

## CryoGuard

### Over fill protection for cryogenic storage vessels

The CryoGuard is an independent device, with its own power supply, solenoid valve and sensor, that can be installed on a vessel with or without an automatic filling controller. The CryoGuard has a NTC sensor for liquid nitrogen detection and has a valve that is placed inside the liquid nitrogen supply line of the vessel. In case the CryoGuard detects liquid nitrogen it will close the valve in order to stop the vessel from filling further, regardless of what the automatic filling controller is doing.

### Liquid nitrogen detection

The CryoGuard uses a Negative Temperature Coefficient (NTC) sensor to detect liquid nitrogen. A dedicated hardware circuit is used to read the sensor value. This circuit is calibrated for the specific NTC in order to get an optimal detection point..

This sensor is placed in the vessel at the maximum allowed height of the liquid nitrogen.

### Valve control

The valve of the CryoGuard is open when the NTC does not detect liquid nitrogen, this way the vessel can be filled normally. However the valve can become warm and wears faster than normal. Therefore it is possible to connect the automatic filling controller to the CryoGuard. When the controller starts filling the CryoGuard detects this and opens its valve in order for the filling to happen.

### Alarming

The CryoGuard has an alarm status LED on the front which indicated whether it has detected liquid nitrogen or not. There is also an alarm contact available to connect it to an alarm monitoring system. This is a dry contact I/O which can be connected either normally closed or normally open.



## PRODUCT SPECIFICATIONS

### Basic Features Alarm types Power

Basic Features	Alarm types	Power
NTC level sensor	Alarm status LED	Power status LED
Valve control circuit	Remote alarm (NC/NO)	24VDC power supply
24VDC Supply line value	Remote alarm loop possibility	
24VAC or 24VDC input from connected controller		

