

Important documents:

Please add these documents to the device documents, they must be kept in the immediate vicinity of the control unit, so that they are always accessible.



Series FCUxx00

Installation instructions

Sauna control

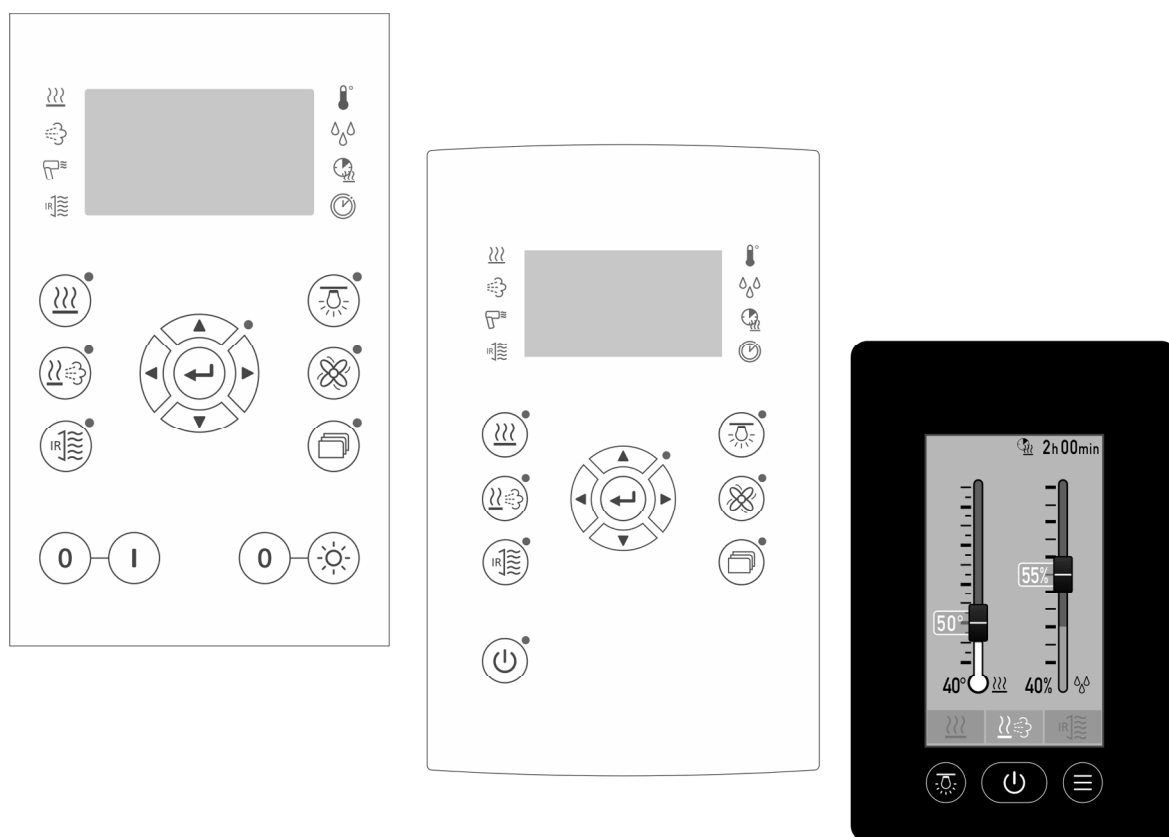
Series FCU2000/FCU2200

Series FCU3000/FCU3200/FCU3400

Series FCU4000/FCU4200/FCU4400

Series FCU5000/FCU5200/FCU5400

Series FCU6000/FCU6200/FCU6400 (not VDE certificated)



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certificated

FASEL GmbH
Germany

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1 Safety

Important safety instructions

Read carefully and keep for future reference

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 Technical safety notes for assembly and installation



– **DANGER!**

- The control device can be installed directly on the outer side of the cabin or at another location, however not within the cabin
- Use the sauna control device only with a cover guard for sauna heaters if one of the following option is enabled:
 - timer option (lockable in service menu)
 - remote start via option input, WEB-Control, App or KNX-module.
- Appropriate VDE applies to public saunas, that a control lamp, showing, that the heater is switched on, is to install in the room of the supervisor.
- This lamp can be connected to the clamp  PS1 (FLE-STB).
- For switching off the mains, the power supply cable must be equipped with a fuse with a contact opening width corresponding to the requirements of the excess voltage category III for total disconnection.
- At FCUxxxx the main switch of the control unit must be accessible.
- The sensor of the thermostat must be installed in such a way that it is not affected by the incoming cool air.

1.3 Intended use

Depending on the version, the FASEL sauna controls of the series FCU2x00, FCU3x00 and FCU4x00 are exclusively meant for operation and control of saunas, saunas with moisture and infrared cabins. The control devices are permitted for operation in houses and commercial facilities.

Intended use



WARNING!

