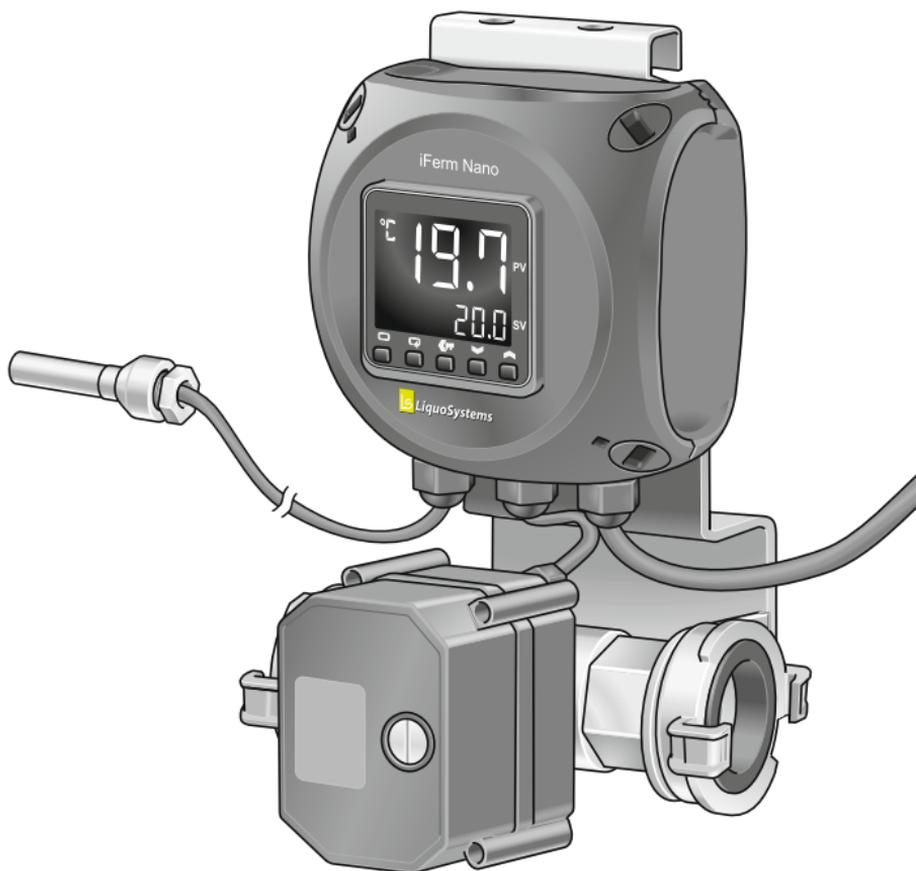


iFerm Nano Solo



Operating instructions

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These operating instructions apply exclusively to *iFerm Nano Solo*. They were written, checked and approved in German. If there are differences in terms of content in translated versions, the information in the German version takes precedence. If you come across any discrepancies, please contact our customer service, see “8.5 Customer service” on page 38.

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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 using *iFerm Nano Solo*.

- ➔ 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 Solo is designed for mobile use for measuring and controlling process temperatures in beverage processing. Normal operation involves regulating the supply of refrigerant as required, which in turn guarantees maintenance of the setpoint temperatures in fermentation processes.

Temperature control applications for processes such as filtration, bottling, tartrate stabilisation, room temperature control and stock cooling are still deemed to be proper. Use for other purposes is only permissible if the manufacturer's written approval has been obtained for the actual situation.

Operation and configuration of *iFerm Nano Solo* are performed via the integrated display that always shows the process temperature and current messages. The supplied temperature probe measures the actual temperature in the tank and adjusts it to the set target temperature via a microprocessor. Every deviation results in an adjustment of the valve that controls the flow to the heat exchanger in the tank.

In conjunction with the optionally available control unit *iFerm Nano Terminal* you can operate *iFerm Nano Solo* centrally (only the 24 V AC, 50/60 Hz + data bus version). *iFerm Nano Terminal* can access up to 30 controllers of the *iFerm Nano* series and can also use them for special functions such as the monitoring of heating processes.



