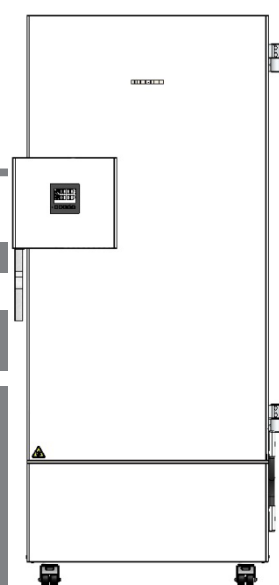


Translation of the original

Installation manual for the Analog output

Ultra-Low Temperature Freezer SUFsg

	Model	Gross content in liters	Voltage
	SUFsg 5001,001	491	230 V
	SUFsg 7001,001	728	230 V
UL chambers	SUFsg 5001,137	491	120 V
	SUFsg 5001,123	491	208-240 V
	SUFsg 7001,137	728	120 V
	SUFsg 7001,123	728	208-240 V
Chambers with water cooling	SUFsg 5001,H72	491	230 V
	SUFsg 7001,H72	728	230 V



SUFsg 5001
SUFsg 7001

7085 887-00

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1 Preface

1.1 General guidelines

This installation manual describes the installation of the analog output of the SUFsg ultra-low temperature freezer and is aimed at service personnel who should install it.

The repair of the cooling system must only be performed by personnel having specialized training and special tools must be available.

References about the required qualification of the personnel can be found in chap. 2.1.

Before starting the service work at an SUFsg ultra-low temperature freezer, compare order and serial number of the unit with the validity note on the front page of this manual.

The of electrical equipment marking of the components refers to the circuit diagrams. With other sizes of the device the marking can deviate. Therefore use always the appropriated circuit diagram of the device.

Additional options are indicated in the text.

This manual will be updated if necessary. Always use the latest version of the manual.

All information about initial operation, normal operation, cleaning, alarm and error messages can be found in the relevant operating manual delivered with the SUFsg ultra-low temperature freezer.



Before connecting the unit, compare the data given on the type plate with the values of your power supply network.

1.2 Syntax

Syntax	Meaning
(-1A1)	Marking of electrical equipment or components of the cooling system, and of electric contacts (Equipment code)
<Taste>	Button to be pushed
"Text"	Displayed text or text to be entered

1.3 Safety instructions structure

This installation manual employs the terms and symbols below to describe dangerous situations, in line with the harmonization of ISO 3864-2 and ANSI Z535.6.

1.3.1 Safety instructions structure

- Instruction how to avoid the hazard: mandatory action
- ⊘ Instruction how to avoid the hazard: prohibition

1.3.2 Warning levels

Depending on the probability of serious consequences, potential dangers are identified with a signal word, the corresponding safety color, and if appropriate, the safety alert symbol.


 DANGER
Indicates an imminently hazardous situation that, if not avoided, will result in death or serious (irreversible) injury.

 WARNING
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious (irreversible) injury.




 CAUTION
Indicates a potentially hazardous situation which, if not avoided, may result in moderate or minor (reversible) injury.

NOTICE
Indicates a potentially hazardous situation which, if not avoided, may result in damage to the product and/or its functions or of a property in its proximity.




1.3.3 Safety alert symbol

	Risk of injury. Observe all measures that are marked with the safety alert symbol in order to avoid death or injury.
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1.3.4 Warning signs

	Danger of electric shock
	Danger of cutting injuries
	Danger of injuries by jumping off mechanical components

1.3.5 Mandatory action signs




	Pull out the power plug
	Wear protective goggles
	Wear protective gloves

1.3.6 Information symbol

	Important information
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2 Safety instructions

2.1 Qualification of service personnel

	 WARNING
	<p>Danger of malfunctions due to incorrect maintenance or repair.</p> <p>Injuries, damage to the chamber and samples</p> <ul style="list-style-type: none">➤ General maintenance work must be conducted by licensed electricians or experts authorized by the manufacturer.➤ Maintenance work at the refrigeration system must only be conducted by qualified personnel who underwent training in accordance with EN 13313:2010 (e.g. a refrigeration technician with certified expert knowledge acc. to regulation 303/2008/EC). Follow the national statutory regulations.
	<p>The Ultra-low temperature freezer should only be maintained, repaired and calibrated / adjusted by qualified personnel.</p>








To be able to carry out the work on ultra-low temperature freezer the enforcing personnel must be familiar with operation, maintenance, repair, calibration, and adjustment of the device. Sufficient qualification is achieved by:

- Electro technical training
- Knowledge of the present installation manual
- Knowledge of the current operating manual
- Experience in servicing ultra-low temperature freezers

Maintenance, repair and inspection of the cooling system must be performed by trained personnel, that has a certification in accordance with EC Regulation 303/2008 and expert knowledge in accordance with EN 13313:2010.

