# NORHOF LN2 Microdosing System #608

The Norhof #608 LN2 microdosing system is a universal, automatic liquid nitrogen filling solution designed for a wide range of laboratory applications. Originally engineered for FTIR detector refilling, the system is now widely adopted for safe, unattended, and precise LN2 delivery to Dewars serving:

- FTIR Detectors (MCT, FPA)
- Scanning Electron Microscopes (SEM)
- Transmission Electron Microscopes (TEM)
- Focused Ion Beam (FIB) Systems
- Cryo-Electron Microscopes (Cryo-EM)
- Other small LN2-cooled laboratory instruments

Adapters are tailor-made for seamless integration with leading brands and custom setups.

***Norhof auto-fill adapter on a FTIR Dewar***

**Key Features of the Norhof LN2 auto-fill system**

- **Universal Compatibility:**
  Custom adapters for Bruker, Netzsch, Shimadzu, Thermo Fisher, Perkin Elmer, Agilent, Horiba, Mettler Toledo, JEOL, FEI, Zeiss, Hitachi, Thermo Fisher Scientific and more.
- **Plug-and-Play Operation:**
  Easy setup with most detectors and Dewars; no special tooling required.
- **Gentle, Precise Filling:**
  Adjustable microdosing from a few drops up to 0.5 L/min, ideal for sensitive detectors and cryo-stages.
- **Timed and On-Demand Refills:**
  Schedule fills at preset intervals or trigger manually/externally to avoid interrupting measurements.
- **Safe and Clean:**
  No operator contact with LN2; low-pressure operation (<300 mBar) for maximum safety in the lab.
- **No Ice Formation:**
  Pressure is generated by internal LN2 vaporization, preventing air ingress and ice buildup.
- **Quiet, Vibration-Free:**
  No solenoid valves or noisy pumps—ideal for sensitive instruments.
- **Overnight and Unattended Operation:**
  Supports long measurement runs and continuous instrument cooling.

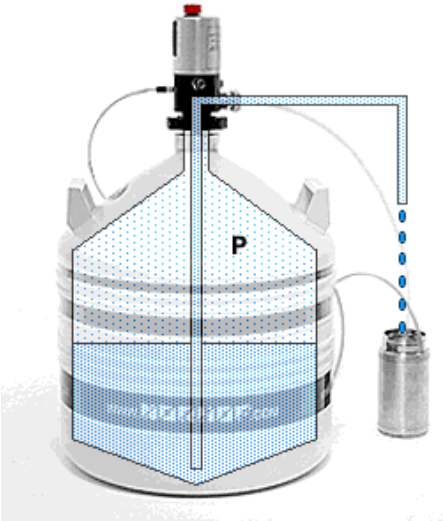
## Norhof #608 LN2 microdosing systems

Norhof manufactures LN2 microdosing systems. Liquid Nitrogen (LN2) is used as the cooling medium and is taken from a storage vessel (Dewar) with low pressure (max. 300 mBar) and delivered (pumped) through a fill line to the application in a micro dosing way.

The Norhof LN2 microdosing system is designed to overcome the drawbacks of LN2 under pressure in which a solenoid valve is used to switch the supply ON / OFF. You may compare the Norhof system with a water tap, but instead of giving water, it gently gives liquid nitrogen, with an adjustable flow, possible to regulate from some drops, up to 0,5 Liter/minute. Our pump can pump LN2 up to 5 meters above the pump itself

***Norhof #608 pump, mounted on a 35 Liter Dewar***

## Working principle




The pressure above the liquid level inside the Dewar is built by heating a small amount of liquid in the bottom of the Dewar.
With only up to 100 mBar of overpressure, the liquid will gentle rise out of the rise pipe and fall into the fill hose.
Because we evaporate some LN2 to build pressure, there is no adding of ice inside the Dewar, such as with manual systems which use air from the environment.

When LN2 is required, a small overpressure is generated by a small heater element in the LN2, and liquid flows out of the system like water from a tap, without spilling, noise, vibrations etc.

## Expanded Applications

### FTIR Detectors

- Automated, gentle LN2 refilling for all major FTIR detector brands.
- Maintains detector cooling for extended measurements.

### SEM, TEM, FIB Systems

- Reliable auto-filling of Dewars for electron microscopes and ion beam systems.
- Supports cryo-stages and cold traps, ensuring stable imaging and analysis.
- Prevents thermal drift and sample warming during long sessions.

### Cryo-Electron Microscopes (Cryo-EM)

- Continuous, unattended LN2 supply for cryo-sample holders and transfer stations.
- Maintains ultra-low temperatures critical for high-resolution imaging.

### Other Laboratory Applications

- Laser detectors, small LN2 reservoirs, and any device requiring low-flow, precise LN2 delivery.

