

iFerm Nano Kit



Operating instructions

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"8.5 Customer Service" on page 31.

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Brands

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1 Introduction

These operating instructions provide you with information about all technical and safety-relevant aspects that you must be familiar with for working with the *iFerm Nano Kit*.

- ➔ Read the operating instructions in full before operating the unit, and also use them for the purpose of instructing all users.

1.1 Proper use

iFerm Nano Kit is a replacement module for 10 units of the central control cabinets with AFC or EFC systems. One kit replaces an entire row in the corresponding control cabinet. With the *iFerm Nano Kit*, the existing system is modernized to the state of the art.

All extensions of the *iFerm Nano* system are available, e.g. the connection to an *iFerm Nano Terminal*. Together with this, temperature curves can be displayed and recipe curves can be run. Or the system can be operated remotely with a PC or smartphone. And much more besides.

1.2 Prior knowledge

The operating instructions define users as all persons involved in the installation and operation of the *iFerm Nano Kit*. Users must be at least 16 years of age. They must have read and understood the operating instructions and must be able to follow all notices and instructions.

The operating instructions are intended for persons with experience in handling comparable instruments and systems. In particular, basic knowledge of beverage production is required.

1.3 Notes about the operating instructions

The following typographical elements are used in the operating instructions in order to notify you of possible hazards or particular information:



DANGER!

Identifies notices of the Danger hazard level. Indicates possible hazards that can result in injury or death if ignored.



Attention!

Identifies notices of the Attention hazard level.

Indicates possible hazards that can result in property damage if ignored.



Information

Indicates more detailed information. Points out alternative actions, further information sources, or helpful tips.

All stated positions (left, right, front, back, top, bottom etc.) relate to an observer looking at the switch from the front of the *iFerm Nano Kit*.

2 Safety notices

- ➔ Read the operating instructions carefully and obey all safety notices. Property damage resulting from ignoring the safety notices is not covered by any warranty.
- ➔ Whenever you use the *iFerm Nano Kit*, follow the laws that apply at the place of use, particularly the general safety and accident prevention regulations. If in doubt, these take precedence over the directions in the operating instructions.
- ➔ *iFerm Nano Kit* is operated with the power supply of the control cabinet.
- ➔ The power supply must be properly connected and then checked and approved by a qualified electrician. There is a risk of electric shock if the connection is faulty!
- ➔ Extreme temperatures caused by heat build-up, frost, UV light, direct sunlight etc. can cause irreparable damage. You must at all times adhere to the specified ambient temperatures, see "**8.1 Technical Data**" on page 27.
- ➔ Avoid any high-intensity contact with liquids (e.g. from high-pressure cleaners).
- ➔ Do not make repairs of any kind on the *iFerm Nano Switch*. Observe the instructions in Section "**7 Maintenance and Care**" on page 26.

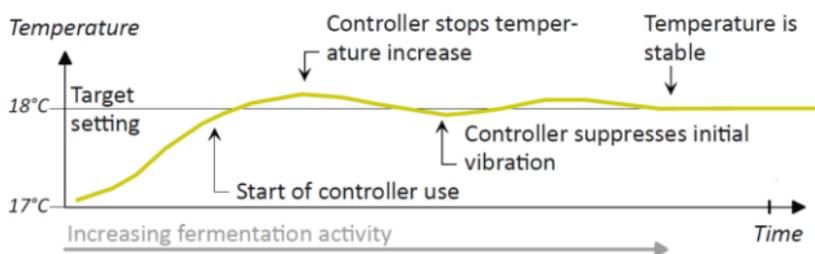
3 Product overview

With the *iFerm Nano Kit*, you can monitor compliance with the process temperatures in up to 10 tanks. Alternatively, you can also monitor room temperatures, heat exchangers, etc.



iFerm Nano Kit keeps the process temperature in the tank constant to the value of the specified target temperature, as long as the cooling or heating medium required for this is constantly available in a sufficient quantity. To achieve this, the temperature probe sends the measured actual temperature to the microprocessor that adjusts it to the target temperature. Every deviation results in an adjustment of the valve setting so that the tank's heat exchanger can be filled as required and the target temperature is maintained in every process phase.

Since fermentation yeasts react sensitively to frequent temperature changes, *iFerm Nano Kit* intervenes in fermentation processes even before the target temperature is reached and starts the cooling. Brief cooling pulses gently slow down the temperature rise, and exceeding of the target temperature is prevented by more intensive cooling.



