



LIQUID NITROGEN
BIOLOGICAL CONTAINER

液氮生物容器

使用手册

USER MANUAL



一、工厂概述 Factory Overview

河南天驰低温机械设备制造有限公司是一家专业研发、生产、销售液氮生物容器及其相关产品的高科技企业，缔造全球领先的液氮生物容器供应商。

Henan Tianchi Cryogenic Machinery Equipment Manufacturing Co., Ltd. is a high technology enterprise specializing in the research, production and sales of liquid nitrogen biological containers and related products. It has become a global leader in the supply of liquid nitrogen biological containers.



天驰低温主营产品——液氮生物容器，多次在质量评定中获得优异成绩，产品通过ISO9001、CE、SGS等国内和国际认证。我们始终坚持“始于客户需求，止于客户满意”的服务理念，一切以用户体验为中心，不断提升自身的科技和服务水平。在全球范围内，我们帮助数以万计的用户解决了问题，同时探索更深层次的用户需求，不断改进产品性能，完善用户体验。

Liquid nitrogen biological container is the main product of Tianchi factory, has achieved excellent results in quality assessment for many times, and the products have passed ISO9001, CE, SGS and other domestic and international certifications. We always adhere to the service concept of "starting from customer needs and ending with customer satisfaction", all focus on user experience, and constantly improve our technology and service level. On a global scale, we have helped tens of thousands of users solve questions, explore deeper user needs, continuously improve product performance, and improve user experience.

一直以来天驰人以“服务,健康,未来”为企业使命，秉承“让世界爱上中国造”的企业理念，坚守“持续改进，力求更好”的质量理念，为“建百年天驰，创世界品牌”的企业愿景不懈奋进。

Tianchi have always taken "service, health, and future" as the corporate mission, adhering to the corporate philosophy of "making the world fall in love with Made in China", and adhering to the quality concept of "continuous improvement, striving for better", and for "building a century old Tianchi, The corporate vision of "creating a world brand" is unremittingly forging ahead.

天驰低温以缔造全球领先的液氮生物容器生产商和供应商为目标，始终致力于先进的产品带给全球用户，通过遍布全球的合作伙伴，我们向世界各地用户提供优质的产品和服务，目前产品已经销售到美国、巴西、乌兹别克斯坦、泰国等四十多个国家。

As the leading global manufacturer and supplier of liquid nitrogen biological containers, Tianchi Cryogenics has always been committed to bringing the most advanced products to users around the world. Through partners all over the world, we provide the highest quality products and services to users around the world. At present, the products have been sold to more than 40 countries such as the United States, Brazil, Uzbekistan and Thailand.

二、工厂资质 Factory qualifications



公司先后通过了 ISO9001 质量体系认证、CE 欧盟安全认证、SGS 国际通用认证、BV 国际通用认证。

The company has passed ISO9001 quality system certification, CE EU safety certification, SGS international general certification, and BV international general certification.

生产车间 Production workshop



三、产品结构 Product structure

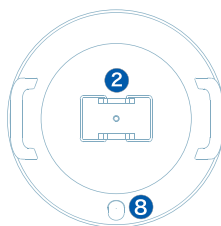
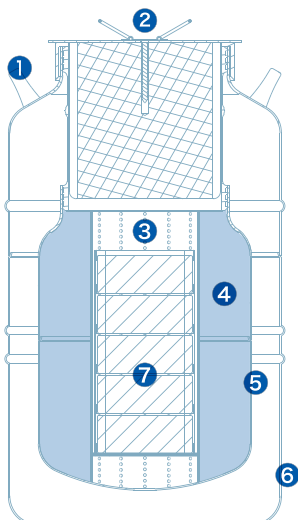


储存型
Storage type



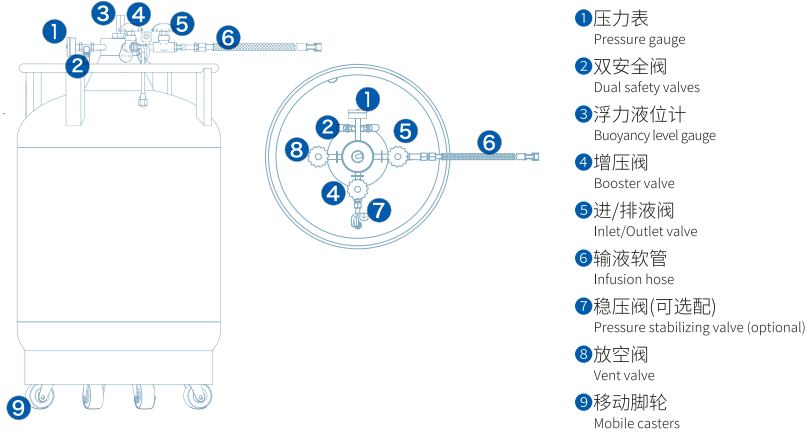
运输型
Transportation type

- ① 把手
Hand
- ② 颈塞
Neck plug
- ③ 颈管
Neck tube
- ④ 外胆
Outer shell
- ⑤ 内胆
Inner shell
- ⑥ 提桶
Canister
- ⑦ 固定支撑
Fixed support

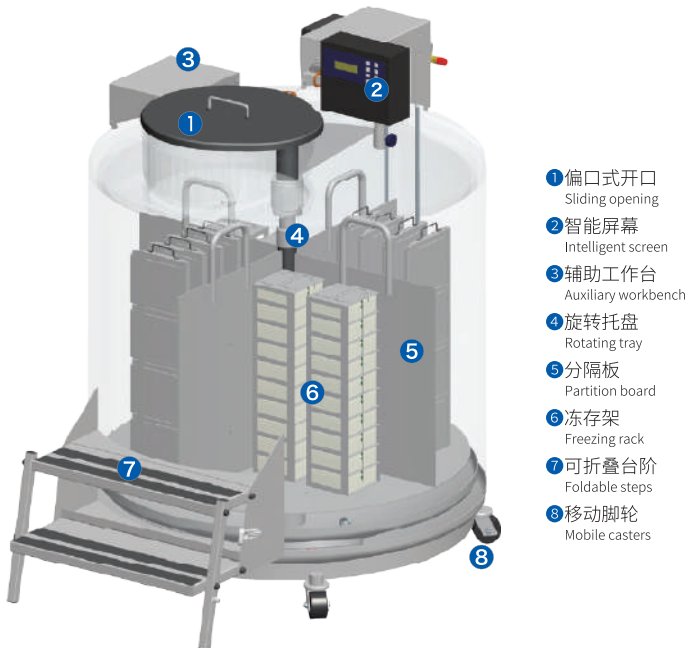


- ① 把手
Hand
- ② 颈塞
Neck plug
- ③ 金属网筛
Metal mesh sieve
- ④ 液氮吸附体
Liquid nitrogen adsorbent
- ⑤ 内胆
Inner container
- ⑥ 外胆
Outer container
- ⑦ 冻存架
Cryopreservation rack
- ⑧ 真空口
Vacuum port

航空型
Dry shipper



自增压液氮罐
Self-pressure liquid nitrogen tank



生物样本库
Biological sample bank

四、产品分类 Product Classification

4.1 储存型液氮罐/Storage-type liquid nitrogen tank



天驰储存型YDS系列液氮罐由优质航空铝制造而成，主要适用于在静态条件下大容量的贮存液氮和生物样品，以及需要经常性地靠人工转移保存样品的用户。具有小巧轻便、易于携带、静态液氮日蒸发率低、贮存生物样品容量大、经济实用等优点。

Tianchi storage type YDS series liquid nitrogen tank is made of high-quality aviation aluminum. It is mainly suitable for users who need to store liquid nitrogen and biological samples in large capacity under static conditions, and who need to store samples by manual transfer frequently. It has the advantages of small size and light weight, easy to carry, low daily evaporation rate of static liquid nitrogen, large storage capacity of biological samples, economical and practical, etc.

- 采用高强度航空铝制造
Made of high-strength aviation aluminum.
- 产品易于长期保存生物样本，便于携带
The product is easy to preserve biological samples for a long time and is convenient to carry.
- 配有保护套，可防止产品在使用中的磕碰
It is equipped with a protective cover to prevent the product from being knocked during use.
- 可编号提桶，方便辨认和独立存取样品
It has numbered buckets, which is convenient for identification and independent access to samples.
- 可选配锁盖，以保护贮存样品安全
It can be optionally equipped with a lock cover to protect the safety of stored samples.
- 高真空多层绝热设计，提供不低于五年真空质保
The high vacuum multi-layer insulation design provides a vacuum warranty of no less than five years.