1.2 Prior knowledge

In the operating instructions, users are defined as all persons who are involved in the installation and operation of the *iFerm Nano Solo*. 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 measuring 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 material 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 display of *iFerm Nano Solo* from the front. The motorised ball valve is therefore at the bottom, the display in front.

2 Safety notices

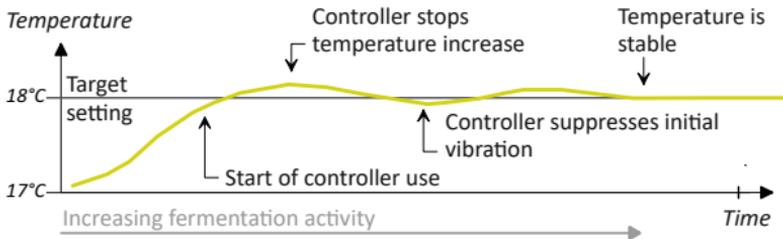
- Read the operating instructions carefully and obey all safety notices. Material damage resulting from ignoring the safety notices is not covered by any warranty.
- Whenever you use *iFerm Nano Solo*, follow the laws that apply at the place of use, particularly the general safety and accident prevention regulations. If in doubt, these take precedence over the directions in the operating instructions.
- *iFerm Nano Solo* can be operated on 230 V AC mains with a 24 V safety low voltage, depending on the version. See “3.2.2 Power connection” on page 12. Use only the preinstalled connecting cable. There is a risk of electric shock if the connection is faulty!

- Extreme temperatures caused by heat build-ups, frost, UV light, direct sunlight etc. can cause irreparable damage. Always maintain the specified ambient temperatures, see “8.1 Technical data” on page 34.
- *iFerm Nano Solo* is protected against water jets (IP65). However, avoid intensive contact with liquids (e.g. immersion, high-pressure cleaners). Keep the power connection dry.
- Always lay cables and hoses so that they do not present a trip hazard and away from sharp-edged objects. Ensure sufficient strain relief and kink protection.
- Clean the *iFerm Nano Solo* with a soft damp cloth. Do not use any aggressive, scouring cleaning agents or cleaning agents containing solvents.
- Do not perform any repairs on *iFerm Nano Solo*. Follow the instructions in the chapter “7 Maintenance and care” on page 32.

3 Product overview

iFerm Nano Solo 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 Solo* 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 [“5 Operation” on page 25](#). Other changes are not possible until after enabling, see [“6 Extended configuration” on page 28](#).

3.1 Scope of delivery

The scope of delivery contains some components that have already been installed. The package contains the following articles:

Quantity	Description
1	<p>Temperature controller <i>iFerm Nano Solo</i> with display; the following components are preinstalled at the factory:</p> <ul style="list-style-type: none"> • Retaining plate with hanging fixture and rubber pull cord, see “4.2 Mounting the housing” on page 21 • Valve with 2 bayonet hose connections, see “3.2.1 Valves” on page 11 • Probe cable (length approx. 5 m) with temperature probe and sensor weight, see “4.3.1 Installing and removing the sensor weight” on page 22 • Power connection cable (length approx. 5 m) with plug. <p>Please note: In the 24 V AC, 50/60 Hz + data bus version, the connecting cable carries both power and the data bus. An integrated plug connection allows mobile use, see “3.2.2 Power connection” on page 12.</p>
1	Operating instructions

➔ Check the package contents against the list provided.



Attention!

Contact our customer service immediately if parts are missing or if you find any damage, see [“8.5 Customer service” on page 38](#).

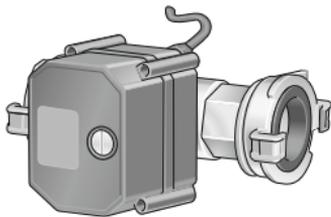
➔ Dispose of all packaging materials in accordance with the disposal regulations that apply in your region.

3.2 Versions

iFerm Nano Solo is available in different versions that vary in terms of the valve and power connection.

