

Chart Inc.

Liquid Discharge Device

Installation and Operating Instructions

Part Numbers

10668004 LAB-30
10668021 LAB-50
10668101 LAB 10 2 1/8"
13467208 LAB-10 EXT RBR
13484139 LAB-20 2-1/8"
13464867 LAB-20 EXT RBR
21293002 YDS-10L EXT RBR
21293003 YDS-20L EXT RBR
21293004 YDS-30L EXT RBR
21293005 YDS-40L EXT RBR



Operation

General

The MVE liquid discharge device provides liquid nitrogen for filling cold traps and smaller dewars without having to scoop out or pour liquid nitrogen from the vessel. The liquid discharge device utilizes the normal evaporation of the cryogenic liquid to slightly pressurize a dewar by plugging the neck of the dewar and forming a hermetic seal. The pressurized vessel can then decant liquid nitrogen through the liquid discharge device. Figure 1 shows a drawing of the liquid discharge device. The primary components of the liquid discharge device are listed below:

- **Rubber Stopper:** Provides a seal against the walls of the neck tube. Tightening the wing nut expands the rubber stopper.
- **Pressure Gauge:** Indicates the pressure inside the container.
- **Safety Relief Valves:** Relieves pressure inside the container automatically when set pressure is reached. The relief valves are safety devices and cannot be adjusted.
- **Vent Valve:** Provides means to vent product. The vent valve can be closed to pressurize the vessel or opened to de-pressurize the vessel.
- **Discharge Valve:** Allows product to flow out of the vessel through the discharge device spout.
- **Safety Cable:** Prevents discharge device from accidentally exiting completely from vessel.
- **SAFETY NOTE:** Always wear approved safety equipment: Face shield, cryogenic gloves and cryogenic apron.
- **WARNING:** Frostbite: Liquid nitrogen is extremely cold (-320° F {-196° C}) and will freeze skin and deep tissue on contact.
- **NOTE:** Read and understand the Operating Manual that accompanied your cryogenic dewar.
- **WARNING:** Liquid nitrogen must be about 1" below the bottom of the dewar neck tube before inserting discharge device! There must be ample gas space at the top of the dewar, below the neck tube, so the discharge device can be inserted without liquid nitrogen coming into the neck tube, or the liquid nitrogen can harden and shrink the rubber boot that seals the discharge device to the dewar. *Serious injury could result from an overfilled dewar.*

INSTALLATION AND PRESSURIZING

Perform the following steps to install the liquid discharge device on a dewar:

1. Attach the discharge device spout to the liquid discharge device (refer to Figure 1 for location). A transfer line can be used in place of the discharge device spout. The transfer line can be ordered from MVE (P/N 9713159) along with the required adapter fitting (P/N 1110052).
2. Verify that the rubber stopper is dry and free from grease and other contaminants. Check for nicks and gouges that may impair normal operation.
3. Verify both safety relief valves open between 4.5 psi and 5.5 psi and reset by 4 psi. Replace any defective safety relief valves immediately.
4. Verify that the cable is in good working condition.
5. Verify that the vent and discharge valves turn freely.
6. Ensure the neck tube area that contacts the rubber stopper is frost-free and dry.
7. Loosen wing nut.
8. Ensure the liquid nitrogen level in the dewar is below the neck tube.
9. Slowly lower discharge device into vessel. As the discharge device is lowered, the nitrogen in the vessel will boil until the dip tube has cooled. The boiling action is normal. Continue lowering until the rubber stopper fits fully into the dewar neck tube.
10. Clip the safety cable to the vessel handle.
11. Tighten the wing nut until it contacts the washer. Tighten wing nut another 1-1/2 to 2 turns (EXT RBR versions 4 to 5 turns).

CAUTION: Tighten the wing nut with hands only, do not use any tools. Tightening the wing nut expands the rubber stopper against the neck tube of the vessel. Excessive tightening may damage the neck tube.

12. Close the vent valve and the discharge valve. Pressure will slowly begin to build to 5 psi. At least several hours will be required to achieve sufficient pressure to operate the liquid discharge device.

WARNING: Excessive pressure can rupture the vessel. Always ensure proper operation of the safety relief valves and monitor the dewar pressure with the pressure gauge. Never allow the dewar pressure to rise above 6 psi.

OPERATION

Perform the following steps to withdraw liquid from the dewar with the liquid discharge device:

1. Turn the discharge valve 1/4 turn to fully open
2. Close the discharge valve to end liquid withdrawal.

WARNING: Cryogenic liquids are extremely cold and can cause severe burns similar to frostbite.

See CGA Bulletin No. P-12 Safe Handling of Cryogenic Liquids. (This bulletin may be ordered from: Compressed Gas Ass'n., <https://portal.cganet.com/Publication/Index.aspx>.)

WARNING: Nitrogen vapors in air may dilute the concentration of oxygen necessary to support or sustain life. Exposure to such oxygen deficient atmosphere can lead to unconsciousness and serious injury, including death.

WARNING: Modifying safety valves on discharge devices causes potentially hazardous conditions.

REMOVAL OF LIQUID DISCHARGE DEVICE

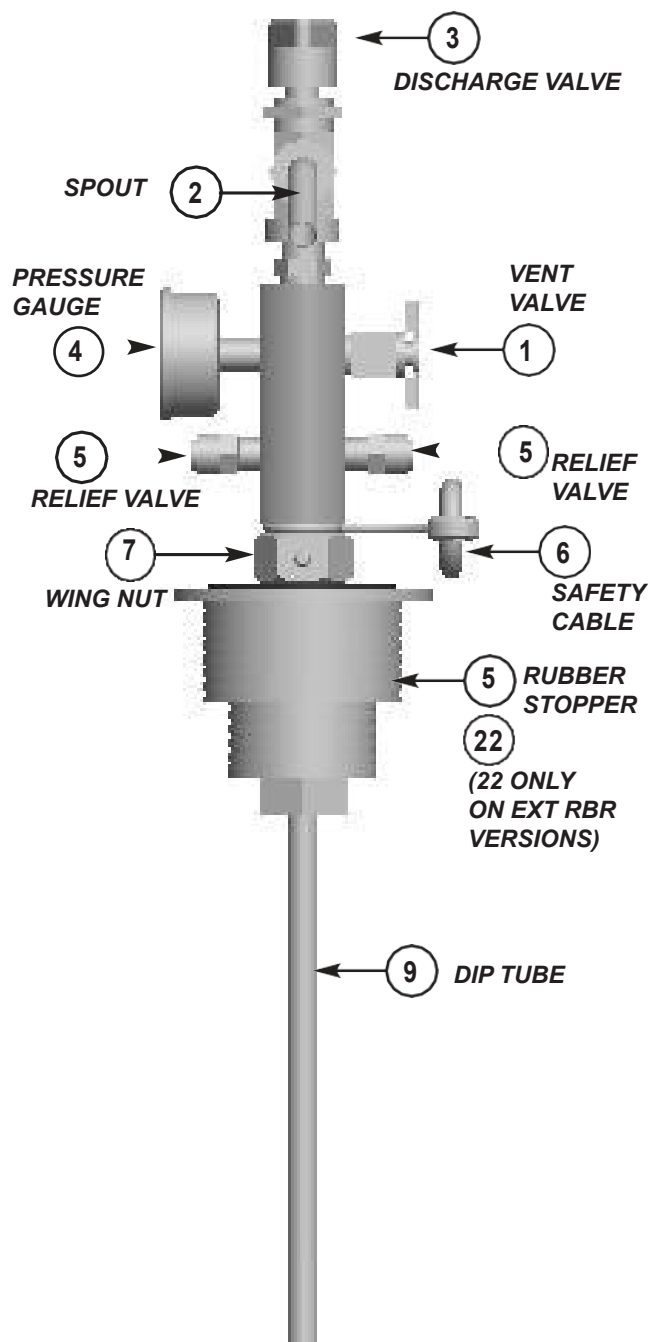
Perform the following steps to remove the liquid discharge device from the vessel:

1. Open the vent valve to remove all pressure.
2. Verify that the pressure gauge reads 0.

WARNING: Dewar must completely vented before removing the discharge device. Any attempt to remove the discharge device before the vessel is completely vented may result in serious personal injury.

3. Loosen wing nut.
4. Rock discharge device gently from side to side to free stopper.
5. Pull discharge device from vessel.
6. When stopper has passed rim of vessel, unclip safety cable.
7. Store liquid discharge device in a clean and dry area.
8. Reinsert dewar cork and cover.

REPLACEMENT PARTS



Phase separator for discharge spout is PN 11734421
 Small Transfer Hose with medium phase separator is PN 14044151
 Small Transfer Hose with small phase separator is PN 14044143
 Large Transfer Hose without phase separator is PN 9713159 and requires adapter fitting PN 1110052.

REPLACEMENT PARTS CON'T

The following is a list of replacement parts that are common to all discharge devices.

<i>Item Number</i>	<i>Part Number</i>	<i>Description</i>
1	1711042	Vent Valve, 1/4" NPT
2	5612941	Spout, 3/8" O.D.T
3	10664126	Discharge Valve, 1/4" NPT
4	2010024	Pressure Gauge, 1/8" NPT, 0-15 PSIG
5	14235804	Relief Valve, 1/8" NPT, 5 PSIG
6	9027109	Safety Cable
7	2912001	Wing Nut
Not Shown	3810209	Label, Caution

The following is a list of components which must be ordered for a specific discharge device.

<i>Discharge Device P/N</i>	<i>Rubber Stopper P/N</i>	<i>Dip Tube P/N</i>
10668004	47-1014-7	90-2712-1
10668021	47-1014-7	90-2715-1
10668101	47-1080-7	90-2719-1
13467208	47-1006-7 & 13465974	90-2719-1
13464867	47-1006-7 & 13465974	90-2709-1
13484139	47-1080-7	90-2709-1
21293002	47-1006-7 & 13465974	21293006
21293003	47-1006-7 & 13465974	21293007
21293004	47-1006-7 & 13465974	21293008
21293005	47-1006-7 & 13465974	21293009

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