产品型号 Model	容积 Volume (L)	口径 Caliber (mm)	外径 OD (mm)	总高 Height (mm)	静态液氮 蒸发率 Static evaporation rate (L/d)	静态液氮 保存期 Static retention period (d)
YDS-1-35	1.30	35	180	350	0.09	11
YDS-2-35	2.20	35	180	420	0.08	23
YDS-2	2.20	50	180	420	0.12	16
YDS-3	3.10	50	225	465	0.12	26
YDS-3-80	3.10	80	224	460	0.20	15
YDS-3-125	3.10	125	224	460	0.75	4
YDS-6	6.40	50	283	520	0.12	52
YDS-6-80	6.40	80	283	500	0.20	30
YDS-6-125	6.40	125	283	475	0.50	12
YDS-6-216	6.40	216	304	480	3.00	2
YDS-10	10.40	50	304	575	0.12	86
YDS-10-80	10.40	80	304	575	0.21	48
YDS-10-125	10.40	125	305	540	0.43	23
YDS-10-216	10.40	216	304	575	1.00	10
YDS-13	15.10	50	304	675	0.12	109
YDS-15	16.40	50	385	610	0.11	134
YDS-15-80	16.40	80	385	590	0.19	80
YDS-15-125	16.40	125	385	600	0.36	42
YDS-15-216	16.40	216	385	590	1.00	15
YDS-16	17.40	50	441	525	0.18	88
YDS-16-80	17.40	80	441	535	0.20	80
YDS-20	21.40	50	385	655	0.12	168
YDS-20-80	21.40	80	385	630	0.22	93
YDS-20-125	21.40	125	385	640	0.35	57
YDS-20-216	21.40	216	385	630	0.61	33
YDS-25	25.20	50	440	675	0.12	208
YDS-30	31.50	50	440	715	0.12	254
YDS-30-80	31.50	80	440	715	0.20	147
YDS-30-125	31.50	125	440	740	0.33	90
YDS-30-216	31.50	216	440	710	0.71	42
YDS-35	35.20	50	440	760	0.12	286
YDS-35-80	35.20	80	440	760	0.22	159
YDS-35-125	35.20	125	440	760	0.36	97
YDS-35-216	35.20	216	440	760	0.70	50
YDS-47-127	52.10	127	516	790	0.46	110
YDS-50B	52.10	50	516	790	0.24	209
YDS-50B-80	52.10	80	516	790	0.34	147
YDS-50B-125	52.10	125	515	815	0.46	110
YDS-50B-216	52.10	216	516	790	0.76	65

4.2 运输型液氮罐/Transportation-type liquid nitrogen tank



天驰运输YDS系列液氮罐是一种经济小型液氮罐，主要为需要短距离运输条件下的用户提供良好的选择。该系列选用高强度轻质航空铝材质制造，内含多个支撑结构，保证罐体安全运输和液氮的低挥发率，具有耐倾倒、适宜长途运输等优点。

Tianchi transportation YDS series liquid nitrogen tank is an economical small liquid nitrogen tank, which mainly provides a good choice for users who need short-distance transportation. This series is made of high-strength lightweight aviation aluminum and It contains multiple supporting structures to ensure the safe transportation of the tank and the low volatilization rate of liquid nitrogen. It has the advantages of being resistant to dumping and suitable for long-distance transportation.

- 采用高强度航空铝制造，产品重量轻
Made of high-strength aviation aluminum.
- 配有保护套，可防止产品在使用中的磕碰
Equipped with a protective cover to reduce bumps.
- 有特制的防震结构，坚固耐用，不易损坏
With a specially designed shock-proof structure.
- 可编号提桶，方便辨认和独立存取样品
Numbered carrying bucket for easy identification.
- 高真空多层绝热设计，提供不低于五年真空质保
High vacuum multi-layer insulation design.
- 可选配锁盖，以保护贮存样品安全
Optional lock cover to ensure the safety of stored samples.

产品型号 Model	容积 Volume (L)	口径 Caliber (mm)	外径 OD (mm)	总高 Height (mm)	静态液氮 蒸发率 Static evaporation rate (L/d)	静态液氮 保存期 Static retention period (d)
YDS-10B	10.40	50	304	575	0.19	52
YDS-15B	16.40	50	385	610	0.18	82
YDS-20B	21.40	50	385	655	0.20	101
YDS-25B	25.20	50	440	675	0.20	125
YDS-30B	31.50	50	440	740	0.19	159
YDS-35B	35.20	50	440	760	0.20	179
YDS-50B	52.10	50	516	790	0.24	209

4.3 大容积小口径液氮罐/Large-capacity small-diameter liquid nitrogen tank



专为大容量存储需求而设计。容积覆盖65-210升，可容纳海量液氮。独特的50mm小口定制设计，有效降低液氮蒸发速率，极大延长保存时间，减少液氮补充频次。是畜牧、科研机构、医疗企业、生物工程等领域液氮存储的理想之选。

Designed specifically for large-capacity storage needs. The volume ranges from 65 to 210 liters, capable of holding a vast amount of liquid nitrogen. The unique 50mm small opening custom design effectively reduces the rate of liquid nitrogen evaporation, significantly prolongs the storage time, and reduces the frequency of liquid nitrogen replenishment. It is an ideal choice for liquid nitrogen storage in fields such as animal husbandry, research institutions, medical enterprises, and biological engineering.

- 65-210升容积，为液氮与各类样本提供海量存储空间
65 - 210 liters capacity, complete range of models.
- 定制50mm口径，有效减缓液氮蒸发，实现卓越的温度锁定，长久守护样本的低温保存环境
Customized with a 50mm diameter, effectively reducing the evaporation of liquid nitrogen.
- 可配移动推车，方便运输
It can be equipped with a mobile cart for easy transportation.

产品型号 Model	容积 Volume (L)	口径 Caliber (mm)	外径 OD (mm)	总高 Height (mm)	静态液氮 蒸发率 Static evaporation rate (L/d)	静态液氮 保存期 Static retention period (d)
YDS-65T-50	70.50	50	610	770	0.35	200
YDS-80-50	85.50	50	680	735	0.35	244
YDS-100-50	105.50	50	680	795	0.38	278
YDS-120-50	120.50	50	680	855	0.40	300
YDS-120T-50	125.50	50	610	1080	0.40	310
YDS-135-50	135.50	50	680	915	0.40	339
YDS-150-50	150.50	50	680	975	0.42	358
YDS-165-50	165.50	50	680	1035	0.44	376
YDS-180-50	180.50	50	680	1095	0.44	410
YDS-195-50	195.50	50	680	1155	0.46	425
YDS-210-50	210.50	50	680	1205	0.47	448

4.4 航空型液氮罐/Dry shipper liquid nitrogen tank



项目	Project	单位 Unit	YDH-2-35	YDH-3
有效容积	Effective volume	L	2	3
液氮吸附	Nitrogen adsorption volume	L	1	1.3
静态液氮蒸发率	Static nitrogen evaporation rate	L/d	0.10	0.15
工作天数	Working days	d	9	9
储存容量/Storage capacity				
提桶尺寸	Canister size	mm	φ25*120	φ47*200
2.0ml冻存管数量	Number of 2.0ml cryotubes	ea	N/A	N/A
冻存盒数量-25格	Number of cryovials with -25 cell	ea	N/A	N/A
冻存盒数量-100格	Number of cryovials with -100 cell	ea	N/A	N/A
血袋数量-50ml	Number of blood bags - 50ml	ea	N/A	N/A
血袋数量-100ml	Number of blood bags - 100ml	ea	N/A	N/A
外形尺寸/Outline dimension				
口径	Caliber	mm	35	50
总高	Height	mm	410	470
外径	Outer diameter	mm	180	224
空重	Empty weight	kg	2.7	3.8

航空运输系列适用于深低温环境下（气相储存,温度低于-190℃）运输样本,可避免运输过程中液氮释放的危险,尤其适用于飞机等短时间航空运输。内部有液氮吸附体,可吸收和保存液氮,即使容器倾倒也不会有液氮溢出;还有特殊的不锈钢网筛分割储存空间和液氮吸收体,可避免液氮吸收体材质混入冻存管内。主要适用于实验室用户和少量样本短时间运输的用户需求。

The dry transportation series is suitable for transporting samples in a deep and low temperature environment (gas phase storage, temperature below -190 °C), which can avoid the danger of liquid nitrogen release during transportation, especially suitable for short-term air transportation such as aircraft. There is a liquid nitrogen absorber inside, which can absorb and store liquid nitrogen. Even if the container is dumped, there will be no overflow of liquid nitrogen; there is also a special stainless steel mesh screen to divide the storage space and the liquid nitrogen absorber, which can prevent the liquid nitrogen absorber material from being mixed into the freezer. in the depository. It is mainly suitable for laboratory users and users who need a small amount of samples to be transported in a short time.