3.2.1 Valves

Motorised ball valve



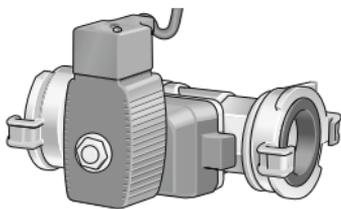
The motorised ball valve provides a high degree of process reliability in open circulation systems and in conjunction with spring water or very hard water. It can either completely open or close the connected line. The red line in the

window of the motor housing shows the current position of the valve:

-  Open: The red line is pointing in the direction of flow.
-  Closed: The red line is vertical.

Solenoid valve

The solenoid valve also completely opens or closes the line. When the tubes are connected however, it is essential to pay attention to the flow direction marked with an arrow. A mix-up between the inlet and outlet would prevent closing of the valve and result in a constant flow. An indicator lamp lights up when the solenoid valve is open.



A fine strainer on the inlet side prevents the ingress of coarse particles. It must be cleaned regularly.

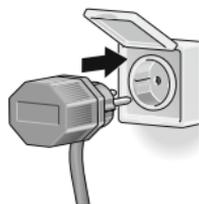


DANGER! – Burns

The solenoid valve's coil is cooled by the medium flowing through. If there is no flow, the coil can reach a temperature of 80 °C when the solenoid valve is open.

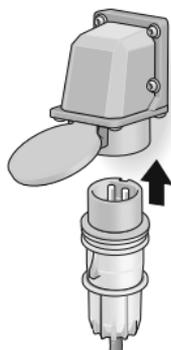
3.2.2 Power connection

iFerm Nano Solo is available with the following power cable variants to provide the required 24 V AC, 50/60 Hz safety low voltage:



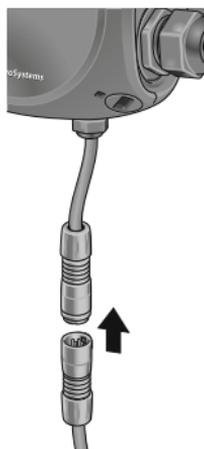
230 V AC, 50/60 Hz version

iFerm Nano Solo is connected to the 230 V AC, 50/60 Hz mains of the building supply. The power cable has a plug-in power supply unit, the transformer of which provides the required voltage.



24 V AC, 50/60 Hz version

iFerm Nano Solo is connected to a properly fused and potential-free mains with a 24 V AC 50/60 Hz safety low voltage. The power cable has a 24 V AC, 50/60 Hz CEE plug for this purpose.

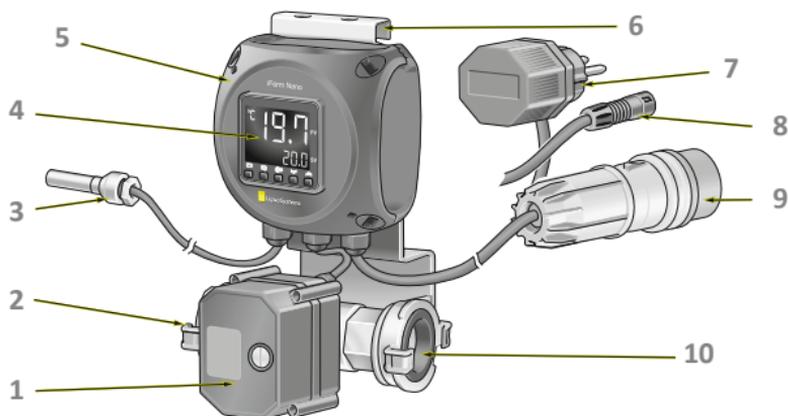


24 V AC, 50/60 Hz + data bus version

iFerm Nano Solo is connected to the power supply and data bus with the preinstalled connecting cable; an integrated plug connection allows mobile use: Part of the connecting cable that is equipped with a coupling is permanently connected via an optionally available terminal box *iFerm Nano Box*, see “4.1 Preparing the power connection” on page 19. There you can simply plug in *iFerm Nano Solo* as necessary.