The frequency of the cooling pulses varies depending on the difference between the actual value and the target value. In the event of major deviations, the pulse/pause ratio can be regulated in such a way that the valve is permanently open. The controller detects temperature deviations that occur mainly in the initial vibrations range, and counteracts them automatically by continually restricting the controller tolerance. After a short time, a stable target temperature is arrived, at which the tank contents can be reliably kept.

The actual and target temperature can always be read off on the display. The target value can simply be adjusted via the display buttons, see *"6 Operation" on page 16*. Other changes are not possible until after enabling, see *"7 Extended configuration" on page 19*.

3.1 Supplied scope

The package contains the following articles:

	Description
1	<i>iFerm Nano Kit</i> , 10 control units mounted on a front mounting plate made of aluminum with cable harnesses and adapter boards for plugging into the existing backplane.
1	Operating instructions

➔ Check the package contents against the list above.

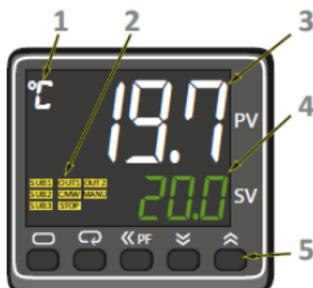


Attention!

Contact our customer service immediately if parts are missing or if you find any damage, see *"8.5 Customer Service" on page 31*.

➔ Dispose of all packaging materials in accordance with the disposal guidelines applicable in your region.

3.2 Display



Pos.	In normal operation	In the menu
1	Shows the unit of the temperature display.	Extends the PV range, see Pos. 3.
2	Message area (texts on yellow background): Shows messages relating to the current operating state, see <i>"3.2.2 Status messages" on page 13.</i>	
3	PV area (<i>process value</i> , white characters): Shows the measured actual temperature.	Shows the name of the current menu.
4	SV area (<i>set value</i> , green characters): Shows the set target temperature. The displayed value can be changed via the display buttons. After a change, the display flashes briefly and the new value is then accepted.	
5	Display buttons for entering values and for configuration; for assignment, see <i>"3.2.1 Display buttons" on page 12.</i>	

3.2.1 Display buttons

The display buttons have the following functions:

Taste	In normal operation	In the menu
	Blocked, no function.	Call up menu and navigate in the menu, see <i>"6 Extended configuration" on page 19.</i>
	Press longer than 1 second: The control is stopped. <i>iFerm Nano Kit</i> is now working in display mode. stop flashes in the PV area. Pressing the button again switches <i>iFerm Nano Kit</i> back to normal operation.	
	Reduce the target temperature by 0.1 K in each case; keep the button pressed for fast forward.	Reduce the value in the SV area or scroll back by one adjustment option.zurückblättern.
	Increase the target temperature by 0.1 K in each case; keep the button pressed for fast forward.	Increase the value in the SV area or scroll forward by one adjustment option.vorblättern.

These operating instructions use the following symbols to represent operation of the display buttons:

Symbol	Meaning
	Press this button briefly.
	Press this button briefly twice.
	Press one of these two buttons.
	Keep this button pressed for up to 3 seconds.
	Keep these two buttons pressed together for up to 3 seconds.

3.2.2 Status messages

In the display's message area, symbols with a yellow background describe the current operating state as long as certain criteria are met. These status messages mean the following:

Symbol	Meaning
SUB2	The valve is open. (Always displayed in <i>Cooling</i> mode, in <i>Heating</i> mode only in operation without <i>iFerm Nano Terminal</i> .)
SUB3	Alarm: The difference between the actual and target temperature is greater than 1.5 K (the value preset at the factory).
OUT2	<i>Cooling</i> mode is activated. (Always displayed in <i>Cooling</i> mode, in <i>Heating</i> mode only in operation without <i>iFerm Nano Terminal</i> .)
CMW	The interface is activated. Communication via the data bus is possible.
s.err	Error message in the PV display area (<i>sensor error</i>): The sensor shows incorrect behavior, see " 8.2 Troubleshooting " on page 28.
stop	Message flashes in the display area PV: The control was stopped by pressing the PF key and works in display mode.

When there is central control via the *iFerm Nano Terminal* control unit, additional displays are possible such as the following messages:

Symbol	Meaning
MANU	Manual mode; control mode is interrupted, i.e. a certain valve setting was specified, e.g. a value for the parameter <i>Cooling outlet</i> : SV area = 100: Valve is open (100%). SV area = 0: Valve is closed (0%).
STOP	Measurement and display operation; the actual temperature continues to be measured and displayed. Control and display in the SV area are deactivated.
SUB1	The valve is open. (Only displayed in operation with <i>iFerm Nano Terminal</i> in <i>Heating</i> mode.)
OUT1	<i>Heating</i> mode is activated. (Only displayed in operation with <i>iFerm Nano Terminal</i> in <i>Heating</i> mode.)