- 气相低温储存, 无液氮溢出
Gas-phase low-temperature storage, no liquid nitrogen leakage.
- 液氮吸附体, 快速液氮填充
Liquid nitrogen adsorption body, rapid liquid nitrogen filling.
- 麦管、冻存管、血袋储存选择
Selection of straw tubes, cryotubes and blood bags for storage.
- 坚固耐用的铝制结构
Sturdy and durable aluminum structure.
- 欧盟CE认证
EU CE certification.
- 安全锁盖结构, 防止他人擅自开启
Safe locking cover structure, safe storage.

YDH-4-80	YDH-6-80	YDH-10-125	YDH-15-216	YDH-25-216
4	6	10	15	25
1.8	2.4	6	7	10
0.19	0.21	0.4	0.89	0.89
9	11	15	7	11
储存容量/Storage capacity				
φ76*276	φ76*200	81*85*225	139*141*168	139*141*280
N/A	N/A	100	300	500
N/A	N/A	4	N/A	N/A
N/A	N/A	N/A	3	5
N/A	N/A	6	N/A	11
N/A	N/A	N/A	N/A	11
外形尺寸/Outline dimension				
80	80	125	216	216
505	510	595	585	665
224	283	304	385	375
5.5	6.1	9	12.7	12.5

4.5 实验室液氮罐/Laboratory liquid nitrogen tank



天驰实验室YDS系列液氮罐由专用航空铝材质制造而成，具有液氮挥发率低，重量轻，占用空间少，较大容量样本冻存等优点，可满足实验室专业人士的不同需求。所有型号可配冻存架和PC冻存盒，确保样本方便储存。同时该系列产品还满足利用液氮对零部件、元器件进行深冷处理的用户，具有口径较大、易于操作等优点。

Tianchi YDS series laboratory liquid nitrogen tank is made of special aviation aluminum material. It has the advantages of low liquid nitrogen volatilization rate, light weight, less space occupation, and efficient storage of large-capacity samples, which can meet the needs of laboratory professionals. different needs of people. All models can be equipped with freezer racks and PC freezer boxes to ensure convenient sample storage. At the same time, this series of products also meet the needs of users who use liquid nitrogen to cryogenically treat parts and components, and have the advantages of large diameter and easy operation.

- 欧盟CE认证，五年真空质保
EUCE certification, five-year vacuum warranty.
- 大容量大口径设计，方便存取
Large capacity and large diameter design, convenient for storage and access.
- 配有专用锁盖，保证样本安全
Equipped with a dedicated lock cover to ensure sample safety.
- 配套冻存架和冻存盒，大容量储存
Complemented by a cryogenic storage rack and cryogenic box for large-capacity storage.
- 可选配液氮罐小推车/液氮液位监测报警器，使用更便捷
Optional liquid nitrogen tank trolley / liquid nitrogen level monitoring alarm device, making operation more convenient.

产品型号 Model	YDS-10-125	YDS-15-125	YDS-20-125	YDS-30-125	YDS-35-125	YDS-47-127
容积 Volume (L)	10.4	16.2	21.6	31.5	35.2	52.1
口径 Caliber (mm)	125	125	125	125	125	127
外径 OD (mm)	305	385	385	440	440	515
总高 Height (mm)	540	600	640	740	760	790
静态液氮蒸发率(L/d)	0.43	0.36	0.35	0.33	0.36	0.46
静态液氮保存期(d)	23	42	57	90	97	110
最大储存容量/ Maximum storage capacity						
冻存架数量 Qty racks	1	1	1	6	6	6
2.0ml 冻存管数量 Qty 2.0ml tube	10x10	—	—	—	—	—
	5x5	75	75	100	600	750
冻存架层数 Layers	3	3	4	4	5	5

产品型号 Model	YDS-50-125	YDS-65-216	YDS-65T-216	YDS-95-216	YDS-115-216	YDS-120T-216
容积 Volume (L)	52.1	65.2	65.2	95.3	115.5	120.5
口径 Caliber (mm)	125	216	216	216	216	216
外径 OD (mm)	515	680	610	680	680	610
总高 Height (mm)	815	705	800	770	810	1106
静态液氮蒸发率(L/d)	0.46	0.89	0.76	0.91	0.91	0.83
静态液氮保存期(d)	110	73	85	105	127	145
最大储存容量/ Maximum storage capacity						
冻存架数量 Qty racks	6	6	4	6	6	4
2.0ml 冻存管数量 Qty 2.0ml tube	10x10	—	2400	2000	3000	3600
	5x5	900	—	—	—	—
冻存架层数 Layers	6	4	5	5	6	10

产品型号 Model	YDS-130-216	YDS-145-216	YDS-160-216	YDS-175-216	YDS-190-216	YDS-210-216
容积 Volume (L)	130.5	145.5	160.5	175.5	192.5	209.5
口径 Caliber (mm)	216	216	216	216	216	216
外径 OD (mm)	680	680	680	680	680	680
总高 Height (mm)	870	940	990	1045	1110	1170
静态液氮蒸发率(L/d)	0.91	0.91	0.91	0.87	0.91	0.91
静态液氮保存期(d)	144	160	177	202	210	233
最大储存容量/ Maximum storage capacity						
冻存架数量 Qty racks	6	6	6	6	6	6
2.0ml 冻存管数量 Qty 2.0ml tube	10x10	4200	4800	5400	6000	6600
	5x5	—	—	—	—	—
冻存架层数 Layers	7	8	9	10	11	12

4.6 小型智能气液相液氮罐/Gas-phase liquid nitrogen tank



小型气相液氮罐实现了实时温度监控、液位监控、自动补液、远程监控报警以及监控数据自动备份储存。基于电容式液位传感器，可以轻松自动控制液位实现罐体顶部-190℃的气相存储，彻底解决了电子信息技术在-196℃低温环境下应用的技术难题。将先进的液氮罐生产制造技术和智能监控技术完美结合。

产品重量轻、占地小，容量大，样本存取高效，可实时监控液氮罐的运行状态，一旦出现问题及时报警，确保样本储存安全。主要适用于生物医疗和样本库等用户。

- 实时液氮液位及温度监控功能
- 远程监控和通信功能
- 自动液氮灌注系统,安全可靠
- 兼容气相和液相储存模式
- 屏幕保护功能，延长使用寿命
- 远程报警功能(语音/短信/微信/邮件等)
- 热气旁通设计，减少内部温度波动
- 卓越的内部温度均匀性和稳定性
- 液氮消耗实时显示
- 现场声光报警功能
- 具有除雾功能，方便样本查看
- 智能本地及云端数据备份及导出

产品型号 Model	Cryobank 2400	Cryobank 3000	Cryobank 3600	Cryobank 4200
最大储存容量/ Maximum storage capacity				
方提桶数量 Qty racks	6	6	6	6
2.0 ml冻存管数量 Qty 2.0ml tube	2400	3000	3600	4200
层数 Layers	4	5	6	7
性能/ Performance				
液氮容积 Volume (L)	65.20	95.30	115.50	130.50
静态液氮蒸发率 Static evaporation rate (L/d)	1.2	1.2	1.2	1.5
外形尺寸/ Boundary dimension				
口径 Caliber (mm)	216	216	216	216
总高 Height (mm)	785	840	905	832
外径 OD (mm)	678	678	678	678

The small gas-phase liquid nitrogen tank realizes real-time temperature monitoring, liquid level monitoring, automatic refilling, remote monitoring alarm, and automatic backup and storage of monitoring data. Based on capacitive liquid level sensors, it can easily and automatically control the liquid level to achieve gas-phase storage at -190°C on the tank top, completely solving the technical problems in the application of electronic information technology at -196°C low temperatures. By perfectly combining advanced liquid nitrogen tank production technology and intelligent monitoring technology.

