1,400

*) Daily evaporation and static holding time are given for the following conditions: 20°C, 1 013 mb, and vessel is stationary with lid closed. These are nominal values and may vary according to the history of the vessel and the manufacturing tolerances.

*
page
42-45

ESPACE 151 and 331 with casing

ESPACE liquid and gas phase
with casing



page 54



OPTIMAL			
ESSENTIAL			
BASIC with: T° Tracker	T°	INITIAL without racks, with: level & temperature indicator filling security server option second temperature	NT R S 2T
		with: overflow kit output for 4/20 mA & rs485	D S0
		with: Memo Traceability	M

liquid phase

gas phase

ESPACE 151 liquid or gas – without rotating tray (PT)			
			151
BASIC	T° Tracker		ESP151N-LC-1
INITIAL	NT + R + S + 2T	 	ESP151N-LC-2 ESP151N-GC-1
ESSENTIAL	NT + R + S + 2T + D + S0	 	ESP151N-LC-5 ESP151N-GC-4
OPTIMAL	NT + R + S + 2T + D + S0 + M	 	ESP151N-LC-7 ESP151N-GC-6

ESPACE 331 liquid or gas – without rotating tray (PT)			
			331
BASIC	T° Tracker		ESP331N-LC-1
INITIAL	NT + R + S + 2T	 	ESP331N-LC-3 ESP331N-GC-1
ESSENTIAL	NT + R + S + 2T + D + S0	 	ESP331N-LC-9 ESP331N-GC-7
OPTIMAL	NT + R + S + 2T + D + S0 + M	 	ESP331N-LC-13 ESP331N-GC-11

ESPACE liquid



Samples and products
are emerged completely
in liquid Nitrogen.

ESPACE gas



Samples and products
have no contact with liquid
Nitrogen.

ESPACE 331 with rotating tray PT

ESPACE 331 liquid or gas – with rotating tray (PT)			
			331
BASIC	T° Tracker		ESP331N-LC-2
INITIAL	NT + R + S + 2T	 	ESP331N-LC-4 ESP331N-GC-2
ESSENTIAL	NT + R + S + 2T + D + S0	 	ESP331N-LC-10 ESP331N-GC-8
OPTIMAL	NT + R + S + 2T + D + S0 + M	 	ESP331N-LC-14 ESP331N-GC-12

Other storage configurations are possible, please contact CRYOPAL directly.

ESPACE 331 and 661 without casing



*
page
54

ESPACE liquid and gas phase
without casing

OPTIMAL			
ESSENTIAL			
BASIC with: T° Tracker	T°	INITIAL without racks, with: level & temperature indicator filling security server option second temperature	NT R S 2T
		with: overflow kit output for 4/20 mA & RS485	D SO
		with: Memo Traceability	M

liquid phase

gas phase

ESPACE 331 liquid or gas – without rotating tray (PT)			331
BASIC	T° Tracker		ESP331N-LNC-1
INITIAL	T + R + S + 2T	 	ESP331N-LNC-3 ESP331N-GNC-1
ESSENTIAL	NT + R + S + 2T + D + SO	 	ESP331-LNC-9 ESP331-GNC-7
OPTIMAL	NT + R + S + 2T + D + SO + M	 	ESP331-LNC-13 ESP331-GNC-11

ESPACE 661 liquid or gas – with rotating tray (PT)			661
BASIC	T° Tracker		ESP661N-LNC-1
INITIAL	T + R + S + 2T	 	ESP661N-LNC-2 ESP661N-GNC-1
ESSENTIAL	NT + R + S + 2T + D + SO	 	ESP661N-LNC-5 ESP661N-GNC-4
OPTIMAL	NT + R + S + 2T + D + SO + M	 	ESP661N-LNC-7 ESP661N-GNC-6

ESPACE 331 with rotating tray PT

ESPACE 331 liquid or gas – with rotating tray (PT)			331
BASIC	T° Tracker		ESP331N-LNC-2
INITIAL	T + R + S + 2T	 	ESP331N-LNC-4 ESP331N-GNC-2
ESSENTIAL	NT + R + S + 2T + D + SO	 	ESP331N-LNC-10 ESP331N-GNC-8
OPTIMAL	NT + R + S + 2T + D + SO + M	 	ESP331N-LNC-14 ESP331N-GNC-12

Other storage configurations are possible, please contact CRYOPAL directly.

ESPACE liquid



Samples and products
are emerged completely
in liquid Nitrogen.

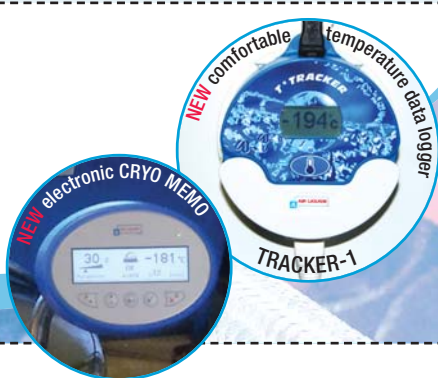
ESPACE gas



Samples and products
have no contact with liquid
Nitrogen.

RCB 500 and 600

RCB liquid or gas
with rotating tray



BASIC with: T° Tracker T°	OPTIMAL
SIMPLE with: standard lid without racks without electronics	ESSENTIAL
	INITIAL without racks, with: compensated lid B level & temperature indicator NT filling security R
	with: overflow kit D output for 4/20 mA & RS485 SO
	with: Memo Traceability M

liquid phase

RCB 500 liquid – with rotating tray (PT)		500
SIMPLE		RCB500N-L-1
BASIC T°		RCB500N-L-3
INITIAL B + NT + R		RCB500N-L-6
ESSENTIAL B + NT + R + D + SO		RCB500N-L-12
OPTIMAL B + NT + R + D + SO + M		RCB500N-L-16

liquid phase

RCB 600 liquid – with rotating tray (PT)		600
SIMPLE		RCB600N-L-1
BASIC T°		RCB600N-L-3
INITIAL B + NT + R		RCB600N-L-6
ESSENTIAL B + NT + R + D + SO		RCB600N-L-12
OPTIMAL B + NT + R + D + SO + M		RCB600N-L-16

RCB liquid



Samples and products
are emerged completely
in liquid Nitrogen.

RCB gas



Samples and products
have no contact with liquid
Nitrogen.

gas phase

RCB 600 gas – with rotating tray (PT)		600
INITIAL B + NT + R		RCB600N-G-2
ESSENTIAL B + NT + R + D + SO		RCB600N-G-8
OPTIMAL B + NT + R + D + SO + M		RCB600N-G-12

Other storage configurations are possible, please contact CRYOPAL directly.

RCB 1000 and 1001



RCB liquid or gas
with rotating tray

BASIC with: T° Tracker T°	OPTIMAL		
SIMPLE with: standard lid without racks without electronics	ESSENTIAL		
	INITIAL without racks, with: compensated lid B level & temperature indicator NT filling security R	with: overflow kit D output for 4/20 mA & RS485 SO	with: Memo Traceability M

liquid phase

RCB 1000 liquid – with rotating tray (PT)		1000
SIMPLE		RCB1000N-L-1
BASIC T°		RCB1000N-L-3
INITIAL B + NT + R		RCB1000N-L-6
ESSENTIAL B + NT + R + D + SO		RCB1000N-L-12
OPTIMAL B + NT + R + D + SO + M		RCB1000N-L-16

liquid phase

RCB 1001 liquid – with rotating tray (PT)		1001
SIMPLE		RCB1001N-L-1
BASIC T°		RCB1001N-L-3
INITIAL B + NT + R		RCB1001N-L-6
ESSENTIAL B + NT + R + D + SO		RCB1001N-L-12
OPTIMAL B + NT + R + D + SO + M		RCB1001N-L-16

RCB liquid



Samples and products
are emerged completely
in liquid Nitrogen.

RCB gas



Samples and products
have no contact with liquid
Nitrogen.

gas phase

RCB 1001 gas – with rotating tray (PT)		1001
INITIAL B + NT + R		RCB1001N-G-2
ESSENTIAL B + NT + R + D + SO		RCB1001N-G-8
OPTIMAL B + NT + R + D + SO + M		RCB1001N-G-12

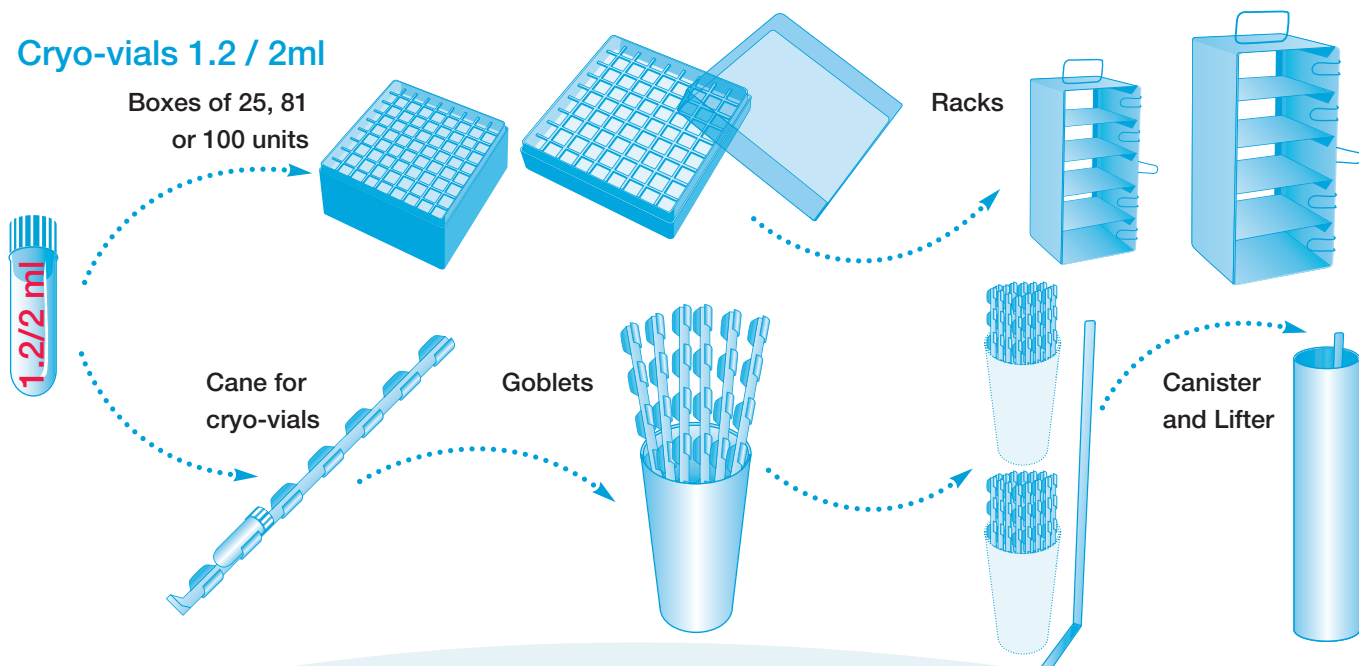
Other storage configurations are possible, please contact CRYOPAL directly.

