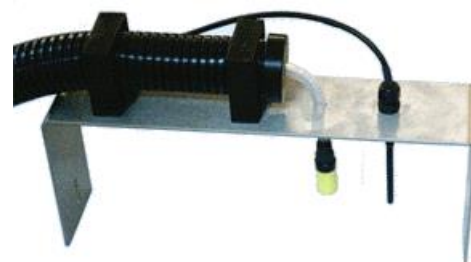


NORHOF LN2 Microdosing System #606

Fully automatic slow filling system for Differential Scanning Calorimeters.

Are you still poring LN2 into your DSC by hand, several times per measurement?

- ◆ Universal automatic filling system for DSC systems;
- ◆ Safe auto filling of DSC;
- ◆ No direct contact with LN2 for the operator;
- ◆ System fills up to 4 cm level in the DSC reservoir, and then very slowly keeps filling while measurement runs;
- ◆ Controlled by the DSC, filling stops when cold is not any longer needed.
- ◆ Pressure-less flowing LN2, without spilling, noise, vibrations etc.



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 606 pump, mounted on a 35 Liter Dewar

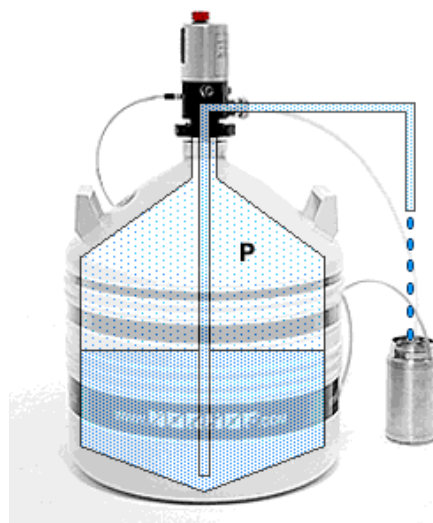
Working principle

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 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..

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 #606 pump when switched ON, starts building a small over-pressure, forcing the liquid gently to rise into the fill line and fall into your dry DSC reservoir. The sensor, placed also in the reservoir, makes the filling slower when for example 4 cm level is reached. If the level becomes lower, filling is increased. If the level becomes too high, filling is slower, thus keeping the level continuous on 4 cm.

606 series Technical Specifications

Static evaporation rate	< 0,5 liters per day		
Flow rate	Dripping up to 0.1 Liter/minute, depending on application level		
Maximum working pressure	< 300 mBar		
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	1-point level flow control (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 for Shimadzu DSC60 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)		

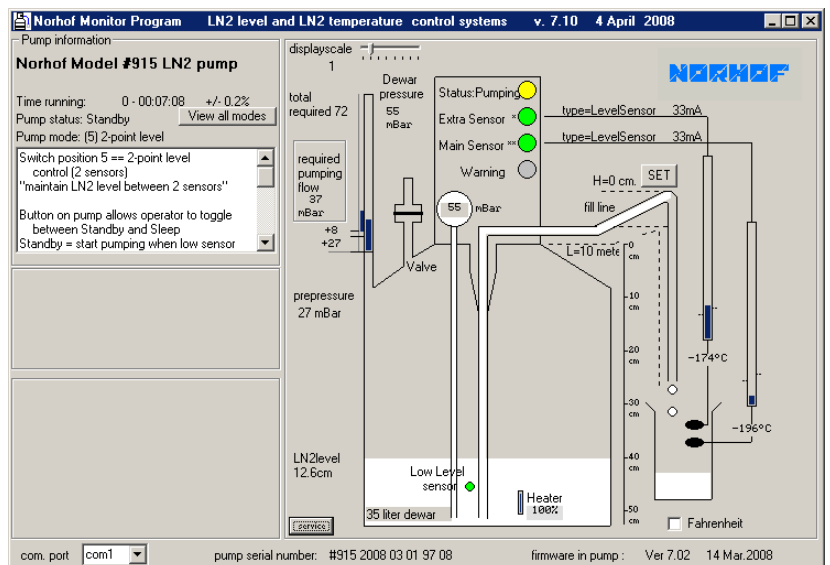
606 Series DSC Adaptors

Standard we have adaptors to fit on the different DCS systems like the Shimadzu DSC60. Custom adaptors are possible.

The majority of this system finds use in the field of laboratories, research centers where DSC 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 #606 series pump. This software works under Windows '98 - 2000 - ME - NT - Vista - W7 - Windows 10



606 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 pour in LN2 several times
- **the system can cool the DSC system just with a press on the start button;**
this means that the DSC 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.