Operating Instructions

TW-347

Cryo-Exchange Vapor Shippers

CX SERIES

SAFETY

Before using any cryogenic refrigerator, read the *Handle with Care* booklet provided with the unit. It details safety precautions that must be understood before using the equipment. If a replacement booklet is needed, order publication TW-10 *Handle with Care* from your supplier.

Following are a few of the safety precautions described in the *Handle with Care* booklet. Please be sure to read the entire booklet.

Store and use these containers only in well ventilated areas. In a confined area, nitrogen gas from these units may cause suffocation by displacing air needed for breathing. Install a suitable oxygen monitor.

Do not touch liquid or cold metal surfaces with your bare skin. The liquid nitrogen refrigerant in these containers is **extremely cold:** -196°C (-320°F). Exposure of skin or eyes to liquid, cold gas or frosted parts could result in a severe frostbite-like injury. Because of the extremely low temperature, a face shield and gloves must be worn when transferring liquid nitrogen and material into or out of these containers.

Use only the necktube core supplied with this unit or a listed replacement part. A tight fitting plug of stopper will cause a pressure increase in the container that may damage the container and/or cause personal injury.

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

OPERATION

Important note: Before filling the CX for the first time, record the tare weight and serial number of each container. Recording the "as received" tare weight on the container itself is recommended.

Filling: Adding liquid nitrogen to a warm container may cause splashing and will generate a significant volume of nitrogen gas as cold liquid contacts warm refrigerator surfaces. Add liquid slowly to minimize these effects. Be sure there is adequate ventilation. Keep your head clear of the heavy volume of vapor that may be produced. It is extremely cold and could cause personal injury.

WARNING
DO NOT OVERFILL. Over-filling may result in personal injury due to liquid spillage.

With regular usage, moisture can accumulate in the refrigerator as a result of lowering a frosted canister back into the shipping cavity. This moisture will displace nitrogen in the absorbent materials on the subsequent filling and effect the overall holding time.

CAUTION: When filling the Cryogenic Refrigerator, avoid liquid nitrogen coming in contact with the vacuum plug. In order to accomplish this, the Cryo-Exchange must be removed from its shipping carton during the "fill" operation.

Remove the unit from its shipping enclosure. Set the unit on a scale and fill the refrigerator with liquid to the bottom of the necktube. Then allow the unit to stand undisturbed while the refrigerant is being absorbed. About every five minutes, add liquid to maintain the refrigerant level as the liquid is absorbed by the filler. This procedure can take ten to fifteen cycles. When the liquid levels remains at the bottom of the necktube, the shipper is full. At this point, the quantity of liquid standing in the central cavity of the refrigerator must be poured out to prevent spillage during shipment. To assure a complete fill, the dry CX100 weight should increase by approximately 7.9 lb. (3.7 kg) and the dry CX500 weight should increase by approximately 11.5 lb. (5.2 kg).

The material to be stored in the Cryo-Exchange Refrigerator, as well as the canister or rack, should be pre-cooled before being placed in the shipper. When the refrigerator is fully charged, place the pre-cooled material to be stored in the pre-cooled canister and lower it into the necktube. Install the necktube core and cap to hold the canister in place.

CAUTION: When the Cryo-Exchange is in use, it must be kept upright. When properly filled, there is no concern for liquid refrigerant spills. However, holding time will be drastically reduced when the refrigerant is on its side.

Securing contents: The contents of all models may be secured with a seal or lock through tabs on the edge of the lid.

ROUTINE CARE AND MAINTENANCE

Do not attempt to fasten any device to the container. Welding, brazing, or piercing of the container in any manner will cause permanent damage.

Refrigeration depends on the presence of cryogenic nitrogen refrigerant in the refrigerator. Be sure to maintain a full charge of refrigerant to prevent loss of stored materials. Please refer to the "Operations" section of this document for instructions on the filling procedure. If you are not able to fully charge the Cryo-Exchange by weight, it is possible that more moisture has accumulated in the filler material over time with normal usage. This accumulation will result in the displacement of refrigerant. Allow the refrigerant to warm to room temperature. The warming procedure may take as long as four weeks. Then direct dry heat not to exceed 150°F (65°C) from hair dryer to other source, into the refrigerator. The unit is acceptably dry when the tare weight is within 1 lb. (0.45 kg) of the "as received from the manufacturer" tare weight.

If high evaporation rates are apparent under normal operating conditions, the dewar may be losing its vacuum. Sweating and the formation of frost on the outer casing are indications the refrigerator may be losing its vacuum. All necessary steps should be taken to protect the refrigerator's contents. If these conditions persist, contact your supplier or Taylor-Wharton's Technical Response Team (1-800-TW-TANKS or email us at cryotanks@taylorwharton.com) for information on how to conduct a normal evaporation rate (NER) test in the field.

TRANSPORTATION

Although these refrigerators are rugged, they can be damaged or abused or otherwise mishandled. A specially designed hard-shell shipping container (refer to the parts section for ordering information) should be used anytime the refrigerator is transported. This container will help prolong the life of the unit and should be replaced if damaged during use. When moving or transporting a refrigerator, take every precaution to prevent sliding, tipping, bumping or dropping the unit. **Keep the unit upright.** Although there is no safety hazard if the properly filled refrigerator is on its side, the refrigerant consumption is much greater with the unit in this position and holding time will be significantly reduced.

RETURNS

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

ACCESSORIES

The following accessories are available for CX Series Refrigerators:

- **Roller Base -** will ball-bearing swivel casters to provide convenience and portability within a working area where frequent container movement is necessary or desirable.
  P/N R018-8C00 ..... CX500
- **Inventory Control Boxes -** made of cardboard or plastic to hold 2ml vials. Can be used to store samples.
  (Plastic) 100 cell box
  P/N N-374187-92 ..... CX500
- **Rugged Shipping Enclosures -** for easy transport.
  P/N 3701-9277(padded carton).....CX100
  P/N CX10-8C00 (Hard shell) CX100
  P/N CP19-8C00 (Hard shell) CX500

REPLACEMENT PARTS

Description	CX100	CX500
Handle	R005-5C11	N/A
Handle Pin	8631-5000	N/A
Canister	R005-9C24	Note*
Necktube Core	R005-9C21	CP70-9C18
Hard Shell Shipping Enclosure	CX10-8C00	CP19-8C00

*Note**: Five shelf rack (for TW plastic box).....RS30-9C40
Blood Bag Rack……CP70-9C44

ORDERING INFORMATION

Order all replacement parts and accessories from your distributor. Please include the part and model number of your refrigerator, the part number, quantity, and description of each part requested. for more information contact Taylor-Wharton at the address listed.

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