

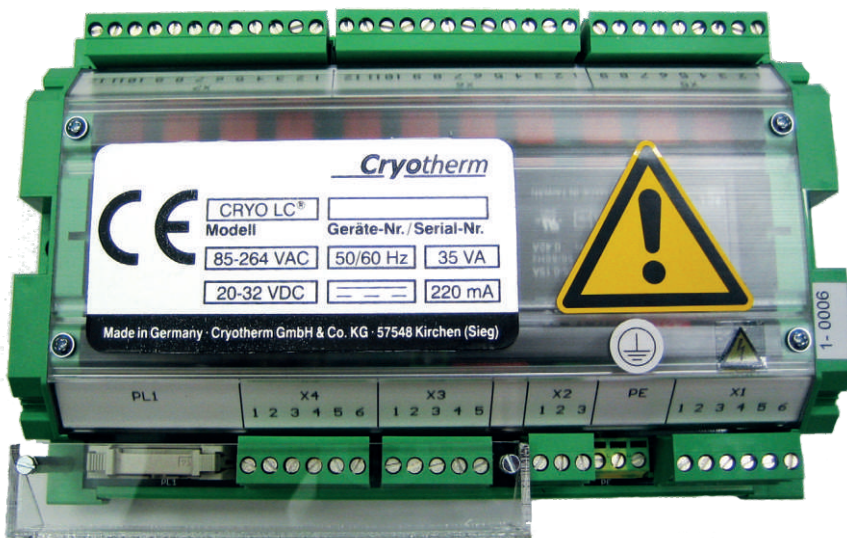
CRYO LC[®]

for liquid nitrogen,
level measurement and controller



Reliable Control ...

... and regulation.



CRYO LC® = Level Control

Device for level measurement registration and level control of deeply cold, liquid nitrogen in containers and systems.

CRYO LC® works independent of pressure.

System

CRYO LC® consists of the basic device as a built-in piece for C-track with a level probe manufactured according to customer requirements and both the optional components display and operating panel as well as housing.

Functions

Level Measurement Registration: Registers 4 Levels (LEVEL 1 to LEVEL 4), display and signal output (=floating change-over contact)

Level Control: Automatic level control between LEVEL 2 and LEVEL 3).

In both functions there is an alarm if level is lower than LEVEL 1 or higher than LEVEL 4 or there is a sensor short circuit or sensor wire breakage.

Application

The CRYO LC® can be applied to containers and systems of all sizes where the level probe can be fitted.

The device can be installed in various ways:

- compact device, wired ready for use in casing with display and operating panel
- for assembly in a control cabinet, modular, CRYO LC® basic device for installation on C-track, display and operating unit with flat ribbon cable ready for mounting in the control cabinet door.
- for assembly in a control cabinet, modular, CRYO LC® basic device for installation on C-track, without display and operating unit, control and signal monitoring can be executed directly by SPS.
- two display and operating units on one CRYO LC® basic device (local and remote operation)

Advantages that convince

- modular construction
- fast assembly
- easiest operation
- individually adjusted level control and level probe, according to application and customer requirement
- suitable for installation in a control cabinet or as a separate, independent device
- measurement and control independent of pressure as measured against a reference sensor
- basic device can be operated concurrently with a minimum of two display and operating units
- switch-on protection against manipulation and faulty operation/device switches into automatic mode only when the reference sensor is colder than approximately -100°C
- level measurement self-supervisory as the sensors are monitored for short circuit and wire breakage.
- each signal (LEVEL 1–4, fill, alarm) is implemented in duplicate as a change-over contact
- floating change-over contact; with a high switching capacity (230 V AC/3A), thus also direct external device can be controlled
- SPS-compatible interface
- flexible current supply in wide ranges (85–264 V AC and 24 V DC)



So that you are always up to date!



Application examples:

- Phase Separators
- Dewars/cryostat
- cooling baths

Functional Description

Level Registration:

Level registration is effected by means of 4 probes.

At the lowest point of the level probe there is a fifth PT-sensor as a reference sensor. Only when this sensor reaches a temperature lower than $-100\text{ }^{\circ}\text{C}$ is the level registration activated.

The conditions LEVEL 1 and LEVEL 4 are displayed on the operating unit and can be accessed via the change-over contact. If level is higher than LEVEL 4 or lower than LEVEL 1 an alarm is set off (optically and acoustically at the display and operating unit or via the floating change-over contact on the basic device).

Level Control:

The level is controlled automatically between LEVEL 2 and LEVEL 3. If level is lower than LEVEL 2 a change-over contact on the basic device is switched by which a magnetic valve can be controlled. If the level reaches LEVEL 3 the the floating change-over contact will switch again and the solenoid valve will close. The filling process is shown on the display and operating unit by "FILL". An alarm is effected as described. The function can be switch on and off on the display and operating unit by means of the buttons "AUTO FILL ON" and "AUTO FILL OFF".

Further functions:

- Simultaneous filling
- "MANUAL FILL"
- "START AUTOFILL"
- "AUTO FILL ON/OFF"
- Monitoring the sensors for wire breakage and short circuiting



various level probes

Cryo-Supply Systems

The vacuum super-insulated containers by Cryotherm serve to store and transport the deeply cold fluid gases. We deliver for you the ideal supply containers for all uses in research, development, medicine and industry – completely equipped and immediately operational.

JUNO® LIN-Supply container (25 - 100 l) · APOLLO® LIN-Supply Container (50 - 350 l)
 SATURN® LIN-Transport Container (100 - 300 l) · MERKUR® Transport Tank (500 - 2,000 l)
 SIRIUS® LIN-Supply Container (1,000 - 2,000 l) · HELIOS® LHe-Storage Container (100 - 10,000 l)
 STRATOS® LHe-Transport Container (100 - 1,000 l)

Cryo-Piping Systems

In order to transport deeply cold fluid gases from A to B almost without any loss we have developed special vacuum super-insulated transfer piping. These transfer piping systems are distinguished by high thermal quality. For LIN/LOx/LAr/LHe/LH₂ rigid transfer piping (DN 14 - 100) · flexible transfer piping (DN 20 - 32) plug-in coupling – weld coupling · gas phase separator (10 l) · phase separator (50 - 200 l)

Cryo-Customizing/Cryo-Engineering

If you have completely individual research tasks to perform. Do you have the right partner for the job? Whether you work in micro-electronics or one of the many other areas of research we have the specialist staff who know your field and speak your language.

Cryo-Storage Systems

Today storage periods of many years are in demand. Make use of our Cryo - Storage Systems for long - term storage of biological, medicinal and chemical materials in laboratories and Cryobanks. BIOSAFE® MD-sample storage system (medical product) (120 - 1,400 l)
 BIOSAFE® SC-sample storage system (120 - 1,400 l) · CHRONOS®-sample container (120 - 1,400 l)
 STELLA®-work container (0.5 - 63 l) · Freezing apparatus (3.3 - 16 l) · dryo shipper

Cooling of Transport Systems

Deep frozen foods cover an ever larger part of our daily requirements. For an optimal cooling quality we equip your cold storage vehicles, trailers, semi-trailers, swap bodies and containers with transportable Cryo-Systems. CRYOGEN®-Trans-System

After-Sales-Service

Installation/Assembly, Start Up, Spare Parts Service, Repair/Maintenance, Instruction/Training, Technical Hotline +49 (0)2741 958575



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