EN

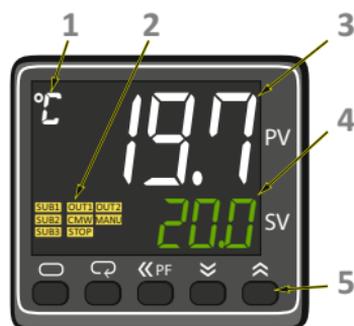
3.3 Connections and control elements



Pos.	Brief description
1	Valve with motorised ball valve (optionally a solenoid valve)
2	Bayonet hose connection, inlet side
3	Probe cable with temperature probe and sensor weight
4	Display with display buttons, see <i>"3.4 Display" on page 15.</i>
5	Robust controller housing
6	Retaining plate with hanging fixtures and rubber pull cord, see <i>"4.2 Mounting the housing" on page 21.</i> (Type plate on the back of the retaining plate.)
7	Plug-in power supply unit with transformer (only with the 230 V AC, 50/60 Hz version)
8	Data bus plug (only with the version supplied with power via data bus), see <i>"4.1 Preparing the power connection" on page 19.</i>
9	CEE plug (only with the 24 V AC, 50/60 Hz version)
10	Bayonet hose connection, outlet side

3.4 Display

EN



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>"3.4.2 Status messages" on page 17.</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>"3.4.1 Display buttons" on page 16.</i>	

3.4.1 Display buttons

The display buttons have the following functions:

Button	In normal operation	In the menu
	Blocked, no function.	Call up menu and navigate in the menu, see <i>"6 Extended configuration" on page 28.</i>
	Enter a value directly in the SV area: Each press of the button moves the flashing cursor one space to the left. Changes are all made using the buttons on the right.	
	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.
	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.

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

Symbol	Meaning
	Press this button briefly.
 , 2x	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.

3.4.2 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. (Only displayed in <i>Cooling</i> mode.)
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.
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 behaviour, see " 8.2 Troubleshooting " on page 35.

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.

Symbol	Meaning
SUB1	The valve is open. (Only displayed in <i>Heating</i> mode.)
OUT1	<i>Heating</i> mode is activated.

3.5 Optional accessories

The accessories listed here enable you to extend *iFerm Nano Solo* and to optimally adapt to your system technology. Details of the available versions can be found in our current catalogue at:

<https://liquosystems.de/downloads>

Item	Brief description
Simplex cooling tube	Portable solution for heat transfer.
Heat exchanger plate	Guarantees efficient temperature control of the tank contents.
Thermowell	Permanently installed in the tank so that the temperature probe does not have to be hung loose into the container.
<i>iFerm Nano Terminal</i> control unit	Used for centrally controlling up to 30 temperature controllers via touch display and data bus.
CEE socket	Socket for connecting the 24 V AC, 50/60 Hz version to a mains with safety low voltage.
Mounting plate	Secures <i>iFerm Nano Solo</i> safely in a mesh tray.

4 Installation

Before each commissioning, all connections must be made and safe mounting at the place of use must be ensured.

4.1 Preparing the power connection

On every version, the power connecting cable has a plug for allowing portable use.

➔ Follow the instructions below to ensure safe operation at the place of use:



DANGER! – Electric shock

The plug and socket must remain dry. Select a connection in an area where there is no danger from splashing water.



Attention!

Because *iFerm Nano Solo* switches itself on automatically when connected to a power supply, you should not connect it up until the commissioning stage, see “5.1 Commissioning” on page 25.

4.1.1 230 V AC, 50/60 Hz version

A properly fused earthed socket of the 230 V building supply must be reachable for the connection.

Other preparations are not necessary.

4.1.2 24 V AC, 50/60 Hz version

A properly fused CEE socket in the 24 V supply (safety low voltage) must be reachable for the connection.

Other preparations are not necessary.

4.1.3 24 V AC, 50/60 Hz + data bus version

The connecting cable carries all signals that *iFerm Nano Solo* requires for the power supply and data bus. To prepare, the part of the connecting cable fitted with a coupling must be properly connected.



DANGER! – Electric shock

Always disconnect the system from the power supply before working on the electrical connection.



Attention!

iFerm Nano Solo switches itself on automatically when connected to a power supply, see “5.1 Commissioning” on page 25. Therefore, do not plug it in until connection and installation have been completed.

