



# 液氮生物容器

## Liquid nitrogen biological container

### 使用手册

### Operation Manual



河南天驰低温机械设备制造有限公司  
Henan Tianchi Cryogenic Machinery Equipment Manufacturing Co., Ltd.

## 1、工厂概述 Company Profile

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-tech enterprise specializing in the research, development, production and sales of liquid nitrogen biological containers and related products, creating the world's leading supplier of liquid nitrogen biological containers.



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 "Begin with customers' needs, End (complete, finish) with customers' 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.

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.

## 2、工厂资质 Company Qualification



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



### 3、产品结构 Structure



- 外胆、内胆由一种特殊的高强度、耐腐蚀航空铝板制成，坚固耐用。  
Outer liner, inner liner is composed of a high strength, special corrosion resistant Aviation aluminum plate made of durable.
- 颈管是由特殊玻璃钢增强塑造而成，强度高，导热小。  
The neck tube is made of special glass fiber reinforced plastic with high strength and low heat conductivity.
- 绝热材料填充在内胆与外胆之间，使用先进工艺迭层缠绕制成。  
Insulation material is filled between the inner liner and the outer liner, laminated winding made use of advanced technology.
- 颈塞由特殊材质成型，有减小液氮蒸发量和固定提筒的双重作用。  
The neck plug is made of special material, and has the dual function of reducing the evaporation of liquid nitrogen and the fixing of the lifting cylinder.
- 真空抽气口是封闭真空的重要部件，必须严格保护。  
The vacuum port is an important position to close the vacuum and must be strictly protected.
- 保护套在移动或搬运容器时保护容器，还有一定的保温效果，可减少蒸发量。  
Protection bag protects the container when moving or transported, and has a certain thermal insulation effect to reduce the amount of evaporation.

## 4、产品分类

### 4.1 储存型 Storage series 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.

#### 产品特点/Features

- 1.采用高强度航空铝制造
- 2.产品易于长期保存生物样本，便于携带
- 3.配有保护套，可防止产品在使用中的磕碰
- 4.可编号提桶，方便辨认和独立存取样品
- 5.可选配锁盖，以保护贮存样品安全
- 6.高真空多层绝热设计，提供不低于五年真空质保

1. Made of high-strength aviation aluminum
2. Easy and long-term preservation of biological samples, easy to carry
3. Equipped with a protective bag to avoid product bump
4. Numbered canisters for easy identification and independent access to samples
5. Optional lock cover to protect the safety of stored samples
6. High vacuum multi-layer insulation design, providing no less than five years vacuum

产品型号 Model	容积 Volume (L)	口径 Caliber (mm)	外径 O.D (mm)	高度 Height (mm)	静态储存 Static storage (D)	静态液氮蒸发量 Static power dissipation (L/day)
YDS-1	1.30	35	180	350	16	0.08
YDS-2	2.30	35	180	420	28	0.08
YDS-3	3.10	50	223	455	26	0.12
YDS-6	6.50	50	280	525	53	0.12
YDS-10	10.50	50	304	565	87	0.12
YDS-10-80	10.50	80	304	565	50	0.21
YDS-10-125	10.50	125	304	585	25	0.42
YDS-10-216	10.50	216	304	560	11	0.88
YDS-13	15.18	50	304	680	126	0.12
YDS-15	16.40	50	385	600	136	0.12
YDS-15-80	16.40	80	385	600	78	0.21
YDS-15-125	16.40	125	385	585	45	0.35
YDS-20	21.50	50	385	660	178	0.12
YDS-20-80	21.50	80	385	665	102	0.21
YDS-20-125	21.50	125	385	660	60	0.35
YDS-30	31.50	50	440	720	260	0.12
YDS-30-80	31.50	80	440	710	150	0.21
YDS-30-125	31.50	125	440	710	90	0.35
YDS-30-216	31.50	216	440	670	46	0.68
YDS-35	35.20	50	440	760	290	0.12
YDS-35-80	35.20	80	440	710	167	0.21
YDS-35-125	35.20	125	440	710	100	0.35
YDS-35-216	35.20	216	440	710	50	0.68
YDS-50	52.10	50	516	790	217	0.24
YDS-50-80	52.10	80	516	790	162	0.32
YDS-50-125	52.10	125	516	790	115	0.45
YDS-50-216	52.10	216	516	790	70	0.73