ESPACE et RCB – Storage systems

Storage systems
cryo-vials 2ml / 5ml

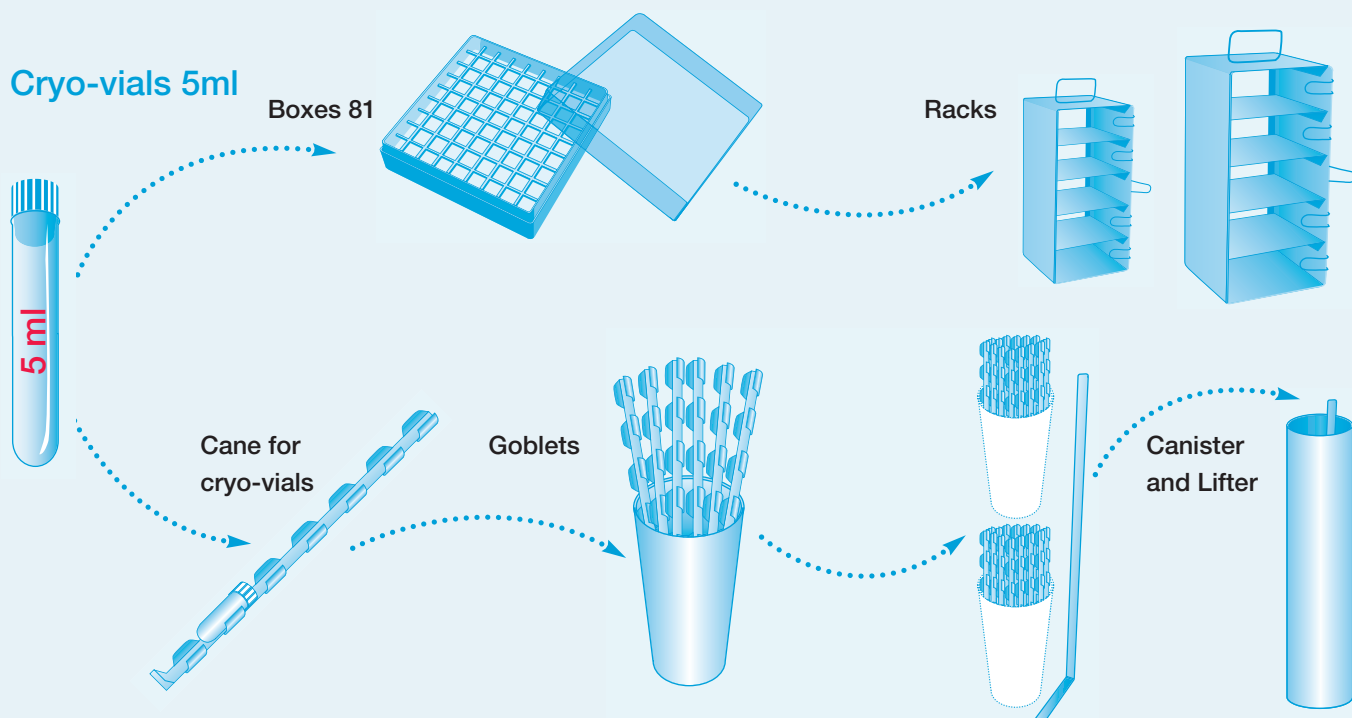
Cryo-vials 1.2 / 2ml

Boxes of 25, 81
or 100 units

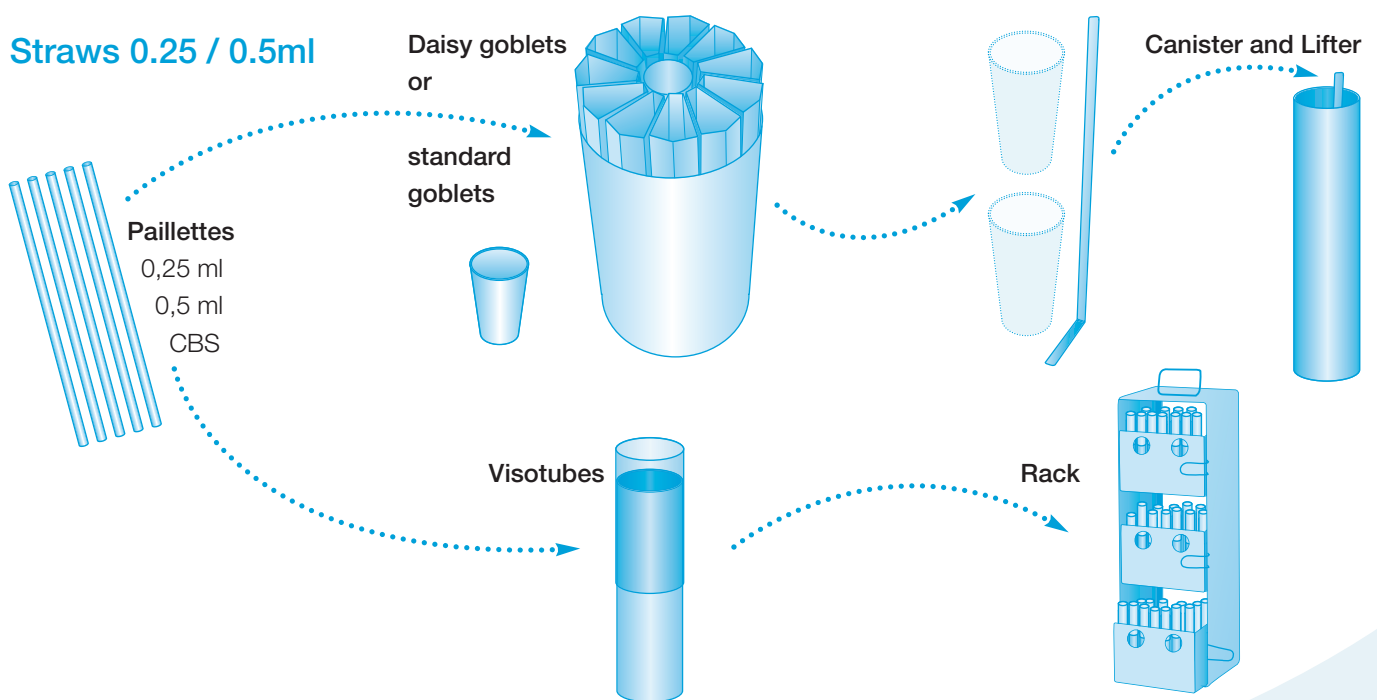


Cryo-vials 5ml

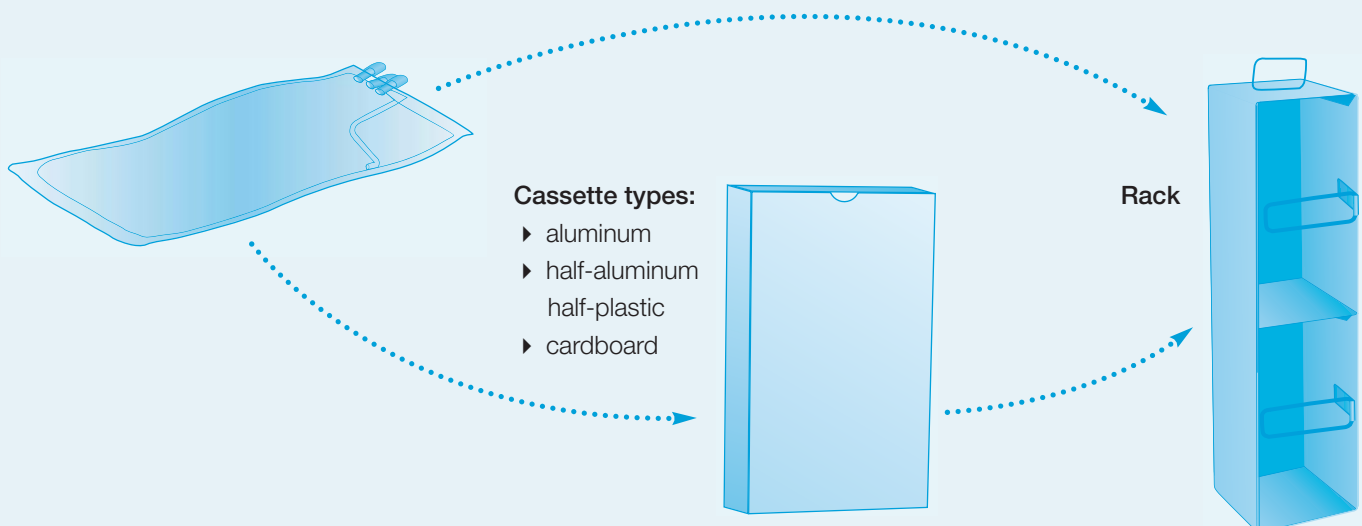
Boxes 81



Storage systems straws and bags



Bags 25 – 1000ml



ESPACE 151 / 331 / 661

Storage systems for cryo-vials

1.2/2 ml

Storage systems for Cryo-vials 1.2 / 2ml	ESPACE 151 without PT ¹⁾	ESPACE 331 without PT ¹⁾	ESPACE 331 with PT ¹⁾	ESPACE 661 with PT ¹⁾
Number of racks	7 + 4 ²⁾	17 + 6 ³⁾	15 + 6 ⁴⁾	31 + 4 ⁵⁾
Number of levels per rack	13	12	12	12
Number of cryo-vials	10,400 ⁶⁾	22,200 ⁶⁾	19,800 ⁶⁾	38,400 ⁶⁾
MAIN ACCESSORY REFERENCES				
Complete set of racks	ACC-RACK-146	ACC-RACK-148	ACC-RACK-150	ACC-RACK-152
Rack for cryo-vial boxes 81 / 100 (units per box)	ACC-RACK-6	ACC-RACK-5	ACC-RACK-5	ACC-RACK-5
Rack for cryo-vial boxes 25 (units per box)	ACC-RACK-9	ACC-RACK-8	ACC-RACK-8	ACC-RACK-8
Boxes				
complete set of 10 boxes 133 x 133 x 51 (100 units per box)	ACC-BOXTUBE-104			
complete set of 8 boxes 76 x 76 x 51 (25 units per box)	ACC-BOXTUBE-105			
complete set of 4 boxes 133 x 133 x 51 (81 units per box)	ACC-BOXTUBE-106			
Cryo-vials 1.2 / 2ml	on request			

1) PT: rotating tray

2) 7 racks (81 / 100 boxes) and 4 racks (25 boxes)

3) 17 racks (81 / 100 boxes) and 6 racks (25 boxes)

4) 15 racks (81 / 100 boxes) and 6 racks (25 boxes)

5) 31 racks (81 / 100 boxes) and 4 racks (25 boxes)

6) ESPACE 151: 10,400 cryo-vials 2ml (100 boxes) or 8,671 cryo-vials 2ml (81 boxes)

ESPACE 331: 22,200 cryo-vials 2ml (100 boxes) or 18,324 cryo-vials 2ml (81 boxes)

