


# LN2 Safety Refill Controller

- LN2 SRC V1.2 - 140124  
User Manual  
Version 001



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# 1 About This Manual

This service manual is the technical documentation for Bruker Service technicians.

Before starting any work, personnel must read the manual thoroughly and understand its contents. Compliance with all specified safety and operating instructions, as well as local work safety regulations, are vital to ensure safe operation.

The figures shown in this manual are designed to be general and informative and may not represent the specific Bruker model, component or software/firmware version you are working with. Options and accessories may or may not be illustrated in each figure.

## 1.1 Symbols and Conventions

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Safety instructions in this manual and labels of devices are marked with symbols.

The safety instructions are introduced using indicative words which express the extent of the hazard.

In order to avoid accidents, personal injury or damage to property, always observe safety instructions and proceed with care.

### General Hazard



Sign indicating a general hazard.

Read the manual for safety instructions or action guidelines. Noncompliance with the information provided in the manual may result in hazards or incorrect operation.

### Hazardous Electrical Voltage



Sign indicating hazardous electrical voltage.

Noncompliance with the safety instructions provided in the manual may result in serious hazards.

### Radioactive Material or Ionizing Radiation



Sign indicating radioactive material or ionizing radiation.

Noncompliance with the safety instructions provided in the manual may result in serious hazards.

### **DANGER**



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

This is the consequence of not following the warning.

1. This is the safety condition.
  - ▶ This is the safety instruction.

### **WARNING**



**WARNING** indicates a hazardous situation, which, if not avoided, could result in death or serious injury.

This is the consequence of not following the warning.

1. This is the safety condition.
  - ▶ This is the safety instruction.

### **CAUTION**



**CAUTION** indicates a hazardous situation, which, if not avoided, may result in minor or moderate injury or severe material or property damage.

This is the consequence of not following the warning.

1. This is the safety condition.
  - ▶ This is the safety instruction.

### **NOTICE**

**NOTICE** indicates a property damage message.

This is the consequence of not following the notice.

1. This is a safety condition.
  - ▶ This is a safety instruction.

### **SAFETY INSTRUCTIONS**

**SAFETY INSTRUCTIONS** are used for control flow and shutdowns in the event of an error or emergency.

This is the consequence of not following the safety instructions.

1. This is a safety condition.
  - ▶ This is a safety instruction.



This symbol highlights useful tips and recommendations as well as information designed to ensure efficient and smooth operation.

## 2 Introduction



---

Installation, initial commissioning, retrofitting, repairs, adjustments or dismantling of the device must only be carried out by BRUKER Service or personnel authorized by BRUKER. Damage due to servicing that is not authorized by BRUKER is not covered by your warranty.

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### 2.1 Overview

---

The LN2 SRC unit (P/N W136176) is a device designed to avoid the accidental overfilling of the LN2 Dewar of a LT-MAS cooling equipment that may create a hazard or damage to the laboratory.

The safety controller measures the temperature a few centimeters under the lid of the LN2 exchanger reservoir. If the LN2 level in the reservoir is too high it detects a very low temperature and the controller closes the LN2 safety valve and stops immediately the filling.

The LN2 safety valve is installed on the LN2 supply line in the lab and is part of the customer installation; it is not furnished by Bruker.

The SRC controller has an interlock input connector for an optional oxygen gas monitor to stop the LN2 refilling in case of danger.

### 2.2 Bill of Material

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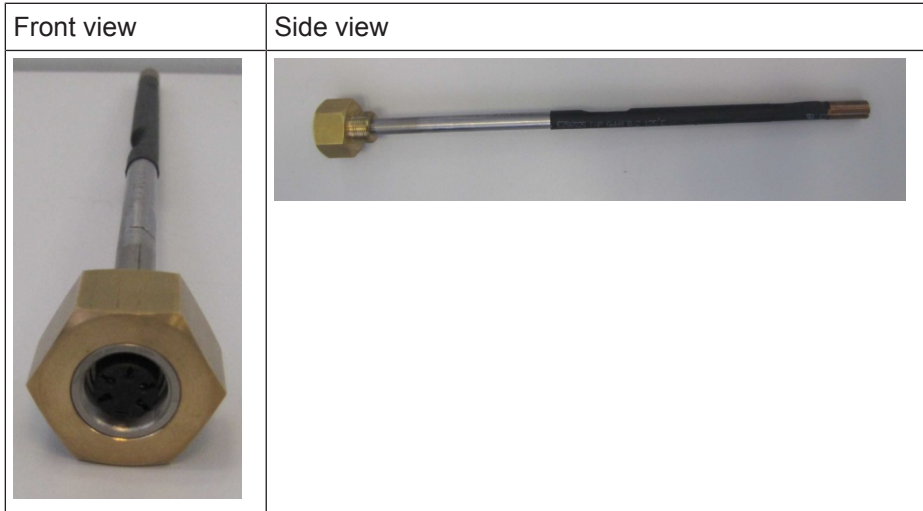
The complete safety system is composed of:

- A LN2 safety controller
- A LN2 Safety Sensor and a sensor holder
- A Dummy O2 Interlock Plug.
- A cable set.

## 2.2.1 LT-MAS LN2 Safety Sensor (P/N W136735)

The safety sensor is composed of temperature sensor PT100 slightly heated by a small resistor thermally linked.

Both components are contained in metallic tube terminated by a connector. The safety sensor is mounted on the holder described below.





