

NORHOF LN2 FTIR detector filling system model 608

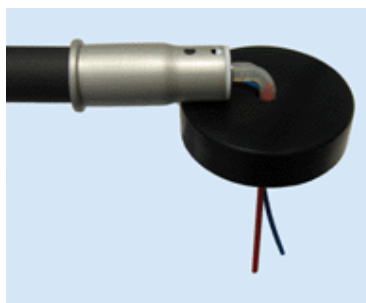
Universal automatic filling system for FTIR detectors as from Bruker or Shimadzu.

Plug and play refilling system, to refill the detector at a presettled time interval.

Usable for overnight measurements

Possible to steer extra filling, so that 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



adaptor for
Bruker Vertex70/80



adaptor for Shimadzu AIM88000

picture shows pump
mounted on a 35 Liter
dewar

total system height 79
cm

possible dewars are 25,
35 or 50 Liter



Norhof manufactures cooling systems in which Liquid Nitrogen (LN2) is used as the cooling medium. LN2 is supplied without any pressure and filling an application is like a teapot filling a teacup. You may compare our liquid nitrogen dispenser system with a water tap, but instead of giving water, it gives LN2, starting with some drops, up to 1 Liter/minute.

The reservoir dewar can safely stand next to your working place, ready for use.

The pump is adjusted with a certain time interval, some shorter than the hold-time of your detector. After this interval time is past, the detector is carefully slowly refilled.

Refilling is done with a very gentle steady flow. After the detector is full, the pump stops, and will start again after this time interval, or when another signal is sent to the pump.

In this way you are sure that your detector is always cold.

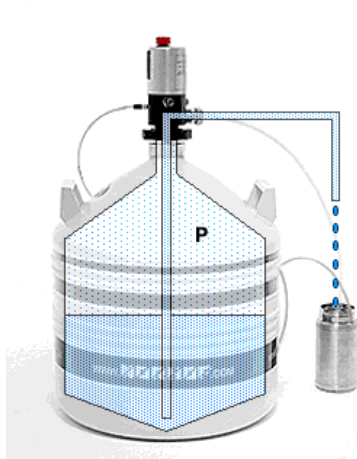
The system comes with PC software to read out all what is happening, and to preset the time interval for your detector. Pump can be steered ON and OFF by 5 Volt signals, or by RS232 commands.

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 etc. where FTIR measurements are made and where a safe and unattended refill of LN2 is required.

Use of this system is for example for:

- 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



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 40 mBar of overpressure, the liquid will gently 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.

In the Norhof LN2 cooling systems, Liquid Nitrogen is stored in pressure less Dewars. 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.

*For automatic filling of other small applications we have the #900 serie of microdosing pumps, see the website

The advantages are numerous:

- **the system is extremely safe**, the operator comes not in contact with LN2.
- **the system is time saving**, the operator does not need to pour 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.
- **the system delivers LN2 without any pressure**, this means without noise, vibration, excessive waste, etc.
- **there is no external LN2 valve used**, that implies no unnecessary heat input, which spoils a lot of LN2
- **there is a very low thermal masse to cool down in the pump**
Filling efficiency is better than 90%, due to very less loss for cooling down pump parts.
- **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
- **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.

Technical Specifications

Static evaporation rate	< 0,5 liters per day		
Flow rate	preset on 35 mBar (adjustable with the supplied software)		
Maximum working pressure	< 300 mBar		
Reaction time	ab. 1 minute for cooling down the fill line		
Power connection	115V / 230V AC with supplied power supply or 12 Volt AC/DC		
Power consumption	average 10 Watts, during pumping 50 watts		
Storage container volume	25 Liter (on request)	35 Liter (standard)	50 Liter
Outside dimensions (round)	395	480	500 mm
Height dimensions	736	643	727 mm
Weight (empty,full)	10 / 31	13 / 41,5	17 / 51,5 kg
System includes	Dewar, pump, fill line 1.60 m, power supply, cables, level sensor, PC software		
External steering	5 volt signals for ON, OFF, RS232 signals for ON, OFF.		
Alarms/warning acoustical/ visual / mechanical	Dewar empty, 5 liters left, broken sensor, overpressure protection		
Options	Adaptor with sensor for Bruker detectors Adaptor for Shimadzu AIM8800 or similar Transport trolley 5 wheels (12 cm height) Stand for pump (when dewar is refilled)		