The product is lightweight, occupies less space, has a large capacity, efficient sample retrieval, can monitor the operation status of the liquid nitrogen tank in real time, and will promptly alarm in case of any problems, ensuring the safety of sample storage. It is mainly applicable to users such as biomedicine and sample libraries.

- Real-time liquid nitrogen level and temperature monitoring function.
- Remote monitoring and communication function.
- Automatic liquid nitrogen infusion system, safe and reliable.
- Compatible with gas phase and liquid phase storage modes.
- Screen protection function, prolongs service life.
- Remote alarm function (voice/text message/wechat/email etc.)
- Hot gas bypass design, reduces internal temperature fluctuations.
- Excellent internal temperature uniformity and stability.
- Real-time display of liquid nitrogen consumption.
- On-site sound and light alarm function.
- With dehumidification function, convenient for sample viewing.
- Intelligent local and cloud data backup and export.

Cryobank 4800	Cryobank 5400	Cryobank 6000	Cryobank 6600	Cryobank 7200
最大储存容量/ Maximum storage capacity				
6	6	6	6	6
4800	5400	6000	6600	7200
8	9	10	11	12
性能/ Performance				
145.50	160.50	175.50	192.50	209.50
1.5	1.5	1.5	1.8	1.8
外形尺寸/ Boundary dimension				
216	216	216	216	216
1040	944	1090	1060	1185
678	678	678	678	678

4.7 自增压液氮罐/Self-pressurized liquid nitrogen tank

天驰YDZ系列自增压式液氮罐由优质不锈钢制造而成，配有自升压系统，能自身产生内压力连续排液，可选配监控终端和监控软件，可实现对液位、压力等数据的远程传输，也可手动远程增压和控制补液。目前广泛用于深冷、畜牧业、医药、半导体、食品、低温化工、航空航天等领域。

The Tianchi YDZ series self-pressurized liquid nitrogen tanks are made of high-quality stainless steel and are equipped with a self-pressurization system. They can generate internal pressure to continuously discharge the liquid on their own. Optional monitoring terminals and monitoring software can be selected. Remote transmission of data such as liquid level and pressure can be achieved. They can also be manually remotely pressurized and controlled for liquid replenishment. Currently, they are widely used in fields such as cryogenics, animal husbandry, medicine, semiconductors, food, low-temperature chemical engineering, aerospace, etc.

- 工作压力小于0.1MPa，安全性高
The working pressure is less than 0.1 MPa, ensuring high safety.
- 产品100%经低温严格测试
The product has been strictly tested at low temperatures and is 100% qualified.
- 采用优质304耐低温专用不锈钢
It is made of high-quality 304 stainless steel specially designed for low-temperature resistance.
- 配有双安全阀，双重安全保护措施
It is equipped with two safety valves and has dual safety protection measures.
- 独特抽空技术，确保极低的蒸发损失率
The unique vacuum extraction technology ensures an extremely low evaporation loss rate.
- 可选配稳压系统装置，保证液体流速平稳
Optional pressure stabilization system device can be equipped to ensure stable liquid flow rate.
- 高承载能力的移动脚轮，移动快捷方便
The mobile casters with high load-bearing capacity enable quick and convenient movement.
- 可配低温电磁阀，实现全自动补液功能
It can be equipped with a low-temperature solenoid valve to achieve the automatic liquid replenishment function.

项目	Project	单位 Unit	YDZ-15	YDZ-30	YDZ-50
几何容积	Geometric volume	L	16.5	33	55
有效容积	Effective volume	L	15	30	50
罐体外径	Outer diameter of the tank	mm	377	404	455
高度	Height	mm	830	850	960
空重	Empty weight	kg	24	42	50
静态液氮日蒸发率	Static daily evaporation rate	%	7	3	2
标准工作压力	Standard working pressure	Mpa	0.05	0.05	0.05
最高工作压力	Maximum working pressure	Mpa	0.09	0.09	0.09
输液量	Infusion volume	L/min	≥2L/Min	≥5 L/Min	≥5 L/Min
安全阀开启压力	Open pressure of safety valve	Mpa	0.099	0.099	0.099



YDZ-100	YDZ-150	YDZ-200	YDZ-230	YDZ-300	YDZ-500
110	165	220	250	330	550
100	150	200	230	300	500
556	656	656	656	806	958
1100	1260	1300	1400	1410	1500
68	110	125	140	205	265
1.2	1.1	1	1	0.8	0.8
0.05	0.05	0.05	0.05	0.05	0.05
0.09	0.09	0.09	0.09	0.09	0.09
≥5 L/Min	≥10 L/Min	≥10 L/Min	≥10 L/Min	≥15 L/Min	≥15 L/Min
0.099	0.099	0.099	0.099	0.099	0.099

4.8 生物样本库液氮罐/Biological sample bank liquid nitrogen tank



天驰生物样本库YDD系列液氮罐主要为用户提供全自动、安全可靠的深低温液氮储存系统，其口部采用偏口结构，容量大，适用于大批量生物样本的长期静态保存。采用高真空多层绝热、电子控温和液氮分散等先进技术，使智能降温、恒温过程均匀稳定。可提供气相和液相两种储存方式，特别适用于干细胞、血浆、精液、胚胎、各类组织器官等实验样本的长期超低温保存。

The YDD series liquid nitrogen tanks of Tianchi Biotechnology Sample Repository mainly provide users with a fully automatic, safe and reliable deep-temperature liquid nitrogen storage system. The opening adopts a slanted structure, with a large capacity, suitable for the long-term static preservation of large quantities of biological samples. Advanced technologies such as high vacuum multi-layer insulation, electronic temperature control and liquid nitrogen dispersion are adopted to ensure a uniform and stable cooling and temperature control process. Two storage methods, gas phase and liquid phase, are available, which are particularly suitable for the long-term ultra-low temperature preservation of experimental samples such as stem cells, plasma, semen, embryos, and various tissues and organs.

产品型号 Model	YDD-350-320P	YDD-370-320P	YDD-460-320P	YDD-550-445P	YDD-800-445P
最大储存容量/ Maximum storage capacity					
1.2&2ml冻存管 Storage Tube	14000	16800	21000	28000	39200
10x10/9x9 Racks	12	12	12	24	24
5x5 Racks	8	8	8	16	16
方提桶层数 Layers	10	12	15	10	14
罐体参数/Tank parameters					
几何容积 Geometric volume (L)	350	370	460	588	800
液氮容积 LN volume (L)	55	55	55	125	133
罐口直径 Caliber (mm)	320	320	320	445	445
有效高度 Effective height (mm)	596	708	914	590	840
总体高度 Total height (mm)	1268	1400	1600	1400	1650
外径 OD (mm)	820	820	820	1090	1090
空重 Empty weight (kg)	200	211.5	264	310	394.2
满重 Full weight (kg)	501.5	513	638	790	1040

- 占地面积小，储存样品多，高密度储存
Small in size, capable of storing a large number of samples, and with high-density storage.
- 真空隔热不锈钢箱体结构，真空覆盖率高，确保极佳的绝热及保温性能
Vacuum-insulated stainless steel box structure, with high vacuum coverage, ensuring excellent insulation performance.
- 偏移的小开口优良设计，可大大降低液氮挥发率
Optimal design of the slightly offset opening, reducing the evaporation of liquid nitrogen.
- 先进的温度监控系统，可实时显示箱体内的最高和最低温度
Advanced temperature monitoring system, displaying the highest/lowest temperature inside the box in real time.
- 自动灌注液氮及液位监控系统，确保液氮自动灌注过程安全可靠
Automatic liquid nitrogen filling and level monitoring system, safe and reliable.
- 大尺寸液晶屏，可显示：顶部温度、底部温度、液位高度及运行状态等参数
Large-sized LCD screen displays parameters such as temperature, liquid level height and operating status.
- 热气旁路设计，可在液氮注入前先排除管道中的室温氮气
The hot gas bypass design can remove the room-temperature nitrogen gas in the pipeline before liquid nitrogen injection.
- 不锈钢辅助工作台，可用于冻存架的暂时放置，加快样品取放速度
Stainless steel auxiliary workbench, accelerating the speed of sample retrieval and placement.
- 一体式折叠台阶使操作高度降低，取放方便省力
Integrated folding steps, convenient and effortless to use.
- 内部旋转托盘备用开口方便寻找样品
The internal rotating tray has a convenient opening for easily locating the samples.