4 Assembly and installation

The scope of the assembly work depends on the respective application. In the following you will find information on the basic steps that are necessary to prepare the *iFerm Nano Kit* and the assembly variants available in each case.

For assembly and installation of *iFerm Nano Kit* is compliance with the following steps should be performed:

4.1 Dismantling the old system

- ➔ Switch off the control cabinet
- ➔ Remove the AFC or EFC controller from the rack
- ➔ Remove the top and bottom card guides
- ➔ Remove the side faceplate
- ➔ AFC system: The network card remains in the rack
- ➔ Disconnect / separate data line in this rack

4.2 Installation of the *iFerm Nano Kit*

- ➔ Jumpers on the adapter board must not be changed!
Order of the control units: first row 1 - 5 / second row 6 - 10
- ➔ Insert the adapter boards (numbered) into slots 1-10
- ➔ Insert the front panel and fix it with the 6 screws (you may not use the upper middle screw, otherwise the tank lettering cannot be affixed in the middle)
- ➔ Print out the tank numbers (e.g. DYMO labeling tape) and stick them on the aluminum front panel above the controller

5 Operation

This chapter provides information on operating steps that are usually required during normal operation. Information on further settings can be found in the chapter

"6 Advanced configuration" on page 19.

5.1 Commissioning

You can start commissioning as soon as *iFerm Nano Kit* is properly installed and connected to all the necessary cables.



Attention! - First commissioning

When *iFerm Nano Top* is commissioned for the first time, the factory preset values apply, see *"8.5 Technical data" on page 27*. Change these as required before you start a process.

- ➔ Switch on the power supply for the *iFerm Nano Kit*. The display switches on showing the actual and target temperature.
- ➔ The valve moves into the position obtained from the current difference between the actual and target temperatures. In *Cooling* mode this means, for example:
 - Actual temperature > target temperature: Valve opens.
 - Actual temperature < target temperature: Valve closes.
- ➔ Test the function of the valve by setting another target temperature. The following example applies to *Cooling* mode (message *OUT2*):
 - Increase the target temperature to the extent that the valve must close. There should then no longer be any detectable flow at the tube.
 - Reduce the target temperature again to open the valve.

- ➔ Start operation:
 - Set the desired target temperature, see “5.2 Setting the target temperature” on page 17.
 - Start up the production process in the usual way.
- ➔ Check *iFerm Nano Kit* at regular intervals to ensure correct operation.

5.2 Setting the target temperature



The correct setting of the desired target temperature is the only action that you must perform during operation of *iFerm Nano Kit*.

- ➔ Check the setting at regular intervals.



- ➔ Lower or increase the target temperature (SV area) by 0.1 degrees with each press of the button.

Or



- ➔ Activate fast forward to make greater value changes.



Information

Alarm threshold **SUB3**

In the case of a greater value change, this message indicates that the actual temperature deviates from the target value by more than 1.5 K. The message disappears as soon as the difference between the actual and target values is once again less than 1.3 K (set hysteresis 0.2 K).



Information

You can change the target temperature centrally if there is a connection via data bus to the *iFerm Nano Terminal* control unit. The data line required for this is retrofittable at any time by having the connecting cable replaced at the factory.

5.3 Switching between control and display mode



- ➔ Each time the button is pressed for more than 1 second, the *iFerm Nano Kit* jumps from control mode to display mode and vice versa.
- ➔ The display mode is shown with the word **stop** alternating with the actual temperature.



Information

To use *iFerm Nano Kit* in display mode only, you can deactivate *Cooling* mode: Set a high value for the target temperature that the actual temperature of the process cannot attain (e.g. 50 °C). This means that the valve constantly remains closed.

6 Extended configuration

This chapter gives instructions on how to change appliance settings with which you can adapt *iFerm Nano Kit* to certain operational situations. These settings are not required in normal operation.



Attention!

Do not make any configuration changes that exceed the framework described here. Ignoring this can result in irreparable damage and can also render any warranty void. If in doubt, contact our customer service, see “8.5 Customer service” on page 31.

6.1 Changing cooling – heating mode



Attention!

The operating mode of *iFerm Nano Kit* can be changed from *Cooling to Heating*. There is no signalling in the display!



Attention!

In cooling mode, the valve opens when the target temperature is **below** the actual temperature. In heating mode, the valve opens when the target temperature is **above** the actual temperature. A status message **SUB2** indicates that the valve is open.



Attention!

- ➔ After each heating operation, set the operating mode back to *Cooling* mode!

If the mode has been changed, you must check the actual operating mode of *iFerm Nano Kit* before each use!



