NORHOF LN2 Microdosing System #608

FTIR detector filling system

- Universal automatic filling system for FTIR detectors as from Bruker or Shimadzu;
- Plug and play refilling system, to refill the detector at a pre-set time interval;
- Usable for overnight measurements;
- Possible to control extra filling;
  in order an automatic fill action can not disturb your automatic measurements
- Fully safe to use inside the laboratory
- Always ready to use
- Very slow and gentle filling rate
- Easy setup, on most FTIR detectors, no tooling needed
- Universal adaptor for Bruker Vertex70 or Vertex80 or similar
- Adaptor for Shimadzu AIM8800 or similar

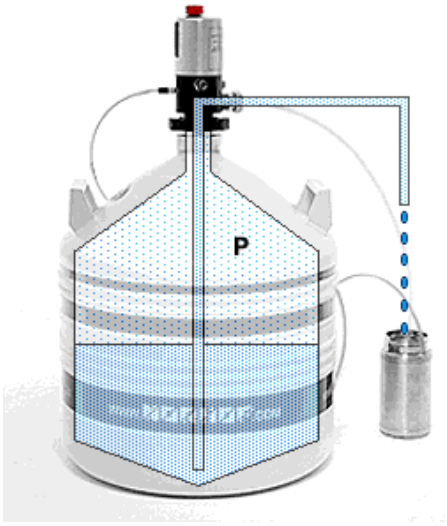
Norhof LN2 microdosing systems

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 1 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.

The reservoir Dewar can safely stand next to your working place, ready for use. The #608 pump is adjusted with a certain time interval, which is shorter than the hold-time of your detector. After this interval time is past, the detector is carefully and slowly refilled. Refilling is done with a very gentle steady flow. As soon as the detector is full, the pump stops, and will start again after the set time interval, or when another signal is sent to the pump. In this way you are sure that your detector is always cold.

608 series Technical Specifications

Static evaporation rate	< 0,5 liters per day		
Flow rate	Pre-set on 40 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 Watts, during pumping 50 watts		
Storage container volume	**35 Liter**	**50 Liter**	**100 Liter**
Outside dimensions (diameter)	480	500 mm	500 mm
Height dimensions	791	875 mm	1235 mm
Weight (empty, full)	13 / 41,5 kg	17 / 57,5 kg	32 / 113 kg
Standard fill line	6.25 mm OD, 4 mm ID PTFE tube, with 32mm foam insulation		
System includes	Dewar, pump, fill line 1.6 m, phase separator, power supply, cables, level sensors, 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 5 liters LN2 left, broken sensor(s), frozen alarm, mechanical overpressure protection valve.		
Options	Adaptor with sensor for Bruker detectors Adaptor for Shimadzu AIM8800 or similar Custom built adaptor to fixate sensor(s) on application Transport trolley 5 wheels (10 cm height) Stand for pump (when Dewar is refilled)		

608 Series FTIR Adaptors

Standard we have adaptors to fit on the Bruker detectors, and Shimadzu AIM8800, but for other detectors we have adaptors available.

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

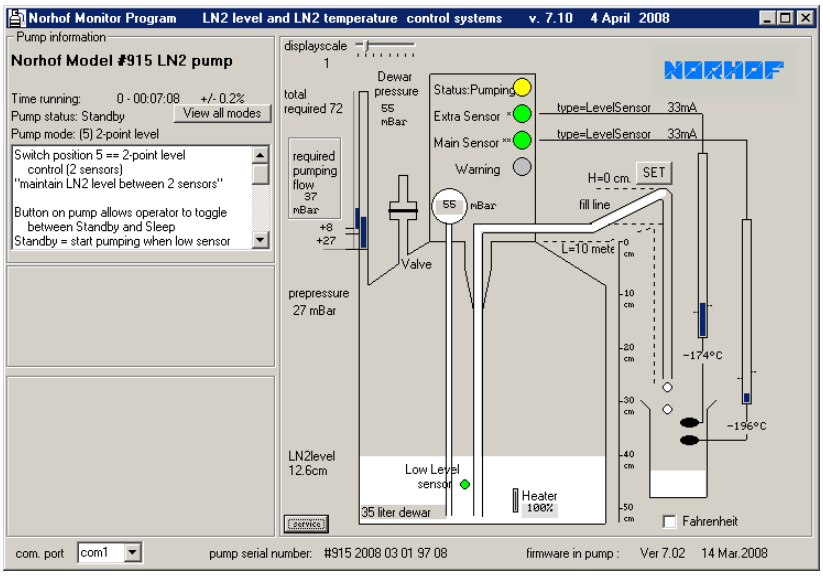
608 series applications:

- unattended automatic refill of LN2 for FTIR detectors
- refilling of laser detectors
- Overnight measurements
- Automatic sequences of measurements
- auto filling of other small LN2 reservoirs, with very low LN2 flowrate

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

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 series advantages:

- **the system is extremely safe;**
  the operator is not coming in direct contact with LN2
- **the system is time saving;**
  the operator does not need to poor in LN2 several times
- **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 that the system is extremely economic in stand-by.
  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 lower than 300mBar.Therefore this system is allowed to be used inside the lab, near your working place, without danger.