

Series FCU1x00

## Installation instructions and operating manual

### Sauna control system FCU1000 / FCU1200

only sauna  
FCU1000

additional humidity  
FCU1200



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certificated

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# 1 Safety

## 1.1 Explanations of symbols

### Warnings

Warnings in this operating manual are indicated through symbols. The instructions are introduced through signal words, which express the degree of danger.

Follow these instructions strictly and take care to avoid accidents, personal injuries and property damage.



#### **DANGER!**

...indicates an imminent dangerous situation, which could lead to loss of life or cause serious injuries if not avoided.

---



#### **WARNING!**

...indicates a possible dangerous situation, which can be fatal or cause serious injuries if not avoided.

---



#### **CAUTION!**

...indicates a possible dangerous situation, which could lead to small or slight injuries if not avoided.

---



#### **ATTENTION!**

...indicates a possible dangerous situation, which could lead to property damage if not avoided.

---

### Tips and recommendations



#### *NOTE!*

...highlights useful tips and recommendations as well as information for an efficient and smooth operation.

---

## 1.2 Requirements for operator and technicians

This device can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning the safe use of the device and understand the hazards involved. Children shall not play with the device. Cleaning and user maintenance shall not be carried out by children without supervision.

Read this operating manual carefully before switching on. Adherence to all the safety and operating instructions specified in this operating manual is a basic prerequisite for safe operation and safe working.

Please contact your customer service in case of doubts.

Inadequate qualification



**WARNING!**

**Risk of injury in case of inadequate qualification!**

Improper handling could lead to considerable personal injuries and damage to property.

For this reason:

The assembly, installation, Start-up as well as troubleshooting, maintenance and repairs must only be carried out by qualified persons, unless otherwise specified.

**1.3 Intended use**

The FASEL sauna control systems of the FCU1x00 series are designed exclusively for operation and control of sauna cabins and sauna with humidity cabins, depending on the model. The control units are permitted only for the use in private households.

Intended Use



**WARNING!**

**Risk due to non-intended use.**

Any use apart from the intended use and/or any other use of the sauna control system can result in dangerous situations.

For this reason:

- Use sauna control system only as described.
- Operate sauna control system only within the permissible ambient temperature range and humidity range.
- All specifications in the operating manual and installation instructions must strictly be adhered to.

Claims of any type due to damage as a result of non-intended use are exempted. The operator bears sole responsibility for damages caused by non-intended use.

**1.4 Changes and alterations**

Changes and alterations to the sauna control system or to the installation can lead to unexpected risks.

Always obtain the written permission of the manufacturer before any technical changes and alterations to the sauna control system.

## 1.5 Occupational safety and special risks

The safety notes and warnings specified here and in the following sections of this manual must be taken into account in order to reduce health hazards and avoid dangerous situations.

**Following instructions are for your own safety and for the safety of the system and must be adhered to:**

---

### Electric voltage



#### **DANGER!**

#### **Danger to life due to electric shock.**

There is imminent danger to life in case of direct contact with live parts.

Damage of insulation or individual parts could pose danger to life.

For this reason:

- For disconnecting from the mains, the power supply line must be equipped with a fuse having a contact opening according to the requirements of overvoltage category III for full separation.
- Disconnect power supply to the system before any work (switch off the fuse in the junction box) and secure against restarting. Check if the equipment is disconnected from the power supply. Disconnect the control unit from the mains before opening the housing.
- In case of damages to the insulation, immediately switch off power supply and initiate repairs.
- Works on electrical machinery should be carried out only by skilled personnel.
- Never bypass or switch off fuses.
- Adhere to the correct current specification while changing the fuses.
- Keep moisture away from live parts as it can lead to short-circuits.



#### **WARNING!**

**If there is a short-circuit in a 230V/400V load, the contact of a relay can fuse due to the high short-circuit current. Even the safety relay can fuse if restarted before removing the short-circuit. This will lead to steady state of the consumer. Switch off the automatic circuit breaker in the junction box. Send the device back to the factory for checking/repair.**

---

Improper operation

**WARNING!**

**Improper operation can result in serious injuries.**

For this reason:

- Read and follow the operating manual.

