

NORHOF N2 Cold Gas Supply System #855 Series

- 💧 Controllable N2 Cold Gas flow up to 60 liter / minute;
- 💧 Several N2 Cold Gas control possibilities:
 - 💧 Pressure control;
 - 💧 PID temperature control with one temperature sensor;
 - 💧 Software monitoring



Norhof manufactures N2 cold gas supply systems. 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 line to the application in a gaseous cold flow.



Working principle

Norhof 855 series pump, mounted on a 50 Liter Dewar

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 cold gas will gently flow out of the outlet pipe. In these systems a pressure less storage Dewar is used as a reservoir for LN2. On the Dewar our unique cold gas pump is mounted. Inside the housing of the pump a microprocessor is used to control the various actions, depending upon the mode selected. The selection of a particular mode is made by a 16-position switch, also located inside the pump housing. By controlling the pressure at time of cold gas transport, the flow is controlled and thus any temperature between ambient and -160°C can be realized.

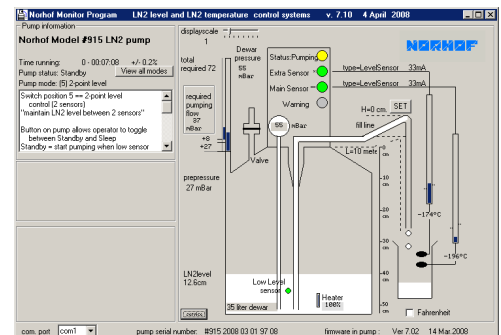
Important: cold N2 gas supply may have its application advantages, however, important to know it has much lower heat removal capacity compared with liquid Nitrogen

Any #855 series model will work without modifications as:

- 💧 autonomous stand-alone unit;
- 💧 direct remote controlled unit; (controlled by your existing PID controller, PLC, computer with A/D conversion card, etc.);
- 💧 will operate on 24 V, DC or with our power supply (115V or 230 V);
- 💧 a system with almost no installation time required.
- 💧 no need for a pressurized supply of LN2;
- 💧 no need for a cryogenic solenoid valve ;
- 💧 no need for additional control instruments.

Software

To display sensor temperature, vessel pressure, status of LED's on the pump etc. our Norhof Monitoring software is included with #855 series pump. This software works under Windows '98 - 2000 - ME - NT - Vista - W7 - Windows 10



855 series Technical Specifications

Static evaporation rate	< 0,5 liters per day	
Flow rate	adjustable from 0.01mBar to 270 mBar (by potmeter on pump) == up to 60 liter / minute (with a fill line of 2 meter and 6.6 mm ID)	
Maximum working pressure	< 300 mBar	
Reaction time	+/- 1 minutes for cooling down the fill line (with 2 meters fill line)	
Power connection	115V / 230V AC with supplied power supply or 24 Volt DC	
Power consumption	average 125 Watts, during pumping 250 watts	
Storage container volume	50 Liter	100 Liter
Outside dimensions (diameter)	500 mm	500 mm
Height dimensions	875 mm	1235 mm
Weight (empty, full)	17 / 57,5 kg	32 / 113 kg
Standard fill line	9.6 mm OD, 6.6 mm ID PTFE tube, with 32mm foam insulation	
System includes	Dewar, pump, fill line 2.00 m, power supply, cables, 2 level sensors, PC software.	
Working modes	#855, working mode 1 to 7 for control	
External control	#855, 5 volt signals for ON, OFF and RS232 signals for ON, OFF	
PC software	Monitor software, to monitor pump behavior, and for some working modes to adjust some parameters.	
Alarms/warning acoustical/ visual / mechanical	Dewar empty, Dewar 5 liters LN2 left, broken sensor(s), frozen alarm, mechanical overpressure protection valve.	
Options	Transport trolley 5 wheels (10 cm height) Stand for pump (when Dewar is refilled) Custom built adaptor to fixate sensor(s) on application	

Summary of #855 series

Model:	#855
autonomous operation	√
remote control by TTL signal	√
remote control by +24V signal	√
display system status on PC screen	√

855 series advantages:

- **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
- **the pump is software driven and many control modes are already built-in;**
subzero temperature control, flow control by 0-5V input, control by RS232 line, etc.
- **temperature sensor(s) are plugged directly into the pump housing;**
and not into a separate control box
- **the system can deliver N2 cold gas with a flow optimized for the application;**
without noise, vibration, excessive waste, etc.
- **the variable flow feature makes subzero temperature control extremely easy;**
see the website under SOFTWARE > sample drivers > freeze curve
- **the system is prepared to be connected to a PC;**
perfect for monitoring and data logging or remote control
- **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.