ESPACE 331 PT: 19,800 cryo-vials 2ml (100 boxes) or 16,380 cryo-vials 2ml (81 boxes)

ESPACE 661: 38,400 cryo-vials 2ml (100 boxes) or 31,332 cryo-vials 2ml (81 boxes)

5 ml

Storage systems for Cryo-vials 5ml	ESPACE 151 without PT	ESPACE 331 without PT	ESPACE 331 with PT	ESPACE 661 with PT
Number of racks	7	17	15	31
Number of levels per rack	7	6	6	6
Number of cryo-vials	3,969	8,262	7,290	15,066
MAIN ACCESSORY REFERENCES				
Complete set of racks	ACC-RACK-147	ACC-RACK-149	ACC-RACK-151	ACC-RACK-153
Rack for cryo-vial boxes 81 (units per box)	ACC-RACK-29	ACC-RACK-28	ACC-RACK-28	ACC-RACK-28
Boxes				
complete of 4 boxes 133 x 133 x 95 (81 units per box)	ACC-BOXTUBE-107			
Cryo-vials 5ml	on request			

Storage systems for straws

Storage systems for straws with visotubes / racks	ESPACE 151 without PT ¹⁾	ESPACE 331 without PT ¹⁾	ESPACE 331 with PT ¹⁾	ESPACE 661 with PT ¹⁾
Number of racks	7	17	15	31
Number of levels per rack	4	4	4	4
Number of visotubes per rack	85	85	85	85
Number of 0.25 ml straws	54,740	132,940	117,300	242,420
Number of 0.25 ml straws per visotube Ø 12 mm	28	28	28	28
Number of 0.5 ml straws	21,420	52,020	45,900	94,860
Number of 0.5 ml straws per visotube Ø 12 mm	10	10	10	10
Number of 0.3 – 0.5ml CBS™	14,280	34,680	30,600	63,240
Number of 0.3 – 0.5ml CBS™ per visotube Ø 12 mm	7	7	7	7
MAIN ACCESSORY REFERENCES				
Complete set of racks	ACC-RACK-196	ACC-RACK-197	ACC-RACK-198	ACC-RACK-199
Individual rack per unit	ACC-RACK-39			
Visotube with lid Ø 12 mm (batch of 100 units)	ACC-BOXTUBE-5			

Storage systems for straws in goblets / canisters	ESPACE 151 sans PT ¹⁾	ESPACE 331 sans PT ¹⁾	ESPACE 331 avec PT ¹⁾	ESPACE 661 avec PT ¹⁾
Number of canisters	46	97	88	163
Number of goblets	230	485	440	815
Number of levels of goblets	5	5	5	5
Number of 0.25 ml straws per vessel	188,600	397,700	360,800	668,300
Number of 0.25 ml straws per goblet	820	820	820	820
Number of 0.5 ml straws	83,950	177,025	160,600	297,475
Number of 0.5 ml straws per goblet	365	365	365	365
Number of 0.3 – 0.5ml CBS™ straws	51,750	109,125	99,000	183,375
Number of 0.3 – 0.5ml CBS™ straws per goblet	225	225	225	225
MAIN ACCESSORY REFERENCES				
Complete set of canisters and goblets	ACC-PLASCAN-116	ACC-PLASCAN-105	ACC-PLASCAN-104	ACC-PLASCAN-106
Plastic canisters per unit	ACC-PLASCAN-3			
Goblet Ø 65 mm (batch of 20)	ACC-BOXTUBE-301			
Goblet Ø 65 mm "Daisy" (batch of 5)	ACC-BOXTUBE-302			
Goblet with whole Ø 65 mm + lid (batch of 10)	ACC-BOXTUBE-415			

1) PT: rotating tray

ESPACE 151 / 331 / 661

Storage systems for bags

ESPACE 151 – 331 – 661 – Bags		ESPACE 151 without PT ¹⁾	ESPACE 331 without PT ¹⁾	ESPACE 331 with PT ¹⁾	ESPACE 661 with PT ¹⁾
25ml – maximum capacity bags / bags with cassette					
PALL	Number of racks	15	36	32	62
	Number of levels per rack	7	6	6	7
	Number of bags with cassettes	735	1,512	1,344	3,038
	Rack per unit	ACC-RACK-204	ACC-RACK-203	ACC-RACK-203	ACC-RACK-204
THERMOGENESIS	Number of racks	24	57	52	99
	Number of levels per rack	8	7	7	7
	Number of bags with cassettes	960	1,995	1,820	3,465
	Rack per unit	ACC-RACK-195	ACC-RACK-202	ACC-RACK-202	ACC-RACK-202
BIOSAFE	Number of racks	24	57	52	99
	Number of levels per rack	8	7	7	7
	Number of bags with cassettes	768	1,596	1,456	2,772
	Rack per unit	ACC-RACK-195	ACC-RACK-202	ACC-RACK-202	ACC-RACK-202
Cardboard cassette (9 x 76 x 92 mm) batch of 700 units		ACC-BOXTUBE-254			
Rack number labels for ESPACE / RCB (1 to 100)		ACC-RACK-223			
50ml – maximum capacity bags / bags with cassette					
Baxter R4R9951	Number of racks	14	30	29	56
	Number of levels per rack	7	7	7	7
	Number of bags with cassettes	294	630	609	1,176
	Number of bags without cassettes	392	840	812	1,568
Complete set of racks		ACC-RACK-119	ACC-RACK-127	ACC-RACK-135	ACC-RACK-142
Rack per unit		ACC-RACK-37			
Cardboard cassettes (14 x 83 x 166 mm) batch of 600 units		ACC-BOXTUBE-250			
Aluminum-plastic cassettes (17 x 92 x 173 mm) per unit		ACC-BOXTUBE-203			
Aluminum cassettes (17 x 92 x 173 mm) per unit		ACC-BOXTUBE-200			
Rack number labels for ESPACE / RCB (1 to 100)		ACC-RACK-223			
200ml / 250ml – maximum capacity bags / bags with cassette					
Gambro DF200 / Baxter R4R9954	Number of racks	12	27	25	50
	Number of levels per rack	4	4	4	4
	Number of bags with cassettes	144	324	300	600
	Number of bags without cassettes	192	432	400	800
Complete set of racks		ACC-RACK-115	ACC-RACK-123	ACC-RACK-131	ACC-RACK-138
Rack per unit		ACC-RACK-38			
Cardboard cassettes (14 x 155 x 188 mm) batch of 380 units		ACC-BOXTUBE-251			
Aluminum-plastic cassettes (17 x 164 x 194 mm) per unit		ACC-BOXTUBE-204			
Aluminum cassettes (17 x 164 x 194 mm) per unit		ACC-BOXTUBE-205			
Rack number labels for ESPACE / RCB (1 to 100)		ACC-RACK-223			

1) PT: rotating tray

Storage systems for bags

ESPACE 151 – 661 – Bags		ESPACE 151 without PT ¹⁾	ESPACE 331 without PT ¹⁾	ESPACE 331 with PT ¹⁾	ESPACE 661 with PT ¹⁾
500ml – maximum capacity bags / bags with cassette					
Baxter R4R9955	Number of racks	7	16	16	28
	Number of levels per rack	4	4	4	4
	Number of bags with cassettes	140	320	320	560
	Number of bags without cassettes	168	384	384	672
	Complete set of racks	ACC-RACK-121	ACC-RACK-129	ACC-RACK-129	ACC-RACK-129
	Rack per unit	ACC-RACK-34			
	Cardboard cassettes (12 x 138 x 236 mm) batch of 300 units	ACC-BOXTUBE-252			
	Aluminum-plastic cassettes (15 x 147 x 244 mm) per unit	ACC-BOXTUBE-202			
	Aluminum cassettes (15 x 147 x 244 mm) per unit	ACC-BOXTUBE-201			
	Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223			
750ml – maximum capacity bags / bags with cassette					
Baxter R4R9957	Number of racks	7	13	12	23
	Number of levels per rack	4	4	4	4
	Number of bags with cassettes	0	0	0	0
	Number of bags without cassettes	112	208	192	368
	Complete set of racks	ACC-RACK-122	ACC-RACK-130	ACC-RACK-137	ACC-RACK-144
	Rack per unit	ACC-RACK-35			
	Cardboard cassettes (15 x 155 x 281 mm) batch of 300 units	ACC-BOXTUBE-253			
	Aluminum-plastic cassettes (17 x 164 x 288 mm) per unit				
	Aluminum cassettes (17 x 164 x 288 mm) per unit				
	Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223			
700ml – maximum capacity bags / bags with cassette					
Gambro DF700	Number of racks (vertical / horizontal)	10 / 8	21 / 18	20 / 16	38 / 32
	Number of levels per rack (vertical / horizontal)	2 / 4	2 / 4	2 / 4	2 / 4
	Number of bags per cassette (vertical / horizontal)	/ 96	/ 216	/ 192	/ 384
	Number of bags without (vertical / horizontal)	120 / 128	252 / 288	240 / 256	456 / 512
	Complete set of vertical racks	ACC-RACK-116	ACC-RACK-124	ACC-RACK-132	ACC-RACK-139
	Complete set of horizontal racks	ACC-RACK-174	ACC-RACK-175	ACC-RACK-176	ACC-RACK-177
	Vertical racks per unit	ACC-RACK-32			
	Horizontal racks per unit	ACC-RACK-36			
	Cardboard cassettes (15 x 155 x 281 mm) batch of 300 units	ACC-BOXTUBE-253			
	Aluminum-plastic cassettes (17 x 164 x 288 mm) per unit horizontal format	ACC-BOXTUBE-207			
	Aluminum cassettes (17 x 164 x 288 mm) per unit horizontal format	ACC-BOXTUBE-206			
	Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223			

1) PT: rotating tray

RCB 500 / 600 / 1000 / 1001

Storage systems for cryo-vials

1.2/2 ml

Storage systems for Cryo-vials 1.2 ml / 2ml	RCB 500	RCB 600	RCB 1000	RCB 1001
	with rotating tray			
Number of racks	20 + 4 ¹⁾	20 + 4 ¹⁾	40 ²⁾	40 ²⁾
Number of levels per rack	13	14	12	12
Number of cryo-vials	27,300 ³⁾	29,400 ^{3) 4)}	48,000 ⁴⁾	48,000 ⁴⁾
MAIN ACCESSORY REFERENCES				
Complete set of racks	ACC-RACK-168	ACC-RACK-170	ACC-RACK-172	ACC-RACK-172
Vertical racks per unit	ACC-RACK-6	ACC-RACK-30	ACC-RACK-5	ACC-RACK-5
Boxes				
complete set of 10 boxes 133 x 133 x 51 (100 units per box)	ACC-BOXTUBE-104			
complete set of 8 boxes 76 x 76 x 51 (25 units per box)	ACC-BOXTUBE-105			
complete set of 4 boxes 133 x 133 x 51 (81 units per box)	ACC-BOXTUBE-106			
Cryo-vials 1.2 / 2ml	on request			