## 4.2 运输型 Transport series 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.

### 产品特点/Features

- 1、采用高强度航空铝制造,产品重量轻
- 2、有特制的防震结构，坚固耐用，不易损坏
- 3、可编号的提筒，方便辨认贮存样品
- 4、配有保护套，防止产品在使用中的磕碰
- 5、可选配锁盖，以保护贮存样品安全
- 6、产品有高真空多层绝热设计，提供不低于五年的真空质保

1. Made of high-strength aviation aluminum
2. Have a special shock structure, strong and durable
3. Numbered canisters for easy identification and independent access to samples
4. Equipped with a protective bag to avoid product bumps
5. Optional lock cover to protect the safety of stored samples
6. High vacuum multi-layer insulation design, providing no less than five years vacuum warranty

产品型号 Model	几何容积 Volume (L)	口径 Caliber (mm)	外径 O.D (mm)	高度 Height (mm)	静态储存 Static storage (D)	静态液氮蒸发量 Liquid nitrogen evaporation (L/day)
YDS-10B	10.50	50	304	565	52	0.20
YDS-15B	16.40	50	385	600	82	0.20
YDS-20B	21.40	50	385	660	107	0.20
YDS-30B	31.50	50	440	720	158	0.20
YDS-35B	35.20	50	440	720	176	0.20

注:

- 1.本说明书所有表中所述的几何容积/高度/外径/直径等数值均属于实际测量值,因测量器具/环境等因素影响,可能存在误差,误差范围不超过±3%。
- 2.静态液氮保存期:在标准状态(大气压 101.325 kPa,环境温度 20℃)下,容器中充入液氮预冷并达到热平衡后,且液氮充满率达到 100%,静态放置至液氮全部蒸发完的天数。
- 3.静态蒸发率:容器在规定的充满率下,静置达到热平衡后,24 h 内自然蒸发损失的液氮质量和与内胆有效容积下盛装液氮质量的百分比,换算为标准状态(大气压 101.325 kPa,环境温度 20℃)下的蒸发。

### 4.3 实验室系列 Laboratory series 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.

#### 产品特点/Features

欧盟 CE 认证

CE certification

五年真空质保

Five-year vacuum warranty

大容量，低液氮消耗

Large capacity, low liquid nitrogen consumption

配有专用锁盖，保证样本安全

Equipped with lock cover to ensure sample safety

配套冻存架和冻存盒配有运输脚轮，方便移动

Compatible racks and boxes, come with casters for easy move

型号	YDS-30-125	YDS-35-125	YDS-47-127	YDS-50-125	YDS-65-216	YDS-95-216	YDS-115-216
最大储存容量							
方提桶数量	6/7	6/7	6/7	6/7	6/7	6/7	6/7
2.0ml 冻存管数量 (100 格方提桶)	/	/	/	/	2400/2800	3000/3500	3600/4200
2.0ml 冻存管数量 (25 格方提桶)	600/700	750/875	750/875	900/1050	/	/	/
冻存架层数	4	5	5	6	4	5	6
性能							
容积 (L)	31.50	35.20	48.50	52.10	65.20	95.30	115.50
静态蒸发率 (L/day)	0.35	0.35	0.42	0.45	0.89	0.91	0.92
静态保存期 (D)	90	100	115	115	73	105	126
外形尺寸							
口径 (mm)	125	125	127	125	216	216	216
总高 (mm)	710	710	790	790	715	775	835
外径 (mm)	440	440	516	516	680	680	680

型号	YDS-130-216	YDS-145-216	YDS-160-216	YDS-175-216	YDS-190-216	YDS-210-216	YDS-230-216
最大储存容量							
方提桶数量	6/7	6/7	6/7	6/7	6/7	6/7	6/7
2.0ml 冻存管数量 (100 格方提桶)	4200/4900	4800/5600	5400/6300	6000/7000	6600/7700	7200/8400	7800/9100
2.0ml 冻存管数量 (25 格方提桶)	/	/	/	/	/	/	/
冻存架层数	7	8	9	10	11	12	13
性能							
容积 (L)	130.50	145.50	160.50	175.50	192.50	209.50	226.50
静态蒸发率 (L/day)	0.93	0.94	0.95	0.95	0.96	0.97	0.98
静态保存期 (D)	140	155	169	185	201	216	231
外形尺寸							
口径 (mm)	216	216	216	216	216	216	216
总高 (mm)	895	955	1015	1075	1135	1185	1240
外径 (mm)	680	680	680	680	680	680	680

