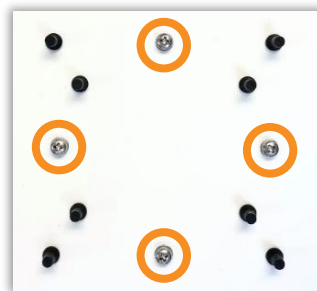


Introduction

Welcome to your new Instec LN2 suction-based cooling system! The LN2-P4C system was designed to provide active cooling as low as -190°C for Instec stages/plates/chucks. If you can't wait to get your system setup, consult this quick start guide for basic setup and operating instructions. For full instructions consult the included user's manual

Warning – Transit Screws

REMOVE TRANSIT SCREWS ON PUMP BOTTOM BEFORE OPERATION, OTHERWISE WARRANTY WILL BE VOIDED!



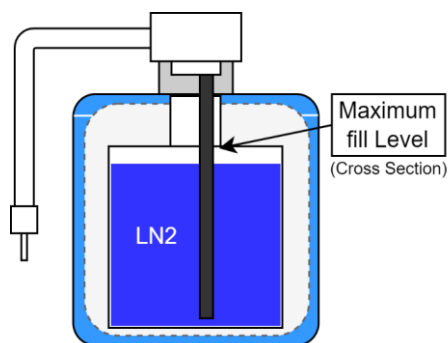
Included Parts

1. LN2-P4C Pump
2. 3L Dewar with Dewar Head
3. Rubber Dewar Plug
4. LN2 Suction and Vent tubes (5cm long ends)
5. Cooling I/O Cable
6. AC Power Cable



Setup

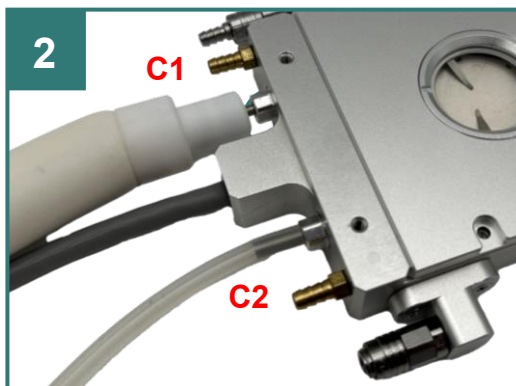
1



Fill LN2 Dewar, Install head

Fill dewar up to the top of the insulated neck. Drop dewar head into place, carbon-fiber tube down.

2



Connect Supply/Suction lines

Remove protecting sleeve, insert small Teflon line into LN2 tube, press until sealed. Connect suction line between C2 and "IN" Port

(Optional) Connect Vent Line

Exhaust gas can be used for gas-purge or defrost by installing the vent line onto the pump "Out" port

3

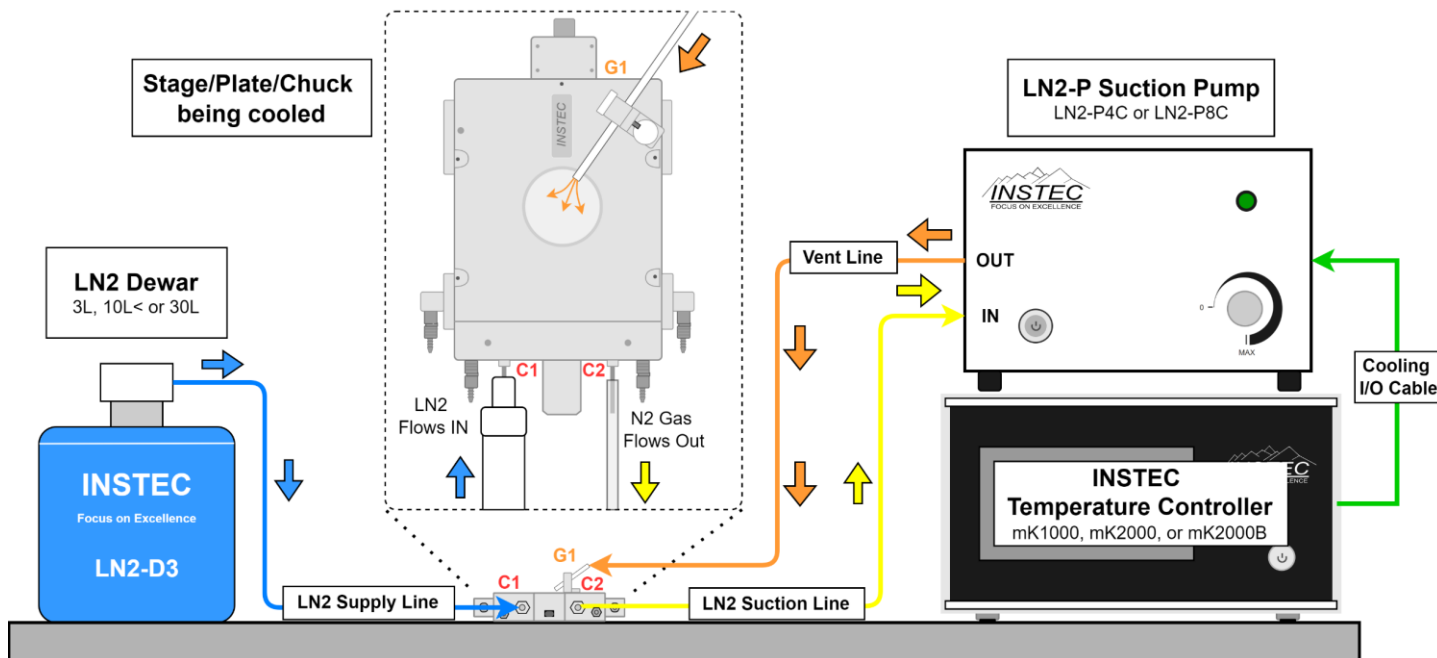


Test With Control Knob

Power on the LN2-P4C, and turn the control knob clockwise to test the system setup. If connected correctly, LN2 should flow. Connect pump to temperature controller for intelligent control.

Operation

When connected to an appropriately configured Instec temperature controller, the pump power will automatically be controlled to provide a precise flow of LN2. LN2 is drawn via suction from the dewar, through the sample area, and is then heated and expelled as N2 gas. While cooling, the green LED on the front of the pump will pulse with a duty cycle corresponding to the cooling power, ie. 50% power, LED is on for 1s, off for 1s. Seal dewar head with rubber plug when not in use to conserve LN2.



Cooling Tips/ Tricks

- To maximize cooling power, minimize the length of the LN2 suction line by cutting it with scissors
- Try to keep the LN2 dewar at or above the pump height
- For best cooling performance, keep dewar filled at least $\frac{3}{4}$ full
- The LN2 dewar can be filled during operation
- The LN2-P4C can be controlled either by an Instec temperature controller, or via the manual control knob

Maintenance and Troubleshooting

Periodic Maintenance Schedule

Every 3-5 full Dewars	Every 2-3 months	Every 3-5 years
- Basic Dewar cleaning - Stage/Plate/Chuck bakeout	Complete Dewar Cleaning	LN2 transfer Line Replacement

Common Issues and Solutions

Q. Control signal is applied (manual or remote), but pumps cannot be heard

A. Verify that PS2 cable is fully inserted, and that the pump is powered

Q. Pump is extremely loud, and vibrates when running

A. Verify that transit screws were removed from the bottom of the pump chassis

Q. Pump runs, but sample temp does not decrease

A. Double-check system setup using full User's manual, ensure suction can be felt at C1 when dewar head is disconnected. Check dewar level, and verify that no transfer lines are kinked.