- 1) 20 racks (81/100 boxes) and 4 racks (25 boxes) 4) RCB 500: 26,000 cryo-vials 2ml (100 boxes) or 21,600 cryo-vials 2ml (81 boxes) et 1,300 cryo-vials 2ml (25 boxes)
 2) 40 racks (81/100 boxes) RCB 600: 28,000 cryo-vials 2ml (100 boxes) or 22,680 cryo-vials 2ml (81 boxes) et 1,400 cryo-vials 2ml (25 boxes)
 3) RCB 600 gas: 27,300 cryo-vials 2ml RCB 1000 / 1001: 48,000 cryo-vials 2ml (100 boxes) or 38,800 cryo-vials 2ml (81 boxes)

5 ml

Storage systems for Cryo-vials 5ml	RCB 500	RCB 600	RCB 1000	RCB 1001
	with rotating tray			
Number of racks	20	20	40	40
Number of levels per rack	7	8	7	7
Number of cryo-vials	11,340	12,960 ^{*)}	22,680	22,680
MAIN ACCESSORY REFERENCES				
Complete set of racks	ACC-RACK-169	ACC-RACK-171	ACC-RACK-173	ACC-RACK-173
Vertical racks per unit	ACC-RACK-29	ACC-RACK-3	ACC-RACK-29	ACC-RACK-29
Boxes				
complete set of 4 boxes 133 x 133 x 95 (81 units per box)	ACC-BOXTUBE-107			
Cryo-tubes 5ml	on request			

*) RCB 600 gas: 11,340 cryo-vials 2ml

Storage systems for straws

Storage systems for straws with visotubes / racks

	RCB 500	RCB 600	RCB 1000	RCB 1001
	with rotating tray			
Number of racks	20	20	40	40
Number of levels per rack	4	4	4	4
Number of visotubes per rack	85	85	85	85
Number of 0.25 ml straws	156,400	156,400	312,800	312,800
Number of 0.25 ml straws per visotube	28	28	28	28
Number of 0.5 ml straws	61,200	61,200	122,400	122,400
Number of 0.5 ml straws per visotube	10	10	10	10
Number of 0.3 – 0.5ml CBS™	40,800	40,800	81,600	81,600
Number of 0.3 – 0.5ml CBS™ per visotube	6	6	6	6

MAIN ACCESSORY REFERENCES

Rack per unit	ACC-RACK-200	ACC-RACK-200	ACC-RACK-201	ACC-RACK-201
Vertical racks per unit	ACC-RACK-39			
Visotube with lid Ø 10 mm (batch of 100 units)	ACC-BOXTUBE-5			

Storage systems for straws in goblets / canisters

	RCB 500	RCB 600	RCB 1000	RCB 1001
	with rotating tray			
Number of canisters	120	120	225	225
Number of goblets	575	580	1,125	1,125
Number of levels of goblets	5	6	5	5
Number of 0.25 ml straws per vessel	471,500	570,720	922,500	922,500
Number of 0.25 ml straws per goblet	164	164	164	164
Number of 0.5 ml straws	209,875	254,040	410,625	410,625
Number of 0.5 ml straws per goblet	73	73	73	73
Number of 0.3 – 0.5ml CBS™ straws	129,375	156,600	253,125	253,125
Number of 0.3 – 0.5ml CBS™ straws per goblet	45	45	45	45

MAIN ACCESSORY REFERENCES

Complete set of canisters and goblets	ACC-PLASCAN-100	ACC-PLASCAN-101	ACC-PLASCAN-102	ACC-PLASCAN-102
Plastic canisters per unit	ACC-PLASCAN-3	ACC-PLASCAN-5	ACC-PLASCAN-3	ACC-PLASCAN-3
Goblet Ø 65 mm (batch of 20)	ACC-BOXTUBE-301			
Goblet Ø 65 mm "Daisy" (batch of 5)	ACC-BOXTUBE-302			
Goblet with whole Ø 65 mm + lid (batch of 10)	ACC-BOXTUBE-415			

RCB 500 / 600 / 1000 / 1001

Storage systems for bags

liquid phase

gas phase

RCB 500 – 600 – 1000 – 1001 – Bags

RCB 500

RCB 600

RCB 600

RCB 1000

RCB 1001

RCB 1001

with rotating tray

25ml – maximum capacity bags / bags with cassette

PALL	Number of racks	42	42	42	82	82	82
	Number of levels per rack	7	8	8	7	7	7
	Number of bags with cassettes	2,058	2,352	2,352	4,018	4,018	4,018
	Rack per unit	ACC-RACK-204	ACC-RACK-206	ACC-RACK-205	ACC-RACK-204	ACC-RACK-205	ACC-RACK-204
THERMOGENESIS	Number of racks	68	68	68	126	126	126
	Number of levels per rack	8	9	9	8	8	8
	Nombre de poches avec étuis 	2,720	3,060	3,060	5,040	5,040	5,040
	Rack per unit	ACC-RACK-195	ACC-RACK-193	ACC-RACK-194	ACC-RACK-195	ACC-RACK-194	ACC-RACK-195
BIOSAFE	Number of racks	68	68	68	126	126	126
	Number of levels per rack	8	9	9	8	8	8
	Number of bags with cassettes	2,176	2,448	2,448	4,032	4,032	4,032
	Rack per unit	ACC-RACK-195	ACC-RACK-193	ACC-RACK-194	ACC-RACK-195	ACC-RACK-194	ACC-RACK-195

*  page 37
Cardboard cassette (9 x 76 x 92 mm) batch of 700 units
Rack number labels for ESPACE / RCB (1 to 100)

ACC-BOXTUBE-254

ACC-RACK-223

50ml – maximum capacity bags / bags with cassette

Baxter R4R9951	Number of racks	36	36	30	70	70	70
	Number of levels per rack	7	7	7	7	7	7
	Number of bags with cassettes	756	756	756	1,470	1,470	1,470
	Number of bags without cassettes 	1,008	1,008	1,008	1,960	1,960	1,960
	Complete set of racks	ACC-RACK-157	ACC-RACK-157	ACC-RACK-157	ACC-RACK-164	ACC-RACK-164	ACC-RACK-164
	Rack per unit	ACC-RACK-37					
	Cardboard cassettes (14 x 83 x 166 mm) batch of 600 units	ACC-BOXTUBE-250					
	Aluminum-plastic cassettes (17 x 92 x 173 mm) per unit	ACC-BOXTUBE-203					
	Aluminum cassettes (17 x 92 x 173 mm) per unit	ACC-BOXTUBE-200					
	Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223					

200ml / 250ml – maximum capacity bags / bags with cassette

Gambro DF200 / Baxter R4R9954	Number of racks	32	32	32	62	62	62
	Number of levels per rack	4	4	4	4	4	4
	Number of bags with cassettes	384	384	384	749	749	749
	Number of bags without cassettes 	512	512	512	992	992	992
	Complete set of racks	ACC-RACK-154	ACC-RACK-154	ACC-RACK-154	ACC-RACK-161	ACC-RACK-161	ACC-RACK-161
	Rack per unit	ACC-RACK-38					
	Cardboard cassettes (14 x 155 x 188 mm) batch of 380 units	ACC-BOXTUBE-251					
	Aluminum-plastic cassettes (17 x 164 x 194 mm) per unit	ACC-BOXTUBE-204					
	Aluminum cassettes (17 x 164 x 194 mm) per unit	ACC-BOXTUBE-205					
	Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223					

Storage systems for bags

liquid phase

gas phase

RCB 500 – 600 – 1000 – 1001 – Bags

RCB 500

RCB 600

RCB 600

RCB 1000

RCB 1001

RCB 1001

with rotating tray

500ml – maximum capacity bags / bags with cassette

Number of racks	18	18	18	36	36	36
Number of levels per rack	4	4	4	4	4	4
Number of bags with cassettes	360	360	360	720	720	720
Number of bags without cassettes	432	432	438	864	864	864
Complete set of racks	ACC-RACK-159	ACC-RACK-159	ACC-RACK-159	ACC-RACK-166	ACC-RACK-166	ACC-RACK-166
Rack per unit	ACC-RACK-34					
Cardboard cassettes (12x138x236 mm) batch of 300 units	ACC-BOXTUBE-252					
Aluminum-plastic cassettes (15x147x244 mm) per unit	ACC-BOXTUBE-202					
Aluminum cassettes (15x147x244 mm) per unit	ACC-BOXTUBE-201					
Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223					

750ml – maximum capacity bags / bags with cassette

Number of racks	14	14	14	30	30	30
Number of levels per rack	4	4	4	4	4	4
Number of bags with cassettes						
Number of bags without cassettes	224	224	224	480	480	480
Complete set of racks	ACC-RACK-160	ACC-RACK-160	ACC-RACK-160	ACC-RACK-167	ACC-RACK-167	ACC-RACK-167
Rack per unit	ACC-RACK-35					
Cardboard cassettes (15x155x281 mm) batch of 300 units	ACC-BOXTUBE-253					
Aluminum-plastic cassettes (17x164x288 mm) per unit						
Aluminum cassettes (17x164x288mm) per unit						
Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223					

700ml – maximum capacity bags / bags with cassette

Number of racks (vertical / horizontal)	26 / 20	26 / 20	26 / 20	50 / 38	50 / 38	50 / 38
Number of levels per rack (vertical / horizontal)	2 / 4	2 / 4	2 / 4	2 / 4	2 / 4	2 / 4
Number of bags per cassette (vertical / horizontal)	/ 240	/ 240	/ 240	/ 1456	/ 1456	/ 1456
Number of bags without (vertical / horizontal)	312 / 320	312 / 320	312 / 320	600 / 608	600 / 608	600 / 608
Complete set of vertical racks	ACC-RACK-156	ACC-RACK-156	ACC-RACK-156	ACC-RACK-163	ACC-RACK-163	ACC-RACK-163
Complete set of horizontal racks	ACC-RACK-178	ACC-RACK-178	ACC-RACK-178	ACC-RACK-179	ACC-RACK-179	ACC-RACK-179
Vertical racks per unit	ACC-RACK-32					
Horizontal racks per unit	ACC-RACK-36					
Cardboard cassettes (15x155x281 mm) batch of 300 units	ACC-BOXTUBE-253					
Aluminum-plastic cassettes (17x164x288 mm) per unit(horizontal)	ACC-BOXTUBE-207					
Aluminum cassettes (17x164x288mm) per unit (horizontal)	ACC-BOXTUBE-206					
Rack number labels for ESPACE / RCB (1 to 100)	ACC-RACK-223					

ESPACE and RCB

Options and accessoires



Rotating tray makes it easier to store and access samples and products (ESPACE 331 option ??? ESPACE 661 and included in the RCB line).



Flexible cryogenic hose to connect the storage vessels to the Nitrogen source.

1.1 m: ACC-FL180180NL-11
1.5 m: ACC-FL180180NL-15
2.0 m: ACC-FL180180NL-20
3.0 m: ACC-FL180180NL-30
4.0 m: ACC-FL180180NL-40



Portable step platform making it easier to store and access samples and products (available for ESPACE 661 and the RCB line).