YDD-800-445R	YDD-850-465P	YDD-1000-465P	YDD-1300-635R	YDD-1600-635R	YDD-1800-635R
最大储存容量/ Maximum storage capacity					
40600	42900	51000	63000	81900	95250
26	32	32	60	60	60
12	4	8	12	12	14
14	13	15	10	13	15
罐体参数/Tank parameters					
800	890	1031	1346	1634	1854
133	165	165	296	296	296
445	465	465	635	635	635
840	765	889	617	787	906
1650	1600	1700	1500	1650	1750
1090	1190	1190	1565	1565	1565
394.2	400	495	724	765	805
1040	1112	1319	2189	2230	2270

4.9 定制款液氮罐/Customized liquid nitrogen tank

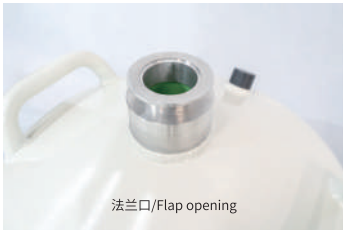
法兰口、平口液氮罐 Flanged and flat-mouth liquid nitrogen tanks

法兰口、平口液氮罐是一种专为特定低温存储需求设计的专业容器。

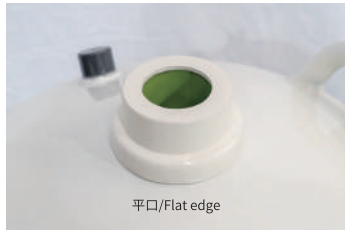
它采用高强度轻量化铝制结构制造，通过独特的KF法兰口，平口设计，方便与各类相关设备或管道进行连接，实现液氮的高效传输与存储。口径小，蒸发损失率低，是一种高效、方便、经济的储存和分配液氮的容器类型，操作中可倾倒、加压排出液氮。广泛应用于科研实验、生物样本库、工业生产等领域。

The flanged and flat-mouth liquid nitrogen tank is a specialized container specifically designed for specific low-temperature storage requirements.

It is manufactured with a high-strength, lightweight aluminum structure. Through its unique KF flanged mouth and flat-mouth design, it facilitates connection with various related equipment or pipelines, enabling efficient transmission and storage of liquid nitrogen. With a small diameter and low evaporation loss rate, it is an efficient, convenient, and economical type of container for storing and distributing liquid nitrogen. During operation, it can be poured and pressurized to discharge liquid nitrogen. It is widely used in fields such as scientific research experiments, biological sample libraries, and industrial production.



法兰口/Flap opening



平口/Flat edge

GP/Lab系列液氮罐 GP/Lab series liquid nitrogen tanks



产品型号 Model	容积 Volume (L)	口径 Caliber (mm)	外径 OD (mm)	总高 Height (mm)	静态液氮 蒸发率 Static evaporation rate (L/d)	静态液氮 保存期 Static retention period (d)
GP-2	2.00	35	180	400	0.10	20
Lab-3	3.15	35	180	520	0.10	30
Lab-4	4.00	35	224	475	0.16	25

4.10 液氮罐辅助工具/Liquid nitrogen tank auxiliary tools

可倾倒液氮罐推车

Dumpable liquid nitrogen tank cart



TCQT-A30+

液氮液位监测报警器

Liquid nitrogen level monitoring alarm



TCLMA-D1

液氮罐移动小推车/Liquid nitrogen tank mobile cart



TCMT-A(平板型)



TCMT-X(交叉型)



液氮自动转移泵/Automated liquid nitrogen transfer pump



TCLNP-50A(遥控)



TCLNP-50A



TCLNP-50



TCLNP-50(手捏)

五、安全说明 Safety Instructions

为确保该产品的正常功能,使其具有较高的稳定性和使用寿命,请根据本说明书中的规定要求和应用条件进行操作使用。

In order to ensure the normal function of this product and enhance its stability and service life, please operate and use it in accordance with the specified requirements and application conditions as described in this manual.

⚠ 安全注意事项

1. 产品属于低温容器,建议用户落实专人使用操作,并熟读本使用说明书、按说明书规定进行操作。
2. 定期对相关人员进行安全教育,避免操作不当造成的损失。
3. 严禁液氮容器装的过满,最佳注入量为颈管下沿。
4. 转移过程中应小心谨慎,防止液氮溢出和飞溅。
5. 本产品严禁盛装除液氮以外的任何低温及高温介质!凡是加注过其他介质的产品,我们有权拒绝质保。
6. 由于液氮温度极低(-195.8°C),在操作时,勿让任何肌肤暴露,并戴上低温手套、护目镜等防护措施,不可穿长筒靴,防止因液氮掉进鞋内产生冻伤。
7. 如果从增压液源灌注容器,应确保源容器处于低压安全状态。
8. 液氮的容器口部温度较低,严禁直接触碰。
9. 严禁用任何方法堵塞盛有液氮的容器口部,否则有增压爆炸的危险。
10. 充装液氮时,宜用软管通过颈口充装液氮,充装时须在容器口部留有空隙,让氮气排出。
11. 容器应避免阳光直射,存放在阴凉通风处。操作时,房间应打开门窗,通风换气,以避免室内缺氧而发生窒息现象。必要时可使用氧浓度监控设备。
12. 严禁使用带中空的管状物测量液氮液位,否则可能会引起低温烧伤,建议使用专业的设备仪器测量。
13. 严禁擅自打开容器保持容器夹层真空的真空封口接头,一旦受损将立即导致容器夹层真空恶化。
14. 严禁刮擦颈管部分,取放样本时应小心,颈管刮伤将导致真空过早或立即失效。
15. 严禁私自拆卸主产品任何部件!不允许在容器表面施焊!
16. 严禁倾斜、横放、倒置、堆压、撞击等行为,使用中应轻拿轻放且始终保持容器处于直立状态。
17. 任何因液氮引起的冻伤应立即就医。
18. 本产品在使用过程中需要持续观察,发现罐体外表面结冰结霜时应立即转移样本,否则会有样本损坏的风险,我公司只承担产品本身损失,不承担第三方责任。

本产品生产涉及多项专业技术,若出现质量问题,只能将产品返回本公司进行检查和维修。

⚠ Safety Precautions

1. The product is a low-temperature container. It is recommended that a dedicated person be assigned to operate it, and the user should read this manual carefully and follow the instructions to operate it properly.
2. Regular safety education should be provided to relevant personnel to avoid losses caused by improper operation.
3. The liquid nitrogen container must not be filled to the brim. The optimal filling amount is at the lower edge of the neck tube.
4. During the transfer process, be careful to prevent the leakage and splashing of liquid nitrogen.
5. This product is strictly prohibited from being filled with any medium other than liquid nitrogen! Any product that has been filled with other media is subject to our refusal of warranty.
6. Due to the extremely low temperature of liquid nitrogen (-195.8°C), during operation, do not expose any skin and wear protective measures such as low-temperature gloves and goggles. Do not wear long boots to prevent frostbite caused by liquid nitrogen falling into the shoes.
7. If filling the container from a pressurized liquid source, ensure that the source container is in a safe low-pressure state.
8. The temperature at the mouth of the liquid nitrogen container is relatively low. Do not touch it directly.
9. Do not block the mouth of the container filled with liquid nitrogen by any means. Otherwise, there is a risk of pressure explosion.

10. When filling liquid nitrogen, it is advisable to use a flexible hose to fill the liquid nitrogen through the neck opening. During the filling process, there should be a gap left at the container opening to allow the nitrogen to escape.
11. The container should avoid direct sunlight and be stored in a cool and ventilated place. During operation, open the windows and doors of the room for ventilation and air exchange to avoid oxygen deficiency and asphyxiation. In necessary cases, an oxygen concentration monitoring device can be used.
12. Do not use hollow tubes to measure the liquid nitrogen level. Otherwise, it may cause low-temperature burns. It is recommended to use professional equipment and instruments for measurement.
13. Do not open the vacuum sealing joint that maintains the vacuum in the container's inner layer. Once damaged, it will immediately lead to deterioration of the vacuum in the inner layer of the container.
14. Do not scratch the neck tube part. When taking and placing samples, be careful. Scratches on the neck tube will cause the vacuum to fail prematurely or immediately.
15. Do not dismantle any components of the main product privately! Do not weld on the surface of the container!
16. Do not tilt, lay horizontally, invert, stack, or impact the container. During use, handle it gently and keep the container upright at all times.
17. Any frostbite caused by liquid nitrogen should be treated immediately by medical professionals.
18. During the use of this product, continuous observation is required. When the outer surface of the tank is covered with water or frost, immediately transfer the samples. Otherwise, there is a risk of sample damage. Our company only assumes the loss of the product itself and does not assume the responsibility of a third party.