## 1.6 Safety and instructions

Electric voltage

**DANGER!**

**Danger to life due to electric shock.**

There is imminent danger to life in case of direct contact with live parts.

For this reason:

- The control system may be opened only by authorised electricians.
- Works on electrical machinery should be carried out only by skilled personnel.

Risk of fire

**WARNING!**

**Risk of injury due to fire.**

Objects on the heater or in the immediate vicinity of the heater can cause a fire and in turn result in injuries.

For this reason:

- Always keep objects away from the heater.

Health risks

**WARNING!**

**Risk of injury if the temperature sensor is covered.**

Covering the temperature sensor can result in increased temperatures. This increased value can result in health hazards or severe injuries.

For this reason:

- Do not cover the temperature sensor.
- Ensure free air circulation.

## 2 Ambient conditions

Description	Type
	<b>Series FCU1x00</b>
Ambient temperature	0 to +40 °C With protective coating -20°C to +40°C
Rel. humidity	max. 80 % rel. humidity, not condensing

## 3 Structure and function


### 3.1 Function

Depending on the variant, the control system is suitable for the following bath modes:

- Sauna
- Sauna with humidity


#### 3.1.1 Sauna

In the “Sauna” bath mode, the cabin is heated to the desired temperature (set point temperature) using a stove. To maintain the desired temperature in the cabin, the control unit switches the stove on and off.


As long as the stove is heating, the heating lines in the status display flicker . As soon as the desired temperature is reached, the heating lines remain permanently on.

#### 3.1.2 Sauna with humidity (only FCU1200)

In the “Sauna with humidity” bath mode, the cabin is heated to the desired temperature (set point temperature) using a stove. Besides, the desired air humidity (set point humidity) is generated using an evaporator.

As long as the evaporator produces steam, the heating lines and the vapour symbol in the status display flicker . The drying program is started automatically after completion of the bath mode.

#### 3.1.3 Drying program after Sauna with humidity (only FCU1200)

The program sequence of the drying program; status display 

1. The remaining time is set to 2:00 hours (maximum time), then the oven heats with all 3 phases and the fan is switched on for 5 minutes.
2. The cabin is heated to the drying temperature (82°C)
3. After reaching the drying temperature, the remaining time is set to 30 minutes, the fan is switched on again and the temperature is kept constant for the remaining drying time,
4. After finished the remaining time, at least 2 hours, the oven and the fan are switched off automatically.

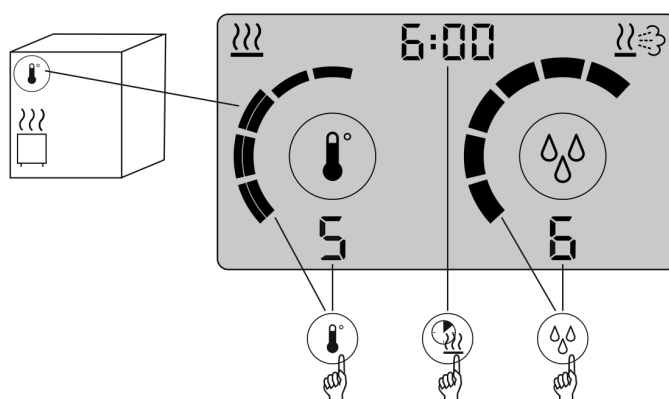


### 3.2 Operating and display elements

#### 3.2.1 FCU1000 / FCU1200



#### 3.2.2 Display clarification FCU1x00



## 4 Operation



### 4.1 Operating buttons and setting of the sauna control system

<p><b>TEMPERATURE</b> The temperature increases with every keypress, changing from level 9 to level 1.</p>	<p><b>HEATING DURATION</b> The heating duration is increased by 15 minutes with every keypress, and after 6:00 it switches to 0:15</p>	<p><b>HUMIDITY</b> The humidity increases with every keypress, changing from level 9 to level 1.</p>
		<b>Only for FCU1200</b>
<b>BATH MODE</b> start/stop	<b>CABIN LIGHT</b> on/off	<b>BATH MODE</b> change

### 4.2 Switch on and off the sauna control system

#### 4.2.1 Switch on the sauna control system

Ensure that the stove, its immediate surroundings and the sensor is free from objects.