- ➔ Connect the connecting cable to your system properly. For this, use for example the optionally available *iFerm Nano Box* terminal box and always follow the directions in the installation instructions.

The strands of the *iFerm Nano Solo* connecting cable are coloured differently and are assigned as follows:

Wire colour	Assignment
White	24 V AC, 50/60 Hz power supply
Brown	0 V AC, 50/60 Hz power supply
Green	Switching contact, cooling valve, 24 V AC, 50/60 Hz
Yellow	Modbus RS485 A
Grey	Modbus RS485 B
Pink	Switching contact, heating valve, 24 V AC, 50/60 Hz
Blue	Reserve
Red	Reserve (optional)

**Attention!**

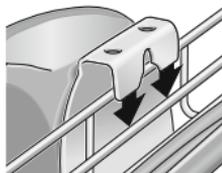
When connecting, ensure that you follow the assignment stated here. Ignoring this can result in functional faults. If in doubt, contact our customer service, see “8.5 Customer service” on page 38.

4.2 Mounting the housing

**Attention!**

Each mount must be installed sufficiently securely so that it can absorb contact and impacts that can arise from display operation, pressure fluctuations in the tubes etc.

iFerm Nano Solo can simply be mounted on or close to the tank. Several hanging fixtures are available for this:



- ➔ Hang *iFerm Nano Solo* with the retaining plate onto a mesh tray, a ladder bracket or a tank shield.

Or

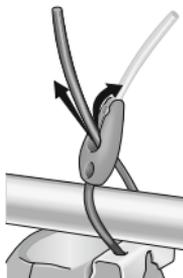


- ➔ Use the notch in the retaining plate to hang *iFerm Nano Solo* e.g. on a bolt, thermowell or hook.

Or



- ➔ Thread the supplied rubber pull cord into the two holes in the retaining plate in order to secure *iFerm Nano Solo* flexibly, e.g. on the tank or to a pipeline.



- ➔ Make sure that you clamp the free end of the rubber pull cord securely in the plastic fastener.

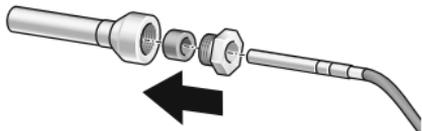
4.3 Fitting the temperature probe

You can simply hang the temperature probe in the tank or introduce it through a thermowell. For this, follow the instructions below.

4.3.1 Installing and removing the sensor weight

The preinstalled sensor weight is only needed if the temperature probe is simply hung into the tank. In all other cases it must be removed.

- ➔ Undo the screw connection and sealing ring from the sensor weight.
- ➔ Apply some force to pull the sensor weight off the temperature probe.



- ➔ Remove the sealing ring and the screw connection from the probe cable and keep them in a safe place with the sensor weight.
- ➔ When reassembling, proceed in reverse order and then tighten the screw connection securely.

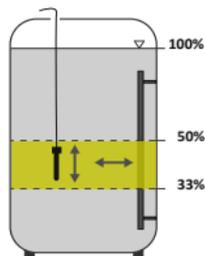
4.3.2 Hanging the temperature probe loose in the tank

If you simply hang the sensor probe loose in the tank, the sensor weight prevents it from floating up in the tank.



Attention!

iFerm Nano Solo only supplies reliable measured values if the temperature probe is completely surrounded by the tank contents for the entire duration of the process. Positions just under half the fill level and a sufficient distance from the heat exchanger are the most suitable.



- ➔ Make sure that the sensor weight is securely installed, see [“4.3.1 Installing and removing the sensor weight” on page 22](#).
- ➔ Hang the temperature probe into the tank.
- ➔ Secure the temperature cable so that the temperature probe is immersed to a sufficient depth and is constantly surrounded by the tank contents.
- ➔ Lay the probe cable so that it doesn't pose a trip hazard, and provide sufficient strain relief and kink protection.

4.3.3 Using the thermowell on the tank

You can guide the temperature probe safely and precisely into the tank if the tank is fitted with a thermowell.

- ➔ Make sure that the sensor weight has been removed.
- ➔ Apply slight pressure to push the temperature probe as far as it will go into the thermowell and lock it in place if possible.
- ➔ Lay the probe cable so that it doesn't pose a trip hazard, and provide sufficient strain relief and kink protection.