ESPACE 661: ACC-ESP-341
RCB 600: ACC-RCB-213
RCB 1000/1001: ACC-RCB-212



Manual level ruler for measuring the liquid Nitrogen level in a vessel.
ACC-BOXTUBE-412



Compensated lid for easier use.
RCB 500 / 600: ACC-RCB-215
RCB 1001 / 1001: ACC-RCB-214



Tank dividers to facilitate sample and product storage management and traceability. **RCB 500 / 600**

double partition: ACC-RCB-5
triple partition: ACC-RCB-6
quadruple partition: ACC-RCB-7

RCB 1000 / 1001

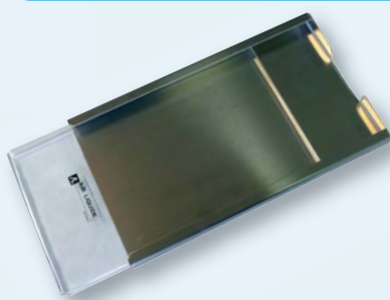
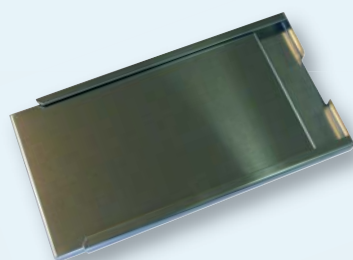
double partition: ACC-RCB-8
triple partition: ACC-RCB-9
quadruple partition: ACC-RCB-10

Storage cassettes

Protecting your biological samples
for cryogenic storage



- ▶ **Less expensive and disposable:**
available in cardboards
- ▶ **For all types of bio-storage bags:**
from 25 ml up to 1000 ml
- ▶ **Compact and easy to stock**



Main Characteristics

- ▶ 6 times lighter than traditional aluminum cassettes making it much easier and safer for operators when handling the storage racks
- ▶ Use in all types of cryogenic storage freezers and freezer racks, in liquid and gas phase
- ▶ Easy to identify: bar code, specific label or hand written with a standard ink pen
- ▶ Printing option to personalize the cassettes (minimum order of 20,000 units)

Storage	Bag Size	Manufacturer	Bags	Ref of Article
CHARACTERISTICS				
Set of 700 Cardboard cassette	25 ml	PALL	PALL25	ACC-BOXTUBE-254
Set of 600 Cardboard cassette	50 ml	BAXTER	CRYOCYTE 50	ACC-BOXTUBE-250
		MACO-PHARMA	GSR1000AU	
Set of 380 Cardboard cassette	200/250 ml	BAXTER	CRYOCYTE 250	ACC-BOXTUBE-251
		GAMBRO	DF200	
Set of 380 Cardboard cassette	500 ml	MACO-PHARMA	GSR2000AU	ACC-BOXTUBE-252
		BAXTER	CRYOCYTE 500	
Set of 300 Cardboard cassette	700/750 ml	GAMBRO	DF170	ACC-BOXTUBE-253
		MACO-PHARMA	GSR5000AU	
Set of 300 Cardboard cassette	1,000 ml	BAXTER	CRYOCYTE 750	ACC-BOXTUBE-255
		GAMBRO	DF700	
Aluminium cassette	50 ml	MACO-PHARMA	GSR7000AU	ACC-BOXTUBE-254
Aluminium cassette	200 ml	GAMBRO	DF1000	ACC-BOXTUBE-255
Aluminium cassette	50 ml	BAXTER	BAXTER 50	ACC-BOXTUBE-200
Aluminium cassette	200 ml		DF200	ACC-BOXTUBE-205
Aluminium cassette	500 ml	BAXTER	BAXTER 500	ACC-BOXTUBE-201
Aluminium cassette	700 ml		DF 700	ACC-BOXTUBE-206
Mid-Aluminium mid-Plastic cassette	50 ml	BAXTER	BAXTER 50	ACC-BOXTUBE-203
Mid-Aluminium mid-Plastic cassette	200 ml		DF200	ACC-BOXTUBE-204
Mid-Aluminium mid-Plastic cassette	500 ml	BAXTER	BAXTER 500	ACC-BOXTUBE-202
Mid-Aluminium mid-Plastic cassette	700 ml		DF 700	ACC-BOXTUBE-207
Mid-Aluminium mid-Plastic cassette	1,000 ml		DF 1000	ACC-BOXTUBE-208

VOYAGEUR – Dry Shippers (2 – Plus)



A dedicated line of transportation vessels for biological and pharmaceutical samples (straws, cryo-tubes, bags...)



- ▶ Maximum storage – 500 cryo-tubes 2 ml
- ▶ Vessels comply with the EC Medical Directive 93/42 EEC
- ▶ Vessels comply with the international regulations applicable to the transport of dangerous materials by land (ADR) air (IATA-OACI) and rail (RID)
- ▶ No risk during transportation – the liquid nitrogen is absorbed
- ▶ Samples are transported in a gaseous or “dry” phase
- ▶ Liquid nitrogen use is reduced
- ▶ 6 year guarantee on the vacuum

T°Tracker C

- ▶ Option: comfortable temperature data logger



Voyageur 5 with T°TRACKER

Protective shipping cases B

Main characteristics include:

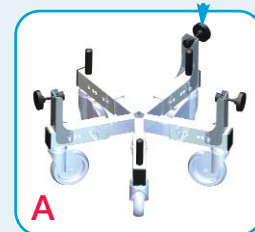
- ▶ Made out of aluminum with insulating resin
- ▶ Lightweight and very resistant
- ▶ High quality polyurethane paint
- ▶ 4 different models



The Voyageur's lids are designed to be locked (except for Voyageur 2, the locks are not included)

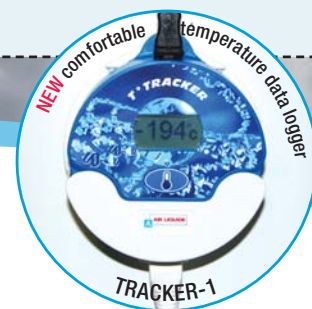


Fixation kit for the roller bases (optional): ACC-ALU-32





Storage racks



VOYAGEUR

		VOYAGEUR 2	VOYAGEUR 5	VOYAGEUR 12	VOYAGEUR PLUS
CHARACTERISTICS					
Liquid capacity	l	1,75	6,5	15	20,6
Absorbed capacity	l	1,35	4,8	10,5	7,2
Diameter of neck	mm	30	50	80	215
Weight empty	kg	2,4	7,5	11,6	14,2
Weight full	kg	3,5	11,3	20	20
External diameter	mm	174	248	308	356
Total height	mm	395	550	570	575
Daily evaporation rate	l/d	0,1	0,13	0,24	0,8
Dynamic holding time ¹⁾	d	8	23	28	6
Number of canisters		2	2	2	

STORAGE CAPACITY AND TYPE OF CANISTERS

Diameter of canisters	mm	26	41	71	
Height of canisters	mm	120	280	280	
Number of level of goblets		1	2	2	
Max. capacity of 0.25 ml straws		220	1,040	3,280	9,840
Max. capacity of 0.5 ml straws		100	400	1,320	4,380
Total capacity of 2 ml cryo-vials on canes			84	252	612 ²⁾
Total capacity of 5 ml cryo-vials on canes			42	126	306
Total capacity of (2 ml / 5 ml) cryo-vials in box					500/162
For the different capacities for bags, e.g. Baxter, Gambro, etc					please contact us

PRODUCT REFERENCES

VOYAGEUR with T°Tracker, including 2 canisters	VOYAGEUR2-3	VOYAGEUR5-3	VOYAGEUR12-3	VOYAGEUR20-3
VOYAGEUR including 2 canisters	VOYAGEUR2-2	VOYAGEUR5-2	VOYAGEUR12-2	VOYAGEUR20-2 ³⁾

MAIN ACCESSORY REFERENCES

A: Roller base				ACC-ALU-29
B: Plastic protective shipping case	ACC-VOY-100	ACC-VOY-101	ACC-VOY-102	ACC-VOY-103
C: T°Tracker	TRACKER-1			
D: Lid	ACC-ALU-18	ACC-VOY-4	ACC-VOY-5	ACC-VOY-6
E: Straight canister	ACC-PLASCAN-7	ACC-PLASCAN-10	ACC-PLASCAN-11	
E1: Off-centered canister	ACC-PLASCAN-6	ACC-PLASCAN-9	ACC-PLASCAN-8	
F: Rack with 5 levels for 2 ml cryo-tubes 75x75 (box for 25 units)				ACC-RACK-7
G: Rack with 5 levels for 2 ml cryo-tubes 133x133 (box for 100 units)				ACC-RACK-4
G1: Rack with 2 levels for 5 ml cryo-tubes 133x133				ACC-RACK-2
H: Rack with 3 levels for 25 ml bags				ACC-RACK-316

Rack for 2 ml cryo-tubes
2 ml (in boxes of 25 units)

F

Rack for 2 ml
cryo-tubes (in boxes
of 100 units)

G



Rack for bags

Carrying strap VOYAGEUR 2



1) VOYAGEURS 2, 5, 12 include
canisters

2) Cryo-tube box for 100 units

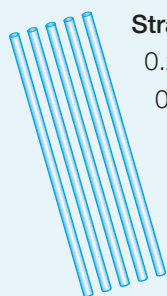
3) VOYAGEUR PLUS without canisters



VOYAGEUR

Storage systems

VOYAGEUR 2



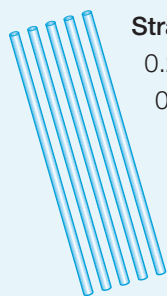
Straws
0.25ml
0.5ml
CBS



Canister
plastic 1 level



VOYAGEUR 5 and 12



Straws
0.25ml
0.5ml
CBS



Goblets
ø 35 VOYAGEUR 5
ø 65 VOYAGEUR 12

Lifter
for removing
2 goblets from
a canister with
2 levels



**Canister in
stainless steel**



Cryo-vials

Canes



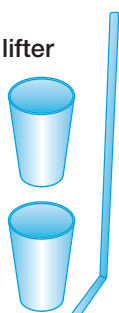
**Canister in
stainless steel**



Str
0.
0

Straws
0.25ml
0.5ml
CBS

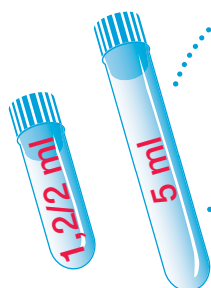
Goblet and lifter



Canister
in plastic



Cryo-vials

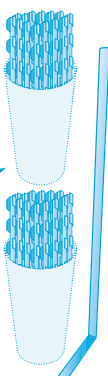


Canes

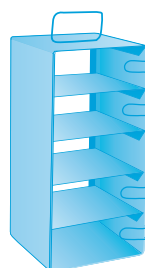


Goblet and lifter

Boxes
25, 81 and 100



Rack



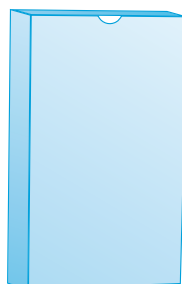
Canister
in plastic



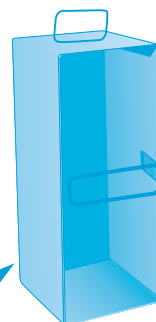
Bags 25 750ml



Cassette



Rack



Information management

Temperature monitoring, level monitoring, control and traceability

A comprehensive line of electronic kits designed for recording the key information linked to the required specifications of stored products, e.g. temperature, liquid and gas levels, and automatic filling of the vessels. The principal configurations for this monitoring include:

A : NT

level and temperature indicators

B : NT + R

A + auto-filling to maintain correct level of liquid nitrogen

C : NT + R + 4-20mA

B + 4-20mA unit

D : NT + R + RS485

B + RS485 unit



Temperature indicator (T)

Records and displays temperature in °C or °F. The indicator includes a programmable alarm that is both audible and visual, dry contacts that record the alarms and open and close a solenoid valve for auto-filling (available on the NATAL40 and the ARPEGE, ESPACE and RCB lines).

