

CBS Isothermal Freezers: No liquid nitrogen contact

Liquid nitrogen is, like all liquids, a possible transporter of contaminants. Contamination between samples, leakage of liquid nitrogen into sample vials during storage and contact of liquid nitrogen with skin are just some of the risks that can be eliminated with an Isothermal liquid nitrogen dry storage freezer from Custom BioGenic Systems (CBS).

CBS Isothermal freezers feature a patented liquid nitrogen jacket to provide uniform storage temperatures in the -190°C range, free from liquid nitrogen contact.

In the year 2000 Custom Biogenic Systems patented the first -190°C dry storage system. This new storage system uses the same vacuum insulated vessel as conventional LN_2 freezers, but instead of the liquid nitrogen being in the sample storage space of the freezer, it is in a patented liquid nitrogen jacket in the wall of the freezer. This liquid nitrogen jacket produces a

unique vapour circulation in the freezer. This vapour circulation, in combination with the convection from the freezer walls, produces a very stable temperature in the -190°C range without the large vertical temperature gradients found in traditional vapour phase LN_2 storage tanks. The minimal temperature gradient and lack of liquid nitrogen in the bottom of the vessel means that the full internal volume of each freezer is available for storing samples at liquid nitrogen temperatures, making the most efficient use of capacity.

All Isothermal models are certified to Medical Device Directive 93/42/ECC: 1993 Class IIA



Model: V-3000AB

Model: V-5000AB



The innovative design of CBS Isothermal freezers eliminates a number of major risks of traditional LN₂ storage, including:

- **Cross contamination:** Studies have shown that viral, bacterial and fungal pathogens can survive after suspension in liquid nitrogen. Infected samples can cross contaminate other samples in the same liquid nitrogen tank.
- **Loss of samples:** Storage directly in liquid nitrogen can make vials shrink. This may cause liquid nitrogen to seep into the vials, which on rewarming, expand and subsequently explode as nitrogen vapourizes inside the vials.
- **Health and safety:** Traditional storage in liquid nitrogen exposes users to direct contact with LN₂ which can lead to cold skin burns.

AUTOMATIC OPERATION

Isothermal freezers feature the series 2301 auto-fill and monitor system, which controls the automatic filling of the liquid nitrogen jacket and provides the user with an easy to read overview of the freezer temperature and status.

SAMPLE SECURITY

A comprehensive alarm system with remote alarm contact constantly monitors all aspects of the freezer's operation. Samples are also protected by lid and control panel locks. The freezer can be monitored by a central BMS or monitoring system.

SAMPLE STORAGE

A wide selection of inventory systems for vials and bags are available to complete the system and optimize sample storage.

Standard square rack configuration V-1500AB

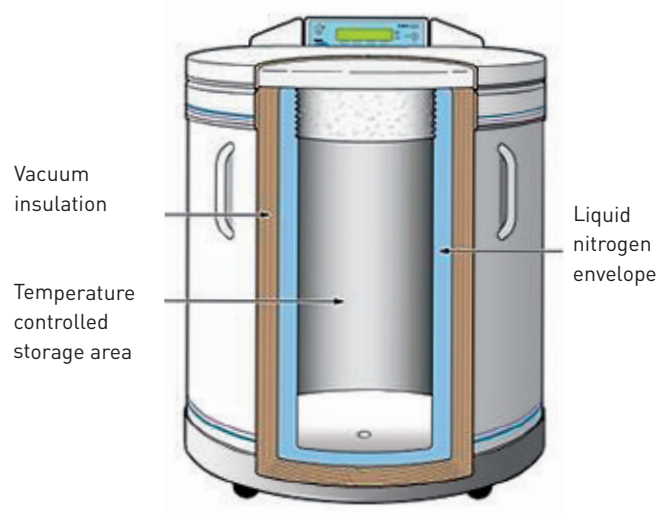


THE ISOTHERMAL CONCEPT

The sample storage area is cooled by a liquid nitrogen jacket surrounding the stainless steel interior, and by nitrogen vapour entering the freezer from the jacket via directional vents. This patented technology provides exceptional temperature uniformity in the -190°C range, allowing the full freezer capacity to be used with confidence. The circulation of vapour within the freezer also results in less cold air loss during lid opening and improved visibility. This allows full-width lids to be used providing quick, unrestricted access to sample racks.

NO LIQUID NITROGEN CONTACT

With no liquid nitrogen in the storage area, samples can be stored safely in the -190°C range without the risk of cross-contamination through liquid nitrogen.



The Isothermal design also provides added user safety with no splashing or contact of liquid nitrogen when removing racks and samples from the freezer.