1. Switch on the sauna control system using the switch “ON (230V)”.
2. Select the bath mode with the button .
3. The set point temperature and probably the set point humidity of the previously selected bath mode are displayed.
4. To start the sauna, press for 0.5 – 1 s the button .

#### 4.2.2 Switch off the sauna control system

A bath mode is active.

1. Press  button.

Bath mode is inactive.

2. Switch off the sauna control system using the switch “OFF (230V)”.



#### **WARNING!**

**Repeated improper shutdown can lead to premature damage to electronic parts.**

For this reason:

- Switch off sauna control system as described.
- 






#### **WARNING!**

**Cabin damage, e.g. mould growth due to premature ending of the drying function.**

After completion of the “sauna with humidity” bath mode, the cabin is automatically dried according to the guidelines of the German Sauna Association. This drying function helps to avoid damage to the cabin, e.g. mould growth.

For this reason:

- Do not end drying function prematurely.
  - The drying function may only be ended if the cabin is operated afterwards in the “Sauna” bath mode.
  - The message   appears on the display if the drying function has been accidentally stopped. Restart the drying function by pressing the button .
- 

## 5 Maintenance

The sauna control systems are maintenance-free.

## 5.1 Cleaning

### Aggressive cleaning agents and media



**WARNING!**  
**Device damage possible!**

Aggressive cleaning agents and media can damage or destroy components or electric cables.

For this reason:

- Do not use any cleaning agents or media with aggressive substances.

1. Turn off the control unit and secure it against being switched on again (switch off the automatic circuit breakers.)
2. Clean the housing only from outside using a damp soft cloth. The housing must not be opened.

## 6 Faults

### 6.1 Safety

#### General



**WARNING!**  
**Risk of injury due to improper troubleshooting!**

Improper troubleshooting can result in serious injuries or even death.

For this reason:

- In case of faults, switch off the control system, disconnect it from the mains and secure against restarting. Contact customer service.
- Repair work must be carried out only by qualified personnel, unless otherwise specified.
- Before starting work make sure there is sufficient space for the installation.
- Pay attention to order and cleanliness at the place of installation. Loose components and tools lying around or on top of each other are safety hazards.
- If parts have been replaced: Ensure correct installation of spare parts. Install all fastening elements properly again. Only use original spare parts.
- Ensure that all covers are properly installed before restarting.

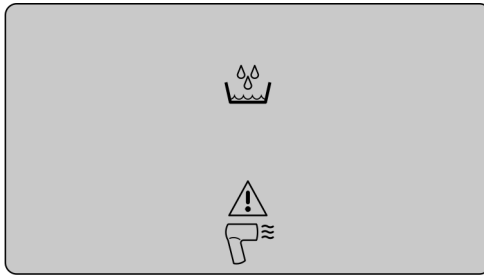






**WARNING!**

*If there is a short-circuit in a 230V/400V load, the contact of a relay can fuse due to the high short-circuit current. This can lead to steady state of the consumer. Switch off the automatic circuit breaker in the junction box. Contact customer service.*


## Faults

### 6.2 Messages and instructions on the display



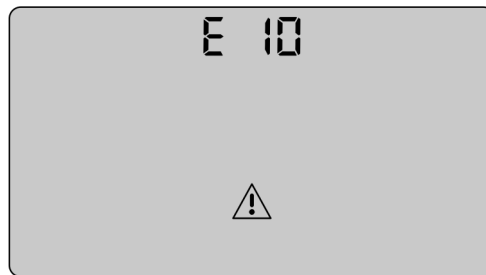
Messages/ instructions	Possible causes	Measures	To be carried out by
Water deficiency 	Evaporator without water	Fill water according to the operating manual of the evaporator.	Operator
Drying function interrupted 	After completion of the "sauna with humidity" bath mode, the cabin is automatically dried to prevent mould growth. This drying function was interrupted prematurely.	Restart the drying function by pressing the button  , or acknowledge the message and then start the sauna program.	Operator
 flashing	Internal device temperature too high	Stove off	Control unit

### 6.3 Acknowledge message

1. Eliminate the cause of the fault.
2.  -Press the button for approx. 2 seconds. Message expires.

## 6.4 Error messages

If an error occurs during operation, the error number is displayed on the screen.