### 2.2.2 Sensor Holder (P/N W136732)

It is an adapter that receives the LN2 safety sensor and is screwed on reservoir lid. A pressure gauge is attached on the side.

Sensor holder	Safety sensor mounted on holder with pressure relief valve
	
Safety sensor mounted on its holder and equipped with the pressure gauge	
	

## 2.2.3 Dummy O2 Interlock (P/N W136933)

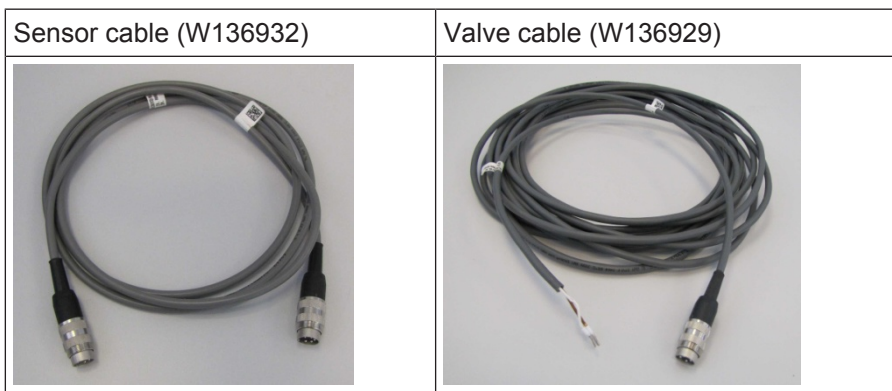
The dummy O2 interlock must be installed on controller box if no O2 gas detector is attached. We strongly recommend installing such a detector in the laboratory.



## 2.2.4 The Cable Set

The cable set is composed of 2 cables.

- Safety sensor cable W136932
- LN2 Safety valve cable W136929



## 2.2.5 LT MAS LN2 Safety Controller (W136936)



This box is the safety controller.

On the front panel, an Eurotherm controller displays the PT100 sensor temperature.

On the rear side, several connectors:

### **PT100 Input**

The PT100 temperature sensor (LN2 Safety Sensor) is connected to this plug.

### **O2 Sensor Interlock Input**

If an O2 gas detector is installed in the lab with an alarm output it can be connected to this plug. More information will be available on the connector description section. If the O2 gas monitor is not attached, a dummy interlock plug **MUST** be connected to this plug.

### **Hi level Interlock**

This input can be connected to the AMI186 LN2 level controller (inside LTMAS cabinet) or left unconnected.

### **LN2 Valve Output**

The LN2 safety valve is mounted ahead the cryogenic refill valve controlled by the LTMAS equipment. The safety valve is open until an overfill or an error condition is detected. The valve will remain closed until the default is acknowledged by the user.

### 2.3 Intended Use

---

The device has been designed and constructed solely for the intended use described here. Intended use also includes compliance with all specifications within this manual.

Any use which exceeds or differs from the intended use shall be considered improper use. No claims of any kind for damage will be entertained if such claims result from improper use.

### 2.4 Limitation of Liability

---

All specifications and instructions in this manual have been compiled taking account of applicable standards and regulations, the current state of technology and the experience and insights we have gained over the years.

The manufacturer accepts no liability for damage due to:

- Failure to observe this manual.
- Improper use.
- Deployment of untrained personnel.
- Unauthorized modifications.
- Technical modifications.
- Use of unauthorized spare parts.

The actual scope of supply may differ from the explanations and depictions in this manual in the case of special designs, take-up of additional ordering options, or as a result of the latest technical modifications.

The undertakings agreed in the supply contract, as well as the manufacturer's Terms and Conditions and Terms of Delivery, and the legal regulations applicable at the time of the conclusion of the contract shall apply.

### 2.5 Warranty Terms

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The warranty terms are included in the manufacturer's Terms and Conditions.

### 2.6 Product Safety and Electromagnetic Compatibility

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The device complies with the standard

- IEC 61010-1 and with UL 61010-1 / CSA C22.2 No. 61010-1-04 Safety Requirements for Electrical Equipment.
- IEC 61326-1 for Electromagnetic Compatibility (EMC).

## 3 Safety

This section provides an overview of all the main safety aspects involved in ensuring optimal personnel protection, as well as safe and smooth operation.

Non-compliance with the action guidelines and safety instructions contained in this manual may result in serious hazards.

### WARNING



#### **Danger of injury from electrical shock.**

A life threatening shock may result when the service access housing is opened and work performed while connected to the line power.

Only electrically qualified personnel should open the housing and carry out work.

- ▶ Disconnect from line power.
- ▶ Prevent reconnection.
- ▶ Test for absence of harmful voltages.

### 3.1 Conditions of Use

---

In order to secure the equipment, please verify the points below:

- The LN2 SRC equipment must not be used in temperature and/or humidity conditions other than those described in the general data section.
- Do not use the LN2 SRC in an environment with explosive hazards.
- Locate the LN2 SRC so the ON/OFF switch will always remain accessible. If the LN2 SRC is used in a cabinet, ensure the LN2 SRC switch button is accessible.
- Only qualified personal is allowed to manipulate this equipment.
- Only qualified personal should carry out repairs.

### 3.2 Labels

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Labels are provided to alert operating and service personnel to conditions that may cause personal injury or damage to the equipment from misuse or abuse. Please read the labels and understand their meaning.

## 3.2.1 Rating Plate

The LN2 SRC has an identifying label on the front panel of the unit. The label contains the following information.