The production of this product involves multiple technical specialties. In case of any quality issues, the product can only be returned to our company for inspection and repair.

液氮急救措施

① 皮肤、衣物接触液氮

迅速脱去伤者身上沾有液氮的衣服、鞋子、袜子等，使其冻伤部位血液能够循环。将伤者转移到暖和的地方(室温)用干净自来水或干净微温水连续冲洗冻伤部位。直到冻伤部位皮肤由苍白色转变为粉红色。冲洗后用已消毒且无粘性的布覆盖在冻伤处。若出现严重冻伤或冷烧伤,急救后应立即送到当地医院,并告诉医务人员是由于接触到深冷液体引起的。(注意:冷烧伤的治疗方法与热烫伤很类似,若冷烧伤很严重,应迅速与当地医院联系。不得用热水或采用其它加热方式对冻伤处进行解冻!不得搓揉或按摩冻伤处!解冻期间,不要让病人抽烟喝酒!未经医生同意,不得擅自让伤员吃任何药品。)

② 眼睛接触

若眼睛接触到液氮应立即翻开病人眼帘,用干净自来水或干净微温水轻轻冲洗眼睛至少15分钟并快速就医。

③ 吸入大量氮气

迅速将受害者转移到空气新鲜流通的地方,并立即安排送往医院进行检查治疗。

Emergency measures for liquid nitrogen

① Skin and clothing come into contact with liquid nitrogen

Quickly remove the clothes, shoes, socks, etc. on the injured person that are contaminated with liquid nitrogen, so that the blood in the frozen area can circulate. Transfer the injured person to a warm place (room temperature) and continuously rinse the frozen area with clean tap water or clean lukewarm water until the skin of the frozen area turns from pale white to pink. After rinsing, cover the frozen area with a disinfected and non-sticky cloth. If severe frostbite or cold burns occur, after emergency treatment, immediately send the patient to the local hospital and inform the medical staff that it was caused by contact with a deep cold liquid. (Note: The treatment method for cold burns is similar to that of hot burns. If the cold burn is very serious, contact the local hospital immediately. Do not use hot water or other heating methods to thaw the frozen area! Do not rub or massage the frozen area! During the thawing process, do not allow the patient to smoke or drink alcohol! Without the doctor's consent, do not allow the injured person to take any medicine at will.)

② Eye contact

If the eyes come into contact with liquid nitrogen, immediately open the patient's eyelids and gently rinse the eyes with clean tap water or clean lukewarm water for at least 15 minutes and seek medical attention promptly.

③ Inhalation of large amounts of nitrogen

Quickly transfer the victim to an area with fresh and circulating air and immediately arrange for them to be sent to the hospital for examination and treatment.

六、产品使用 Product usage

1. 安装及使用环境要求

液氮生物容器存放区需有足够的空间、阴凉且通风良好处；
室内温度需控制在-30°C~30°C常温水平；
室内相对湿度需控制在40%~70%范围内；
放置液氮生物容器室内地面应平整；
铝合金液氮生物容器安放位置必须远离热源、易燃品、易腐蚀、强磁场、粉尘和油污严重的场所。

1. Installation and Usage Environment Requirements

The storage area for liquid nitrogen biological containers should have sufficient space, be cool and well-ventilated;
The indoor temperature should be maintained at a normal level of -30°C to 30°C;
The indoor relative humidity should be controlled within the range of 40% to 70%;
The floor of the room where the liquid nitrogen biological containers are placed should be flat;
The placement position of the aluminum alloy liquid nitrogen biological containers must be far away from heat sources, flammable materials, corrosive substances, strong magnetic fields, dust and areas with severe oil contamination.

2. 产品使用步骤

- ①将容器放到样本库房指定位置 ②检查塞体盖运行情况
- ③检查容器内部清洁情况 ④用输送管将液氮缓慢注入新容器中

2. Product usage instructions

- ① Place the container at the designated location in the sample storage room.
- ② Check the operation of the sealing cover.
- ③ Check the cleanliness of the container interior.
- ④ Slowly inject liquid nitrogen into the new container through the delivery tube.

3. 锁盖开关方式

为防止非正常的震动、碰撞等原因造成容器盖(未加锁时)的意外开启,产品可选配带自锁结构的锁盖,用户在开启、关闭锁盖时,应按如下方式操作:

在锁盖上锁处,伸入手指(食指和中指)扣住上盖边缘朝外施加并维持一定的力,然后向上翻转即可打开锁盖。关闭锁盖时,当听见轻微“咔嚓”声,表明锁盖已关闭,上盖与底座之间已形成自锁。

3. Lock cover switch mode

To prevent accidental opening of the container lid (when not locked) due to abnormal vibrations, collisions, etc., the product can be equipped with a self-locking cover. When opening or closing the lock cover, users should follow the steps below:
At the locking position of the lock cover, insert your fingers (the index finger and the middle finger) and grip the edge of the upper cover, apply and maintain a certain force outward, and then flip it upwards to open the lock cover. When closing the lock cover, when you hear a slight "click" sound, it indicates that the lock cover has been closed, and a self-lock has been formed between the upper cover and the base.

4. 提筒提取方式

用手握住提筒提勾垂直向上提升约20~40mm,然后将提筒平移至罐体中心位置,再垂直向上提出提筒。按照上述办法便可将容器中所有提筒提取出来。

4. Bucket extraction method

Hold the lifting tube with your hand and lift the hook vertically upwards by about 20 to 40 mm. Then move the lifting tube horizontally to the center position of the tank, and then lift the tube vertically again. By following this procedure, all the lifting tubes in the container can be extracted.

5. 航空罐使用方法

- ①将容器中提桶取出,然后首次称重并记录(重量单位:kg)。
- ②向容器内注入液氮,液面高度达颈管底部。
- ③放好盖塞,静置12小时后,再向容器内注入液氮,液面高度达颈管底部。
- ④第二次静置12小时后,将残余液氮倒出,然后末次称重,并记录。(重量单位:kg)。
- ⑤(末次称重重量-首次称重重量)÷0.808=实际液氮吸附体吸附的液氮贮量(L)。
- ⑥将计算出来的实际液氮吸附量值与理论液氮吸附值进行对比。若两者偏差不大(由于大气压情况、制造误差,液氮吸附体的实际吸附能力和理论值可能有偏差)便可判定液氮吸附体已经饱和。
- ⑦若偏差较大,应再次向容器内注入液氮,液面高度达颈管底部,静置2小时后,倒出残余液氮,即可使用。

盖塞仅在取放样本、加注液氮时可取下,其余状态请盖好盖塞,避免液氮吸附体降低吸附能力。
如果从增压液源灌注容器,应确保源容器处于低压安全状态。

5. Usage instructions for the dryshipper tank

- ① Remove the bucket from the container, then weigh it for the first time and record (weight unit: kg).
- ② Inject liquid nitrogen into the container until the liquid level reaches the bottom of the neck tube.
- ③ Place the lid back, let it stand for 12 hours, then inject liquid nitrogen into the container again until the liquid level reaches the bottom of the neck tube.
- ④ After the second 12-hour standing, pour out the remaining liquid nitrogen, then weigh it for the last time and record. (weight unit: kg).
- ⑤ (Final weight - Initial weight) ÷ 0.808 = Actual liquid nitrogen storage capacity of the liquid nitrogen adsorption body (L).
- ⑥ Compare the calculated actual liquid nitrogen adsorption value with the theoretical liquid nitrogen adsorption value. If the deviation is not significant (due to atmospheric pressure conditions and manufacturing errors, the actual adsorption capacity of the liquid nitrogen adsorption body may have a deviation from the theoretical value), it can be determined that the liquid nitrogen adsorption body is saturated.
- ⑦ If the deviation is large, inject liquid nitrogen into the container again until the liquid level reaches the bottom of the neck tube, let it stand for 2 hours, pour out the remaining liquid nitrogen, and it can be used.

The cap can only be removed when taking out or putting in the sample, or when adding liquid nitrogen. In all other states, please keep the cap on to prevent the liquid nitrogen adsorbent from losing its adsorption capacity. If filling the container from a pressurized liquid source, ensure that the source container is in a low-pressure safe state.