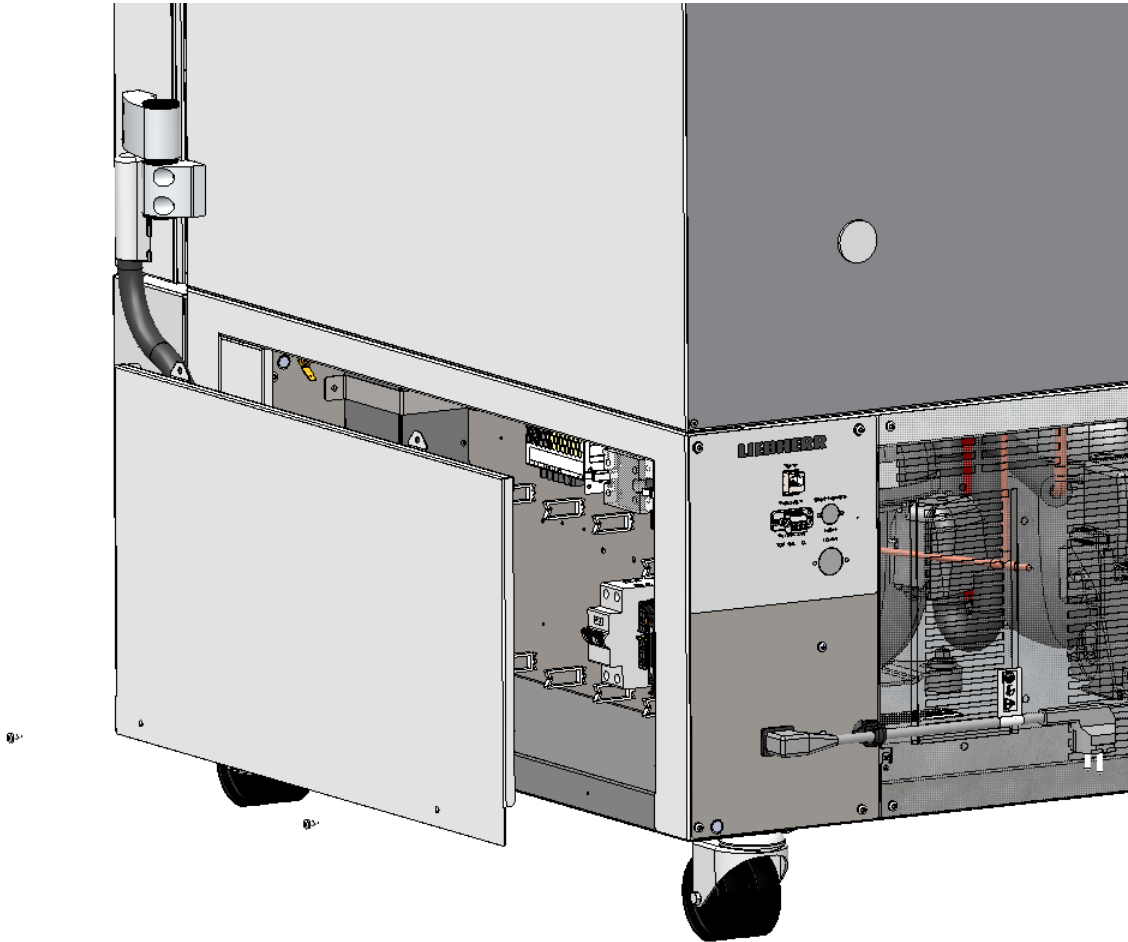
All work (repairs, inspections) must be recorded in the associated plant log book.