Figure 3.1: Rating Plate

- **Part Number:** This field indicates the part number of the product.
- **Variant:** This field indicates the variant number that identifies the production category of the product. The default variant is 00.
- **ECL:** This field indicates the revision number that identifies the product configuration. The initial revision is 0.00.
- **Serial Number:** This field indicates the serial number of the product.
- **Type:** This field contains the designation of the product.
- **Information:** This field contains additional information about the product.

## 3.2.2 Manufacturer's Name Plate

You will find a manufacturer identifying plate at the rear of the unit. This label contains the following information:



Figure 3.2: Manufacturer's Name Plate







# 4 Transport, Packaging and Storage



Installation, initial commissioning, retrofitting, repairs, adjustments or dismantling of the device must only be carried out by Bruker Service or personnel authorized by Bruker. Damage due to servicing that is not authorized by Bruker is not covered by your warranty.

## 4.1 Symbols on the Packaging

The following symbols are affixed to the packaging material. Always observe the symbols during transport and handling.

<b>Top</b>		The arrow tips on the sign mark the top of the package. They must always point upwards; otherwise the content may be damaged.
<b>Fragile</b>		Marks packages with fragile or sensitive contents. Handle the package with care; do not allow the package to fall and do not allow it to be impacted.
<b>Protect Against Moisture</b>		Protect packages against moisture and keep dry.
<b>Attach Here</b>		Lifting gear (lifting chain, lifting strap) must only be attached to points bearing this symbol.
<b>Center of Gravity</b>		Marks the center of gravity of packages. Note the location of the center of gravity when lifting and transporting.
<b>Weight, Attached Load</b>		Indicates the weight of packages. Handle the marked package in accordance with its weight.






<b>Permitted Stacking Load</b>		<p>Indicates packages which are partially stackable.</p> <p>Do not exceed the maximum load-bearing capacity specified on the symbol in order to avoid damaging or destroying the content.</p>
<b>Do not Damage Air-tight Packaging</b>		<p>The packaging is air-tight. Damage to the barrier layer may render the contents unusable.</p> <p>Do not pierce.</p> <p>Do not use sharp objects to open.</p>
<b>Component Sensitive to Electrostatic Discharge</b>		<p>The packaging contains components which are sensitive to an electrostatic discharge.</p> <p>Only allow packaging to be opened by trained personnel.</p> <p>Establish potential equalization before opening.</p>
<b>Protect from Heat</b>		<p>Protect packages against heat and direct sunlight.</p>
<b>Protect from Radioactive Sources</b>		<p>Protect packages against radioactive sources.</p>

Table 4.1: Symbols on the Packaging

## 4.2 Inspection at Delivery

Upon receipt, immediately inspect the delivery for completeness and transport damage.

Proceed as follows in the event of externally apparent transport damage:

- Do not accept the delivery, or only accept it subject to reservation.
- Note the extent of the damage on the transport documentation or the shipper's delivery note.
- Initiate complaint procedures.



Issue a complaint in respect to each defect immediately following detection. Damage compensation claims can only be asserted within the applicable complaint deadlines.



## 4.3 Packaging

---

### About Packaging

The individual packages are packaged in accordance with anticipated transport conditions. Only environmentally friendly materials have been used in the packaging.

The packaging is intended to protect the individual components from transport damage, corrosion and other damage prior to assembly. Therefore do not destroy the packaging and only remove it shortly before assembly.

### Handling Packaging Materials

Keep the original container and packing assembly, at least as long the warranty is valid, in case the unit has to be returned to the factory. When the packaging material is no longer needed dispose of in accordance with the relevant applicable legal requirements and local regulations.

## 4.4 Storage

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### Storage of the Packages

Store the packages under the following conditions:

- Do not store outdoors.
- Store in dry and dust-free conditions.
- Do not expose to aggressive media.
- Protect against direct sunlight.
- Avoid mechanical shocks.
- Storage temperature: 15 to 35 °C.
- Relative humidity: max. 60%.
- If stored for longer than 3 months, regularly check the general condition of all parts and the packaging. If necessary, top-up or replace preservatives.



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Under certain circumstances, storage instructions may be affixed to packages which expand the requirements specified here. Comply with these accordingly.

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# 5 Technical Data

## 5.1 LN2 Safety Valve Output

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The LN2 valve output can drive a **24 VDC valve, 1A max.**

The valve output is protected by a fuse; if the fuse is blown it must be replaced by a 250 V/ 1 AT model type.

The safety valve is closed when:

- SRC controller unit is not powered:
  - LN2 level too high in the reservoir
  - O<sub>2</sub> concentration in air is below safe level. The interlock contact provided by the O<sub>2</sub> gas monitor is opened. The Eurotherm displays "2FSH" on the lower line.
  - If the SRC is connected to the AMI186 and the LN2 level is above the high level, the interlock contact provided by the AMI is closed. The Eurotherm displays "1FSL" on the lower line.

A close safety valve can also be due to malfunction or unconnected cables in particular if:

- The safety valve cable is not connected.
- The safety sensor is not connected or broken.

## 5.2 Environmental Conditions

---

### 5.2.1 Temperature, Humidity and Altitude

---

The LN2 SRC unit is for inside and must be used only below 2000 m above sea level (6600 feet).

It should, however, be in an environment which conforms, the 5°C - 40°C (41°F - 104°F) thermal specifications, a 80% maximum relative humidity of air and a contamination level of 2 (means a normal, only nonconductive contamination, temporary conductivity due to condensation is possible).