Straw storage inventory system

Designed for the CBS V-1500AB and V-3000AB Isothermal freezers, this patent-pending inventory system provides an efficient solution for storing and working with straws, free from liquid nitrogen contact.



KEY ADVANTAGES

- 1) Dry storage freezer.
- 2) Unique patented liquid nitrogen jacket allows for no liquid in sample storage space and improves user safety.
- 3) Superior temperature uniformity.
- 4) No risk of cross-contamination through liquid nitrogen contact.
- 5) Manufactured to ISO 13485 standards.



Model: V-1500AB

Model: V-5000ABEH

2301 Controller

Features

- Compatible with all on site automated LN₂ supply systems.
- Available on all standard and Isothermal LN₂ freezers.
- Programming of LN₂ auto-fill levels and cycles.
- Sequential filling capabilities, one-fill-all-fill.
- Warm gas by-pass.
- Output data to PC / printer (USB port and printer port).
- RS-485 communication port.

- Cryomonitor software for freezer function and alarm download.
- System validation with print out.
- Key pad lock.
- Lid lock.

Front panel display

- System status display.
- Liquid level inches / centimeters.
- Two level temperature display; at lid and inside storage space.
- System status start / stop fill.

Alarms

- Visual, audible and remote.
- High and low LN₂ levels in jacket.
- Temperature deviation.
- Sensor and valve abnormality.
- LN₂ source / supply.
- Remote alarm contact.
- Overflow sensor/alarm (optional).



Isothermal carousel

Easy access to samples from the front of the freezer

The Isothermal carousel liquid nitrogen vapour storage system combines the innovative -190°C Isothermal design with a small opening and an interior rotating carousel. The small opening provides low liquid nitrogen consumption, a lightweight, user-friendly lid and a consistently low temperature in the freezer. The interior carousel is rotated by a unique ratcheting handle on top of the freezer that will position samples to the front of the freezer, even with the lid on.

Each Isothermal carousel system includes the advanced 2301 auto-fill/monitoring controller to provide security and ease of operation. There are several Isothermal carousel models available and an extensive selection of inventory racks to store any size tube, vial, box, microplate, etc. to complete the system. Custom configurations can also be designed to meet any requirement.



- No need to remove one rack to retrieve another rack.
- No unnecessary exposure to room temperatures.
- Carousel is rotated from the outside of the freezer eliminating the risk of injury or temperature fluctuations.
- Exceptional temperature uniformity.
- Easy access to samples from the front of the freezer.
- Removable console allows for complete access to the sample storage space if necessary.
- CBS Isothermal carousel freezers are cooled by a patented liquid nitrogen jacket, with no liquid in the sample storage space.
- No risk of cross-contamination through liquid nitrogen contact.
- No need for special packaging for vials.
- The isothermal design also provides added user-safety eliminating contact or splashing of liquid nitrogen.
- Manufactured to ISO 13485 standards.



Isothermal -190°C Dry Storage Freezers						
Model Number		V-1500AB	V-3000AB	V-3000ABEH	V-5000AB	V-5000ABEH
Liquid nitrogen capacity	litres	30	70	89	93	140
Dimensions						
External dimensions (W x D x H)	mm	660 x 939 x 1143	939 x 1219 x 1206	939 x 1219 x 1473	1219 x 1371 x 1320	1219 x 1371 x 1473
Usable interior height	mm	736	736	940	736	864
Usable interior diameter	mm	534	787	787	1016	1016
Weight empty	kg	148	272	295	425	453
Weight full	kg	174	327	367	500	566
Maximum capacity						
Max. vial capacity (2ml)**	qty	9100	22100	25500	40300	46500
Max. blood bag capacity (50ml)**	qty	434	1120	1280	1936	2208

** Capacity is subject to rack type

Isothermal Carousel					
Model Number		V-3000AB/C	V-3000ABEH/C	V-5000AB/C	V-5000ABEH/C
Liquid nitrogen capacity	litres	70	89	93	140
Dimensions					
External dimensions (WxDxH)	mm	939 x 1219 x 1130	939 x 1219 x 1384	1194 x 1372 x 1257	1194 x 1372 x 1384
Usable interior height	mm	686	889	737	813
Usable interior diameter	mm	736	736	978	978
Weight empty	kg	272	288	425	452
Weight full	kg	327	361	499	566
Maximum capacity					
Max. vial capacity (2ml)**	qty	16800	21000	36400	42000
Max. blood bag capacity (50ml)**	qty	852	1136	1722	1968

** Capacity is subject to rack type



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