2.2 Safety and hazard instructions

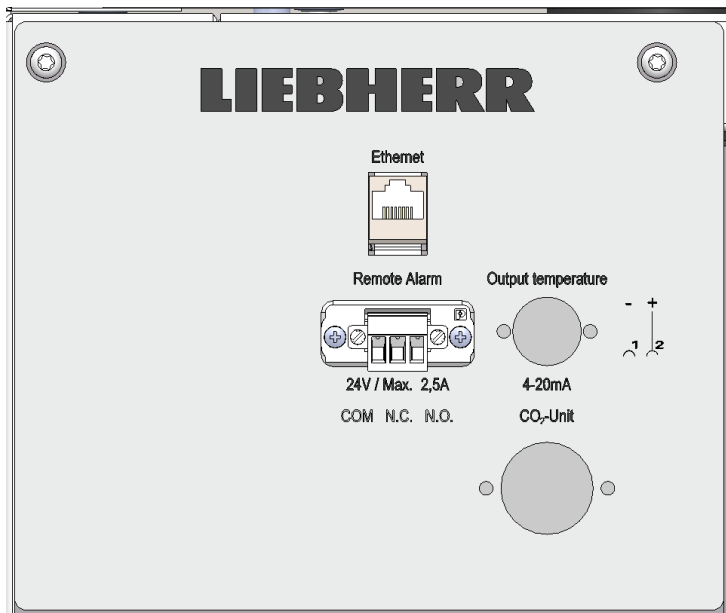
 	<div style="background-color: red; color: white; padding: 5px; text-align: center;">  DANGER </div> <p>Electrical hazard during live maintenance and repair work Deadly electric shock.</p> <ul style="list-style-type: none"> ➤ Before conducting most of the described work, turn off the chamber at the main power switch and disconnect the power plug ➤ Take all precautionary measures that a unit which is disconnected from the power supply will not be inadvertently connected to the power supply. ➤ If the unit must be live to perform special service tasks: Make sure that a second person is present who is able to switch off the unit in case of emergency.
 	<div style="background-color: yellow; padding: 5px; text-align: center;">  CAUTION </div> <p>Danger of cutting by sharp edges of sheet metal parts. Cutting injuries.</p> <ul style="list-style-type: none"> ➤ Wear protective gloves during mounting and dismantling inner chamber and housing because sheet metal components may be sharp-edged.
	<div style="background-color: #00aaff; color: white; padding: 5px; text-align: center;"> NOTICE </div> <p>Danger of damaging electronic components by handling malpractices and electrostatic discharge. Malfunctions and damage of the electronics.</p> <ul style="list-style-type: none"> ➤ Prior to work at electronic components, take appropriate protective measures against electrostatic discharge. Wearing ESD shoes and a grounding bracelet have shown to be useful. ➤ Before opening the lock and controller housing, electrostatically discharge by touching a grounded metallic object. ➤ Prior to work at the electrical equipment check identity of the components with the aid of the wiring diagram. The assembly of the electrical equipment may be different from the description in this manual. ⊘ NEVER let mechanical components hang at electric cables. Electric cables are not appropriate to hold bigger components and will be damaged if you do so

3 Installation of the optional analog output 4-20mA

1. Turn off the chamber and disconnect it from the power supply.
2. Open the lateral cover on the hinge side of the chamber.



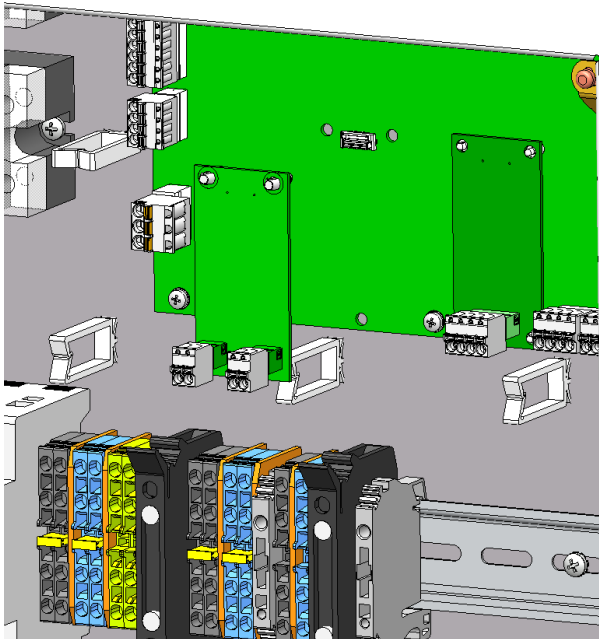
3. Cut the hole for the socket into the panel film on the unit rear under "Output temperature 4-20mA" with a knife