Danger if not used correctly

- Any improper use of the sauna control can lead to dangerous situations. Therefore:
- Use the sauna control correctly.
 - Operate the sauna control only within the permissible room temperature and moisture range. → See technical data
 - All the specifications in the operating manual and the installation manual must be strictly adhered to.

Claims of any type due to damages caused by improper use will not be accepted. Only the user is responsible for damages caused by improper use.

1.4 Modifications and alterations

Modifications and alterations of the sauna control or installation can lead to unforeseen dangers. All technical modifications and add-ons to the sauna control require the written permission of the manufacturer.

1.5 Demands on technical personnel

The assembly, installation, commissioning as well as rectification of defects and repairs must be carried out by qualified persons only unless otherwise mentioned.

Inadequate Qualification



WARNING!

Danger of injury due to inadequate qualification

Improper handling can lead to significant personal injuries and material damage.

Therefore:

- The assembly, installation, commissioning as well as rectification of defects, maintenance and repairs must be carried out by qualified persons only unless otherwise mentioned.

■ **Technical personnel**

Due to their technical training, knowledge and experience as well as the knowledge of the relevant regulations these persons are in a position to carry out the tasks assigned to them and to identify possible dangers on their own. Also they are familiar in handling with ESD sensitive devices.

■ **Certified electricians**

Due to their technical training, knowledge and experience as well as the knowledge of the relevant standard specifications and regulations these experts are in a position to carry out jobs on the electrical unit and to identify possible dangers on their own. In Germany certified electricians have to fulfill the stipulations of the accident prevention regulation BGV A3 (e.g. master electrician). In other countries corresponding stipulations are applicable that have to be followed.

1.6 Operational safety and special dangers

- Pay attention to the safety and warning notes in the following chapters of this manual to minimize health hazards and to avoid dangerous situations.

The following instructions are to be adhered for your own safety and the safety of the unit:

Electric potential



DANGER!

Danger to life due to electric potential!

Contact with live components can be fatal.

Damage of the insulation of the individual components can be dangerous to life.

Therefore:

- For switching off the mains, the power supply cable must be equipped with a fuse with a contact opening width corresponding to the requirements of the excess voltage category III for total disconnection.
- Disconnect the unit from the mains before carrying out any work on it (switch off the fuse in the distribution box) and secure against restarting. Check for zero potential. The control device should be disconnected from the mains before opening the casing.
- In case of damage to the insulation, switch off the power supply immediately and carry out the repair.
- Work on electrical unit should be carried out by certified electricians only.
- Never bypass fuses or put them out of operation.
- While replacing fuses, pay attention to correct current specifications.
- Keep moisture away from live components, since it can lead to short circuit.



WARNING!

If a short circuit occurs in a 230V/400V load, the relay contact can be welded by the high short-circuit current. Is turned on before removing the short circuit, the safety relay can be also welded. This can lead to the continuous operation of the load. Turn off the circuit breaker in the distribution box. Send the unit back to the factory for check/repair.

Improper operation



WARNING!

Improper operation can result in serious injuries!

Therefore:

read and note the operating manual.

2 Technical Data

2.1 General information

General data						
Designation	Unit	FCU2x00	FCU3x00	FCU4x00	FCU5x00	FCU6x00
Dimensions basic device	[mm]	(H x W x D) 247 x 285 x 86,5				
Dimensions operating element:		(H x W x D)				
FCUxxxx DESIGN	[mm]	198,5 x 124 x 30,5			---	---
FCUxxxx DESIGN-GLAS	[mm]	197,5 x 122,5 x 35			---	---
FCU5xxx DESIGN-TOUCH	[mm]	NA			158x104x38	---
FCU6xxx	[mm]	---				
Max. Distance Basic device to operating element FCUxxxx DESIGN, FCUxxxx DESIGN-GLAS or interior display	[m]	100				
Voltage supply	[V AC / Hz]	see nameplate				
Number of temperature sensors		1	2 (+IR sensor)			
safety OFF	[°C]	Sensor interruption (at ca. >138°C) sensor short circuit (at ca. < -25°C) STB interruption (at ca. 140°C accordingly to DIN EN 60335-2-53 section 19)				
Humidity Sensor connectable		No	Yes	Yes	Yes	Yes
Timer		Yes	Yes	Yes	Yes	Yes
Week Timer		No	No	Yes	No	No
Light/ Fan dimming		No	Yes	Yes	Yes	Yes
Terminals for power switch gear		Yes				
Ambient condition						
Ambient temperature	[°C]	0 to +40 With protective coating -20 to +40				
Rel. humidity	[% r.F.]	max.80 % r. humidity, non-condensing				
Storage temperature	[°C]	-10 to +60				
Storage rel. humidity,	[% r.F.]	max.80 % r. humidity, non-condensing				
Insulation type	[-]	IPx4				

Table 1: Technical Data – General

2.2 Cables

Use of inappropriate cables – Electric potential



DANGER!

Danger to life due to electric potential

Use of inappropriate cables can lead to short circuits and subsequent fires.

Damage to the insulation can be dangerous to life.