#### 4.4 畜牧系列 Animal husbandry series liquid nitrogen tank



天驰畜牧储存 YDS 系列产品是一种养殖业专用经济实用型液氮罐，主要针对需要长期静态储存冻精和方便采样工作而设计。小型液氮罐适用于人工转移保存生物样品的用户，特别是为山区用户使用而设计，具有小巧轻便、易于携带、静态液氮日蒸发率低、经济实用的优点。该系列产品不仅被广泛用于畜牧业冷冻精液、疫苗、细胞、微生物的贮存，并可用于机械制造、电子、冶金、能源等领域。

Tianchi Animal Husbandry Storage YDS series is an economical and practical liquid nitrogen tank for breeding industry, mainly designed for long-term static storage of frozen semen and convenient sampling. And small liquid nitrogen tanks are suitable for Users who manually transfer and preserve biological samples, especially designed for mountain users. It has the advantages of small size and light weight, easy to carry, low daily evaporation rate of static liquid nitrogen, economical and practical. This series of products are not only widely used in the storage of frozen semen, vaccines, cells and microorganisms in animal husbandry, but also in machinery manufacturing, electronics, metallurgy, energy and other fields.

#### 产品特点/Features

- 1、罐子保证 100%液氮检测，确保液氮罐质量
- 2、2 年内有任何质量问题免费换新
- 3、配有保护套，防止产品在使用中的磕碰
- 4、可选配安全锁盖结构，防止他人擅自开启
- 5、五年真空质保
- 6、不同的口径选择，方便取放
- 7、高真空多层绝热设计，超低蒸发损失
- 8、大容量冻精细管储存

型号	YDS-2	YDS-3	YDS-6	YDS-10	YDS-10-80	YDS-16	YDS-30	YDS-35
容积(L)	2.30	3.10	6.50	10.50	10.50	17.48	31.50	35.20
口径(mm)	35	50	50	50	80	50	50	50
外径(mm)	180	223	280	304	304	440	440	440
高度(mm)	420	455	525	565	565	525	720	760
静态液氮蒸发量(L/d)	0.08	0.12	0.12	0.12	0.21	0.12	0.12	0.12
静态液氮保存期(D)	28	26	53	87	50	145	260	290
可选提桶样本储存容量								
提桶数量(ea)	3	6		6		6	6	
提桶直径(mm)	23	36		36	60	36	36	36
提桶高度(mm)	110	120		120	120	120	120	276
细管容量-单层 0.5ml	90	792		792	2244	792	792	/
细管容量-单 0.25ml	204	1788		1788	5022	1788	1788	/
细管容量-双层 0.5ml	/	/	/	/	/	/	/	1284
细管容量-双 0.25ml	/	/	/	/	/	/	/	2832

型号	YDS-30-80		YDS-35-80		YDS-30-125			YDS-35-125			YDS-16-80 (9槽)	YDS-47-127 (10槽)
容积(L)	31.50		35.20		31.50			35.20			17.48	52.10
口径(mm)	80		80		125			125			80	127
外径(mm)	440		440		440			440			440	516
高度(mm)	710		710		710			710			525	790
静态液氮蒸发量(L/d)	0.21		0.21		0.35			0.35			0.21	0.45
静态液氮保存期(D)	150		167		90			100			83	115
可选提桶样本储存容量												
提桶数量(ea)	6				6				9		10	
提桶直径(mm)	36	36	60	60	36	36	60	60	90	90	36	60
提桶高度(mm)	120	276	120	276	120	276	120	276	120	276	120	276
细管容量-单层 0.5ml	792	/	2244	/	792	/	2244	/	5124	/	1188	/
细管容量-单 0.25ml	1788	/	5022	/	1788	/	5022	/	11640	/	2682	/
细管容量-双层 0.5ml	/	1284	/	3624	/	1284	/	3624	/	9048	/	6040
细管容量-双 0.25ml	/	2832	/	8460	/	2832	/	8460	/	20706	/	14100