## #608 Technical Specifications

| | | | |
|---|---|---|---|
| **Flow rate** | Up to 0,5 liter per minute | | |
| **Average working pressure** | 100 mBar (adjustable with the supplied software) | | |
| **Maximum working pressure** | 300 mBar | | |
| **Reaction time** | +/- 1 minutes for cooling down the fill line (with 1.6 meters fill line) | | |
| **Power connection** | 115V / 230V AC with supplied power supply or 12-24 Volt AC/DC | | |
| **Power consumption** | average 10 watt, during pumping 50 watt | | |
| **Model** | **608-100-035** | **608-100-050** | **608-100-100** |
| **Storage container volume** | 35 liter | 50 liter | 100 liter |
| **Outside dimensions (diameter)** | 460 mm | 460 mm | 500 mm |
| **Height dimensions** | 802 mm | 917 mm | 1235 mm |
| **Weight (empty, full)** | 15 / 42 kg | 17 / 59 kg | 34 / 115 kg |
| **Static holding time (days)** | 112 days | 122 days | 164 days |
| **Standard fill line** | 1,6 m line length, 6,25 mm OD, 4 mm ID, Teflon FEB tube, with 32 mm OD Armaflex foam insulation | | |
| **System includes** | Dewar, pump, fill line 1,6 m, phase separator, fill tubes, power supply, cables, 1 level sensor, PC software. | | |
| **Working modes** | Automatic fill control with timer (1 sensor) | | |
| **External control** | 5 volt signals for ON/OFF and RS232 signals for ON/OFF | | |
| **PC software** | Monitor software, to monitor pump and data logging | | |
| **Alarms/warning acoustical/ visual / mechanical** | Dewar empty, Dewar 4 liter LN2 left, broken sensor(s), frozen alarm, mechanical overpressure protection valve. | | |
| **Options** | Tailor-made Adaptor with sensor for all brands of detectors<br>Custom built adaptor to fixate sensor(s) on application<br>Transport trolley 5 wheels (10 cm height)<br>Stand for pump (when Dewar is refilled) | | |
| **Dewar Trolley option** | 900-400-000 | 900-400-000 | 900-400-000 |
| **Floor Stand option** | 900-400-100 | 900-400-100 | 900-400-100 |
| **Custom made adapter** | 600-400-000 | 600-400-000 | 600-400-000 |

## #608 recommended options:

***Norhof Dewar Trolley***
***for safe and easy transport of the LN2 Dewar***

***Norhof Floor Stand***
***for storing the pump in vertical position during refill of the LN2 Dewar***

## #608 Series Adaptors

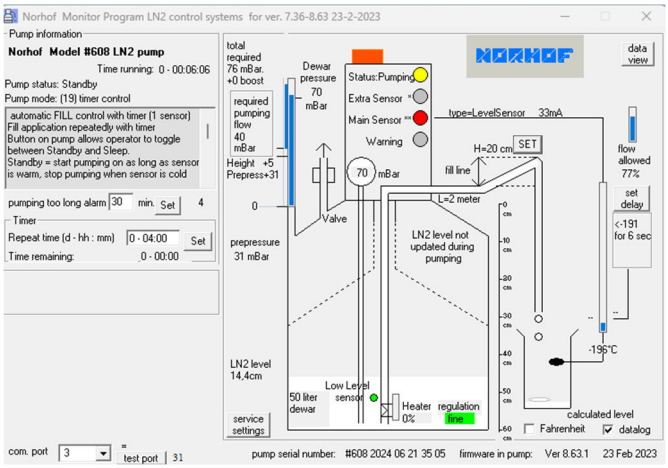
Standard we have adaptors to fit on systems of Bruker, Netzsch, Shimadzu, Thermo Fisher, Perkin Elmer, Agilent, Horiba, Mettler Toledo, JEOL, FEI, Zeiss, Hitachi, Thermo Fisher Scientific but also for other detectors we have adaptors available or make a tailor-made design.

The majority of these system finds use in the field of laboratories, research centers where high precision measurements are made and where a safe and unattended refill of LN2 is required.

### Software

To display sensor temperatures, vessel pressure, status of LED's on the pump etc. our Norhof Monitoring software is included with any #608 series pump. This software works under Windows '98 - 2000 - ME - NT - Vista - W7 – Windows 10 – Windows 11

With each #608 system a software Datalogger function is included. This recorder allows you to document any parameter value over time and to preset the time interval for your detector.




### #608 advantages:

- **the system is extremely safe**
  the operator is not in direct contact with LN2
- **the system is time saving**
  the operator does not need to pour LN2 several times in a run
- **the system can cool the detector just with a press on the start button**
  this means that the detector is cold 24 hours a day
- **there is no LN2 valve required**
  that implies no unnecessary heat input
- **there is no additional control unit required**
  which adds to a clean and elegant setup
- **there is a very low thermal connection to the ambient temperature**
  this means the system is extremely economic in stand-by modes (typical usage less than 0,5 Liter / day)
- **the system can deliver LN2 liquid with a flow optimized for the application**
  without noise, vibration, excessive waste, etc.
- **the system is prepared to be connected to a PC**
  perfect for monitoring and data logging
- **P.E.D. 99/36/EC (Pressure European Directive) for pressurized vessels does not apply for this system**
  The maximum possible pressure is 300mBar.Therefore this system is allowed to be used inside the lab, near your working place, without danger.