Therefore:

- All the cables, which lead to the sauna, must be designed for at least 150 °C.
- When laying the cables in the ground, it is essential to use a cable approved for underground installation. Signal lines must be routed in a separate trench, not in the same trench as the 230 / 400V lines.
- Use cables as per specifications in Table 2 and electrical circuit diagram (see annexure). The specified cross sections are designed for copper cables. In case of aluminum cables the cross sections should be appropriately increased.
- The cross sections can increase due to the length of the cables, the type of cable laying or special regulations.

Designation		Type
Power supply cables	Type / Cross section / Number of leads	H07RN-FG2,5 (heavy rubber hose 2,5 mm ²) Power supply cables must be polychloroprene-coated and should not be lighter than heavy polychloroprene-coated flexible cables.
230 / 400V cables for supply to oven, evaporator, fan, light etc.	Type	Heat resistant, at least 150°C ambient temperature (= 180°C operating temperature)
Signal cables for sensors	Type	<ul style="list-style-type: none"> ■ In case of longer distances: LiYCY (flexible, shielded cable) ■ Within the cabin: heat resistant, minimum 150°C ambient temperature (= 180°C operating temperature)
Cross section Number of leads		→ See electrical circuit diagram.
Connecting cable Control device to operating element or interior display	The patch cable can be delivered with a standard length of 5 or 10m. If another length is desired then the cable must be configured by the electrician. Another option would be to bridge a stretch by installing two network sockets (CAT 5).	
Specification of the patch cable	<ul style="list-style-type: none"> ■ Minimum CAT 5, minimum AWG26 ■ Plugs should have no rubber covering over the locking mechanism ■ Pin 1 to Pin 1 cable configuration (straight through) 	
Conduit for patch cable	Min. M32 (inner diameter min. 24mm), smallest bending radius 30 cm	

Table 2: Technical data – cables

2.3 Voltage and switching capacity - electrical load

Designation	Type
	FCU2x00, FCU3x00, FCU4x00, FCU5x00, FCU6x00
Nominal voltage	400 V 3 N ~ 50Hz
Oven	3x 230 V~ max. 3x 3 kW (AC1) / 3x 0,55kW (AC3) / 3x 0,75kW (AC15) (Inrush current max. 30A for 5ms)
Evaporator ¹⁾	230 V~ max. 3 kW (Inrush current max. 30A for 5ms)
Infrared ²⁾	230 V~ max. 3 kW (Inrush current max. 120A for 5ms)
PS1 (FLE-STB)	230 V~ max. 60 W (Inrush current max. 30A for 5ms)
Fan	230 V~ max. 15W...120 W (Inrush current max. 10A for 5ms)
Cabin light	230 V~ max. 15W...120 W (Inrush current max. 10A for 5ms)
Cleaning light	230 V~ max. 120 W (Inrush current max. 10A for 5ms)
Color light ³⁾ OUT 13 ... OUT 16, C5	230 V~ / max. 120 W per relay / total capacity see circuit diagram (Inrush current max. 150A for 20ms)
OUT 1 ... OUT 4 ³⁾ OUT 5 ... OUT 12 ³⁾	Potential free, safety extra low voltage max. 50 V / 1 A, 230 V~ / max. 120 W per relay; total capacity see circuit diagram (Inrush current max. 6A for 5ms)
IN 1 ... IN 4, IN 9 ... 12 ³⁾ IN 5 ... IN 8 ³⁾	safety extra low voltage approx. 15 V, switching current approx. 10 mA , 230 V~ 50 Hz, all inputs same phase

Table 3: Technical data – voltages and switching capacity consumer

1) Only in controls with the bathing option "Sauna with humidity" (Series FCUx200 and FCUx400)

2) Only in controls with the bathing option "Infrared" (Series FCUx400). For full spectrum radiators (e.g. Vitae radiators) with high inrush currents max. 1,5 kW

3) Optional



NOTE!

FASEL additionally offers a extension power unit for loads of 9 kW, 18 kW and 24 kW.

2.4 If the sauna control device is installed in the technical room

If the sauna control device is not directly installed on the outer wall of the cabin

The control device can be installed directly on the outer side of the cabin or at another location, however not within the cabin. If the installation is not done directly on the outer wall of the cabin then the following points should be noted:

- Lay the signal cables separately from the power line.
- Do not lay the signal cables parallel to the power line.
- Install a distribution box for the signal lines and another one for the power lines as per Figure 1
- Note EN 60335-2-53 for remote start