Here, possible faults and measures for rectification are given.

If the cause is not one to be eliminated by the end user, note down the error number and contact your service technician (installer or dealer of your sauna system).

No.	Fault	Possible causes	Troubleshooting	To be carried out by
E 10	STB circuit open	The connection to the safety temperature limiter (STB) is interrupted or the thermal fuse is destroyed due to a excessively high temperature.	<ul style="list-style-type: none"> <li>■ Check STB.</li> <li>■ Check cable.</li> <li>■ Check clamps 29 and 30.</li> </ul>	Qualified electrician/service engineer
E 20	Stove sensor short-circuit	Stove sensor short-circuit	<ul style="list-style-type: none"> <li>■ Check cable.</li> <li>■ Check clamps 27 and 28.</li> </ul>	Qualified electrician/service engineer
E 21	Stove sensor interruption	Stove sensor cable break Clamp contacts	<ul style="list-style-type: none"> <li>■ Check cable.</li> <li>■ Check clamps 27 and 28.</li> </ul>	Qualified electrician/service engineer
E 1-	I <sup>2</sup> C error	Error in I <sup>2</sup> C Bus	Switch off mains, wait for a while, switch on and contact the service engineer if the error occurs again.	Service engineer

## 6.5 Acknowledge error message

1. Eliminate the cause of the fault.
2. Press  -button ca. 2 s. Message expires.

## 7 Decommissioning and disposal



- Do not dispose of the sauna control system with regular garbage.
- Dispose the control system in accordance with the respective country-specific regulations.

# 8 General

## 8.1 Limitation on liability

All the specifications and directions in this manual have been prepared based on the statutory standards and regulations, the present state of technology, as well as our many years of knowledge and experience.

The manufacturer is not responsible for damage due to:

- Non-adherence to the operating and installation instructions
- Unintended use
- Unauthorised alterations
- Technical changes
- Use of own installation tools (only the provided installation tools are permitted)
- Use of non-licensed spare and wear parts.

The actual delivery package can deviate from the given descriptions and illustrations in case of special designs, additional orders or due to latest technical changes.

Otherwise, the obligations agreed in the delivery contract, the General Terms and Conditions as well as the delivery conditions of the manufacturer and the legal regulations valid at the time of entering into the contract are applicable.

### Guarantee

The warranty period of the manufacturer shall commence with the dispatch from the manufacturer's place and is valid for 24 months. The dispatch date can be obtained from device number on the type plate.

The manufacturer is not responsible for any warranty claims deviating from this regulation. Warranty claims must be made to the manufacturer of the sauna system or the dealer.

## 8.2 Copyright protection



### NOTE!

All data, texts, drawings, images and other illustrations are copyright protected and are subject to the commercial copyright laws. Any misuse is punishable by law.

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Distribution of any kind, even in parts, as well as reproduction and/or sharing the content without the prior written consent of the manufacturer is strictly prohibited.

## 8.3 Scope of delivery

See the enclosed delivery note for the delivery package.

### 8.4 Spare parts



#### **CAUTION!**

#### **Risk of injury due to incorrect spare parts.**

Wrong or defective spare parts can result in damage, malfunctions or total failure as well as hamper safety.

For this reason:

- Only use original spare parts from the manufacturer.
- Repair work at the control unit must be carried out only by qualified personnel.

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Order spare parts from the installer or the dealer of the sauna system. For address, see invoice, delivery note or the back of this manual.

### 8.5 Customer service

For technical details, please contact your dealer or the installer of the sauna system.

For address, see invoice, delivery note or the back of this manual.