Level indicator (N)

Records and displays the level of liquid nitrogen in % via a capacity gauge placed inside of the vessel. The indicator includes a programmable alarm based on a specified level that



is both audible and visual, dry contacts that record the alarms and open and close solenoid valve for auto-filling and over flow of liquid nitrogen (available on the NATAL40 and the ARPEGE, ESPACE and RCB lines).

T"TRACKER

The T"TRACKER is a traceability device, hardware with integrated software, which shows and records the interior temperature of a shipping vessel, e.g. during the transportation of samples. T"TRACKER shows, measures, records and



stores the temperature readings at regular intervals using a PT100 sensor. The recorded data is convertible to EXCEL. Available on the GT, ARPEGE, ESPACE, RCB and VOYAGEUR lines.

COOLBASE – sample management software

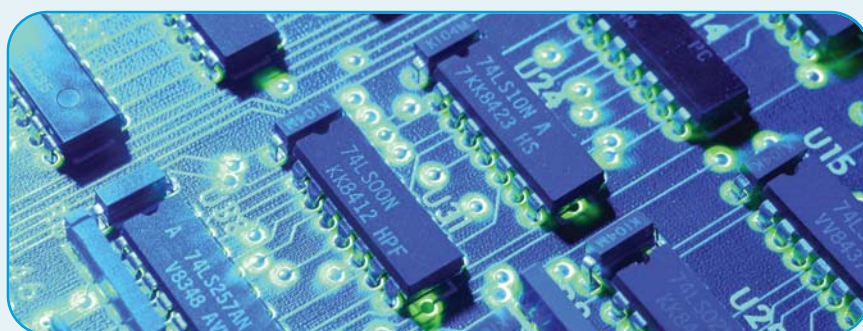
COOLBASE is a software package designed to organize and track the inventory of individual samples. COOLBASE is a complete sample management system, simple in design and easy to use allowing for the definition, visualization, placement and



retrieval of each sample in its storage vessel. The vessel configuration can be adapted or customized for each inventory system. The user defines the fields which characterize the samples, e.g. project reference, donor name, sample type... Profiles can be established to secure and determine the users' function and access to the data. Easy sample "search and find" function and reporting forms for easy printouts to maximize sample traceability. COOLBASE can be installed in a single work station and on and network.

Level indicator and regulator (R)

Mandatory for gas or vapor phase vessels, the level indicator and regulator system works in parallel with the automatic filling of liquid nitrogen between two predetermined levels. The system also includes a solenoid valve and a cryogenic flexible hose connection to the supply of liquid nitrogen, e.g. a vacuum jacketed line, TP or TPED liquid nitrogen storage vessels. The liquid nitrogen level reading and display is in % and



comes from the capacity gauge of the vessel. The display box also shows the high and low level % for the liquid nitrogen, a programmable visual and audio alarm, and dry contacts for recording the alarm reports (classic version available on the ARPEGE; for ESPACE and RCB lines: CryoMemo).

4-20mA electronic unit

The 4-20mA unit is a peripheral option to the standard electronics supplied with cryogenic containers such as the level and temperature gauges in the form of two blue units. The 4-20 unit is used to regulate the nitrogen level within a container fitted with level and temperature gauges for storing in a liquid or gas phase. This unit is also used to monitor the level and temperature remotely using two 4-20mA loops. The unit is able to use the signals coming from the level and temperature indicators, generate alarms, manage operating functions and the dry contacts, control the solenoid valve and transmit data to remote

monitoring boards (measurements) in an analogue manner on a 4-20mA connection (classic version available on the ARPEGE; for ESPACE and RCB lines: CryoMemo).

RS485 level controller and remote control unit

The RS485 unit is a peripheral option to the standard electronics supplied with cryogenic containers such as the level and temperature gauges in the form of two blue units. The RS485 unit is used to regulate the nitrogen level within a container fitted with level and temperature gauges for storing in the liquid or gas phase. This product is also used to monitor via an RS485 modebus link, the interface can transmit temperature and level data and the status of the various alarms and controls. Alarm and data hard contacts are available for local operation (classic version available on the ARPEGE; for ESPACE and RCB lines: CryoMemo).

T° TRACKER

Powerful and easy to use
temperature traceability tool

Easy to affix to all our vessels...

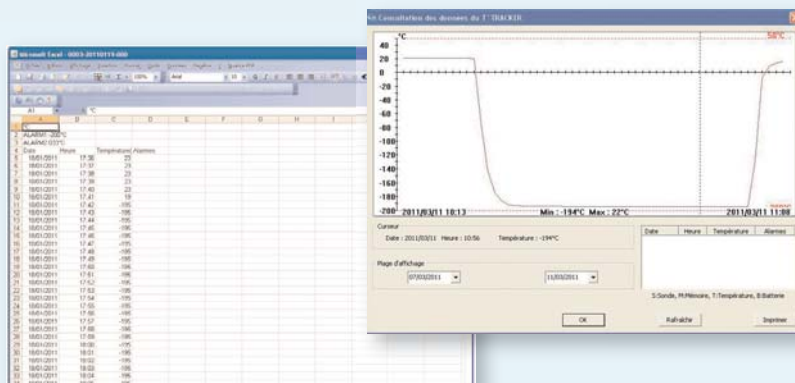


6 reasons to use the T° TRACKER

- **Covers a wide range of temperatures**
 - Real-time display on the T° TRACKER's backlit LCD for temperature levels between +50°C and -200°C.
- **Large memory capacity**
 - Temperature history from 91 days up to 14 years.
- **Real-time display of the different alarms:**
 - Temperature
 - Temperature probe default
 - Memory capacity full
 - Battery level
 - Annual calibration
- **One complete, compact tool for mobile or fixed temperature traceability:**
 - Runs on 3 AAA batteries for period of 15 months when the batteries will need to be replaced or the units can be connected to a standard electrical outlet.
- **Easy to affix on different surfaces:**
 - Compact and easy to affix, (the T° TRACKER can be affixed with screws, rivets and industrial Velcro), the units can be attached to all types of vessels or surfaces.
- **Reliability**
 - Alarm for annual factory calibration
 - Certificate of factory calibration

The operating software

- **User friendly and available in 7 different languages.**
- **Download and store the collected data using a USB cable.**
- **Transform the collected data from table format into graph format.**

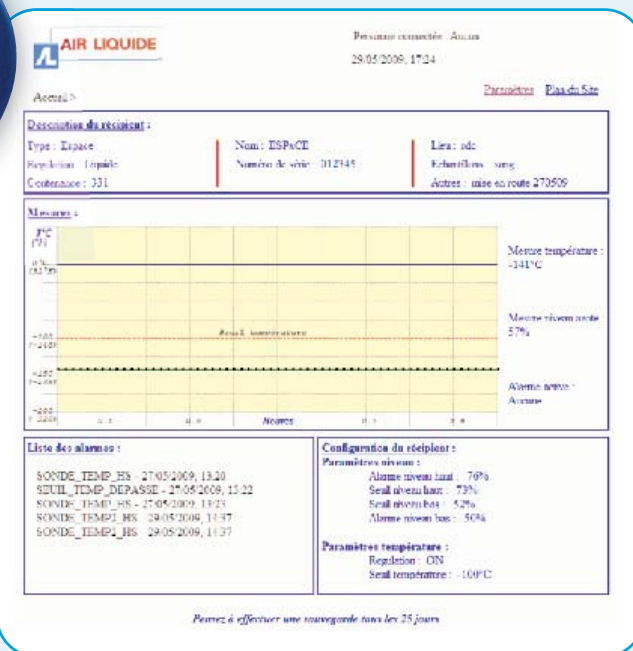


CRYOMEMO

Your choice of electronic option will be simplified and facilitated

The advantages of CRYOMEMO?

- An interface man machine friendlier,
- A new design for more pleasant use,
- An easy access to the data,
- Intuitive menus, multilingual,
- A global offer of traceability and supervision,
- An integration of several options of safety,
- An Internet server for a display and a remote surveillance on all the versions



GT for dermatology (2 – 21)

Vessels designed for storage of liquid nitrogen for dermatological applications

GT equipped with 2 ladle type canisters



Canister height
25 and 50 mm

Hook fixed on the canister



CRYAL JET maxi

- ▶ Compliant to the European Medical Directive 93/42 EEC
- ▶ Available in 4 sizes: 2, 9, 11 and 21 litres
- ▶ Light and easy to handle
- ▶ Secure hook system on the canisters
- ▶ Allows operator to use both hands reducing risks
- ▶ 6 year guarantee on the vacuum



CRYAL JET

Cryogenic spray vessel
for liquid nitrogen equipped with
different spray nozzles for the treatment
of different types of topical skin lesions

Easy to fill the Cryal Jet by using
a TR simplified decanting
system **A**
TR line, see page 10

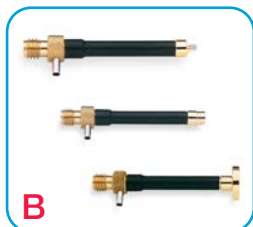
Accessories



Simplified decanting system
Ref.: ACC-DERMATO-1



- Compliant to the European Medical Directive 93/42 EEC
- Available in 2 sizes: 0.3 and 0.5 litres
- Easy to use
- Stainless steel
- Immediate liquid nitrogen spray
- Supplied with a set of six nozzles, designed for treating the most common lesions



Contact probe

Ref. : ACC-CRYALJET-204



Nozzles Buses

Ref. : ACC-CRYALJET-105



Gloves cryo 

Ref.: ACC-SECU-15 / 18



Visor

Ref. : ACC-SECU-1



Polypro disques

Ref. : ACC-CRYALJET-3

DERMATO

		CRYAL JET				
		GT 2	GT 9	GT 11	GT 21	MAXI
MAIN CHARACTERISTICS INCLUDE						
Volume capacity	l	2	9.3	12.2	21.5	0.5
Neck diameter	mm	30	50	50	50	68.5
Static holding time	d	25	84	130	225	24
Weight empty	kg	1.9	8.2	9.2	13	0.62
Weight full	kg	3.5	15.7	19	30.4	0.94
Total height	mm	392	450	630	660	285
Canister diameter	mm	26	31	31	31	
PRODUCT REFERENCES						
GT DERMATO with 2 stainless steel canisters ¹⁾²⁾		GT2-DERMATO-1	GT9-DERMATO-1	GT11-DERMATO-1	GT21-DERMATO-1	
CRYAL JET MAXI 0.5 l (with 6 nozzles)						CRYALJET50-1

1) GT 2 DERMATO: with 1 stainless steel canister 2) GT 9 / 11 / 21 DERMATO: with 1 25 mm high ladle canister and 1 50 mm high ladle canister – stainless steel.