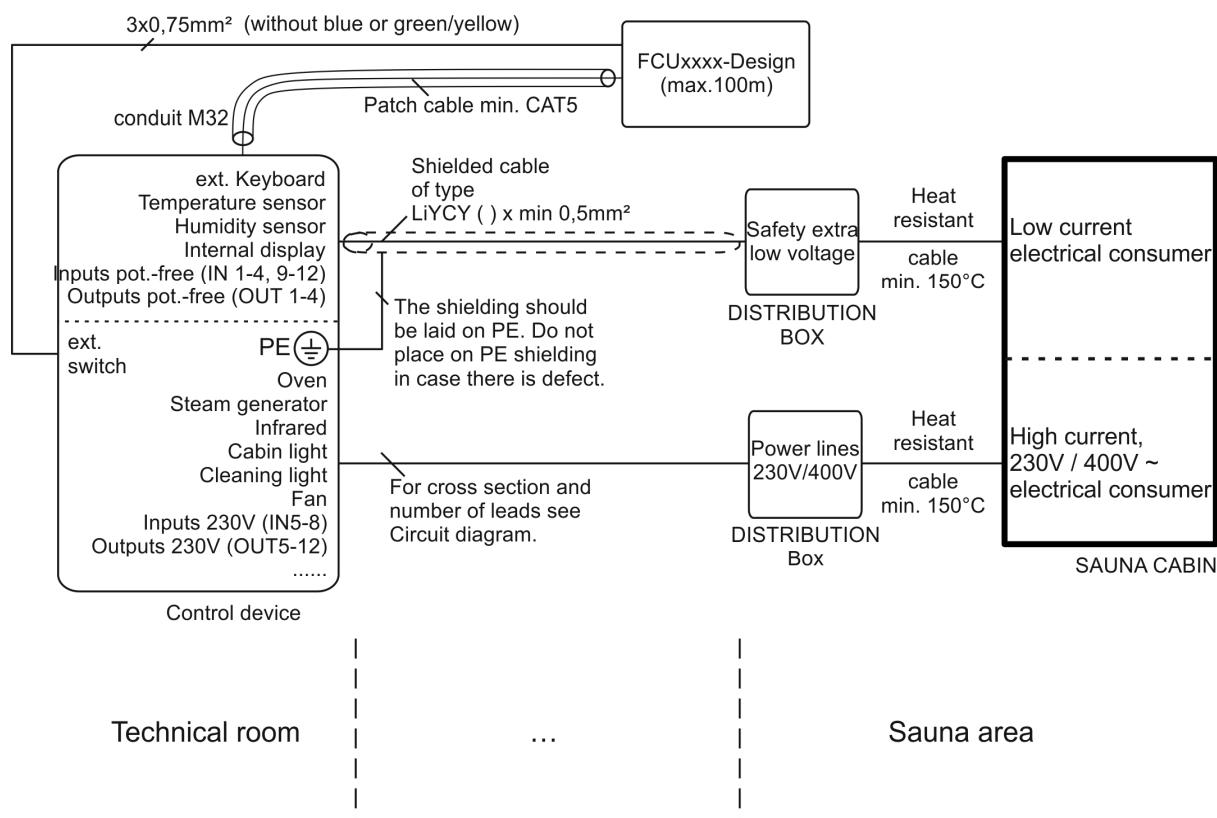


Figure 1: Cabling while installing the sauna control device not directly on the outer wall of the cabin

3 Identification

3.1 Nameplate

The nameplate is located on the control unit on the left side:

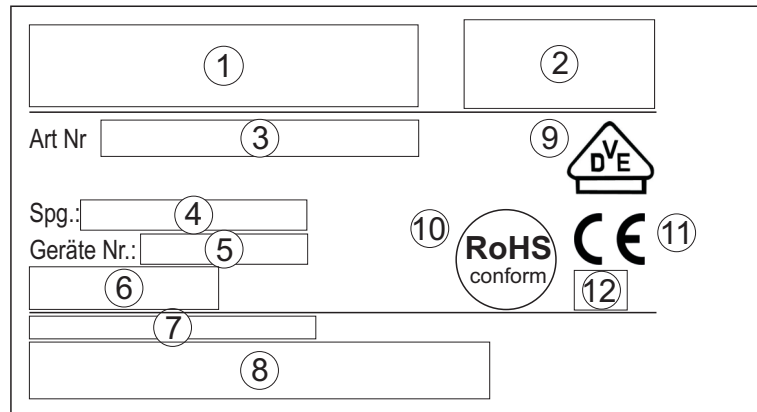


Fig.2 Control unit nameplate

- 1 Type designation
- 2 Company logo
- 3 Article number
- 4 Voltage and max. power
- 5 Device number
- 6 Barcode
- 7 article number
- 8 Barcode article number
- 9 VDE mark (for devices that are approved by VDE)
- 10 RoHS marking
- 11 CE mark
- 12 Protection category

4 Goods receipt, Transport and Storage

4.1 Safety

Inappropriate Transport



ATTENTION!

Damage to the control due to inappropriate transport

The control is a highly sensitive electronic device. It can get damaged due to inappropriate transport.

Therefore:

–Remove the packing only just before starting the installation

4.2 Goods receipt

After receipt, the consignment should be immediately checked for any transport damages.

In case of damages, which are visible from outside, the following course of action should be taken:

- The consignment should not be accepted or accepted conditionally only.
- Note down the scope of damage on the transport documents or on the delivery note of the transporter.
- Initiate claim.