### 5.2.2 Cooling

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No specific cooling or ventilation is required.

### 5.2.3 Sound Level

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No ear protection is required.

## 5.3 Dimensions/Weight

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Width: 83 mm, 87 mm on the front panel.

Height: 247 mm, 263 mm on the front panel.

Depth: 270 mm, 340 mm including rear panel connectors.

Weight: 1,5 kg.

Controller case is nonmagnetic.

## 5.4 Power Requirements

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Line voltage: 208-230 Vac, 50/60 Hz, line fuses 2 x 1 A 250 V

Power: 230 VA

Current: 1 A

Phase: 1

Wires: 2 + Earth

## 5.5 Part Numbers

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Below, you will find the bill of material of the W136176 (complete system). Each part can be ordered separately.

Part Number	Description
W136936	LT MAS LN2 SAFETY CONTROLLER
W136728	LT-MAS LN2 SAFETY SENSOR
W136929	LT MAS LN2 SAFETY VALVE CABLE
W136932	LT MAS LN2 SAFETY SENSOR CABLE
W136933	LT MAS DUMMY O2 INTERLOCK PLUG
W137396	LT MAS LN2 SAFETY CONTROLLER - HOLDER

Table 5.1: Bill of Material of W136176

# 6 Design and Function

## 6.1 Front Panel Presentation

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Figure 6.1: Front Panel Presentation

1 Eurotherm controller

## 6.2 Rear Panel Presentation

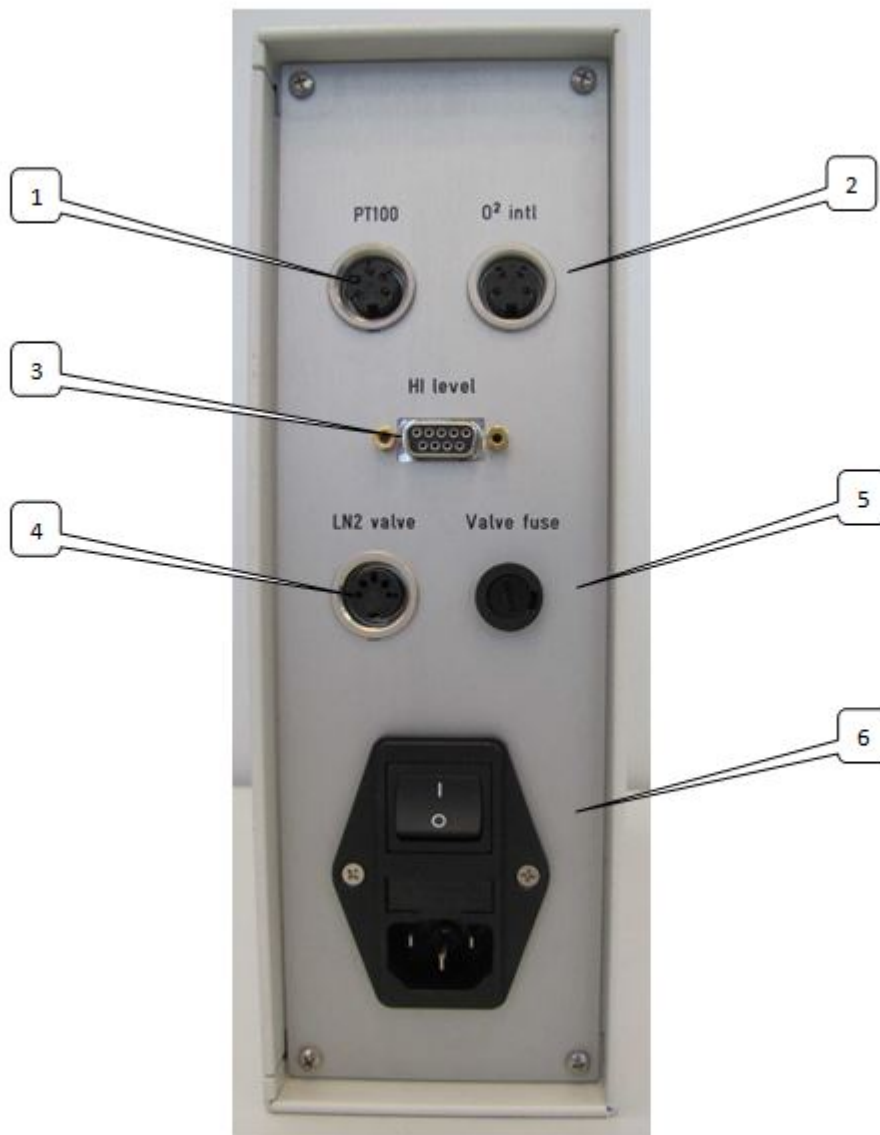
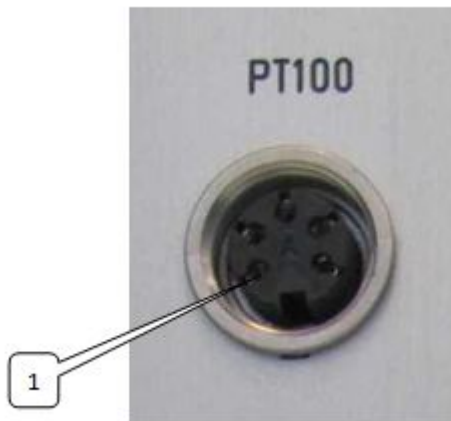