#### **NOTE!**

*For quick processing, have the data of the type plate such as the type, series number, variant etc. ready before making the call.*

## 9 Conformity declaration

You will find the Declaration of conformity online at [www.fasel-gmbh.de](http://www.fasel-gmbh.de) in the section "Wellness, Sauna and Spa control units" under "Service / Downloads".

# 10 Installation instructions

## 10.1 Requirements for the qualified personnel

The assembly, installation, Start-up and troubleshooting, maintenance and repairs must only be carried out only by qualified persons, unless otherwise specified.

- **Qualified personnel**

are those who are able to carry out the work assigned to them and identify and avoid any possible dangers as a result of their professional training, knowledge and experience, as well as knowledge of the applicable standards and guidelines. Besides, they are well-versed with handling ESD sensitive assemblies.

- **Qualified personnel**

are those who are able to carry out the work assigned to them and identify and avoid any possible dangers as a result of their professional training, knowledge and experience, as well as knowledge of the applicable standards and guidelines.

In Germany, the electricians must fulfil the applicable legal provisions on prevention of accidents BGV A3 (e.g. master electrician). Corresponding guidelines are applicable in other countries. The guidelines applicable there must be followed.

# 11 Technical data

## 11.1 Lines

Description		Type
		<b>FCU1x00</b>
Power supply lines	Number of cores / Cross-section / Type	5 x 2.5 mm <sup>2</sup> Power supply lines must be sheathed with polychloropren and not be lighter than heavy polychloropren-sheathed flexible lines.
230 / 400V lines for connection to the stove, evaporator, fan, light	Type	heat-resistant, at least 150 °C ambient temperature (= 180°C operating temperature)
	Cross-section	→ See electric connection diagram.
	Number of cores	→ See electric connection diagram.
Signal lines for the sensor	Type	<ul style="list-style-type: none"> <li>■ For longer distances: LiYCY (flexible, shielded line)</li> <li>■ Within the cabin: heat-resistant, at least 150 °C (= 180°C operating temperature)</li> </ul>
	Cross-section	→ See electric connection diagram.
	Number of cores	→ See electric connection diagram.



## 11.2 Voltage and switching capacities of the consumer.

Description	Type
	<b>FCU1x00</b>
Nominal voltage	400 V 3 N ~ 50Hz
Stove	3x 230 V~ max. 3 x 3 kW (switch on current max. 30A for 5ms)
Evaporator <sup>1)</sup>	230 V~ max. 3 kW (switch on current max. 30A for 5ms)
FLE-STB <sup>2)</sup>	230 V~ max. 60 W (switch on current max. 30A for 5ms)
Fan <sup>1)</sup>	230 V~ max. 120 W (switch on current max. 10A for 5ms)
Cabin / Cleaning light	230 V~ max. 120 W (switch on current max. 10A for 5ms)

1) Only for control systems with the bath mode "Sauna with humidity" (Series FCU1200)

## 11.3 General

Description	Units	Type
		<b>FCU1x00</b>
Dimensions of the basic unit	[mm]	(H x W x D) 241 x 212 x 57
Power supply	[V AC / Hz]	see type plate
Safety shutdown:	[°C]	Sensor break (at approx. >138°C) Short-circuit sensor (at approx. < -25°C) Safety temperature limiter (at approx. 140°, According to DIN EN 60335-2-53 paragraph 19)
Ambient temperature	[°C]	0 to +40 With protective coating -20°C to +40°C
Rel. humidity	[% relative humidity]	max. 80 % rel. humidity, not condensing
Protection class	[-]	see type plate

## 11.4 Storage

Storage	Do not store outdoors, keep it in a dry, dust-free area. Not to be exposed to direct sunlight or to aggressive media. Prevent mechanical shocks
Storage conditions	-10 to +60°C, air humidity max. 80 %, non-condensing

## 12 Installation

### 12.1 Observe ESD protection



#### WARNING!

#### Observe ESD protection

Due to reasons of ESD protection do not touch electrically conductive parts. Therefore, when assembling, touch the conductor plate only on the plastic housing or laterally on the side.

Touch the connecting cable to the plate only at the plug, but do not touch the contact surfaces.

