

USER MANUAL

D Series Dewars



phasetwo®



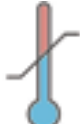
Safety



This Operator Manual contains important warnings and safety instructions. Review the entire manual before using the device.

A replacement manual can be downloaded from the website or ordered from your supplier as needed at any point in time.

SYMBOLS GLOSSARY

	This User Manual contains important warnings and safety instructions.		General information.
	Wear face shield		Liquid nitrogen disposal.
	Wear safety gloves		Asphyxiating atmosphere
	General warning sign.		Use in well-ventilated areas.
	Low temperature warning. Exposure of skin or eyes to liquid or gaseous nitrogen or cold parts may result in frostbite.		Avoid pressure increase due to ice buildup or incorrect lid.
	Air humidity levels at which the freezer can operate without risk		Temperature range at which the Dewars can be exposed without risk.
	Device Disposal		Name and Address of manufacturer Date of manufacture



WARNING: Liquid nitrogen is extremely cold. To avoid injury from frostbite, take extreme care whenever handling liquid nitrogen, liquid nitrogen storage or transfer vessels, or any objects which have come in contact with liquid nitrogen.



- Leave no area of skin exposed.
- Always wear proper PPE attire over clothing: face shield, cryogenic gloves, and cryogenic apron.
- Use extreme care to prevent spilling and splashing liquid nitrogen during transfer.
- Always keep freezer in the upright position. Do not tilt or lay the freezer on its side.
- Immediately remove any clothing or safety attire on which liquid nitrogen has spilled.
- Seek immediate medical attention for any frostbite injuries due to liquid nitrogen.



WARNING: The venting of nitrogen vapors may deplete oxygen in the air, possibly leading to asphyxiation or even death. Do not store or use containers in areas that are small and enclosed or have poor ventilation. The use of an oxygen monitoring system is recommended.



WARNING: Do not tightly seal liquid nitrogen container or prevent nitrogen gas from escaping. Also, excessive humidity levels or exposure to rainfall could result in freezing of the cap and possible failure.



WARNING: Never use a hollow tube to measure liquid nitrogen level. This could lead to personal injury.



Disposal of liquid nitrogen should only be done outdoors or in areas specifically designed for that purpose. Pour the liquid slowly on gravel or bare earth where it can evaporate without causing damage.



CAUTION: Handle the dewar/freezer with care.

- Never overfill dewars with liquid nitrogen. Overfilling can cause personal injury or damage to the freezer, voiding the limited warranty. The liquid nitrogen level should always be below the bottom of the neck tube. Overfilling the tank may cause immediate or premature vacuum failure to occur
- Never ship Liquid Nitrogen Dewars or Freezers on their side or upside down. This can lead to vacuum failure and loss of contents
- Remove and insert canisters carefully. Do not scratch neck tube area scratches can cause premature vacuum failure and loss of contents
- Tampering with or removing the vacuum port will destroy vacuum and void warranty

- Never drop, hit, or strike the unit
- Never spill liquid nitrogen on or near vacuum port
- Never leave the vessel outdoors
- Keep the bottom of dewar clean and away from chemicals, fertilizers, soil, and moisture
- Do not use phasetwo Liquid Nitrogen Dewars or Freezers for transportation
- All performance data published for these products is based on static conditions only



CAUTION: Not for liquid oxygen use.



CAUTION: Never ingest liquid nitrogen, serious harm or death may occur.



CAUTION: In the event there is a serious incident occurring with this device, the user should immediately report the incident to the provider and/or the manufacturer. A serious incident is defined as an injury, death, or potential to cause injury/death should there be a re-occurrence of the incident.

Device Overview & Key Features

D Series dewars from phasetwo are state-of-the-art cryogenic storage systems and include the following key features:

- Uses liquid nitrogen as the cryogenic agent that is non-toxic and non-flammable
- Aluminum vacuum vessel with exceptional vacuum performance

Unpacking and Inspection

phasetwo Aluminum Liquid Nitrogen Dewars are supplied in new condition. Check for any external damage upon delivery.

- Open the shipping box
- Use the packing list to check that all items are present while the unit is being unpacked
- Check the delivery for any damage
- Record all components on the packing list before disposing of any transportation material
- Contact your carrier and report any shipping damage promptly

Intended Use:

phasetwo's Aluminum and Stainless Steel Dewar families are designed for long term cryogenic storage and shipment of biospecimens contained in bags, vials, and similar containers. Biospecimens may be intended for research purposes or for possible re-introduction into humans.

Note: Any other use does not comply with manufacturer recommendations!

phasetwo cannot be held liable in the event, the use of the device does not comply with this Operator Manual.