Figure 6.2: Rear Panel Presentation

- 1 Temperature sensor input
- 2 O<sub>2</sub> interlock input
- 3 High level interlock input
- 4 LN2 safety valve output
- 5 LN2 valve fuse holder (fuse 250V/1A)
- 6 Main power supply connector with power switch line 2x fuses (250V 1A)

## 6.3 Connectors Description

### 6.3.1 PT100 Connector



Pin Number	Function
1	Pt100 I (current)
2	Pt100 V+
3	Pt100 V-
4	Pt100 Heater V+
5	Pt100 Heater Gnd

The PT100 sensor measures the temperature a few centimeters below the cover of the Dewar. During normal operation the sensor is surrounded only by cold nitrogen gas and the temperature is well above the temperature of liquid nitrogen (77.3K)

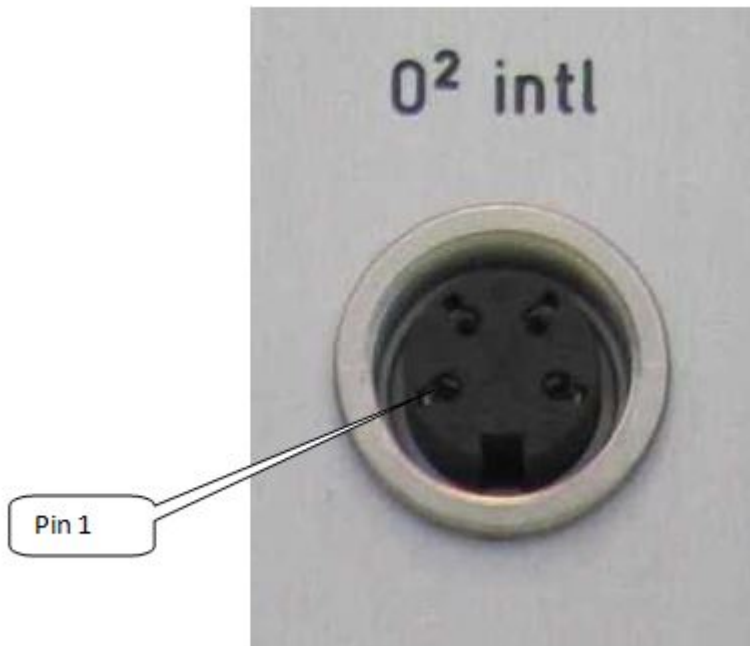
If the level of nitrogen is too high in the reservoir in case of overfilling, the sensor will be immersed in LN2 and the temperature will decrease to nearly to 77.3 K.

As soon as temperature is below a defined temperature threshold (parameter 1FSL), the controller triggers an alarm and closes the safety valve.

The safety valve will remain closed as long as the temperature is below the threshold or the default has not been acknowledged.

The settings of the threshold temperature and how to acknowledge are explained later in the settings section.

## 6.3.2 O2 Interlock Connector



Pin Number	Function
1	Not Connected
2	<b>Interlock Input</b>
3	<b>Interlock Input</b>
4	Not Connected

This connector can be connected to an O2 gas detector equipped with an alarm output and a contact that can short pin 2 and 3.

The pin 2 and 3 must be shorted when the oxygen concentration in air is correct. This contact must be opened as soon as the O2 gas detector detects a low oxygen concentration in the room which represents a safety hazard.

The contact must also remain open when the O2 gas detector is faulty or not powered.

If an O2 gas detector is not used, the delivered *O2 LT MAS Dummy O2 Interlock plug* **MUST** be plugged to allow the LN2 safety refill system to function.

If pin 2 and 3 are not connected, an alarm is triggered that closes the LN2 safety valve.

The safety valve will remain closed as long as the contact is open or the default has not been acknowledged.

The acknowledgement will be explained later on the settings section.



### 6.3.3 HI Level Connector



Pin Number	Function
1	Not Connected
2	Not Connected
3	Not Connected
4	Not Connected
5	<b>Interlock Input</b>
6	<b>Interlock Input</b>
7	Not Connected
8	Not Connected
9	Not Connected

The output of the AMI186 LN2 level controller, located inside LTMAS cabinet, can optionally be attached to this connector.

The relay contacts inside the AMI186 controller are closed when the LN2 level is above a predefined HIGH LEVEL limit. The relay contacts are open when the level is below the HIGH LEVEL.

When the high level is reached it triggers an alarm that closes the LN2 safety valve.

The safety valve will remain closed as long as the contact is closed or the default has not been acknowledged.

A dummy plug for this connector if not used.

The alarm acknowledgement will be explained later on the settings section.



# 7 Installation



Installation, initial commissioning, retrofitting, repairs, adjustments or dismantling of the device must only be carried out by BRUKER Service or personnel authorized by BRUKER. Damage due to servicing that is not authorized by BRUKER is not covered by your warranty.

## 7.1 First Installation

### WARNING



#### **Risk of injury or material damage during the installation process.**

Malfunction and/or destruction of the equipment as well as person injury and/or death can be caused by inadequate use. Therefore:

- ▶ Be very careful. Please, pay special attention to all electrical connections.

## 7.2 First Use

### WARNING



#### **Material damage from improper handling of the LN2 Safety Refill Controller**

To avoid malfunction and/or destruction of the equipment, following actions have to be fulfilled:

- ▶ Check the connection between the LN2 SRC and all the equipments connected at the rear side of the controller.
- ▶ Make sure that the LN2 safety valve is not bypassed.
- ▶ Make sure that the LN2 safety sensor is correctly installed in the Dewar.