6. 液氮液位测量与蒸发率计算

6.1 液氮液位测量

请使用专用液位尺!切勿用带中空的管状物代替测量液氮液位。

- 1.将液位尺通过颈口,垂直缓慢放入液氮罐至底部,拿出。
- 2.液位标高用霜线指示,因为提起液位尺时霜线会形成。

注:液位尺只能测量大概液位,若需精确的液位和温度建议选配智慧瓶塞或专业的测量仪器。

6.2 标称蒸发率计算(N.E.R.)

- 1.从容器中取出提筒。
- 2.向容器内补液,容器内液氮量不低于总容量的50%。
- 3.静置48小时后,第一次记录容器重量(kg)。
- 4.第一次重量记录后再静置72小时,进行二次容器重量记录(kg)。
5. $NER = (\text{第一次重量} - \text{第二次重量}) / (72/24) = \text{被测产品的平均日蒸发量XX升/天}$ 。

产品静态液氮保存期的测量与计算均按GB/T 5458标准执行。测试环境温度 $20^{\circ}\text{C} \pm 3^{\circ}\text{C}$ 和常压情况下进行,否则计算数据与产品实际静态液氮保存期可能存在偏差。

6. Measurement of liquid nitrogen level and calculation of evaporation rate

6.1 Liquid Nitrogen Level Measurement

Please use a dedicated liquid level gauge! Do not use hollow tube-like objects to measure the liquid nitrogen level.

1. Insert the liquid level gauge through the neck opening and slowly lower it vertically into the liquid nitrogen tank to the bottom, then remove it.

2. The liquid level height is indicated by the frost line, as the frost line forms when the liquid level gauge is lifted.

Note: The liquid level gauge can only estimate the liquid level approximately. For precise liquid level and temperature measurements, it is recommended to select a smart bottle stopper or a professional measuring instrument.

6.2 Nominal Evaporation Rate Calculation (N.E.R.)

1. Remove the lifting cylinder from the container;

2. Add liquid to the container, ensuring that the liquid nitrogen volume in the container is not less than 50% of the total capacity;

3. After standing still for 48 hours, record the weight of the container for the first time (kg);

4. After the first weight recording, stand still for another 72 hours and record the weight of the container for the second time (kg);

5. $NER = (First\ weight - Second\ weight) / (72/24) =$ The average daily evaporation volume of the tested product XX liters/day.

The measurement and calculation of the static liquid nitrogen preservation period of the product are carried out in accordance with the GB/T5458 standard. The test is conducted under an environment temperature of $20^{\circ}C \pm 3^{\circ}C$ and at normal pressure; otherwise, there may be deviations between the calculated data and the actual static liquid nitrogen preservation period of the product.

七、产品维护养护 Product maintenance and care

1. 产品只能用于盛装液氮，不允许盛装其他介质。

2. 由于在使用过程中，内部会积蓄些许水分，并混有杂质。为防止杂质侵蚀内壁，液氮罐需每年清洗1~2次。

液氮罐清洗方法：

①从容器取出提筒，移出液氮，放置2~3天，待罐内温度至少上升至 $0^{\circ}C$ 左右。

②倒入温水(低于 $40^{\circ}C$)或配以中性去垢剂注入液氮罐内，然后用布擦洗。

③若发现个别融化物质粘在内胆底上，一定要细心刷洗干净。

④将水倒出，再加入清水冲洗数次。

⑤清洗完成后，将液氮罐放在室内安全不宜翻倒处，使其干燥。干燥法可以采用自然风干法或热风吹干法。

如采用后者，温度限制在 $50^{\circ}C$ 以下，应避免 $50^{\circ}C$ 以上热风，以免影响液氮罐性能,缩短使用年限。

⚠ 注意在整个刷洗过程中，动作要轻慢，倒入水的温度不可超过 $40^{\circ}C$

1. The product can only be used to hold liquid nitrogen and is not allowed to hold any other substances.
2. During use, some moisture will accumulate inside and there will be contaminants. To prevent the inner walls from being eroded by impurities, the liquid nitrogen tank needs to be cleaned 1 to 2 times a year.

Method for cleaning liquid nitrogen tanks:

- ① Remove the container and the cylinder from it, remove the liquid nitrogen, and leave them for 2 to 3 days. Wait until the temperature inside the cylinder rises to at least around 0°C.
- ② Pour in warm water (below 40°C) or add a neutral detergent to the liquid nitrogen cylinder, then wipe it clean with a cloth.
- ③ If you find any melted substances stuck to the bottom of the inner tank, be sure to clean them thoroughly carefully.
- ④ Pour out the water, then rinse several times with clean water.
- ⑤ After the cleaning is completed, place the liquid nitrogen tank in a safe indoor location where it won't be overturned, and let it dry. The drying method can be either natural air drying or hot air drying. If the latter is used, the temperature should be limited to below 50°C. Avoid hot air above 50°C to prevent affecting the performance of the liquid nitrogen tank and shortening its service life.

⚠ During the entire scrubbing process, the movements should be gentle. The temperature of the water added should not exceed 40°C.

八、故障分析与处理 Fault Analysis and Troubleshooting

序号	异常现象	原因	处理方法
1	液氮挥发快，保存期低于规定期限	液氮罐罐口经常被打开	容器打开时间尽量短，不要太频繁
2	罐体结水结霜现象	加注液氮时大量冷气排出造成罐口结霜结水	属于正常现象，当停止加注液氮时冰霜会逐步融化，由于环境温度和湿度的差异罐口出现少量冰霜属于正常现象

Number	Abnormal phenomena	Reason	Treating method
1	Liquid nitrogen evaporates quickly and its storage period is shorter than the stipulated limit.	Always keep the liquid nitrogen tank open.	Do not open the container for a long time or too frequently.
2	The phenomenon of water and frost accumulation on the tank body.	When adding liquid nitrogen, a large amount of cold air was discharged, causing frost and water to form at the top of the container.	This is a normal phenomenon. When the liquid nitrogen supply is stopped, the frost will gradually melt. Due to the differences in environmental temperature and humidity, a small amount of frost appearing at the opening of the container is a normal occurrence.

有限质量保证声明

通用条款：

“新产品”——我公司向买方保证，每件液氮生物容器（以下简称“产品”）在材料和工艺方面均无缺陷，除非下文另有规定，产品质量保证期为从装运之日起（1）年。

但以下有限质量保证条款中规定的除外：

“维修/缺陷产品”——我公司向买方保证，所有维修设备和工厂缺陷产品（统称为“修复/缺陷产品”）在材料和工艺方面均无缺陷，除非下文另有规定，产品质量保证期为从装运之日起（90）天。

“零配件”——我公司向买方保证所有零配件在材料和工艺方面均无缺陷，除非下文另有规定，产品质量保证期为从装运之日起（90）天。

有限质量保证条款：

买方同意，在本有限质量保证生效之前，买方应在交货后（10）天内、产品投入使用前，充分检验每件产品、修复/缺陷产品或零配件。买方亦同意遵照我公司产品操作说明操作产品、修复/缺陷产品或零配件，若未能遵守这项规定，则本有限质量保证应视为作废。买方还同意，任何因违背质量保证规定的索赔要求必须在声称发现缺陷60天内以书面形式做出。对于任何涉嫌违背质量保证规定、经我公司检验确定其原因不在本有限质量保证范围内的行为，我公司概不负责。在这种情况下，我公司将象征性地收取买方一笔费用维修该设备。

本有限质量保证不适用于：(A)正常的例行服务项目；(B)由于误用、滥用、事故或由我公司以外或未经我公司授权的其他人的修补工作而要求的维修或更换；(C)与产品、修复/缺陷产品或零配件一起使用未经我公司核准的外部设备或部件；(D)由于正常磨损影响造成的缺陷；(E)不可抗力，或不在我公司控制范围内的其他原因。

如果买方认为有产品、修复/缺陷产品或零配件不符合上述有限质量保证的规定，买方应联系我公司上述地址，对该质量问题进行说明并提供购买日期证明。如果经我公司指示，买方应退回该产品、修复/缺陷产品或零配件，运费预付，妥善包装在我公司批准的装运容器中，并用我公司核发的退回材料授权号码进行正确标识。没有退回材料授权号码而退回的产品、修复/缺陷产品或零配件将拒绝退回给买方，费用由买方承担。