Intended Location & User Groups

phasetwo Aluminum Dewars and Freezers are intended for use in professional research environments by trained personnel, i.e. clinicians, medical and laboratory technicians, medical and laboratory assistants and other specialist healthcare personnel who have been trained to work with cryogenic liquids and devices.

Optional Accessories and common Replacement Parts can be found on our website: www.phasetwoCCS.com



Technical specifications

D-Series Model	D4	D5	D10	D25	D35	D50
LN2 Capacity (L)	4.6	5	10	25	35	50
Outer Diameter (in/mm)	10.41(264)	9.2(234)	11.4(290)	14.5(368)	18.8 (478)	18.8 (478)
Overall Height (Ins/mm)	18.88(480)	15.34(390)	23.8(605)	25.9(658)	26.1 (663)	32.6 (828)
Neck Opening (Ins/mm)	1.40(36)	1.40(36)	2.19(56)	2.5(64)	2.5 (64)	2.5 (64)
Weight Empty (lbs/kg)	6.1(2.8)	6.6(3.0)	15.0(6.80)	25(11.3)	35 (15.9)	39 (17.7)
Weight Full (lbs/kg)	14.3(6.5)	15.5(7.0)	32.8(14.9)	64.6(29.3)	97.4 (44.2)	128 (58.0)
Evaporation Rate (L/day)	0.4	0.4	0.21	0.23	0.23	0.41
Static Holding Time (days)	11	13	47	120	152	122

Actual evaporation rate and static holding time will be affected by application, atmospheric conditions, and manufacturing tolerances.

Note: For guidance regarding NER, please contact technical support or your supplier.

TECHNICAL DATA AND PERFORMANCE CHARACTERISTICS - Please refer to specific product specification sheet on www.phasetwoCCS.com or contact phasetwo for additional information.



Operations



CAUTION: Failure to follow phasetwo's best operating practices as set forth in this manual can result in loss of contents.

- Indoor use only
- Operating temperature: 0⁰ deg C to 40⁰ deg C
- Relative humidity: Non-condensing
- Storage temperature: -10⁰ deg C. to +50⁰ deg C.
- Storage relative humidity: 10% to 90%, non-condensing
- Atmospheric Pressure: 700 hPa to 1060 hPa
- Altitude: up to 2000m



CAUTION: Liquid nitrogen is extremely cold. Make sure to wear proper PPE before operation. Avoid spilling liquid nitrogen over the vacuum port as this can shrink the seal and allow air to leak into the vacuum space causing premature vacuum failure.



To ensure maximum performance from your phasetwo Liquid Nitrogen Dewar or Freezer follow the steps below:



1. Remove the dewar from the factory packaging. Remove the cap and any accessories. Lift the cap straight up (do not twist).
2. Fill the unit to desired level. The Liquid level should never be above the bottom of the neck tube (the green tube at the top entrance of tank).
 - a. If you are working with a warm dewar, it is phasetwo's recommendation to slowly add a small amount of liquid to the bottom of the unit and allow it to sit until the liquid nitrogen stops rapidly boiling. Position the vacuum port facing away from the operator or other personnel.
 - b. Follow established safety practices and procedures for transferring LN2.
 - c. Fill the vessel with a funnel or transfer hose when possible. Transfer using the LN2 hose with phase separator or pour LN2 into the freezer using a funnel.
 - d. If you are filling your vessel from a pressurized source, make sure it is a low-pressure source (22 psi / 1.5bar / 150kPa or below).
3. Replace the cap and allow the unit to cool.
 - a. If there is excessive frost or sweating after the first few hours, it would indicate a weak vacuum. Examine the unit carefully.
4. Weigh the unit and record.



CAUTION: Observe the container for the first 48hrs after the first fill for signs of vacuum failure. Vacuum failure signs are excessive frost or sweating on the outside of the freezer.

Shipping Instructions

phasetwo Liquid Nitrogen Dewars and Freezers are primarily designed to be storage containers. When transferring empty units to a location, ensure the containers are kept upright. Shipping units in any orientation other than upright can cause permanent damage to the tank causing loss of vacuum.

General Cleaning

Do not use any petroleum-based cleaning solutions.

Inside the vessel: Any cleaning solution that does not react with aluminum, stainless steel, or G10 composite can be used in the sanitation process of a phasetwo Dewar or Freezer. In most cases, any household detergent or mild soap solution is suitable.

Other cleaners and disinfectants that can be used safely include hydrogen peroxide, a chlorine/water mixture, and denatured alcohol. The generally accepted practice of using 10% chlorine bleach with 90% water solution is the best method for decontamination of aluminum freezers. It is important that all surfaces being sanitized are thoroughly rinsed and that all cleaner solution residues are removed after cleaning. Allow the unit to dry completely before putting it into service. It is suggested that the unit is inverted to drain and dry completely.

