Kalstein

Model YR053351

Liquid Nitrogen Biological Container

Instruction Manual

Thank you very much for purchasing our Liquid Nitrogen Biological Container Model YR053351.

Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” at a hand place for future reference.

Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

OUR SERVICES

Benefits and Support

In Kalstein France, we take care of the full satisfaction of our customers, that is why we provide value-added services of the highest level based on our experience.

Online Inductions and Trainings

In any part of the world, receive your induction or training from our specialized team of engineers

Quick Response

Our work team is always available to response all your consults or questions, in order to support you in any situation.

#Letsgivemore 💚

Thanks to your purchase, a donation will be made to a non-profit foundation that fights against breast cancer and helps most vulnerable communities.

Technical Support

Enjoy of personalized advice for the correct preventive and corrective maintenance of your equipment, thanks to Kalstein's manuals and articles, special catalogues and video tutorials.

Delivery Logistics

We take care of all the necessary logistics for the dispatch of your goods, whether is by sea, land or.air.

Kalstein Worldwide

With more than 25 years growing with our customers, Kalstein's multiformat and modern content, is now present in more than 10 countries and increasing.

CONTENTS

I. Safety Precautions

! The Product is a cryogenic vessel. User is recommended to assign specific person to master the Instructions and operate the Product as specified.

! Organize safety education to relevant personnel regularly to avoid losses due to maloperation.

\ It is forbidden to overfill the Product. It should reach the lower edge of neck tube as the optimal injection volume.

! Transfer the Product with care to avoid overflow and splashing.

\ It is forbidden to contain any other low-temperature or high-temperature medium other than **liquid nitrogen**; otherwise, quality warranty will expire!

! Avoid skin exposure and take proper protection measures, such as low-temperature gloves and goggles, while handling the Product due to its ultralow temperature (-195.8 ℃). Do not wear boots to avoid cold injury when liquid nitrogen drops in the boots.

! Make sure the Product is under low-pressure and safe state before injecting the pressurized fluid into the container.

\ Do not touch the container opening of liquid nitrogen due to low temperature.

\ It is forbidden to block the container opening that has liquid nitrogen; otherwise, pressurization and explosion may occur!

! It is recommended to fill liquid nitrogen into the opening at neck through hose; make sure to leave a gap at the opening of container to discharge the nitrogen.

! Avoid direct sunlight but store the container at cool and ventilated place. Make sure to open the doors and windows for ventilation during operation, to avoid suffocation due to oxygen deficit of indoor space. Where necessary, an oxygen concentration monitor can be used.

\It is forbidden to measure the liquid level of liquid nitrogen by using hollow tube; otherwise, cold injury may occur! It is recommended to use professional tools and instruments for measurement.

\It is forbidden to open the vacuum sealing joint that is designed for ensuring vacuum degree of container interlayer; otherwise, the container interlayer may have vacuum deterioration.

\Handle the sample with care and it is forbidden to scrap the neck pipe; otherwise, it may lead to early or immediate vacuum failure.

\It is forbidden to dismantle any part without permission! Welding on container surface is not allowed!

\It is forbidden to have tilting, horizontal or inverted placement, stacking or collision; handle it with care and keep the container vertical.

! For any cold injury due to liquid nitrogen, see a doctor immediately.

! Observe the Product continuously during use. For any condensation or frosting on tank surface, transfer away the sample immediately; otherwise, the sample can be damaged. We bear liability for product loss only and not bear the liability of the third party.

For any quality issue, please return the Product to the Company for inspection and maintenance, as the Product covers multiple professional techniques.

2. First aid measures

1) Skin and clothing contact with liquid nitrogen

Remove the clothes, shoes, socks, etc. on the body of the injured that are stained with liquid nitrogen immediately to ensure the circulation of the blood in the frostbite part. Move the injured to a warm place (room temperature) and rinse the frostbite area with clean tap water or clean lukewarm water continuously until the skin of the frostbite changes from pale to pink. Cover the frostbite with a sterile and non-sticky cloth after rinsing. If severe frostbite or cold burn happens, the injured must be send to the local hospital after first aid right away, and the medical staff must be noted that it is caused by contact with cryogenic liquid. (Note: The treatment of cold burns is typically similar to that of heat burns. If the cold burn is serious, the local hospital must be contacted immediately. Do not thaw the frostbite with hot water or other heating methods! Don't rub or massage the frostbite! The patient is not allowed to smoke or drink during the thawing! The injured shall not be allowed to take any medicine without the permission of the doctor)

2) Eye contact

If the eyes have contacted liquid nitrogen, the eyes of the patient must be opened in a minute, rinse the eyes gently with clean tap water or clean lukewarm water for at least 15 minutes and go to a doctor quickly.