4.4 Connecting hoses

In every version, the valve has bayonet tube connections for portable use. The lines and tubes to be connected must be prepared accordingly.

- ➔ Check the inlet and outlet of the valve for dirt before you make the connection. Where necessary, follow the instructions in the chapter *"7.1.2 Valve and hoses"* on page 33.
- ➔ Place the supply line against the valve's left connection and lock the bayonet fastener by turning it one quarter of a turn clockwise.
- ➔ Connect the line that leads to the heat exchanger on the tank to the valve's right connection in the same way.



Attention!

Follow the instructions below for the tube connection:

- The flow in the valve must be from left to right. With a solenoid valve, a faulty connection can result in malfunctions. Here, it is therefore essential for the flow to be in the direction of the arrow on the solenoid valve.

- The valve drain must always be connected to the inlet of the heat exchanger. A faulty connection can result in pressure surges that weaken the heat exchanger and cause leaks.

4.5 Laying the connecting cable

- ➔ Always lay the connecting cable so that it doesn't pose a trip hazard, and also provide sufficient strain relief and kink protection.



Information

Liquid running along the cable is easily kept away from the controller housing by forming a drip loop under the cable screw connection when laying the cable.

5 Operation

This chapter contains instructions on operating steps that are usually required during normal operation. Instructions on further settings can be found in the chapter “6 *Extended configuration*” on page 28.

5.1 Commissioning

You can start commissioning as soon as *iFerm Nano Solo* is properly mounted and connected to the tank and the cooling system.



Attention! - First commissioning

When *iFerm Nano Solo* is commissioned for the first time, the factory preset values apply, see “8.1 *Technical data*” on page 34. Change these as required before you start a process.

- ➔ Connect *iFerm Nano Solo* to the mains, see “3.2.2 Power connection” on page 12.

The display switches itself on and shows the actual and target temperatures.

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 27.
- Start up the production process in the usual way.

- ➔ Check *iFerm Nano Solo* 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 Solo*.

➔ 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).

For a targeted value change, it is also possible to directly select individual digits of the target temperature:

⏪ PF ➔ Select the digit to be changed in the displayed value. The flashing cursor moves one digit to the left each time the button is pressed.

⏪ / ⏩ ➔ Change the selected digit as required.



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.



Information

To use *iFerm Nano Solo* 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 Solo* 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 38*.

6.1 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: $\bar{0}APL$ display (*operation / adjustment protect*)
-  , 1x → Select the parameter $\bar{1}PL$ (initial setting / *communications protect*). The SV area shows the current setting.

The following values are defined for the button lock:

- $\bar{0}$: The button lock is not activated.
- $\bar{1}$: The button lock is activated and prevents unintentional operation of the two buttons on the left (standard).



Attention!

The values $\bar{1}$ and $\bar{3}$ must not be adjusted because this can cause functional limitations.

-  /  → Select the value $\bar{0}$ to enable access to the extended configuration.
-  +  → End the process. The display switches over to showing the temperature.



Attention!

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

6.2 Changing settings

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

- ➔ First deactivate the button lock, see “6.1 Activating and deactivating the button lock” on page 29.
- ➔ Make the desired changes and then reactivate the button lock.

6.2.1 Changing the appliance address

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



iFerm Nano Solo 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:
 $\bar{2}N-t$ display (*input type*)



- ➔ Select the *PSEL* (*parameter selection*) menu.

-  1x → Select the $U-N\bar{o}$ (*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.

6.2.2 Activating and deactivating communication

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



iFerm Nano Solo can also be used in portable single operation if the power is supplied via the connecting cable with bus cable. For this, simply deactivate the communication connection to the central control unit.

-  1x → Call up the parameter level: $L.Add$ display (*adjustment level*)
 -  2x → Select the $CMW\bar{E}$ (*communications writing*) parameter. The SV area shows the current setting.
 -  /  → Select one of the following values:
 - $\bar{o}N$ (*on*): Communication is activated.
 - $\bar{o}FF$ (*off*): Communication is deactivated.
 -  1x → 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 Solo is designed for continuous and largely maintenance-free operation. The following instructions will help you to always keep *iFerm Nano Solo* 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 Solo*.
- ➔ If in doubt, contact customer service, see “8.5 Customer service” on page 38.