NOTE!

Claim damages as soon as they are identified. Claims for damages can be lodged only within the valid claim period.

4.3 Packing

The packaging should provide protection against transport damages to the individual components till the time of installation. Therefore remove the packaging only just before installation.

4.4 Storage

Store the control device under the following conditions:

- Do not store in open place, store in a dry dust free place.
- Avoid contact with any aggressive media.
- Protect against sunlight.
- Avoid mechanical shocks.
- Storage temperature: –10 to +60 °C
- Relative humidity: max. 80 %, non-condensing

5 Installation

5.1 ESD protection



- **ATTENTION!**
 - **Note ESD protection!**
 - Do not touch on electrical parts because of ESD protection reasons. When assembling only touch the circuit board at the plastic case or at the edge of the board.
 - Also only touch the connection cable to the circuit board, on the connector. Thereby do not touch the contact surfaces.
- Therefore:
- Take appropriate protections. Touch a grounded piece of metal as a minimum protection.

5.2 Installation of sauna control device FCUxxxx

Installation

The sauna control device should be installed sideways, above and below at a distance of at least 5 cm from the walls or other equipment. There should be a distance of 10 cm between other electrical devices.

The control unit and control panel must not be exposed to direct sunlight or rain.

The sauna control device must be mounted on a closed surface (no grid structure) so that no electrical parts can be touched through the openings in the rear panel.

The control unit must be mounted so that it is at any time accessible! (e.g. for service, wear parts, fuses, etc.)



Note!

At FCUxxxx-Design-Glas the main switch of the control unit must be accessible.

5.3 Installation of the operating control of FCUxxxx-Design (-.....)

Installation

The operating control can be installed maximum 100 m away from the basic control device.



ATTENTION!

Damage or malfunction of the operating control FCUxxxx-Design-Glas by steam, humidity or water!

- Therefore:
- It must be ensured, that neither steam, humidity or water can occur at or in the keyboard.