Outside the vessel: Use a lightly dampened cloth with a mild soap solution.

Measuring Liquid Nitrogen Level

1. Always wear proper safety attire - face shield, cryogenic gloves, and cryogenic apron.
2. Use a plastic measuring rod for liquid level measurement inside a unit. Using a hollow tube can cause liquid nitrogen to flash through the tube and result in personal injury.
3. Carefully insert the dipstick in the tank as far as possible for 5-10 seconds. Wave the dipstick in the air and the level will be indicated by a frost line. The frost line will be U-shaped; read the level at the bottom of the U.

Note: A dipstick must return to room temperature before being used again to measure the level.



WARNING: DO NOT OVERFILL.

Over-filling may result in personal injury due to liquid nitrogen spillage.

CAUTION: When filling the unit, avoid liquid nitrogen coming in contact with the vacuum port. Do not pour the liquid nitrogen on the same side of the vacuum port.

Liquid Withdrawal

1. Always wear proper safety attire – face shield, cryogenic gloves, and cryogenic apron.
2. Liquid withdrawal from units may be accomplished by pouring liquid from the dewar or utilizing phasetwo's liquid withdrawal device (LWD). LWD's work by pressurizing the dewar to 7 psi / 0.5 bar / 50kPa.



Care & Maintenance

Normal Evaporation Rate Test:

1. Fill the unit to approximately half full. Refer to OPERATION section step 1, 2 & 3 for details.

2. Allow the unit to stand for a minimum of 24 hours.
3. Weigh unit and record as First Weight [lb.].
4. Allow filled unit to sit undisturbed for another 24 (+/-0.25) hours.
 - a. Consider the accuracy and resolution of your scale to determine if additional days are required between the first and second weights to obtain an accurate NER. Make sure to record the number of hours between the first and second weights.
5. Weigh a second time and record as Second Weight, [lb.].
6. Calculate evaporation rate by using equation below. The difference between the first weight and the second weight is the daily evaporation rate in lbs. This figure roughly signifies the normal evaporation rate, or N.E.R. [Liter/Day]
$$\text{NER} = (\text{First Weight} - \text{Second Weight}) \times 13.468 / \text{Number of Hours}.$$

If there is major frost or condensation on the outside of the container during this time, it would indicate either a weak or bad vacuum. Refer to the static NER specifications on the applicable specification sheet for your model of tank on our website: www.phasetwoCCS.com. Factors such as age of unit, quantity of inventory, ambient environment, shipping condition, and use of accessories, etc. can negatively affect unit NER.



Device Disposal

Cryogenic Storage and Liquid Dewars from phasetwo are made of high-quality, recyclable materials and components.

Note: Do not dispose of Cryogenic Storage and Liquid Dewars with normal waste:

The assembled materials including aluminium and aluminium foil can be recycled. Plastics, fiberglass tubes, insulator paper and the molecular sieve must be disposed of with industrial waste or be burnt.

Note: Dispose of this device and rejected samples in accordance with local regulations



Warranty

phasetwo warrants to the first end user purchaser that all products will be free of defects in materials and workmanship and will perform in accordance with phasetwo published specifications under normal conditions of installation and use. All warranty coverage periods run from the date of shipment of the goods to the original purchaser.

Cryogenic Dewars & Freezers are warranted for a period of two (2) years, except for vacuum failure which is warranted for a period of five (5) years.



Returns

Limited warranty: Manufacturing defects are covered under the containers limited warranty.

Evidence of mishandling, such as dents on the outer vessel or misalignment of the inner vessel are not considered manufacturing defects.

If you would like to return goods to phasetwo for any reason, you must first obtain a Material Return Authorization (MRA) number for tracking purposes.

Please have the unit serial number and symptoms available.

Contact your supplier or call phasetwo's Customer Service Department at +1 770.985.1313 or email us at customerservice@phasetwoCCS.com



Accessories & Replacement parts

Ordering Information: Order replacement parts and accessories from your local distributor.

For more information or the name of your local distributor, contact phasetwo at the phone number or email listed on the next page.

Dewar Series Accessories & Replacements		
Roller Bases		
D25	P2-2015323	Roller Base 14.5" (368 mm)
D35, D50	P2-2015325	Roller Base 18.7" (475 mm)
Liquid Withdrawal Device	P2-2018904	D25, D35, D50 Only
Dippers		
15cc	P2-2017563	
30cc	P2-2017565	

Dewar Series Accessories & Replacements		
Tipping Stands	P2-2018134	D25 Only
Lid Assembly		
D4	P2-20244882	
D5	P2-2015109	
D10	P2-20144823	
D25	P2-2015278	
D35	P2-2012671	
D50	P2-2012680	



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