## 7.3 System Installation

- Remove overpressure valve from LN2 Dewar cover.
- Install safety sensor on sensor holder and screw overpressure valve.
- Install SRC controller inside LTMAS cabinet with front panel towards user.
- Connect a spare power cable from cabinet to controller power socket.
- Install the safety sensor cable.
- Attach the LN2 safety valve cable on valve. The LN2 safety valve is usually a part of the user installation that delivers LN2 through a piping.

## 7.4 Wiring Diagram

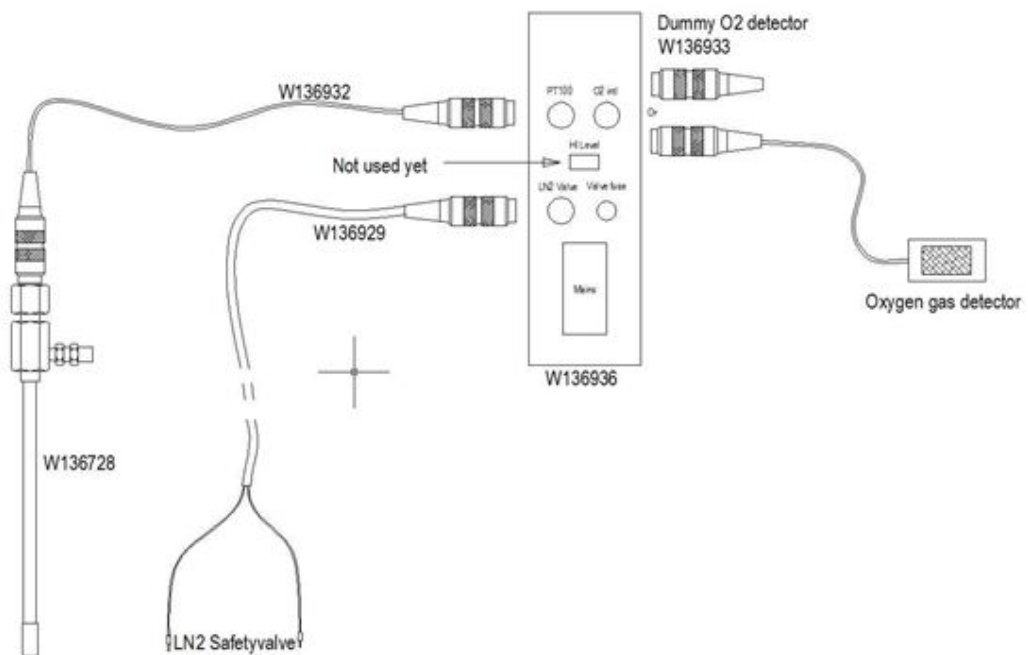


Figure 7.1: Wiring Diagram

LN2 SRC mains is not represented.

# 8 Operation

## 8.1 Getting Started

After a cabling verification switch on the SRC controller.

The LN2 safety valve will be powered and the LT MAS exchanger Dewar can then be supplied with LN2 if no alarm condition is present.

The Eurotherm controller displays the temperature measured by the PT100 sensor. The units are Kelvin.

## 8.2 Eurotherm Parameter Setting

The user is not allowed to change the LN2 SRC configuration. However, two parameters, 1FSL and 2FSH, can be adjusted by the user.

Both parameters are located in the AL menu which is reached by using the buttons on the Eurotherm front panel.