5.4 Installation opening of operating control FCUxxxx-Design and FCUxxxx-Design-Glas

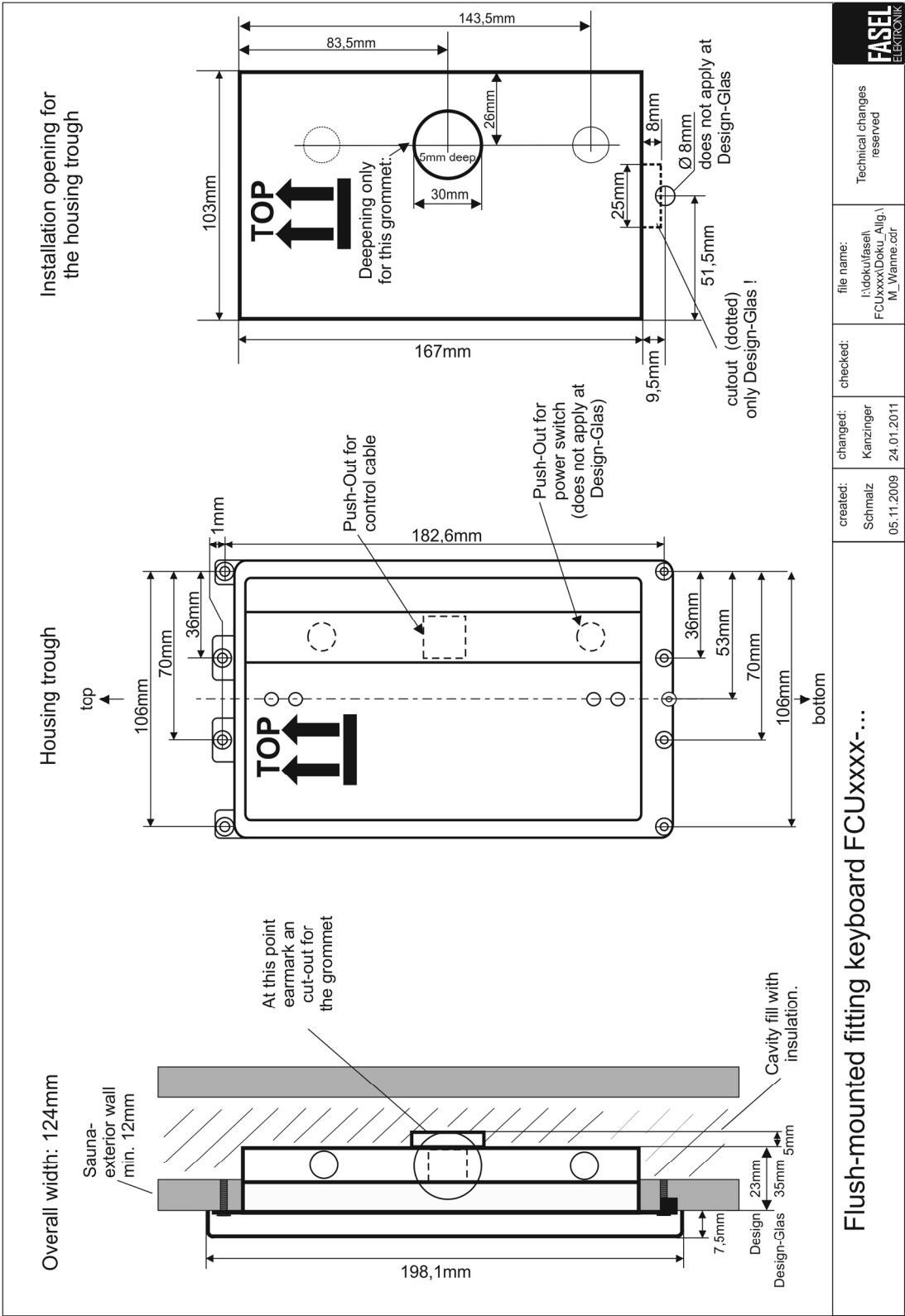
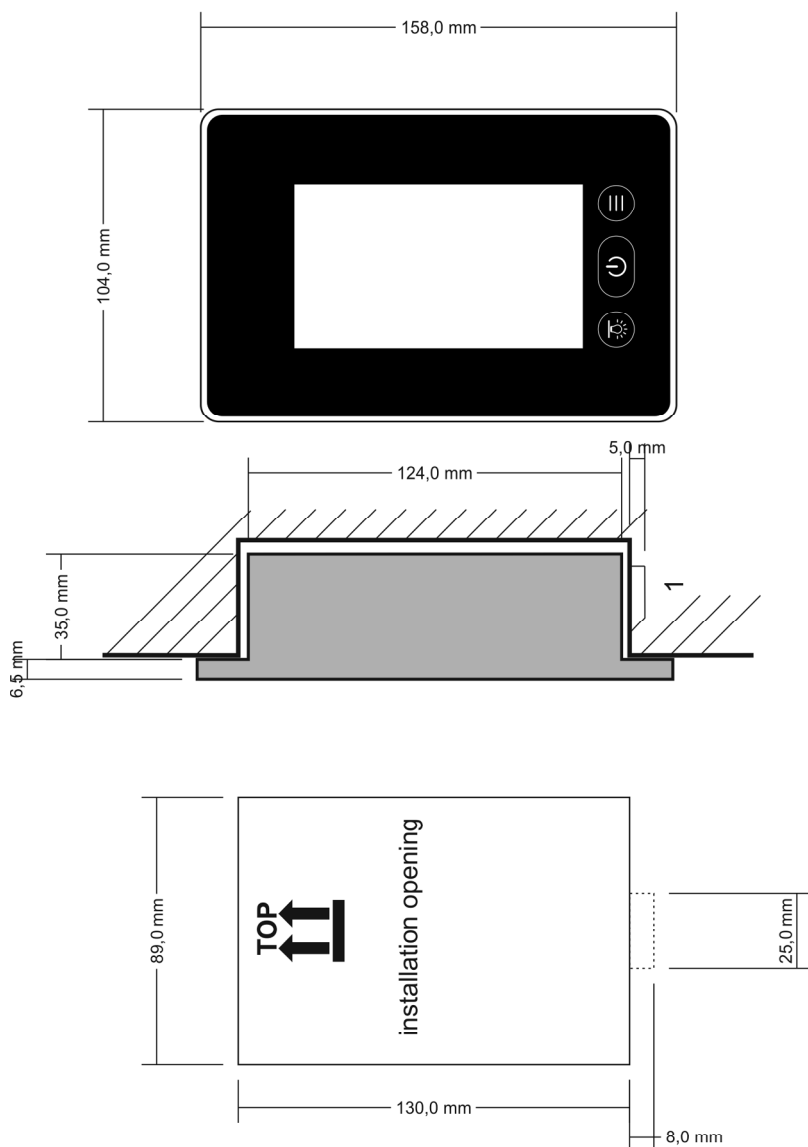


Figure 3: Installation opening for operating control FCUxxxx-Design and FCUxxxx-Design-Glas

5.5 Installation opening of operating control FCU5x00-Touch



1: Flattening for spring

Installation instructions of the keyboard FCU5xxx				<p>FASEL ELEKTRONIK</p>	
created: Kunzelmann 13.02.2017		changed: Kunzelmann 07.05.2017	checked:	file name: I:\dok\fasel\FCUxxx\Draw\Allg.\M_Warne_FCU5XXX.cdr	Technical changes reserved