For this reason:

- Take the corresponding safety precautions. As a minimum safety measure, touch a grounded piece of metal for discharging.

### 12.2 Install the control unit FCU1x00

#### Installation

The control unit can be installed directly at the outside wall of the cabin or at another place but not inside the cabin.

The control unit must be mounted with a distance of at least 5 cm from the walls or other devices, laterally, above and below. A distance of 10 cm must be kept from other electrical devices.

The control unit should be installed in such a way that it is always accessible. (e.g. for servicing purposes, wear parts, safety devices etc.)

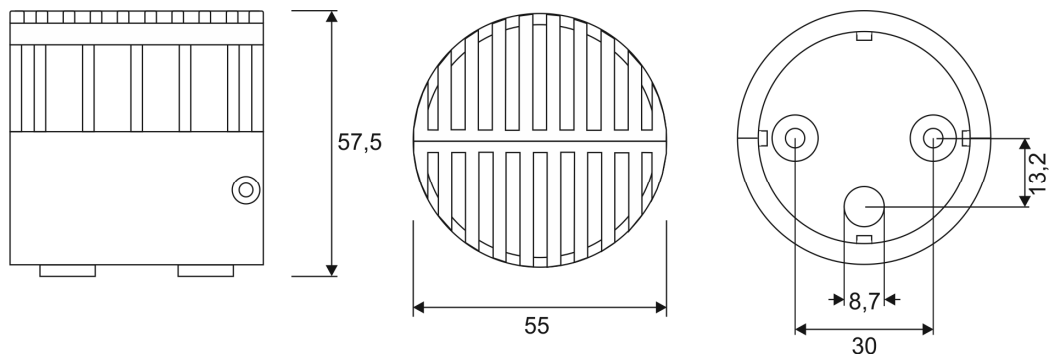
### 12.3 Install the temperature sensor



#### NOTE!

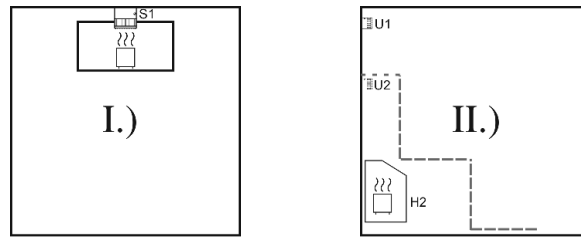
*The temperature sensor should be installed in such a way that it does not get influenced by the cold air coming in from outside (from the door or the window)*

#### Dimensions Temperature sensor



- Stove sensor temperature with safety temperature control fuse (STB 141°C <sup>+0/-5°C</sup>) (FCU-SENSOR-OVEN-A)

## Installation location Stove sensor



### Stove sensor - Temperature

#### ■ I.) Floor-standing - or Wall-mounted heater

Unless a different position is specified by the stove manufacturer, install it on the wall behind the sauna stove (centre sauna stove), 20 cm below the ceiling.

#### ■ II.) Underbench heater

**U1:** Unless a different position is specified by the stove manufacturer, install it on the wall behind the sauna stove (centre sauna stove), 20 cm below the ceiling and additionally install one STB (Safety-Temperature-Limiter) **U2** 5cm below the grating of the airshaft.

- Ensure free air circulation.
- Do not assemble the sensor in close proximity to the door or a window.
- This position for the sensor is only a recommendation for standard cabins.

## Installation and electrical connection



1. Guide the heat-resistant signal line for the sensor through the provided line bushing and the hole in the mounting plate.
2. Attach cable ties as stress relief.



3. Fix the mounting plate with the screws provided. Please ensure that the inscription 'Top' at the back side of the mounting plate is facing upwards. If the mounting plate is assembled the wrong way, the accumulated water cannot drain off.



4. Connect the signal line of the sensor to the board according to the connection diagram.



5. Place the board in one half of the housing. Observe indentation on the sensor plate.
6. Push the housing half with the board laterally onto the mounting plate. Observe indentation on the mounting plate.



7. Push the other housing half laterally onto the mounting plate and the board.
8. Screw together the housing halves with the screws provided.