为任何违背本有限质量保证而提供的修补工作只限于修理或更换存在缺陷的新型产品、修复/缺陷产品或工作部件，或限于退还购买价，由我公司自行决定。我公司保证，对于原质量保证期限未届满的，或向买方从运输之日起九十（90）天期限未届满的（以期限较长者为准），更换或修理的产品、修复/缺陷产品或零配件应在材料和工艺方面均无缺陷。买方从我公司处获得的任何索赔不得超过买方所购并造成该索赔的产品、修复/缺陷产品或零配件的购买价，不论索赔的性质是由于合同、侵权、保证、疏忽、严格法律责任或其他原因。对基于我公司遵照买方设计、规格或指示要求，或由我公司以外的当事人做出的任何产品变更，或与其他产品结合使用等原因引起的任何索赔，我公司对此不承担责任，买方亦应保护、捍卫并使我公司免受此类索赔。

买方在任何情况下都无权获得任何性质的间接、特殊、偶然或后果性损害赔偿，我公司对此也不承担责任，这些损害赔偿包括但不限于业务中断成本、搬迁和/或重安装成本、重购成本、利润或收入损失、数据丢失、宣传或制造费用、管理费用、名誉损害或客户流失等，即使我公司已知悉可能发生上述损害赔偿。

除本有限质量保证以外，我公司未做出其他任何明示或暗示的保证，特此拒绝承认其他任何保证，包括但不限于因特殊目的明示的适销性和合适性保证。我公司的任何表述或声明都不会改变本有限质量保证。

任何因违背本有限质量保证的索赔应遵守相关的法律规定，如必要还可提交出卖人所在地工商行政仲裁委员会仲裁或向出卖人所在地人民法院提起诉讼。

本有限质量保证为买方提供了明确的法律权利。

Limited Quality Assurance Statement

General Terms:

"New Product" - Our company guarantees to the buyer that each liquid nitrogen biological container (hereinafter referred to as "the product") has no defects in terms of materials and craftsmanship, unless otherwise specified. The quality guarantee period for the product is one (1) year from the date of shipment. However, the following limited quality guarantee terms are excluded:

"Repair/Defective Products" - Our company guarantees to the buyer that all repair equipment and factory defective products (collectively referred to as "repaired/defective products") have no defects in terms of materials and craftsmanship, unless otherwise specified. The quality guarantee period for the products is (90) days from the date of shipment.

"Parts" - Our company guarantees that all parts have no defects in terms of materials and craftsmanship, unless otherwise specified. The quality guarantee period for the parts is (90) days from the date of shipment.

Limited Quality Assurance Clause:

The buyer agrees that before the validity of this limited quality guarantee takes effect, the buyer shall fully inspect each product, repair/defective products or spare parts within ten (10) days after delivery and before the products are put into use. The buyer also agrees to operate the products, repair/defective products or spare parts in accordance with the operation instructions of our company. If this regulation is not followed, this limited quality guarantee shall be deemed invalid. The buyer further agrees that any claim for compensation due to violation of the quality guarantee regulations must be made in writing within 60 days from the date when the defect is discovered. For any behavior suspected of violating the quality guarantee regulations and determined by our company to be caused not within the scope of this limited quality guarantee, our company shall not be responsible. In such cases, our company will symbolically charge the buyer a fee for repairing the equipment.

This limited quality guarantee does not apply to: (A) normal routine service items; (B) repairs or replacements required due to misuse, abuse, accidents or repair work by others outside our company or without our authorization; (C) external equipment or components used together with the product, repair/defective products or spare parts that have not been approved by our company; (D) defects caused by normal wear and tear; (E) force majeure, or other reasons beyond our control.

If the buyer believes that any product, repair/defective products or spare parts do not comply with the provisions of the above limited quality guarantee, the buyer should contact our company at the above address, explain the quality issue and provide proof of the purchase date. If instructed by our company, the buyer should return the product, repair/defective products or spare parts, with prepaid freight, properly packaged in our company's approved shipping containers, and correctly marked with the return material authorization number. Products, repair/defective products or spare parts without the return material authorization number returned will be refused to be returned to the buyer, and the cost shall be borne by the buyer.

Any repair work provided for any violation of this limited quality guarantee is limited to repairing or replacing defective new products, repair/defective products or working components, or returning the purchase price, as determined by our company. Our company guarantees that for products, repair/defective products or spare parts with an unexpired original quality guarantee period, or within the ninety (90) day period from the date of transportation to the buyer (whichever is longer), there shall be no defects in materials and workmanship. Any claim obtained by the buyer from our company shall not exceed the purchase price of the product, repair/defective products or spare parts purchased by the buyer and causing the claim, regardless of the nature of the claim, be it due to contract, infringement, warranty, negligence, strict liability or other reasons. For any claims based on any product changes made in accordance with the buyer's design, specifications or instructions, or due to the combination with other products, our company shall not be responsible for such claims, and the buyer shall protect, defend and indemnify our company from such claims.

The buyer shall have no right to obtain any nature of indirect, special, incidental or consequential damages in any circumstances. Our company shall not be responsible for such damages. These damages include but are not limited to business interruption costs, relocation and/or reinstallation costs, re-purchase costs, loss of profit or revenue, data loss, advertising or manufacturing costs, management costs, damage to reputation or customer loss, etc., even if our company is aware that such damages may occur.

Except for this limited quality guarantee, our company has not made any other express or implied warranties, hereby refusing to admit any other warranties, including but not limited to the express warranties of suitability for purpose and appropriateness for use for specific purposes. Any statement or declaration by our company will not change this limited quality guarantee. Any claims arising from the violation of this limited quality guarantee should comply with relevant legal provisions. If necessary, they can also be submitted to the arbitration committee of the local administrative authority where the seller is located for arbitration, or to the local court of the seller for litigation.

This limited quality guarantee provides the buyer with clear legal rights.

保修激活

ACTIVATION OF WARRANTY



注意！请填写申请卡，激活保修/Please fill out the application form and activate the warranty

姓名/Name: 邮编/Postal Code:

地址/Address: 省(市)/Province (City) 市(县)/City (County)

经销商名称/Dealer Name:

地址/Address: 省(市)/Province (City) 市(县)/City (County)

序列号/Serial Number:

采购日期/Purchase Date: 年/Year 月/Month 日/Day

您是通过哪种途径获知产品？/How did you learn about this product?

- ☐ 广告/AD ☐ 分销商/Distributor ☐ 同行/Colleague ☐ 制造商数据/Manufacturer data
☐ 展会/Exhibition ☐ 互联网/Internet ☐ 其他/Others

您目前收到哪些刊物/杂志？/Which publications/magazines have you received?

(1级为常用，3级为较少使用) /(1 is common, 3 is uncommon)

- ☐ 1 ☐ 2 ☐ 3

下列要素促使您购买该产品的重要性？/What makes it important for you to purchase this product?

(10级为很重要，1级为不重要) /(10 is important, 1 is unimportant)

	很重要 Importance					不重要 Unimportance				
信誉 Reputation	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
价格 Price	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
质保 Warranty	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
标准特性 Standard features	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
客户服务 Customer service	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
分销商信誉 Distributor reputation	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
同行推荐 Peer recommendations	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
使用可靠性 Usage reliability	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1
其他 Others	☐ 10	☐ 9	☐ 8	☐ 7	☐ 6	☐ 5	☐ 4	☐ 3	☐ 2	☐ 1

您对当地分销商的满意度如何？/Are you satisfied with the local distributors?

满意度 Satisfaction level ☐10 ☐9 ☐8 ☐7 ☐6 ☐5 ☐4 ☐3 ☐2 ☐1

意见 Opinion

总体上，您对容器满意吗？/Are you satisfied with the product?

满意度 Satisfaction level ☐10 ☐9 ☐8 ☐7 ☐6 ☐5 ☐4 ☐3 ☐2 ☐1

意见 Opinion

其他意见或建议/Other opinions or suggestions:



产品合格证

Certificate of Conformity

检验员/Inspector

本品经检验合格准予出厂

This product has passed the inspection and is approved for shipment.

河南天驰低温机械设备制造有限公司

Henan Tianchi Cryogenic Machinery Equipment Manufacturing Co., Ltd.

服务热线: 18903712477 15290868205

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版本号: 25.12.1版



官网二维码



3D验厂

注: 产品图片仅供参考, 请以实物为准。

本手册产品内容及规格参数可能因产品升级而变化, 恕不另行通知。如需了解产品的最新信息, 可访问官网或联系客服。