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- 2.静态液氮保存期:在标准状态(大气压 101.325 kPa,环境温度 20℃)下,容器中充入液氮预冷并达到热平衡后,且液氮充满率达到 100%,静态放置至液氮全部蒸发完的天数。
- 3.静态蒸发率:容器在规定的充满率下,静置达到热平衡后,24h内自然蒸发损失的液氮质量和与内胆有效容积下盛装液氮质量的百分比,换算为标准状态(大气压 101.325 kPa,环境温度 20℃)下的蒸发率值。

## 4.5 航空运输系列 Air transport series liquid nitrogen tank



航空运输系列适用于深低温环境下（气相储存,温度低于 $-190^{\circ}\text{C}$ ）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 air transport series is suitable for transporting samples in a deep and low temperature environment (gas phase storage, temperature below  $-190^{\circ}\text{C}$ ), 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.

### 产品特点/Features

- 1、气相低温储存;
- 2、无液氮溢出;
- 3、快速液氮填充;
- 4、麦管和冻存管储存选择;
- 5、坚固耐用的铝制结构;
- 6、欧盟 CE 认证;
- 7、可锁的盖子;
- 8、三年真空质保。

型号	YDH-1.5-30	YDH-3	YDH-4-70	YDH-6-80	YDH-6-190	YDH-10-125
容积 L	1.5	3	4	6	6	10
液氮吸附	0.6	1.3	1.8	2.4	1.8	6
提桶尺寸(mm)	Φ 25*120	Φ 47*200	Φ 67*276	Φ 76*200	N/A	81*85*225
冻存管数量	3	21	84	66	200	100
25 格冻存盒	N/A	N/A	N/A	N/A	N/A	4
100 格冻存盒	N/A	N/A	N/A	N/A	2	N/A
50ml 血袋	N/A	N/A	N/A	N/A	5	6
250ml 血袋	N/A	N/A	N/A	N/A	5	N/A
静态蒸发率(L/d)	0.07	0.15	0.19	0.21	0.8	0.4
工作天数	9	9	9	11	2	15
罐口尺寸(mm)	30	50	70	80	190	125
总高(mm)	398	441	505	435	470	584
外径(mm)	180	224	224	300	252	300
空重(kg)	1.7	3.5	5.5	5.5	6.5	8.8
满重(kg)	2.9	5.9	8.8	10.4	11.4	16.9
样本类型	冻存管夹条				冻存盒	

型号	YDH-15-216	YDH-25-216F	YDH-4-125	YDH-6-190L	YDH-25-216L
容积 L	15	25	4	6	25
液氮吸附	6	10	2	1.8	10
提桶尺寸(mm)	139*141*168	139*141*280	81*85*225	N/A	N/A
冻存管数量	300	500	75	N/A	N/A
25 格冻存盒	N/A	N/A	3	N/A	N/A
100 格冻存盒	3	5	N/A	N/A	N/A
50ml 血袋	N/A	11	6	N/A	N/A
250ml 血袋	N/A	11	N/A	2	10
静态蒸发率(L/d)	0.89	0.89	0.45	0.8	0.89
工作天数	7	11	4	2	11
罐口尺寸(mm)	216	216	125	190	216
总高(mm)	610	741	451	470	650
外径(mm)	396	396	300	252	396
空重(kg)	11	12.5	8	6.5	12
满重(kg)	23.2	32.9	11.3	11.4	32.4
样本类型	冻存盒			血袋盒	

## 5、使用须知 Usage notice

5.1 容器只能用于充装液氮，不能充装其他气体，液氮是一种超低温液体（-196℃），在灌充时，应注意安全，以免飞溅伤人，运输储存过程中请保持罐体立放。

The container can only be used to fill liquid nitrogen, not other gases. Liquid nitrogen is an ultra-low temperature liquid (-196°C). When filling, pay attention to safety to avoid splashing and hurt people. Please do so during transportation and storage. Keep the tank standing upright.

5.2 贮存罐保存时间长，适合短途运输及长时间保存，如果需要长距离运输，建议选用运输罐，如我公司生产的 YDS-30B。

The storage tank has a long storage time and is suitable for short-distance transportation and long-term storage. If long-distance transportation is required, it is recommended to use a transportation tank, such as YDS-30B produced by our company.