7.1 Cleaning

7.1.1 Housing, display and connecting cables

iFerm Nano Solo is protected against the ingress of dust and water jets (IP65). Normally, simple cleaning measures are sufficient. Follow the instructions below:

- ➔ Remove accumulated dust and dirt from *iFerm Nano Solo* 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 immersion, high-pressure cleaners). Keep the power connection and plug dry at all times.

7.1.2 Valve and hoses

After every use, you should clean the valve and the hose lines thoroughly in order to counteract the build-up of limescale and other contamination.

- ➔ First remove the rubber seals from the hose connections and clean them separately.
- ➔ With a solenoid valve, pay attention to the inlet's fine strainer. Remove this and clean it carefully with water or compressed air.
- ➔ Rinse the valve and tubes thoroughly with water after every use.
- ➔ After cleaning, properly insert the rubber seals into the connections. With a solenoid valve, this also applies to the fine strainer.

7.2 Putting into storage

Before an extended period of non-use, you should pack *iFerm Nano Solo* securely and put it into storage. Follow the instructions below for this:

- ➔ Thoroughly clean all components and allow them to dry completely before packing.
- ➔ Wrap the probe cable and power cable carefully and make sure that they are sufficiently protected against kinking.
- ➔ Pack all parts in a container so that they are protected against impacts and also against dust and moisture.
- ➔ Make sure that the storage location meets the following criteria:
 - No direct exposure to the weather (sunlight, frost, wet etc.)
 - Dry and well ventilated

- Relative humidity 25 to 85 %
- Storage temperature -25 to +65 °C



Attention!

If *iFerm Nano Solo* is not put into storage but instead remains in a damp cellar, a constant power supply must be ensured to provide protection against moisture.

8 Appendix

8.1 Technical data

Parameter	Value
Default settings	Target temperature 20 °C, Mode <i>Cooling</i> , Appliance address 1 (data bus)
Modes	<i>Cooling</i> (<i>heating only via iFerm Nano Terminal</i>)
Permitted temperature control media	Water and water-glycol mixture; medium temperature -5 to +95 °C
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	230 V AC, 50/60 Hz or 24 V AC, 50/60 Hz (depending on version)
Power consumption	Max. 15 W
Protection class	IP65

Parameter	Value
Length connecting cable	approx. 5 m
Length probe cable	approx. 5 m
Size (H x W x D)	approx. 200 x 110 x 110 mm
Weight	approx. 2.0 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 Solo* is not working properly, the following can help to remedy the fault:

Fault	Cause	Remedy
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 "3.4.1 Display buttons" on page 16
	Button stuck.	Clean button carefully, see "7.1 Cleaning" on page 32 .
	Button faulty, no contact.	Contact customer service.

Fault	Cause	Remedy
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.
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>"7.1 Cleaning" on page 32.</i>
	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>"6.2.2 Activating and deactivating communication" on page 31.</i>

Contact us directly if the fault persists or if you need spare parts, see *"8.5 Customer service" on page 38.*

8.3 Disposal

iFerm Nano Solo 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 Solo

Manufacturer: LiquoSystems GmbH
 Wilhelmstraße 45
 74366 Kirchheim / Neckar
 Germany

Declaration: We hereby declare that the product *iFerm Nano Solo* 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: 22/05/2017

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:

LiquoSystems GmbH

Wilhelmstraße 45 | 74366 Kirchheim / Neckar, Germany

Tel.: +49 7143 891050 | Fax: +49 7143 92868

info@liquosystems.de | www.liquosystems.de

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

Friday: 09:00 am – 13:00 pm

E-mail: e-kundendienst@liquosystems.de

Phone: +49 7143 891050

Hotline

10th September to 10th November

Mon. – Fri.: 08:00 am – 20:00 pm

Sat. + Sun.: 09:00 am – 18:00 pm

iFerm Nano



Top



Terminal



Tank



Box



Solo



Switch