5.6 Assembly (I) / disassembly (II) of operating control FCUxxxx-Design

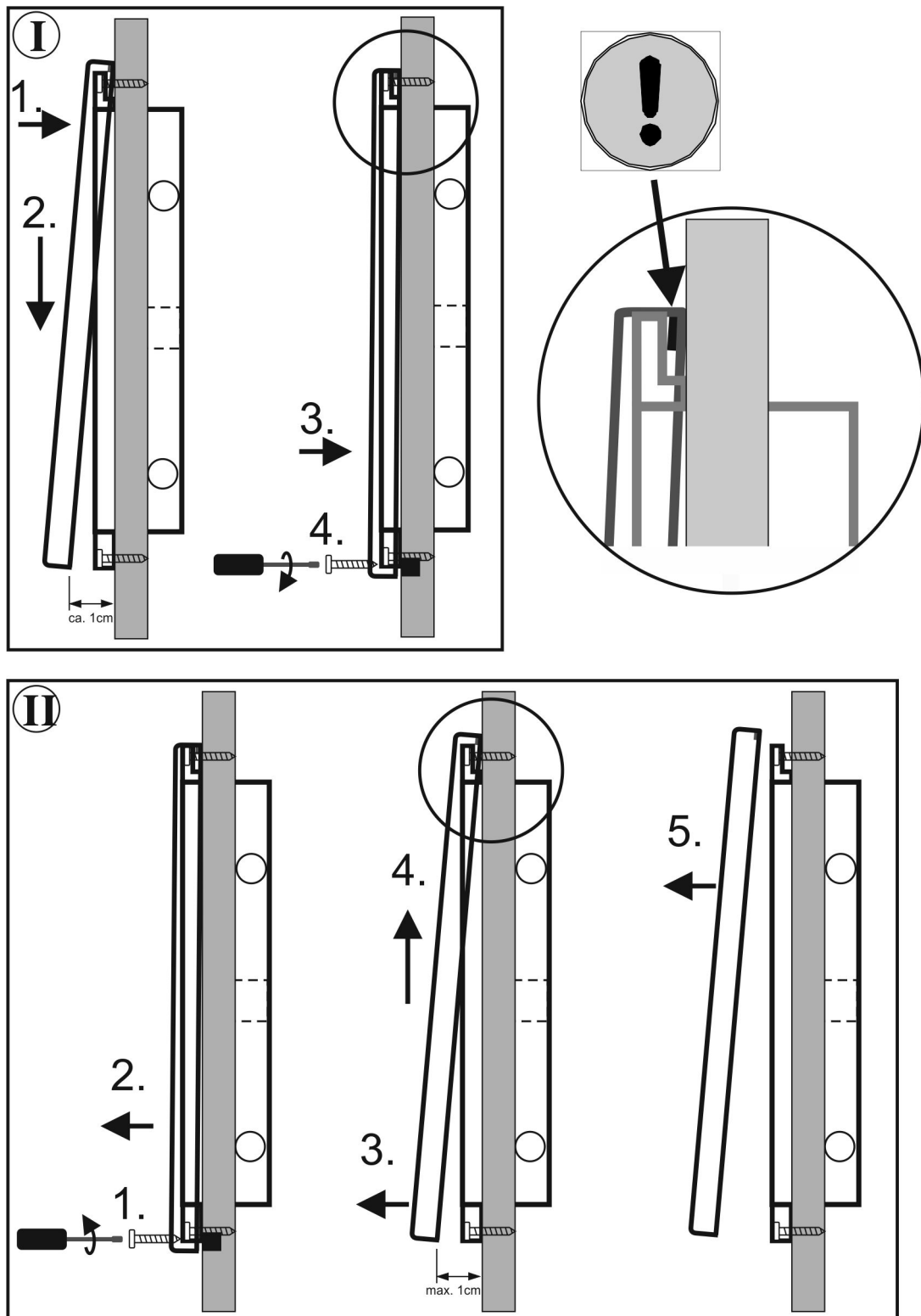
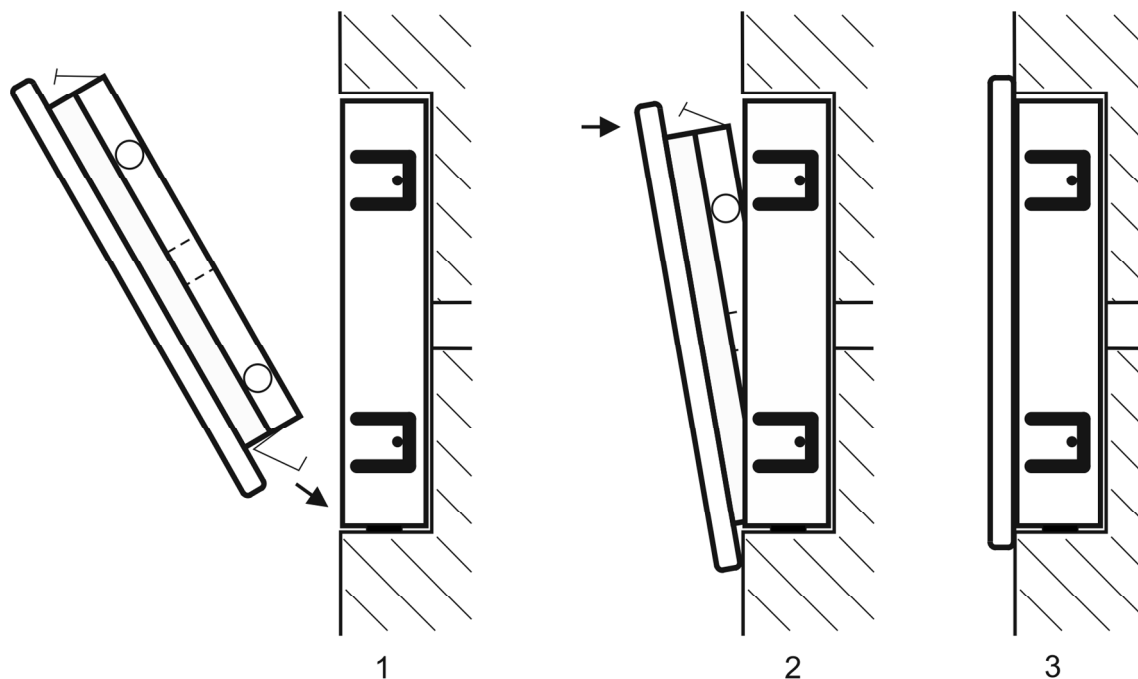