5.3 只能使用与我厂配套的颈塞封闭罐口，不能用其他密闭塞子代替，以免液氮持续蒸发产生压力增高导致容器损坏。

Only the neck plugs matched with the factory can be used to close the mouth of the tank, and other closed plugs cannot be used instead, so as to avoid the continuous evaporation of liquid nitrogen and the increase in pressure and damage to the container.

5.4 容器真空封接头是保持容器夹层真空的关键部件，一旦受到破坏，将立即导致容器夹层真空恶化，产品不能继续使用，因此用户不得擅自打开容器真空封口接头。

The container vacuum sealing joint is a key component to maintain the vacuum of the container sandwich. Once damaged, it will immediately cause the vacuum of the container sandwich to deteriorate and the product cannot be used. Therefore, users are not allowed to open the container vacuum sealing joint without authorization.

5.5 初次加液氮前请预冷，如表面结霜属于正常现象，一般 4-6h 恢复正常，如长时间持续请联系客服。

Please pre-cool before adding liquid nitrogen for the first time. If the surface is frosted, it is normal, and it will return to normal within 4-6 hours. If it continues for a long time, please contact customer service.

5.6 用交通工具运送时，请立放，有必要须固定。

When transporting, please put it upright and fix it if necessary.

## 6、产品质保 Quality Guarantee

本公司生产的液氮生物容器在正常使用情况下，自用户收货之日算起，一年内如发现确因制造原因而影响使用的，按下述方法执行：

Under normal use of the liquid nitrogen biological container produced by our company, from the date of receipt by the user, if it is found that the use is affected by manufacturing reasons within one year, the following methods shall be implemented:

容器初次充注液氮静置 24 小时后，如发现容器表面出现有大量冷凝水，结霜等异常现象，请联系客服。

After the container is filled with liquid nitrogen for the first time and left for 24 hours, if there is a lot of condensation or frost on the surface of the container, please contact customer service.

在一年内，当产品出现确属我公司制造上的质量问题，我公司负责对产品进行检查或维修。

Within one year, when the product is indeed a quality problem of our company's manufacturing, our company is responsible for the inspection or maintenance of the product.

本产品由于涉及多项专业技术，因而出现故障后，只能将容器返回我公司进行检查和维修。

Because this product involves many professional technologies, after failure, the container can only be returned to our company for inspection and maintenance.

若出现下列情况之一，我公司概不实行“三包”。

If one of the following situations occurs, our company will not implement the Guarantees.

用户擅自打开容器真空接头，造成容器真空封口接头破坏或阀芯封签破损的。

The user opens the vacuum connector of the container without authorization, causing the vacuum sealing connector of the container to be damaged or the valve core seal to be damaged.

将贮存型容器在充满液氮或放有冷冻物品情况下，做车载运输使用致使产品质量问题的。

The storage container is used for vehicle transportation when it is filled with liquid nitrogen or frozen goods, which causes product quality problems.

未按产品使用须知及有关规要求使用，容器外壳凹陷，颈管被划伤，受内压变形或者泄露，内胆被腐蚀等情况。

If the product is not used in accordance with the product instructions and relevant regulations, the container shell is sunken, the neck tube is scratched, deformed or leaked under internal pressure, and the inner tank is corroded.

如产品出现质量问题，我司负责维修、调换本产品，不作液氮和保存物的理赔事宜。

If the product has quality problems, our company is responsible for the maintenance and replacement of this product, and does not deal with liquid nitrogen and preservation matters.

## 7、液氮静态日蒸发量测试 Liquid nitrogen static daily evaporation test

液氮静态保存期采用称重法测试；

The static storage period of liquid nitrogen is tested by weighing method;

测试应在常压封闭安静的环境下进行，室内温度控制在 20°C；

将容器灌入 1/2 以上的液氮，静放 48 小时后，进行第一次称重（A）克，3 日后第一次称重得（B）克，按下式计算，蒸发量 Q。

$$Q=A-B/3 \text{ (克/天)}$$

如果需要以容积（升）表示，用下式换算：

$$D=Q/808 \text{ (升/天)}$$

The test should be carried out in a closed and quiet environment under normal pressure, and the indoor temperature should be controlled at 20°C;