Caution!

If *iFerm Nano Kit* is operated in conjunction with *iFerm Nano Terminal*, all settings are carried out on this. The setting options of *iFerm Nano Kit* will be deactivated in this case!

6.1.1 Selecting the operating mode



Attention!

Always follow the order given here when making the change!



iFerm Nano Kit can be switched from *Cooling* to *Heating*. The operating mode *Cooling* is set as standard.



- ➔ Call up the configuration level:
Display *orev* (*oRev*)



- ➔ Set the desired operating mode.
 - *or-d* (*oR-d*): *Cooling*
 - *or-r* (*oR-R*): *Heating*



- ➔ End the process. The display switches over to showing the temperature.

6.1.2 Setting the alarm



Attention!

Always follow the order given here when making the change!

EN



iFerm Nano Kit can be switched to different alarm types. The alarm type 2 (alarm only at upper limit) is set for Cooling as standard.



- ➔ Call up the configuration level:
Display `orev` (*oRev*)



1x

- ➔ Display `alt1` (*Alt1*) appears.



- ➔ Set the desired alarm type.

- 0: Alarm function switched off, setting not recommended
- 1: Alarm at upper and lower limit (*Cooling and Heating*)
- 2: Alarm only at upper limit (recommended in *Cooling* mode)
- 3: Alarm only at lower limit (recommended in *Heating* mode)



- ➔ End the process. The display switches over to showing the temperature.

6.2 Changing the appliance address

(Only necessary when controlling several appliances via data bus.)



iFerm Nano Kit has as standard the appliance address **1**. In most cases, this address must be changed for central control via a data bus in order to allow clear identification.

-  → Call up the configuration level:
Display *orev* (*oRev*)
-  1x → Select the *u-no* (*unit number*) parameter.
The SV area shows the current appliance address.
-   → Set the desired appliance address; the values 1 – 30 are valid.
-  → End the process. The display switches over to showing the temperature.

6.3 Changing further settings

Always observe the following sequence to change one of the settings described below:

- ➔ First deactivate the button lock, see “6.3.1 Activating and deactivating the button lock” on page 23.
- ➔ Make the desired changes and then reactivate the button lock.

6.3.1 Activating and deactivating the button lock



The button lock is used to prevent unintentional changes to the configuration. You must deactivate the button lock in order to be able to change settings.



- ➔ Call up the protected menu area:
oapt display (*operation / adjustment protect*)

The SV area shows the current setting. The following values are defined for the button lock:

- 0: The button lock is not activated.
- 2: The button lock is activated and prevents unintentional operation of the two buttons on the left (standard).



Attention!

The values 1 and 3 must not be adjusted because this can cause functional limitations.

  ➔ Select the value 0 to enable access to the extended configuration.

 +  ➔ End the process. The display switches over to showing the temperature.



Attention!

iFerm Nano Kit saves the respective last setting of the button lock. For safety reasons, you should reactivate the button lock (value 2) as soon as you have made the desired changes.

6.3.2 Changing the alarm threshold



The alarm threshold in Kelvin indicates when the actual temperature exceeds or falls below the target temperature and the alarm **SUB3** is triggered.

The value of 1.5 K is preset at the factory.

 ➔ Select the al-1 (alarm 1) parameter. The SV area shows the current setting.

 /  ➔ Set the desired alarm threshold.

 ➔ End the process. The display switches over to showing the temperature.

6.3.3 Activating and deactivating communication

(Only required in conjunction with *iFerm Nano Terminal* control unit.)



iFerm Nano Kit can also be used in single operation. For this, simply deactivate the communication connection to the central control unit.

-  → Call up the parameter level:
I.adj display (adjustment level)
 -  2x → Select the **cmwt** (communications writing) parameter. The SV area shows the current setting.
 -   → Select one of the following values:
 - on (on): Communication is activated.
 - off (off): Communication is deactivated.
 -  → End the process. The display switches over to showing the temperature.
- CMW** With communication activated, the display constantly shows the message *CMW*.

7 Maintenance and care

iFerm Nano Kit is designed for continuous and largely maintenance-free operation. The following instructions will help you to always keep *iFerm Nano Kit* in an operational state and to immediately remedy any faults that occur.



Attention!

Regular factory inspections help ensure permanently safe operation and that all parameters are reliably adhered to. You should therefore have the inspections carried out regularly every 2 years.