How to transfer cryogenic fluids

Standard flexible hoses

You want to fill **A** from **B**

B

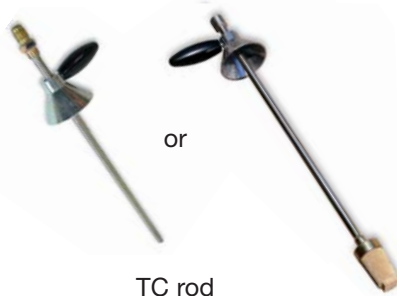


TP 35, 60, 100



Ranger 180

Manual Filling (using a withdrawal rod)



or

TC rod

+



180/180 hose

A



AGIL



VOYAGEUR



GT



TP



ARPEGE



TR

Remplissage Automatique (connexion directe)



Flexible 180/180

A



ARPEGE



TP



RANGER 180

Standard flexible hoses

B



RANGER 450



RANGER 630

Manual Filling (using a withdrawal rod)

Hose



TC rod



Flexible 630/180

A



AGIL



VOYAGEUR



GT



TP



ESPACE



ARPEGE



TR



RCB

Automatic Filling (direct connection)



630/180 Hose



ESPACE



RCB

A



ARPEGE



RANGER 180

B



Storage tank

Automatic Filling (direct connection)



630/180 Hose

A



RANGER 180



630/630 Hose

A



RANGER 450



RANGER 630

How to transfer cryogenic fluids

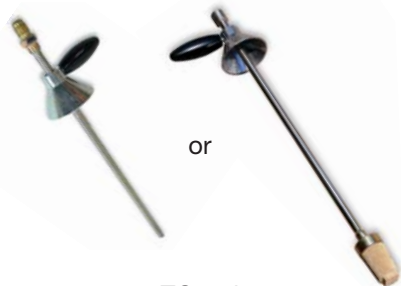
Standard flexible hoses

B



Vacuum line

Manual Filling (using a withdrawal rod)



or

TC rod

+



180/180 hose

A



AGIL

VOYAGEUR



GT



TP



ARPEGE



TR

Automatic Filling (direct connection)



180/180 hose

A



ARPEGE



ESPACE



TP



RCB

BBO "Boyer" hoses

Use BBO hoses (insulated hoses) for transferring cryogenic fluids (nitrogen or argon) more efficiently than with non-insulated hoses.

Main advantages

- ▶ Stays frost-free for longer
- ▶ Reduces liquid nitrogen loss (good thermal performance)
- ▶ Connects using a 180NL (wing nuts) or a 3-part connector
- ▶ 304L/316L stainless steel
- ▶ Tighter bend radius
- ▶ Stainless steel protective outer cover

Applications

- ▶ Cryobiology (healthcare, pharmaceutical products etc.)
- ▶ Chemicals
- ▶ Electronics (semiconductors etc.)
- ▶ Food industry
- ▶ Industry, steel making...

BBO hose - Standard			AL DMC Reference
Ø	Raccordement	Long. m	
DN8	1/4 BSP-T (gas connection)	1	ACC-FLBBONL-DN8-1
		2	ACC-FLBBONL-DN8-2
		3	ACC-FLBBONL-DN8-3
DN8	180 NL	1	ACC-FLBBONL-DN8-4
		2	ACC-FLBBONL-DN8-5
		3	ACC-FLBBONL-DN8-6
DN15	1/2 BSP-T (gas connection)	1	ACC-FLBBONL-DN15-1
		2	ACC-FLBBONL-DN15-2
		3	ACC-FLBBONL-DN15-3



3-part connector



180NL connector

How to transfer cryogenic fluids

Vacuum lines



Superinsulated vacuum lines, whether rigid or flexible, optimise the cryogenic fluid transfer process (nitrogen, oxygen, argon, CO₂).

Made-to-measure at our factory, they are designed to be site-installed by welding or using male-female couplings

They have the following benefits

- ▶ Excellent thermal performance (low consumption)
- ▶ No need for maintenance
- ▶ Maximum security
- ▶ 304L stainless steel
- ▶ Small form factor
- ▶ Frost-free (vacuum sections)

Applications

- ▶ Cryobiology (healthcare, pharmaceutical products etc.)
- ▶ Chemicals
- ▶ Electronics (semiconductors etc.)
- ▶ Food industry
- ▶ Space industry (cryogenic food storage - Ariane 4 and Ariane 5)
- ▶ Industry, steel making...

Technical solutions

- ▶ Flexible or rigid lines
- ▶ Internal diameter: DN10 to DN100
- ▶ Operating pressure: PN6 to PN15
- ▶ Welded or screwed (Johnston couplings)
- ▶ Accessories: purger, phase separator, valves, hoses etc.

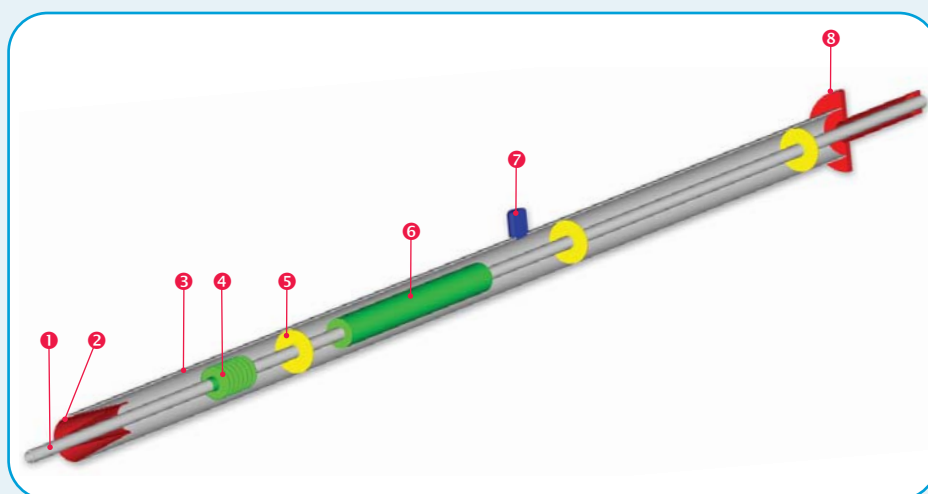


Diagram of a vacuum line

- 1 Inner tube
- 2 Thermal barrier
- 3 Outer jacket
- 4 Contraction compensator
- 5 Centering ring
- 6 Adsorbent
- 7 Vacuum and safety clack valve
- 8 Male Johnston connector (see couplings, page 64)

Description of a vacuum line

Flexible vacuum line

Rigid VL		10	20	32	50	80	100
SPECIFICATIONS							
ø inner	mm	16x1	26,9x1,6	42,4x1,6	60,3x1,6	88,9x1,6	114,3x2
ø outer	mm	60,3	76,1	88,9	114,3	139,7	168,3
Performance	W/m	0,38	0,53	0,73	1	1,4	1,75
Weight	Kg/m	2,9	4,2	5,5	8,5	11,5	15

Flexible VL		10	20	32	50
SPECIFICATIONS					
ø inner	mm	14	23,7	39,2	57,1
ø outer	mm	68	84	103	130
Performance	W/m	0,6	0,85	1,2	1,6
Weight	Kg/m	1,2	3,7	4,8	9,2

Applications

Flexible vacuum lines can be used to transfer your cryogenic fluids such as liquid argon and nitrogen from a storage tank to the point of use without interruption.

They come in three diameters and different lengths. Maximum operating pressure is 6 bar.

Advantages

Lines kept in stock for hire or sale. Lines reinforced with a protective coil.

Connection

Coupling using butt-welding and PU sleeve

CO₂ vacuum line

- ▶ Simplified version of the standard lines
- ▶ Rigid lines only
- ▶ PN25
- ▶ DN10 to 50 (others available on request)
- ▶ Coupling using butt-welding and PU sleeve *



Vacuum line		AL DMC Reference
DN	Length (m)	
DN10	2	NH99410-2M
	5	NH99410-5M
	10	NH99410-10M
	20	NH99410-20M
DN20	2	NH99420-2M
	5	NH99420-5M
	10	NH99420-10M
	20	NH99420-20M
DN32	5	NH99532-5M
	10	NH99532-10M

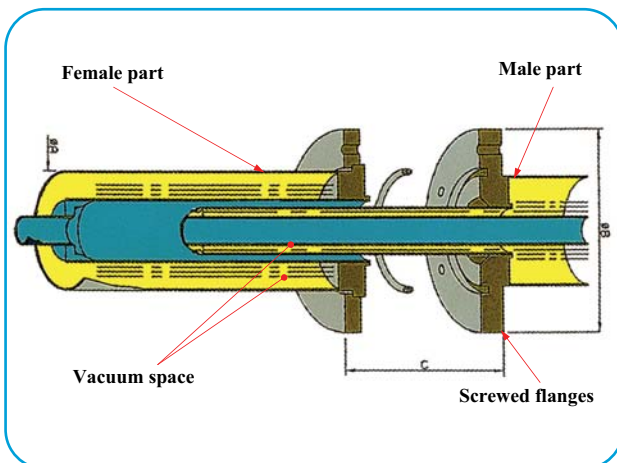
Must not be used with oxygen

Connections and couplings



Johnston connections (vacuum)

Weld-free connections, rapid assembly and dismantling thanks to interlocking parts (screw, collar or clamps).
Guaranteed no disruption to thermal performance.
Available in DN10, 20, 32 (HP), 50.



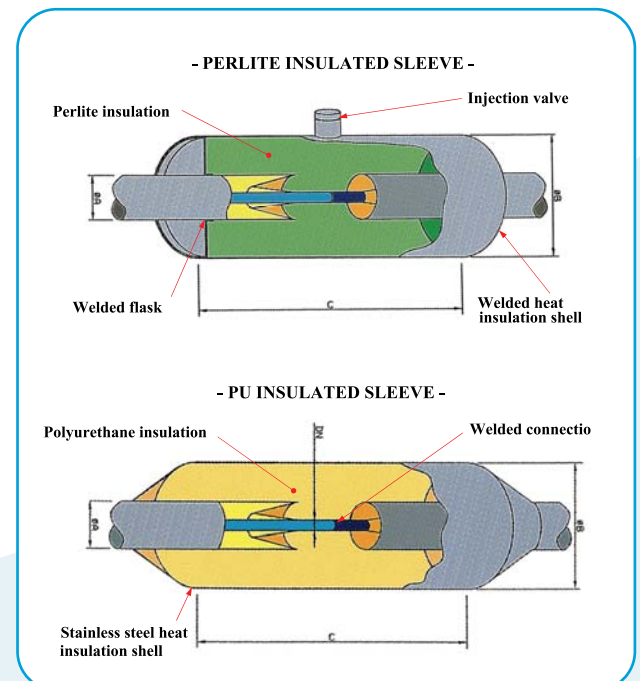
Welded connections

Available in DN10 to 100.