Fill the container with more than 1/2 of liquid nitrogen and let it stand for 48 hours, then weigh (A) grams for the first time, and then weigh (B) grams for the first time after 3 days. Calculate by the following formula, and the evaporation Q .

$$Q=A-B/3 \text{ (g/day)}$$

If it needs to be expressed in volume (liter), use the following formula to convert:

$$D=Q/808 \text{ (liter/day)}$$

本产品装箱时，附产品使用说明书，合格证各一份，请用户在开箱时注意检查，如有疑问，请将信息于 3 个工作日内反馈回我公司销售部（联系方式见封底）。

When this product is packed, a product manual and a certificate of conformity are attached. Please check when unpacking. If you have any questions, please feedback the information to our sales department within 3 working days (for contact details, see back cover).

## 8、液氮罐通用辅助工具 Universal auxiliary tool for liquid nitrogen tank

### 8.1 液氮罐推车 Liquid nitrogen tank transporter

可倾倒液氮罐推车：采用全不锈钢制造，利用它可以在室内方便地转运液氮生物容器，解决了大容积液氮生物容器转运困难及辅助人工倾倒容器中液氮的目的。具有转运和倾倒液氮容器安全可靠、节省操作者体能的优点。

TCQT-A30+ is made of all stainless steel. It can be used to easily transport liquid nitrogen biological containers indoors, which solves the difficulty of transporting large-volume liquid nitrogen biological containers and the purpose of assisting manual dumping of liquid nitrogen in the container. It has the advantages of safe and reliable transport and dumping of the liquid nitrogen container, and saving the operator's physical energy.



TCQT-A30+ 倾倒液氮罐推车  
适用于 30~35L

液氮罐移动小推车：主要用于满足客户对大中型液氮容器进行短距离移动的要求而设计，使用时直接将容器放在小车上，便可灵活移动，具有方便省力、安全可靠的特点。

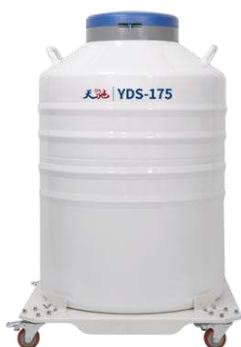
The transportation series is mainly designed to meet the customer's requirements for short-distance movement of medium and large liquid nitrogen containers. When in use, the container can be directly placed on the trolley, and it can be moved flexibly. It is convenient and labor-saving, safe and reliable.



液氮罐移动小推车



液氮罐移动小推车



TCMT-A100	TCMT-A30	TCMT-X50	TCMT-X30
适用于 65~175L	适用于 30~50L	适用于 50L	适用于 30~35L

## 8.2 液氮自动转移泵 Automatic liquid nitrogen transfer pump

天驰脚踏液氮泵系列是让容器内贮存的液氮少量气化，使容器内盛装的液氮排放出来，达到对其它容器补充液氮的目的，具有操作方便，排液过程中液氮率损失低等优点。

liquid nitrogen pump series is to vaporize a small amount of liquid nitrogen stored in the container, so that the liquid nitrogen contained in the container is discharged to achieve the purpose of replenishing liquid nitrogen to other containers. Advantages such as low rate loss.

天驰自动液氮转移泵是集压力测量、显示控制与一体的高精度智能化转移设备，它具有操作简单、抗震性好、控制精度高、升压快、排液迅速、液氮损耗小、使用寿命长等特点，可以实现低压启动，高压停止的控制功能，控制压力全量程可设定等多种功能。液氮在汽化室内迅速汽化，产生低压（ $\leq 0.08\text{MPa}$ ），将液氮从液氮容器内自动排放出来，避免因人工倾倒而损坏液氮容器和大量挥发损耗液氮的弊端，是畜牧、医疗、科研用户实现少量液氮转移的理想设备。

Tianchi automatic liquid nitrogen transfer pump is a high-precision intelligent transfer equipment integrating pressure measurement, display control and integration.

It has the characteristics of simple operation, good shock resistance, high control accuracy, fast boosting, rapid liquid drainage, small liquid nitrogen loss and long service life. It can realize various functions such as easy start under low pressure, high pressure stop control, and the full range of control pressure can be set.