## 13 Electrical connection

### 13.1 Electromagnetic disturbances

Electromagnetic disturbances



**WARNING!**

**The electromagnetic disturbances can lead to malfunction of the control unit and damage of the components!**

The control unit is approved for operation in private homes. Operation in other electromagnetic environments can lead to malfunctions or disturbances.

Malfunctions due to electromagnetic disturbances can be traced back always to influences acting on the device from outside.

Please observe the following points:

- Lay the signal lines separate from the power lines and lines for the consumers.
- Consumers such as lamps, pumps, relays, contactors which are connected to the control unit may not emit any impermissibly high disturbances. Suppress the interference of inductive consumers such as solenoid valves, switch contactors, transformers, chokes or motors.

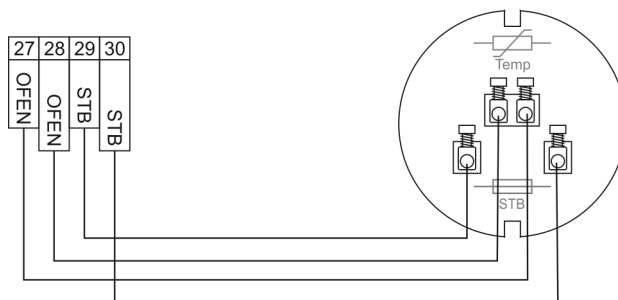
### 13.2 Connect the control unit, consumer and the sensor.

1. Connect the feeder to the control system according to the electric connection diagram.
2. Connect the 230/400V load to the control system according to the electric connection diagram.
3. Connect the sensor to the control system according to the following figures.
4. Place the screen at PE according to the connection diagram. If there is a disturbance in PE, do not fit the screen.

Observe the following points here:

- Observe the technical data for the feeders, lines for the consumers and signal lines.
- Lay the lines in such a way that they are not accessible to the cabin user. If this is not possible, the lines must be provided with stress relief.
- Lay all the protective conductors and busbar in PE.

