

Safety timer for automatic LN2 - niveau level controller



Automatic "Level Control LN2" type LN2 level regulation devices by KGW-ISOTHERM are used in many cryotechnical applications, such as the shrinking of shafts and bushes in LN2, deep-freezing of components or biological samples, use of LN2 as a coolant for cold traps, calibration of sensors in LN2, etc.

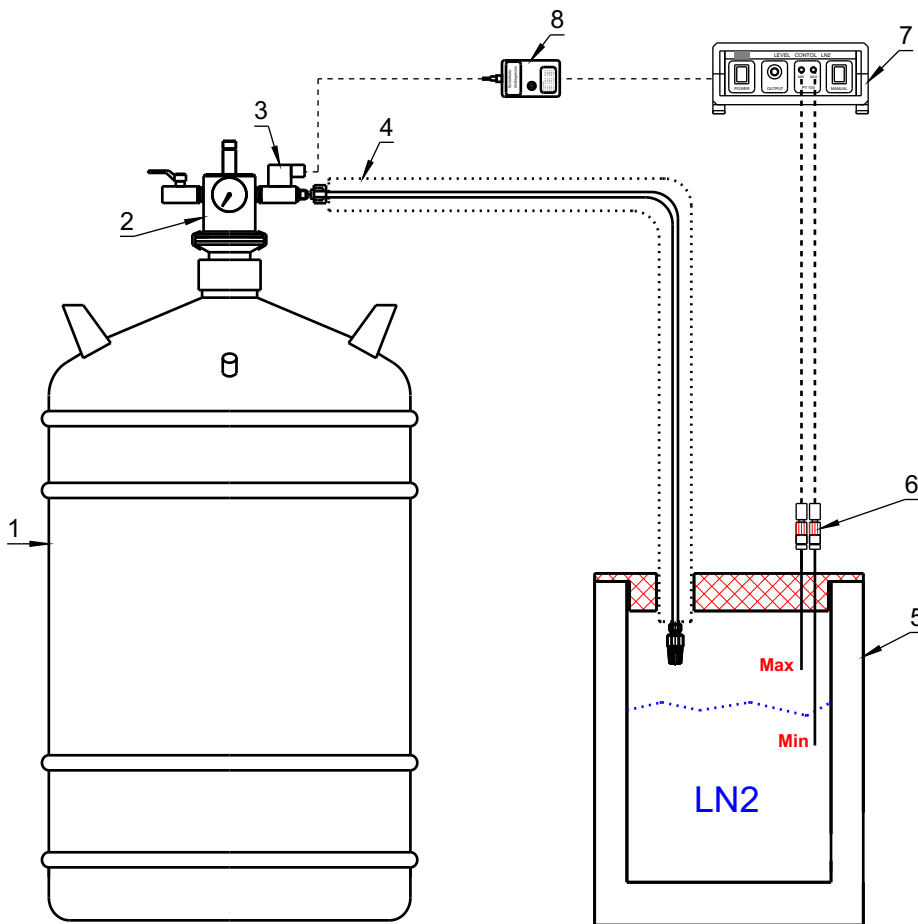
The "Level Control LN2" works as follows: If the LN2 level drops below the minimum sensor, a signal is sent to the "Level Control LN2". The "Level Control LN2" then opens a 24-volt LN2 magnet valve that is connected to the siphon of the LN2 storage tank. Because of the overpressure in the LN2 storage tank, the LN2 is forced out of the tank and into the working Dewar flask through a transfer line. The incoming LN2 raises the liquid level until the maximum sensor is immersed in the LN2. This has a cooling effect on the maximum level sensor, which then transmits a signal to the "Level Control LN2", which in turn switches off the magnet valve, and this then closes and the LN2 supply is interrupted.

If these sensors are not sufficiently secured, it's possible for them to change their position or to completely drop out of the working Dewar flask that is to be filled. This would result in the "Level Control LN2" no longer closing the LN2-magnet valve and LN2 being emitted permanently from the storage tank. In extreme cases, this could result in the complete LN2 storage tank being emptied or the liquid nitrogen spilling over in the working Dewar flask to be filled.

To prevent the LN2 storage tank from being emptied completely, a safety timer can be inserted between the "Level Control LN2" and the magnet valve. This safety timer closes the LN2 magnet valve after the set maximum filling time has expired. If the filling time for the LN2 level regulation takes 3 minutes, the safety timer could be set to, for example, 4 minutes. If the level regulation is not concluded after 4 minutes, then the safety time-limiter interrupts the power supply of the magnet valve and it is closed automatically.

The safety timer does not perform an automatic reset, but instead must be reset manually by the user. To do this, the "Level Control LN2" must be switched off for at least 1 minute. Next, the "Level Control LN2" can be re-activated by switching it on again.

The safety timer can be retrofitted to any installed KGW-ISOTHERM "Level Control LN2" device to optimise the operational safety of your system.



- 1) LN2 storage tank
- 2) Siphon
- 3) LN2 magnet valve
- 4) Transfer line
- 5) Dewar flask
- 6) Minimum/maximum sensor
- 7) Level Control LN2
- 8) Safety timer

Setup and procedure

First, the filling time between the minimum and maximum sensors needs to be determined (e.g. 3 minutes).

Next, the safety timer is installed between the "Level Control LN2" and the magnet valve.

When initially filling the Dewar flask, the time limit must be set to 0 and the device must be filled to a level above the minimum sensor.

After this, the level regulation is briefly switched off. The time limit is set (e.g. one minute longer than the filling time between the minimum and maximum sensors).

Next, the level regulation is started again and will run while being monitored by the safety timer.

Time adjustment knob for the safety timer



Technical data of the Safety Timer

- 1) 24 volt AC
- 2) Time setting for 1 to 15 minutes
- 3) 3-pole diode connector to the control device
- 4) 3-pole diode bush to the magnet valve

KGW Art. No. 1307



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