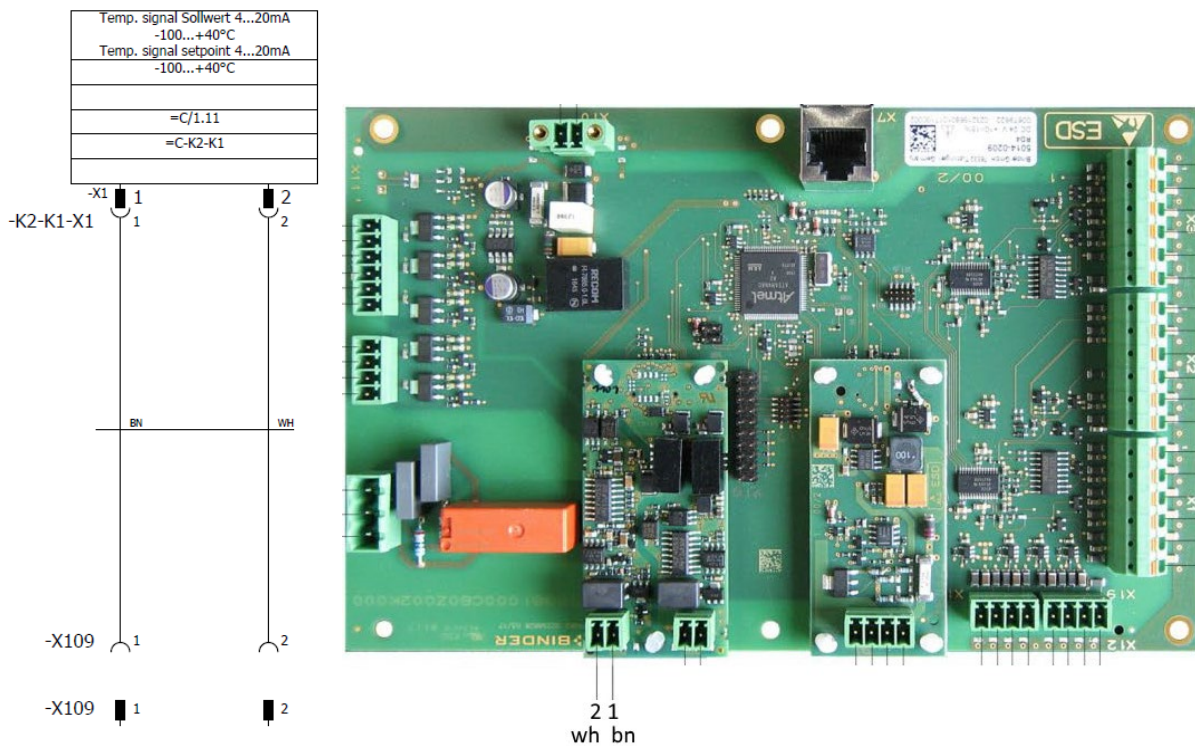
4. Insert the cable of the DIN socket (-X109) and screw on the socket with screws.



5. Plug the analog board (-K2-K1) with 3 plug-in spacers onto the I / O controller board.



6. Connect the brown and white wires of the socket (-X109) to the analog output board (-K2-K1).

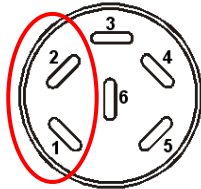


7. Put the rest of the cable in the cable holder of the electrical mounting plate

8. Screw the lateral cover back onto the device

4 Functional test of the analog output

1. Connect the chamber to the power supply and turn it on.
2. A current signal proportional to the temperature must be given out at the analog output.
3. Connect a current measuring device (setting: mA) to pin 1 and 2 of the analog output. The current value shown in the table is given out at the analog output in accordance with the current interior temperature.



4. The reading of both the temperature value and the current value must take place within 15 seconds.

Temperature in °C	Current in mA
35	19,4
30	18,9
25	18,3
23	18,1
21	17,8
19	17,6
17	17,4
15	17,1
0	15,4
-20	13,1
-40	10,9
-60	8,6
-80	6,3

In case of malfunction of the analog output, very different values are measured.



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