- ▶ Perlite & PU sleeve: on-site assembly of sections by butt-welding. Length can be adjusted during installation.
Filled with Perlite (oxygen) or polyurethane foam injection (nitrogen and argon).
- ▶ Vacuum sleeve: on-site assembly of sections and sleeve by butt-welding. Length can be adjusted during installation.

On-site superinsulation and creation of the vacuum in the sleeve.

Guaranteed no disruption to thermal performance.



Fittings and accessories

Gas trap

- ▶ Purges any gas that forms in the distributor line
- ▶ Keeps the line cold
- ▶ Vacuum insulated



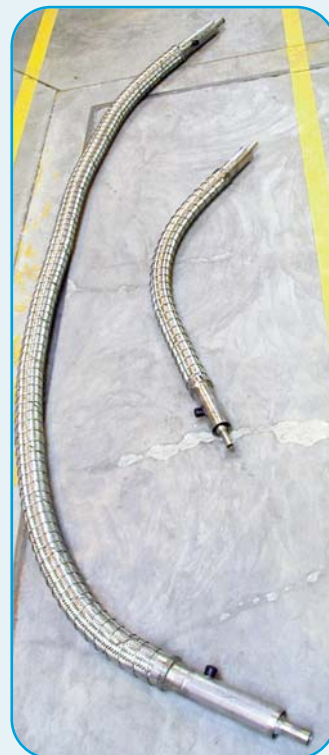
Vacuum insulated valve

- ▶ Manual or electro-pneumatic control
- ▶ D10, 20 and 32
- ▶ (others available on request)



Flexible vacuum lines

- ▶ Nitrogen and argon compatible
- ▶ Available for sale and for hire
- ▶ DN10, 20 and 32 – PN10
- ▶ Different lengths (2 to 20 m, depending on DN)
- ▶ Butt-welded coupling
- ▶ Lines reinforced with a protective coil.



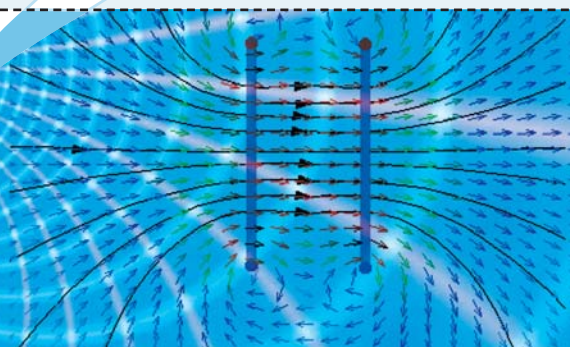
Distribution kit

- ▶ For connecting to 1-4 applications. Assembled at the end of the vacuum line
- ▶ 1- to 4-way



The RH Range

Store and transport liquid helium



- ▶ 65 to 450 litre capacity
- ▶ Non-magnetic
- ▶ Can be used in close proximity to strong magnetic fields
- ▶ Ultra lightweight
- ▶ Sturdy and efficient

Quality

- ▶ Light-weight alloy and composite construction
- ▶ ADR, RID and ICAO compliant
- ▶ Capacity without a liquefier
- ▶ Suitable for MRI systems
- ▶ Liquid draw-off and distribution

RH Range

RH65-1	RH65 laboratory and road transport version
RH100-1	RH100 laboratory and road transport version
RH250-1	RH250 laboratory and road transport version
RH450-1	RH450 laboratory and road transport version
RH65-2	RH65 laboratory and air transport version
RH100-2	RH100 laboratory and air transport version
RH250-2	RH250 laboratory and air transport version
RH450-2	RH450 laboratory and air transport version



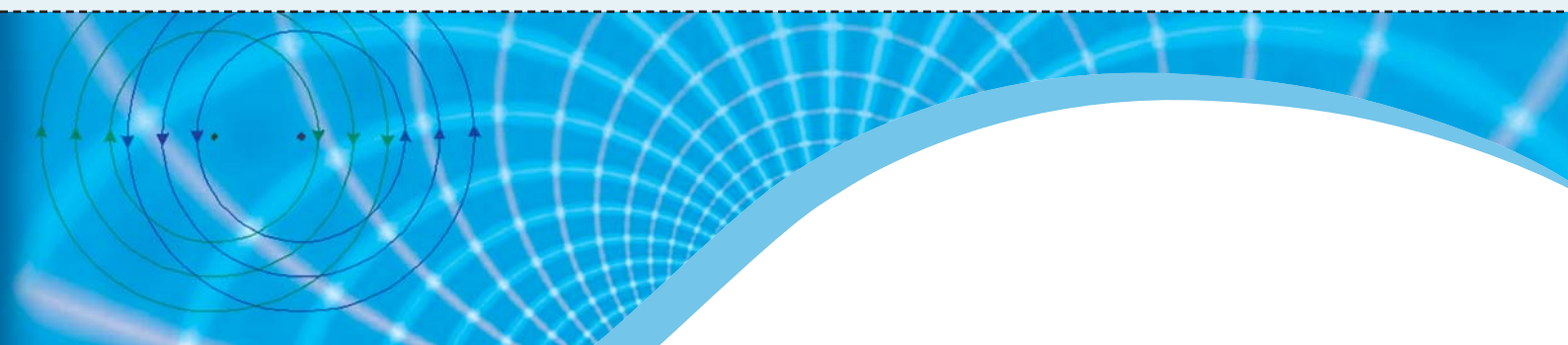
Series hand rail.



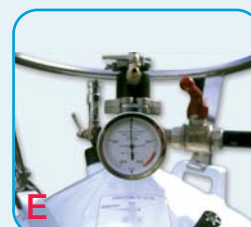
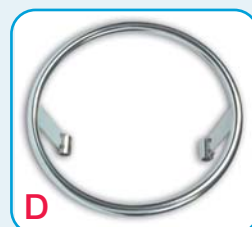
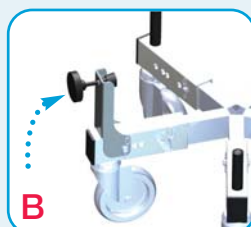
BHK head as standard across the whole RH range.



BHUL head option for attaching syphon, level gauge and level indicator.

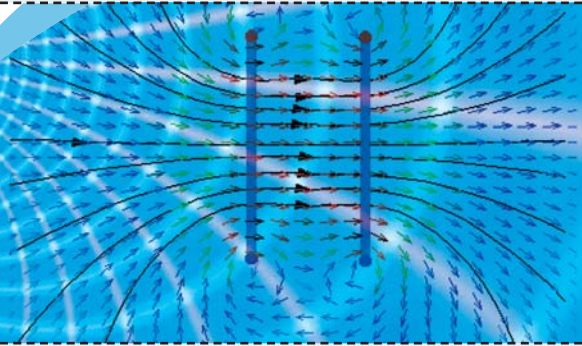


RH Range		RH 65	RH 100	RH 250	RH 450
CONTAINER SPECIFICATIONS					
Working capacity	l	64	96	240	428
Water capacity	l	68	101	253	451
24-hour evaporation loss with BHK head	%	1,5	1,0	0,7	0,5
Empty weight	kg	32	38	89	151
Full weight	kg	40	50	119	204,5
External diameter	mm	503	503	802	1 000
Total height	mm	1 150	1 360	1 560	1 635
Total height with dolly base	mm	1 180	1 390		
Total height with pallet and retractable wheels	mm			1 670	1 745
Minimum service temperature	°C	- 269	- 269	- 269	- 269
Maximum working pressure	bar	0,7	0,7	0,7	0,7
Gaseous phase	%	5	5	5	5
MAIN ACCESSORIES					
A1: A1:Dolly base (lockable) height 220mm, max floor space Ø 602mm		ACC-ALU-29	ACC-ALU-29		
A2: Non-magnetic base (lockable) height 205mm, max floor space Ø 602mm		ACC-ALU-31	ACC-ALU-31		
B: Recipient lock kit (3 units)		ACC-ALU-32	ACC-ALU-32		
C: Protection (Aluminium bar system to protect the container from impacts)		ACC-RH-106	ACC-RH-107	ACC-RH-108	ACC-RH-109
D: Hand rail		ACC-ALU-21	ACC-ALU-21		
E1: BHUL head for siphon Ø 10 with complete Pneurop fitting		ACC-RH-3			
E1: BHUL head for siphon Ø 12 with complete Pneurop fitting		ACC-RH-4			
E1: BHUL head for siphon Ø 12.7 with complete Pneurop fitting		ACC-RH-5			



The RH Range

Fittings for each type of use



LR : For laboratory use + road transport

LA : For laboratory use + air transport

RH Range	RH 65		RH 100		RH 250		RH450	
FITTINGS FOR EACH TYPE OF USE	LR	LA	LR	LA	LR	LA	LR	LA
DN80/DN50 reduction flange					✓	✓	✓	✓
Complete BHK head with 0.7 bar pressure relief valve and Pneurop fitting	✓	✓	✓	✓	✓	✓	✓	✓
Full stopper for BHK head	✓	✓	✓	✓	✓	✓	✓	✓
3/4" blowdown valve with DN40 Pneurop flange	✓	✓	✓	✓	✓	✓	✓	✓
Mano-vacuumeter	✓	✓	✓	✓	✓	✓	✓	✓
Two 0.7 bar relief valves for (1/2" for RH65, 100 and 1" for RH250 and 450)	✓	✓	✓	✓	✓	✓	✓	✓
Anti-oscillator	✓	✓	✓	✓	✓	✓	✓	✓
Hand rail	✓	✓	✓	✓	✓	✓	✓	✓
Transport relief valve tared to 6g/cm2 with shut-off valve	✓		✓		✓		✓	
Absolute taring relief valve 1 160mbar with shut-off valve		✓		✓		✓		✓
Protection hood		✓		✓		✓		✓
Non-retractable dolly base								
Palettable non-magnetic base with retractable wheels					✓	✓	✓	✓





Notes

Notes

Notes

Contacts

CRYOPAL
Parc Gustave-Eiffel
8, avenue Gutenberg
CS1072 Bussy Saint-Georges
77607 Marne La Vallée Cedex 3
France

Tel 33 (0) 1 64 76 15 00 – Fax 33 (0) 1 64 76 16 98

E-Mail order.cryopal@airliquide.com
Web www.cryopal.com

Local contact



cryopAL
www.cryopal.com

A member of the Air Liquide Group  **AIR LIQUIDE**

Founded in 1902 and now present in 65 countries with 30,800 employees, Air Liquide is the world leader in industrial and medical gases and related services. The Group offers innovative solutions based on constantly enhanced technologies to help manufacture many indispensable everyday products and preserve life.