The liquid nitrogen is rapidly vaporized in the vaporization chamber, resulting in a low pressure ( $\leq 0.08\text{MPa}$ ), and the liquid nitrogen is automatically discharged from the liquid nitrogen container. Avoid the disadvantages of damage to the liquid nitrogen container and a large amount of volatilization loss of liquid nitrogen due to manual dumping. It is an ideal equipment for animal husbandry, medical and scientific research users to realize a small amount of liquid nitrogen transfer.



产品型号 Model	适配容器口径 (mm) Compatible container diameter	排液压力 ( $\leq$ MPa) Discharge pressure	排液速度 (L/min) Discharge speed
TCLNP-50	50	0.03	3-5
TCLNP-50A	50	0.05	6-8

### 8.3 液氮液位监测报警器 Liquid nitrogen level monitoring alarm



TCLMA-D1 是一款液氮液位监测报警器，使用瑞士进口高精度传感器探头，保证了产品的优异测量性能。采用双节 18650 大容量电池供电，USB 口可接外部电源供电和充电，超低功耗设计，单用电池可维持 4 个月（10 分钟上报一次实时数据）。数据主动上报到云监控平台，无需监控主机、采集器等设备，设置好温度上下限等相关参数，当环境温度超出上下限、电量过低、外部供电断开和设备离线时，会立即触发告警，告警通知可发送至邮箱和手机短信。支持网页、手机 APP 登陆查看及导出实时数据、实时曲线、告警记录、历史记录等。

TCLMA-D1 is a liquid nitrogen level monitoring alarm that uses Swiss imported high-precision sensor probe to ensure the excellent measurement of the product. The dual -section 18650 large -capacity battery is powered by power. The USB port can be connected to external power supply and charging. The ultra -low power consumption design can be used for 4 months (reporting real -time data once every 10 minutes). The data actively reports to the cloud monitoring platform. There is no need to monitor the host, the collector and other equipment, and set the related parameters such as the upper and lower limit of temperature. When the ambient temperature exceeds the upper and lower limit, the power is too low, the external power supply is broken and the equipment is offline, the alarm will be triggered immediately The alarm notification can be sent to the mailbox and mobile phone text message. Support web pages, mobile app login to view and export real -time data, real -time curve, alarm records, historical records, etc.

### **应用范围/Scope**

广泛应用于液氮低温设备、药库、冷链运输、实验室等场所。

Widely used in liquid nitrogen -nitrogen -low temperature equipment, pharmacy, cold chain transportation, laboratory and other places.

### **产品特点/Features**

- 云监测高温、低温、高湿、低湿、离线、低电量、掉电等，无需监控主机、采集器等设备，离线记录功能，断网时正常监测并记录数据，连网后自动上报到云平台。

Cloud monitoring: high temperature, low temperature, high humidity, low humidity, offline, low battery and power failure; no need to monitor equipment such as hosts and collectors; offline recording function; normal monitoring and data recording when disconnected; automatic reporting to the cloud platform after network connection.

- 全球登陆网页、手机 APP 可查看数据，支持短信报警和邮件报警。

Log in to web site and mobile APP to view data, support SMS and email alarm.

- LCD 大屏显示设计，大方美观，超强稳定性和抗干扰能力。

Preparation for LCD large screen display design, generous and beautiful, super stability and anti-interference ability.

- 使用大容量 18650 电池，可充电，电池防反接，电池装反不会烧机，超低功耗设计，单

用电池供电可维持四个月(上报间隔 10 分钟)。

Used large capacity 18650 batteries, rechargeable, anti-reverse connection of batteries, anti-burn of batteries, ultra-low power design, battery power supply alone can last for four months (report interval is 10 minutes).

- 进口高精度探头，测量精度高，范围宽，一致性好。

Imported high-precision probes, high measuring accuracy, wide range and good consistency.

型号选型/Type	TCLMA-D1
传感器类型/Sensor type	外置 2 米/2 meters per external
温度测量范围/Temperature measurement range	-200°C~200°C
温度测量精度/Temperature measurement accuracy	±0.1°C
本地存储容量/Local storage capacity	10 万组/100,000 groups
输出接口/Output interface	WIFI , USB
电池容量/Battery capacity	两节共 6000mAh/Two knots 6000mAh
额定电压/Rated voltage	USB 供电: 5V /USB power supply: 5V 18650 电池供电: 3.7V/ 18650 battery power supply: 3.7V



视频验厂

Factory video inspection

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