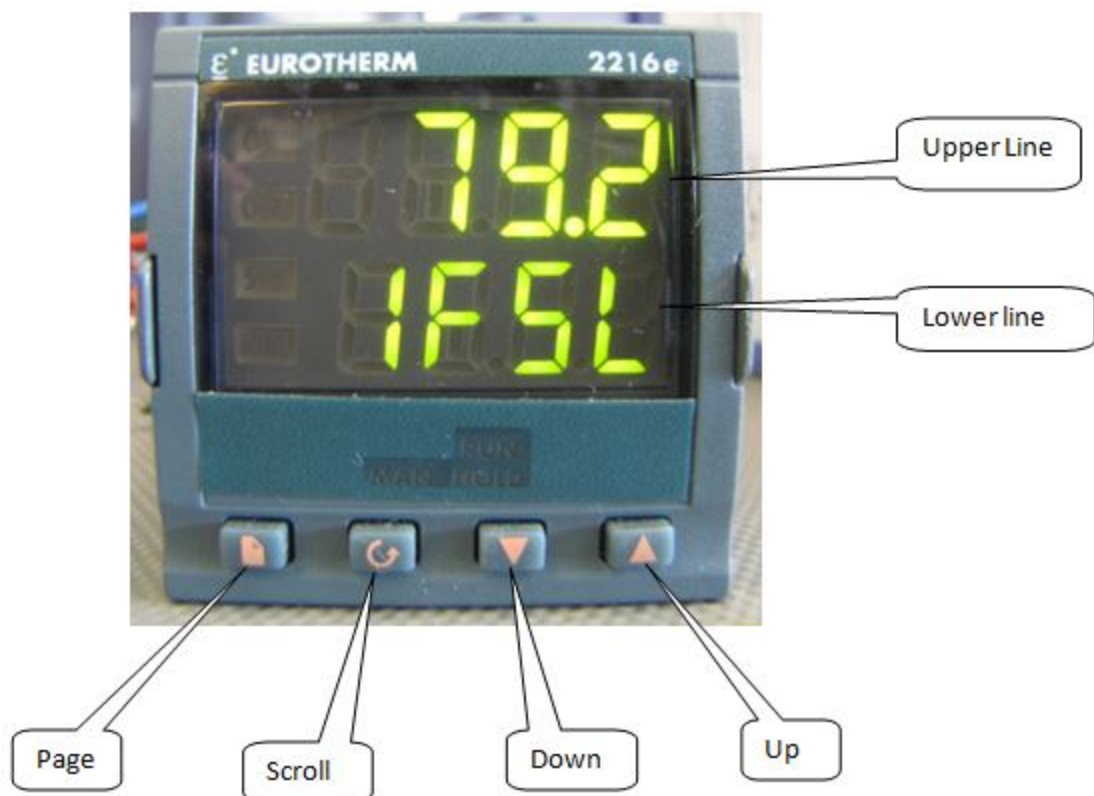


Figure 8.1: Eurotherm Parameter Setting

## 8.2.1 How to change Temperature Threshold Parameter 1FSL

---

The 1FSL parameter defines the temperature used to detect an overfilling of the LN2 reservoir.

To access the AL menu, push the "PAGE" button until the AL Menu appears. The Eurotherm display will be :



Once the AL menu reached, push the "SCROLL" button until the 1FSL parameter is displayed. The Eurotherm display will be:



The upper line indicates the parameter while the lower one displays its value.

In the picture here over, the parameter 1FSL has a value of 100.0 K.

1FSL is factory set to 100 K. To change the value, use the "UP" or "DOWN" button. Once the value adjusted, it will blink once indicating that the new value has been saved.

Notice that the 1FSL parameter can be directly accessed by using the scroll button without being obliged to enter the Eurotherm FULL mode

## 8.2.2 How to change Temperature Threshold Parameter 2 FSL

---

The 2FSL parameter defines the temperature used to detect a too low oxygen concentration creating a safety hazard.

The 2FSL alarm will appear as soon as the attached oxygen gas monitor detects a low concentration of oxygen in air. The O2 interlock contact aperture adds about 300K to the temperature measured by the Pt100 sensor to simulate a high temperature. Normally it is not necessary to modify the 2FSL parameter value. For information we give the procedure to change the settings of the parameter 2FSL.

To access the AL menu, push the "PAGE" button until the AL Menu appears on upper line. The Eurotherm display will be:



Once the AL menu is displayed, push the "SCROLL" button until the 2FSL parameter is displayed. The Eurotherm display will be:



The Eurotherm upper line indicates the accessed parameter while the lower one displays its value. In the picture here over, the parameter 2FSL has a value of 373.0K.

The parameter 2FSL is factory set to 373K. To change its value, use the "UP" or "DOWN" button. Once the value is adjusted, it blinks once indicating that the new value has been automatically saved.

Notice that, as the 1FSL parameter, the 2FSH parameter can be directly accessed by using the scroll button without being obliged to enter the Eurotherm FULL mode.

### 8.3 How to Reset a 1FSL or 2FSH Alarm

---

The default can only be reset if the event condition disappears. In the 1FSL case, the measured temperature must be greater than the 1FSL value. In the 2FSH case, the measured temperature must be smaller than the 2FSH value.

Remember that until a default condition is present, the LN2 security valve is not energised.

To reset the default, press the "PAGE" button and the "SCROLL" button at the same time.

### 8.4 Troubleshooting

---

The LN2 safety valve is powered by the 24 VDC delivered by the SRC unit.

If an alarm condition is present, it is shown on the lower line of the Eurotherm display by a blinking message (1FSL or 2FSH or S.br).

A default can only be reset if the event condition disappears.

To reset the default, press the "PAGE" button and the "SCROLL" button at the same time.

#### Temp

Temperature measured with the PT100 safety sensor.

**T min:** 100 K

If the temperature is below, it means overfilling (1FSL alarm)

**T max :** 373K

In normal case, the measured temperature will never exceed 340-350K. The 2FSL parameter is factory set to 373K to make sure that a 2FSL alarm will be produced when an O2 hazard occurs. A temperature value over 373K means either a missing dummy O2 plug or a real alarm transmitted by the attached oxygen gas detector.

The table below summarizes all miscellaneous conditions and their significations.

	Conditions	LN2 safety valve state	Eurotherm display Upper line Lower line	Comment
1	Temp > T min and Temp < T max Temp ok	LN2 safety valve is OPEN	Temp PT100 ----- - blank	Everything is OK!
2	Temp < T min Overfill detected	LN2 safety valve is CLOSED	Temp PT100 ----- - 1FSL blinking	1FSL indicates that the lower threshold is or has been reached. Default is latched
3	Temp > T max → Temp sensor not in dewar and seriously heated	LN2 safety valve is CLOSED	Temp PT100 ----- - 2FSH blinking	2FSH indicates that the upper threshold has been reached. Default is latched
4	PT100 sensor is disconnected	LN2 safety valve is CLOSED	S.br ----- - Nothing	S. br indicates a broken sensor Default is not latched
5	Pt100 disconnected while LN2 SRC is powered	LN2 safety valve is CLOSED	S.br ----- - blank	S. br indicates a broken temperature sensor Default is not latched
6	PT100 not connected or partially connected at power on	LN2 safety valve is CLOSED	S.br ----- - blank	S. br indicates a broken sensor Default is not latched
7	Temp Ok and O2 interlock default	LN2 Valve is CLOSED	Temp PT100 ----- - 2FSH blinking	2FSH indicates that the Higher threshold is or has been reached. Default is latched
8	Temp Ok and HI Level default	LN2 Valve is CLOSED	Temp PT100 ----- - 1FSL blinking	1FSL indicates that the Lower threshold is or has been reached. Default is latched



# 9 Maintenance

## 9.1 Cleaning

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No special cleaning requirements.