3) Masses of nitrogen is breathed in

Move the injured to a place with fresh air immediately and sent the injured the hospital for examination and treatment.

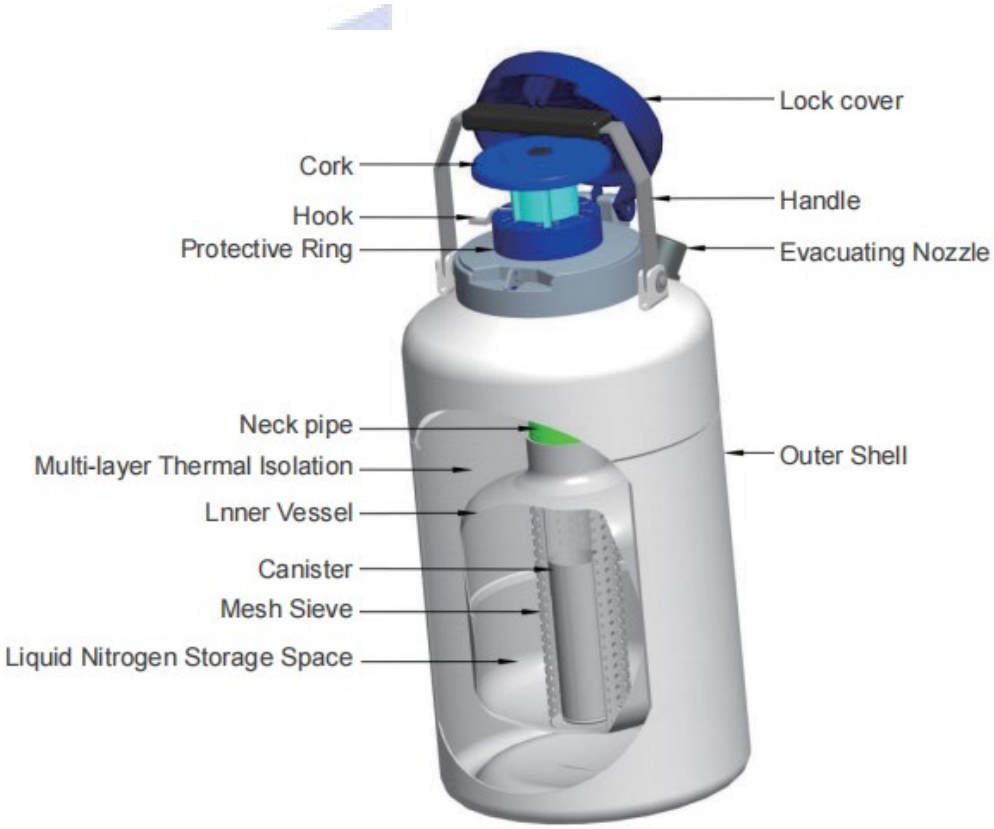
三、Introduction

1. Model Preparation Method

YDH—□—□—□

- Code of special type: F – Square lift cylinder
- Container caliber (mm): Caliber 50mm not marked
- Nominal volume of container (L)
- "H" Dry Shipper type
- The 1st letter of Pinyin "Dan"
- The 1st letter of Pinyin "Ye"

2.Main Structure



3.Product Parameters

Container Model	LN2 Absorbed（L）	Caliber (mm)	Outer Diameter（mm）	Total Height（mm）	Empty Weight（kg）	Static Holding Day（d）	
						Liquid Phase	Vapor Phase
YR05417	1.3	50	223	435	3.2	20	8
YR05418	2.9	80	300	487	6.5	37	14
YR05419 YR05420	3.4	125	300	625	8.9	23	8
YR05421	6	216	394	540	13	10	4
YR053351	9	216	394	716	15	29	10

4. Use

1. Product Installation and Operation Environment

The Product should be placed in cool places with enough space and good ventilation
The indoor temperature should be controlled at -30℃-30℃
The indoor relative humidity should be controlled at 40%-70%
The Product should be placed on flat indoor ground
The Product should be away from heat sources, inflammables, corrosives, high-intensity magnetic fields, dusts and major oil dirt

2. Opening/closing of Lock Cover

The Product can be fitted with lock cover that has self-lock structure, to avoid accidental opening of container cover (unlocked) due to abnormal vibration and collision. The user should open/close the lock cover as follows:

When lock cover is locked, insert the finger (index finger and middle finger), cover the edge of upper cover and apply certain force externally, and then upturn the cover to open it (as shown in diagram). The lock cover is closed, and the upper cover has self-locking with base when you hear “click” sound.