- ➔ Do not perform any repairs on *iFerm Nano Kit*.
If in doubt, contact customer service, see “8.5 Customer service” on page 31.

iFerm Nano Kit is protected against the ingress of dust and water jets through the control cabinet. Normally, simple cleaning measures are sufficient. Follow the instructions below:

- ➔ Remove accumulated dust and dirt from *iFerm Nano Kit* and the connecting cables at regular intervals:
 - Use a soft, damp cloth to do this.
 - Do not use any aggressive, scouring cleaning agents or cleaning agents containing solvents.
- ➔ Avoid intensive contact with liquids (e.g. by high-pressure cleaners).

8 Appendix

8.1 Technical data

EN

Parameter	Value
Default settings	Target temperature 20 °C, Mode <i>Cooling</i> , Appliance address 1 (data
Modes	Cooling, heating
Data bus type	Modbus protocol (optional)
Controller type	PID
Measuring range	-20 to 120 °C
Accuracy	Max. deviation ±0.5 K
Alarm threshold	1.5 K
Valve opening time	Min. 180 seconds
Power supply	24 V AC, 50/60 Hz
Power consumption	Max. 5 W
Protection class	IP65
Size (H x W x D)	approx. 135 x 490 x 200 mm
Weight	approx. 2,8 kg
Operating conditions	Temperature range -10 to +50 °C Icing or condensation not allowed Relative humidity 25 to 85 % No direct sunlight
Storage conditions	Temperature range -25 to +65 °C Icing or condensation not allowed Relative humidity 25 to 85 % No direct sunlight

8.2 Troubleshooting

If the *iFerm Nano Kit* is not working properly, the following can help to remedy the fault:

Fault	Cause	Remedy
Short circuit or no function	Interruption / loose contact.	Check all contact points.
No power.	Fuse faulty.	Replace fuse.
	Transformer switched off or faulty.	Switch on transformer, repair / replace if necessary.
Display shows nothing.	No power.	Check power supply (supply cables, fuses etc.).
	Display faulty.	Contact customer service.
Display button shows no effect.	Button blocked / not working.	Check button assignment, see <i>"3.2.1 Display buttons" on page 12.</i>
	Button stuck.	Clean button carefully, see <i>"7 Maintenance and care" on page 26.</i>
	Button faulty, no contact.	Contact customer service.
The displayed actual temperature is imprecise or there is an error <i>s.err</i> (sensor error).	Probe cable not watertight, moisture causes the measured value to increase slowly.	Check the temperature probe and probe cable for damage and replace if necessary.
No sensors / actuators.	Sensor / actuator faulty.	Repair sensor / actuator, or replace if necessary.

Fault	Cause	Remedy
Solenoid valve indicator lamp faulty.	Lights up even though there is no flow.	Check the pressure difference between the inlet and outlet. Flow is possible only if there is admission pressure at the inlet. Valve or inlet filter dirty, see <i>"7 Maintenance and care"</i> on page 26. Valve stuck (limescale); contact customer service.
	Does not light up despite flow.	Valve stuck (limescale); contact customer service.
No reaction on central controller.	Communication via data bus deactivated.	Activate communication, see <i>"6.3.3 Activating and deactivating communication"</i> on page 25.

Contact us directly if the fault persists or if you need spare parts, see *"8.5 Customer service"* on page 31.

8.3 Disposal

iFerm Nano Kit must be properly disposed of at the end of its useful life:

- ➔ Secure the old appliance against unauthorised access.
- ➔ Never put the old appliance in with domestic waste. Use a collection point for returning and recycling old appliances.
- ➔ Follow the disposal regulations that apply in your region.



8.4 Declaration of conformity



iFerm Nano Kit

Manufacturer: LiquoSystems GmbH
Wilhelmstraße 45
74366 Kirchheim / Neckar
Germany

Declaration: We hereby declare that the product
iFerm Nano Kit meets the requirements of the
following EU directives:
2011/65/EU: RoHS
2014/30/EU: Electromagnetic compatibility
2014/35/EU: Electrical equipment (low voltage)

Product type: Temperature controller

Date: 25.02.2018

Signature:

Stephan Wieland,
Managing director

8.5 Customer service

LiquoSystems is one of the few brand suppliers in the field of cellar technology for professional tank cooling and temperature control. We supply refrigerators, heat exchangers, temperature controllers and accessories, through to turnkey installation on your premises.

If you have any questions about our products or about how to extend and optimise your system, please contact us directly:

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You'll always be on the safe side with our factory customer service and repair service:

Technical assistance

Hours of business: Mon. – Thu.: 09:00 am – 16:30 pm
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Hotline

10th September to 10th November

Mon. – Fri.: 08:00 am – 08:00 pm

Sat. + Sun.: 09:00 am – 06:00 pm

iFerm Nano



Top



Terminal



Tank



Box



Solo



Switch



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