

## NORHOF LN2 / LAr dispensing System #465

### Manual Liquid Nitrogen / Liquid Argon dispensing system

- Flow of 1 liter/minute;
- Pressure-less flowing liquid, without spilling, noise, vibrations, etc.



### Norhof #465 dispensing systems



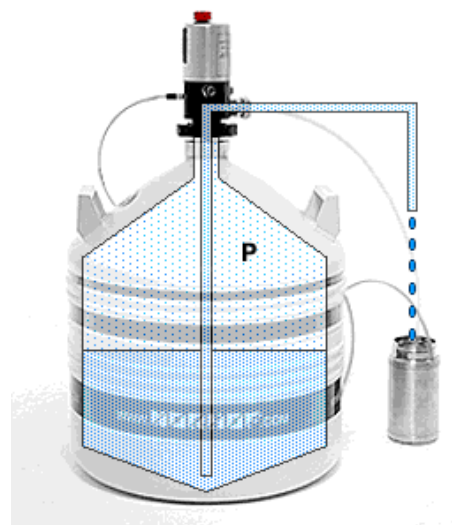
Norhof manufactures liquid Nitrogen/Argon dispensing systems. The liquid Nitrogen or Argon is used as cooling medium and is taken from a storage vessel (Dewar) with low pressure (max. 300 mBar) and delivered (pumped) through a fill line to the receiver Dewar.

The #465 is designed to overcome the drawbacks of high pressure vessels. You may compare the Norhof system with a water tap, but instead of giving water, it gently delivers liquid Nitrogen or Argon, with a flow of 1 Liter/minute. The #465 can deliver the liquid up to 5 meters above the pump itself.

*Norhof #465 pump, mounted on a 50 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 300 mBar of overpressure, the liquid will gently rise out of the rise pipe and fall into the fill hose. Because we evaporate some of the liquid to build pressure, there is no adding of ice inside the Dewar, such as with manual systems which use air from the environment.



In these systems a pressure less storage Dewar is used as a reservoir for LN2 or LAr. On the Dewar our unique dispensing system is mounted. Inside the housing of the pump a microprocessor is used to control the system.

Thanks to our unique static pump design there is:

- 💧 no need for a pressurized supply of LN2 / LAr;
- 💧 no need for a cryogenic solenoid valve ;
- 💧 no need for additional control instruments.

### #465 Technical Specifications

Static evaporation rate	< 0,5 liters per day	
Flow rate	1 liter per minute	
Maximum working pressure	300 mBar	
Reaction time	+/- 1 minute for cooling down the fill line (with 1.60 meters fill line)	
Power connection	115V / 230V AC input with supplied power supply or 12 Volt DC	
Power consumption	average 5 Watts, during pumping 50 watts	
Storage container volume	25 Liter	50 Liter
Outside dimensions (diameter)	395	500 mm
Height dimensions (incl pump)	875	875 mm
Weight (empty)	10	17 kg
Standard fill line	8 mm OD, 5 mm ID PTFE tube, with 36mm OD foam insulation	
System includes	Dewar, pump, fill line, phase separator and power supply	
Alarms/warning acoustical/ visual	Dewar empty, Dewar 5 liters left, broken sensor(s), frozen alarm	
Safety	Mechanical overpressure protection valve	
Options	Transport trolley 5 wheels (10 cm height) Stand for pump (when Dewar is refilled)	

### #465 advantages:

- 💧 **there is no cryogenic valve or stainless steel hose required;**  
that implies no unnecessary heat input
- 💧 **there is no additional control unit required;**  
which adds to a clean and elegant setup
- 💧 **no external pressure source required;**  
which means no input of moisture to the Dewar
- 💧 **P.E.D. 99/36/EC (Pressure European Directive) for pressurized vessels does not apply for this system;**  
The maximum possible pressure is not above 300mBar. Therefore this system is allowed to be used inside the lab, near your working place, without danger.