3.Operating procedures for the initial use or rewarmed containers

1.Take the canister out of the container, then weigh and record it for the first time (unit of weight: KG)

2.Inject liquid nitrogen into the container until liquid level reaches the bottom of the neck tube.

3.Put the cork on and let it stand for 12 hours, then inject liquid nitrogen into the container once again until the liquid level reaches the bottom of the neck tube.

4.After the second standing for 12 hours, pour out the residual liquid nitrogen, and then the weight and record. (Weight unit: KG)

5.(Second time weighing value - First time weighing value) ÷ 0.808 = liquid nitrogen storage capacity (L) absorbed by the actual liquid nitrogen adsorbent

6.Compare the calculated actual liquid nitrogen adsorption value with the theoretical liquid nitrogen adsorption value. If the difference between the two is not large (due to atmospheric pressure and manufacturing errors, the actual adsorption capacity of the liquid nitrogen adsorbent may deviate from the theoretical value), it can be determined that the liquid nitrogen adsorbent is saturated.

7.If the difference is large, liquid nitrogen should be injected into the container again until the liquid level should reach the bottom of the neck tube. After standing for 2 hours, pour out the residual liquid nitrogen and it can be used.

Attention:

! The cork can only be removed when taking samples and filling liquid nitrogen, otherwise it must be in the container

in any situation to prevent the liquid nitrogen adsorber from reducing the adsorption capacity.

! If filling the container from a pressurized fluid source, ensure that the source container is in a low-pressure safe condition.

4.Calculation of Nominal Evaporability (N.E.R.)

1. Take out the cylinder from the Product.
2. Supplement liquid to the Product; the volume of liquid nitrogen in the Product should not be less than 50% of total volume.
3. Keep it still for 48h and record the Product's weight (KG) for the very first time.
4. After finishing the first recording of weight, keep it still for 72h and record the Product's weight (KG) for the second time.
5. NER = (The 1st weight – The 2nd weight)/ (72/24) = Daily mean evaporation capacity of product under test XX L/day

(The storage period for static liquid nitrogen should be measured and calculated at 20℃±3℃ and normal pressure as per GB/T 5458; otherwise, the calculated data may have deviation with the actual storage period of liquid nitrogen).

5. Maintenance

1.Maintenance before transportation and use

A. Check the appearance, cork, neck tube, vacuum nozzle and other parts for damage.

B. Repeat steps 1-4 of "3. Operating procedures for the initial use or rewarmed containers "to confirm that there is no large area of frost or condensation on the appearance. If this phenomenon occurs on the appearance, it means that the vacuum of the container has problems and cannot be used.

2.The Product applies to storage of liquid nitrogen only.

3.The Product should be cleaned for 1-2 times per year to protect the inner wall against corrosion of foreign matters, for water and infectious microbe may accumulate internally during usage.

Cleaning method:

- Uplift the cylinder from the Product, take out liquid nitrogen, keep it still for 2-3 days until the tank temperature is increased to around 0℃.

- Use a clean, no floc cloth dipped in alcohol to wipe away impurities on the inner wall of the container.

6. FAQ

S/N	Fault	Cause	Troubleshooting
1	Liquid nitrogen has fast volatilization and storage period is less than the specified period	The Product's tank is opened frequently	Reduce the opening period and avoid frequent opening of the Product
2	Tank has condensation and frost	The tank opening has frosting and freezing due to discharge of great amount of cold air when injecting liquid nitrogen	Normal phenomenon: it will defrost gradually when injection of liquid nitrogen is stopped; the minor frost at tank opening due to difference of ambient temperature and humidity is normal.
		In general use, the large-area frost at middle of tank is caused by the decreasing vacuum degree	Transfer the sample in tank immediately and contact the company's after-sales department to return the product for inspection.