Electrical connection diagram sensor



### 13.3 Electric connection diagram

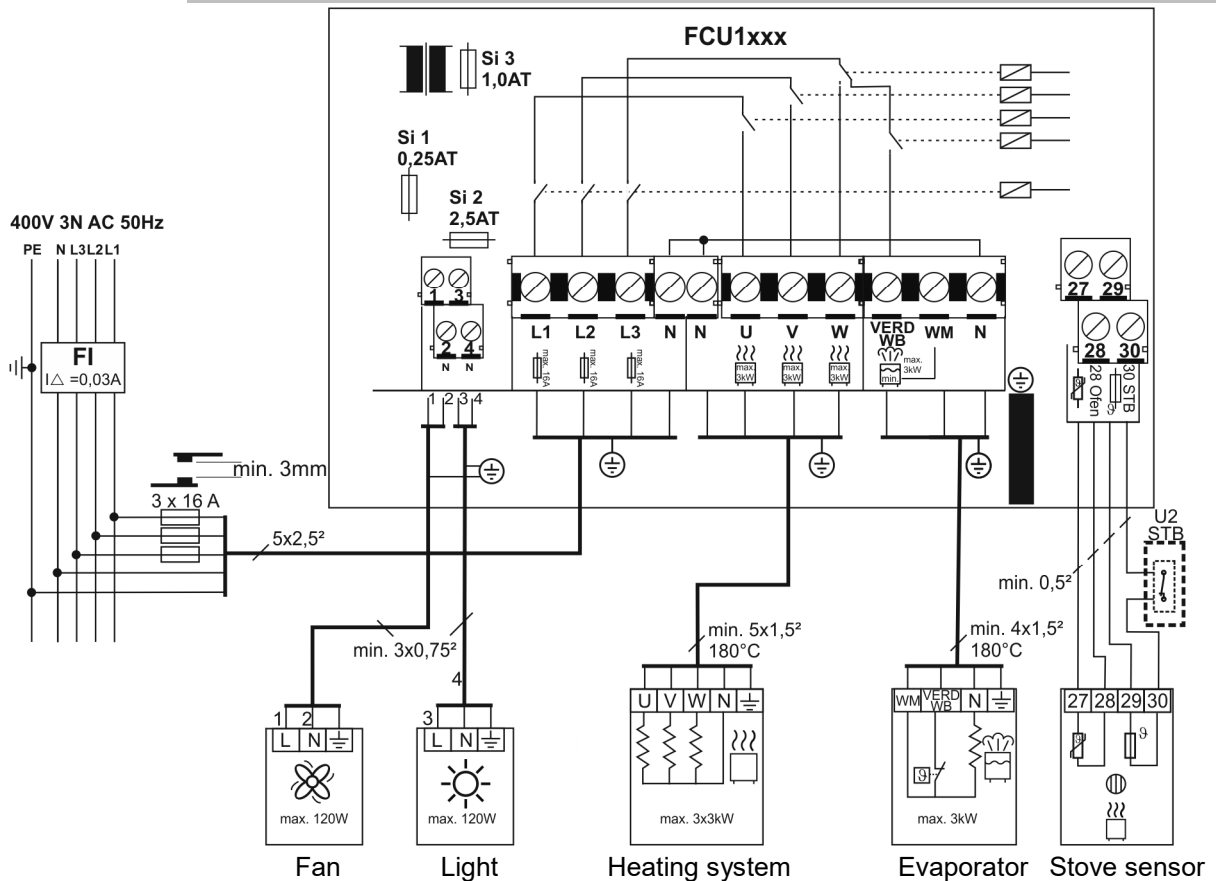
Electric voltage



**DANGER!**

**Danger to life due to electric shock.**

- Disconnect the control system from the mains power supply before maintenance work.
- Disconnect power supply to the system (switch off the fuse in the junction box) and secure against restarting. Check if the equipment is disconnected from the power supply.



## 14 Start-up

### 14.1 Check before first Start-up

The following points must be checked after the sauna control unit and the sensor have been electrically connected:

- Does the power supply agree with the specification on the type plate?
- Are the line specifications maintained with respect to the electrical connection diagram?
- Is the control unit connected according to the electric circuit diagram?
- Is the sensor connected according to the electric circuit diagram?
- Are all the screws tightened correctly?

### 14.2 Switch on and off the sauna control system

Before switching-on, please read the operating manual and safety notes thoroughly and follow them.



**WARNING!**

If there is a short-circuit in a 230V/400V load, the contact of a relay can fuse due to the high short-circuit current. Even the safety relay can fuse if restarted before removing the short-circuit. This will lead to steady state of the consumer. Switch off the automatic circuit breaker in the junction box. Send the device back to the factory for checking/repair.

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### 14.3 Function test of the sauna control unit and the consumer

- Check the safety shutdown. To do this shut down the STB circuit directly at the stove sensor during the ongoing sauna operation. The heating system must switch off automatically. A corresponding message appears on the display.
- Check the stove sensor temperature. To do this shut down the stove sensor circuit directly at the stove sensor during the ongoing sauna operation. The heating system must switch off automatically. A corresponding message appears on the display.
- For the available bath modes “Sauna” and “Sauna with humidity”, check whether the phases L1, L2 and L3 are connected through on the corresponding terminals (see wiring diagram).
- Check cabin light. The consumers should be able to switch on or switch off the sauna control using the corresponding operating buttons.
- Check the direction of rotation of the fan in the drying program (for doing this, the bath mode “Sauna with humidity” must be active for at least 10 min. so that the drying program can start at the end).



**NOTE!**

*Operating a standard stove:*

*In a standard stove, the phases W, V and U are successively switched off just before the set point temperature is reached. When reheating, the phases U, V and W are switched on successively.*

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**NOTE!**

*Bath mode “Sauna with humidity”:*

*For the bath mode “Sauna with humidity”, the phase W is generally not actuated for the heating system. The evaporator is actuated over the VERD/Wb phase. After this bath mode ends, the drying program starts automatically (→ see operating manual). Phase W is again activated for the stove by the drying program.*

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## 15 Notes

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Address of the installer or the dealer of the sauna system: