

VACU-SHIELD TRAPS AND FILTERS

LN2 COLD TRAP

The Liquid Nitrogen trap is ANCORP's recommended cold trap for high vacuum applications. It features an in-line port design for installation and a simple 2-piece clamped body design to ease trap cleaning. The trap is electropolished inside and out, has cap handles, and has a vented stopper all included standard.



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Reccomended Options

A third port is included on all LN2 traps except the 0.8 liter trap. This third port is intended to serve as a vacuum break or vent. Without some means to break vacuum on this line, the liquid nitrogen Dewar will be difficult to disassemble for cleaning or servicing. Under no circumstances should a screwdriver or similar tool be used to separate the liquid nitrogen Dewar from its stainless steel, vacuum jacketed housing.

The most common configuration for this port is to include a tee with the appropriate ISO-QF terminations. On one side of the tee, an up-to-air valve is attached and, on the other side of the tee, a vacuum gauge is attached. The up-to-air valve allows the system to be safely vented and the vacuum gauge provides an additional check on the trap's base pressure to ensure vacuum integrity.

Note: If a separate up-to-air valve is not employed or the vent port is sealed (blanked off) during use, some means of venting or breaking vacuum must be included in the inlet or outlet pumping lines.

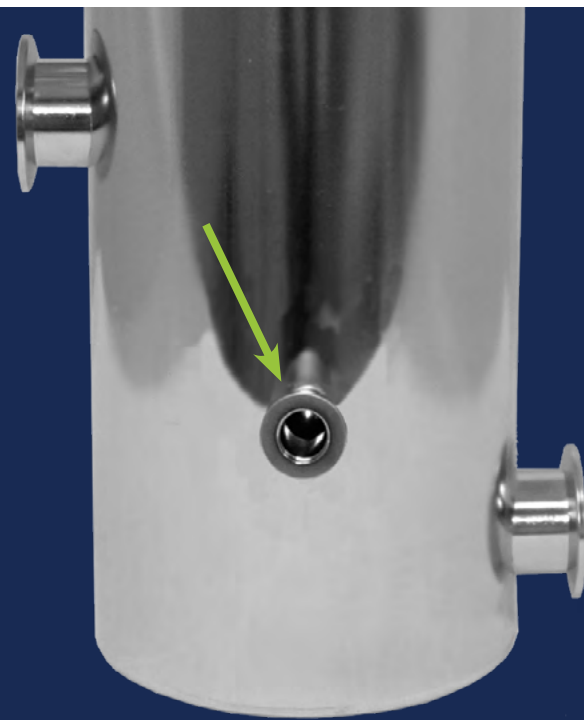
- Trapping Element: cold Dewar
- Pump protection from water and condensable vapor
- Multi-option trapping system
 - **Option 1:** liquid nitrogen for high vacuum trapping of condensable vapors
 - **Option 2:** mixture of dry ice and alcohol to trap condensable vapors in low vacuum or during initial evacuation of your vacuum system
- Simple, clamped two piece body design - eases cleaning, assembly and provides a consistent seal
- Electropolished Body: eases cleaning, de cts heat and reduces iron concentration on trap surfaces which in creases corrosion resistance
- Cap handles included to ease handling of trap
- Large fill port
- Port Stopper Included - reduces liquid nitrogen evaporation and assists in the maintenance of a stable temperature within the Dewar
- Connection options (ISO-QF, others on request)

PURPOSE OF 3RD PORT

All ANCORP LN₂ traps come with a third port terminated with a QF16 vacuum flange. This port should be fitted with either an up-to-air valve or a tee with a vacuum gauge and up-to-air valve. If the port is blanked off, the customer will have a difficult time breaking vacuum - which is necessary to separate the double-walled container for cleaning.

A second feature of the LN₂ trap is that it's designed to be maintained and recharged in-situ. Once vacuum is broken, the inner container may be easily removed for cleaning.

Additional nitrogen may be added by removing the loose fitting lid and pouring the cryogen through the inlet. Auto-refill devices that work in conjunction with liquid cylinder are available through most major liquid nitrogen suppliers.



LN2 Traps in Dry Ice Service

LN2 Traps can be used in dry ice service, but there are limitations.

- First, the dry ice trap has a wider mouth (inlet) to accomodate the small dry ice pellets that are commercially available and almost universally used. Therefore, recharging will be slightly easier with a dry ice trap.
- Second, the dry ice trap has a wider body to help offset the limitations of the cryogen's higher vapor pressure¹ (i.e., higher temperature). Therefore, an LN₂ trap used in dry ice service will have slower pumping speed and lower gas load than a standard dry ice trap.

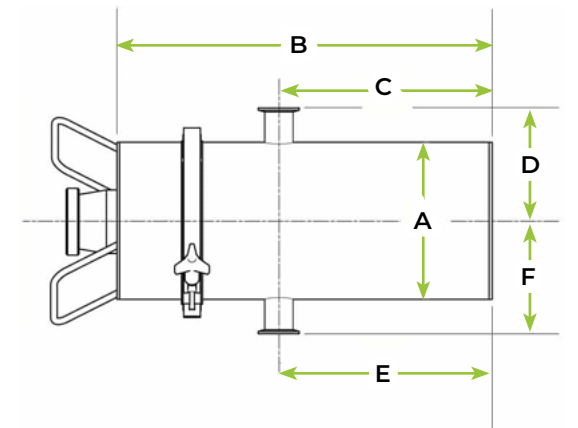
¹Vapor pressure is the pressure exerted by molecules after they have escaped from a liquid or solid and formed a vapor (gas) over that solid or liquid. One tries, in general, to put substances of low vapor pressure into a vacuum system so as to decrease the gas load on the vacuum pump.

Body Sizes and Their Roles

LN₂ traps come in various body sizes. Larger body sizes offer a larger cold wall (surface) and therefore will accomodate larger moisture loads and provide higher pumping speeds (in cryopumping applications).

SMALL BODY

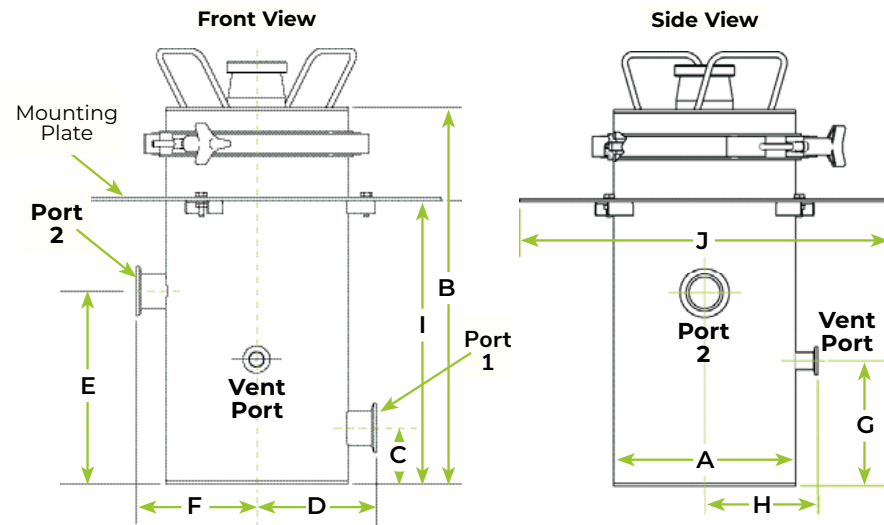
- Port Terminations : ISO-QF
- Materials:
 - **Body, flanges, and baffle:** 304 Stainless Steel electropolished
 - **Seal:** Buna-N



PART #	REFERENCE ID	A	B	C	D	E	F	G	H	J Diameter	Vol (L)	I Height	CONNECTION
7500404	VSCI-800-QF16	4.00	10.00	5.50	2.75	5.50	2.75	N/A	N/A	N/A	0.8	N/A	QF16
7500405	VSCI-800-QF25	4.00	10.00	5.50	2.75	5.50	2.75	N/A	N/A	N/A	0.8	N/A	QF25
7500406	VSCI-800-QF40	4.00	10.00	5.50	2.75	5.50	2.75	N/A	N/A	N/A	0.8	N/A	QF40

LARGE BODY

- Port Terminations : ISO-QF
- Materials:
 - **Body, flanges, and baffle:** 304 Stainless Steel electropolished
 - **Seal:** Buna-N
- Mounting plate and exhaust vent included



PART #	REFERENCE ID	A	B	C	D	E	F	G	H	J Diameter	Vol (L)	I Height	CONNECTION
7500411	VSCI-1000-QF25	4.00	14.50	2.50	2.75	7.50	2.75	5.00	2.98	7.00	1.0	10.20	QF25
7500412	VSCI-1000-QF40	4.00	14.50	2.50	2.75	7.50	2.75	5.00	2.98	7.00	1.0	10.20	QF40
7500425	VSCI-2000-QF25	6.00	15.50	2.50	4.25	8.50	4.25	5.50	3.98	10.00	2.0	11.40	QF25
7500426	VSCI-2000-QF40	6.00	15.50	2.50	4.25	8.50	4.25	5.50	3.98	10.00	2.0	11.40	QF40
7500427	VSCI-2000-QF50	6.00	15.50	2.50	4.25	8.50	4.25	5.50	3.98	10.00	2.0	11.40	QF50
7500431	VSCI-5000-QF25	8.00	16.50	2.50	5.25	8.50	5.25	5.50	4.98	12.00	5.0	12.50	QF25
7500432	VSCI-5000-QF40	8.00	16.50	2.50	5.25	8.50	5.25	5.50	4.98	12.00	5.0	12.50	QF40
7500433	VSCI-5000-QF50	8.00	16.50	2.50	5.25	8.50	5.25	5.50	4.98	12.00	5.0	12.50	QF50

The Role of Temperature

The temperature of Liquid Nitrogen (77 K or -196° C) determines the temperature of the cold wall. The cold wall temperature determines the ambient temperature and, ultimately, the achievable base pressure. The effective base pressure achievable by a cold trap is determined by the highest vapor pressure of the condensable gases being pumped.

	Liquid Nitrogen	Dry Ice
Temperature	77K (-196° C)	195K (-78°C)
Vapor Pressure of Water at Temperature (Torr)	10 ⁻¹² Torr	10 ⁻³ Torr

Note: Vapor pressures provided are nominal values only. Exact values can be found in the *Handbook of Chemistry and Physics*.

For any further questions regarding LN₂ cold traps, contact an ANCORP representative by email at sales@ancorp.com or by telephone at 1-800-FLANGE1.

ICE BLOCKAGE AND ICE CRYSTALS

In most cases, trapped moisture will form a monolayer or an invisible thin layer on the cold surface. However, in rare instances, when dealing with very heavy moisture loads, a significant ice crystal may form that is large enough to choke the trap inlet and prevent further trapping (or cryopumping). In these rare cases, the trap should be isolated from the process, allowed to warm, be cleaned, and then recharged with cryogen.

SAFETY WARNINGS:

- The use of screwdrivers or similar tools to pry the containers apart in order to "break" vacuum is strongly discouraged. The lid of the liquid nitrogen container is intentionally loose fitting and is outfitted with a vent hole to provide a safe relief for nitrogen as it vaporizes. Do not try to seal the container, countermand the lid, seal the vent hole, or "cork the inlet" to conserve on liquid nitrogen.
- Use caution when initially filling a warm LN₂ trap. Cryogenic gloves and safety goggles or safety shields are required. The cryogen will flash (quickly vaporize) as it comes in contact with the warm chamber. It will continue to flash until the chamber is cooled to the liquid nitrogen temperature (77K). During the initial flash boil off, make sure hands, eyes, and exposed skin are clear of the super-cold gas.