## 9.2 User Maintenance

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There is no user serviceable part inside the LN2 SRC.

## 9.3 Manufacturer Maintenance

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There is no manufacturer maintenance for the LN2 SRC.



# 10 Replacement of Parts

In case of failure, the unit needs to be returned to the manufacturer for repair. There are no Field Replaceable Units.

## 10.1 Returning the Unit for Repair

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If the Bruker Hotline diagnoses an instrument failure that requires a part to be returned for repair, please follow the procedure listed here:

1. Contact your local Bruker office to start the repair process (see Contact). Repair is always handled by your local Bruker office. Their reply will contain all necessary information for the subsequent repair process steps.
2. They will provide you with details on the shipping address, and also in most cases a "Return Merchandise Authorization" number (RMA number) that allows references to the repair case. Always refer to this RMA number in case of questions.
3. Send the defective part to the local Bruker office and include the following documents:
  - RMA sheet (if RMA number was assigned).
  - Signed Equipment Clearance Form. The Equipment Clearance Form will be sent to you as part of step 1 (see above) with information about the returned part (part number, serial number, your contact details) already filled in.
4. Attach the relevant papers to the *outside* of the packaging, for instance in a transparent polybag.



The unit should be returned using the original container and packing assembly. If this packaging is no longer available, contact your local Bruker office for further instructions.

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# 11 Dismantling and Disposal

Following the end of its operational life, the device must be dismantled and disposed of in accordance with the environmental regulations.



Installation, initial commissioning, retrofitting, repairs, adjustments or dismantling of the device must only be carried out by Bruker Service or personnel authorized by Bruker. Damage due to servicing that is not authorized by Bruker is not covered by your warranty.

## 11.1 Dismantling

Before starting dismantling:

1. Shut down the device and secure to prevent restarting.
2. Disconnect the power supply from the device; discharge stored residual energy.
3. Remove consumables, auxiliary materials and other processing materials and dispose of in accordance with the environmental regulations.
4. Clean assemblies and parts properly and dismantle in compliance with applicable local occupational safety and environmental protection regulations.

## 11.2 Disposal Europe

**Environmental information for laboratory and industrial customers within the EU (European Union)**



This laboratory product is developed and marketed for Business-to-Business (B2B), so does not fall under article 6 clause 3 of the German Act ElectroG. To meet the demands of the European Directive 2012/19/EU WEEE 2 (Waste of Electrical and Electronic Equipment) and the national Equipment Safety Act, electrical and electronic equipment that is marked with this symbol directly on or with the equipment and/or its packaging must not be disposed of together with unsorted municipal waste or at local municipal waste collecting points. The symbol indicates that the equipment should be disposed of separately from regular industrial/ domestic waste.

Correct disposal and recycling will help prevent potential negative consequences for the environment and risk to personal health. It is your responsibility to dispose of this equipment using only legally prescribed methods of disposal and at collection points defined by government or local authorities in your area.

The WEEE register number can be found on the product label of the equipment. If you need further information on the disposal of equipment or collection and recovery programs available, contact your local Bruker BioSpin sales representative. Local authorities or professional waste management companies may also provide information on specific waste disposal services available in your area.

### **Disposal - End of Life (EoL) information: the common procedure as defined in the sales contract with Bruker BioSpin**

After the lifespan of an electrical and electronic product, Bruker BioSpin takes responsibility for final disassembly and correct disposal in accordance with the European directive 2012/19/EU WEEE 2.

Bruker BioSpin offers to take back the equipment (only for deliveries after 23.03.2006) after termination of use at the customer site upon request by the customer. This request must be affirmed when the equipment is ordered from Bruker BioSpin. Additional costs for dismantling and transport service will apply!

Only 100% pre-decontaminated equipment can and will be accepted by Bruker BioSpin. A release document for decontamination can be inquired from your nearest Bruker BioSpin contact site, also to be used when repairs, going back to Bruker sites, are requested.

In compliance with WEEE II directive: **2012/19/EU**

## **11.3 Disposal USA and Other Countries**

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Disposal of these materials may be regulated due to environmental considerations. For disposal or recycling information, please contact our local office or your local authorities, or in the U.S.A., contact the Electronics Industry Alliance web site at [www.eiae.org](http://www.eiae.org).

# 12 Contact

**Manufacturer:**

Bruker BioSpin SAS  
34, rue de l'Industrie  
67166 WISSEMBOURG Cedex  
France  
Phone: + 33 3 88 06 60 00  
Fax: + 33 3 88 06 68 20  
<http://www.bruker.com>  
WEEE FR311020911

**NMR Hotlines:**

Contact our NMR service centers.

Bruker BioSpin NMR provides dedicated hotlines and service centers, so that our specialists can respond as quickly as possible to all your service requests, applications questions, software or technical needs.

Please select the NMR service center or hotline you wish to contact from our list available at:

<http://www.bruker.com/service/information-communication/helpdesk/magnetic-resonance.html>





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