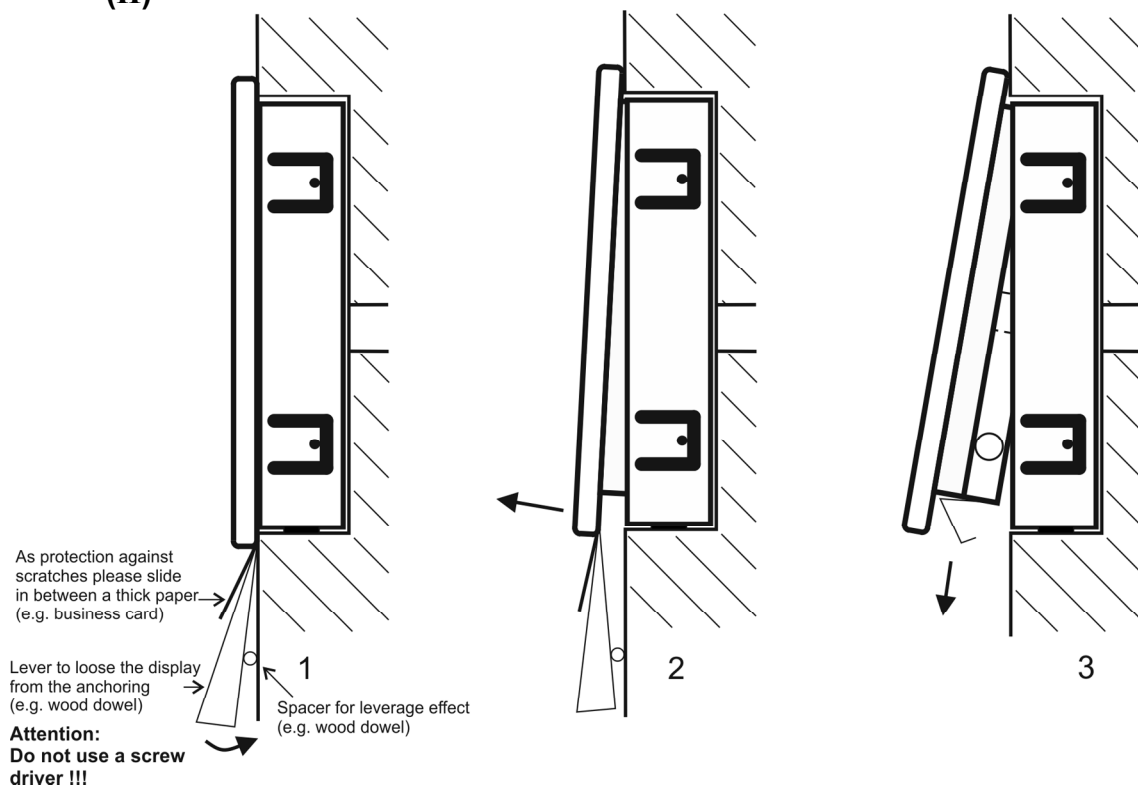
Figure 4: Assembly / disassembly of operating control FCUxxxx-Design

5.7 Assembly (I) / disassembly (II) of operating control FCUxxxx-Design-Glas and -Touch

(I)



(II)



5.8 Installing the temperature and humidity sensor



Note!

An installation of a humidity sensor with humidity control is necessary only for the bathing option "Sauna with humidity ". If a time controlled humidity control is provided then a humidity sensor is not necessary.



Note!

The sensor of the thermostat must be installed in such a way that it is not affected by the cool incoming air.



Note!

The temperature and humidity values displayed on additional thermometers and hygrometers in the cabin can deviate from the displayed values on the control. This could be due to the following reasons:

Depending on the cabin, the temperature differences from the floor to the ceiling or from the oven to the opposite wall can be up to 60 K and the differences in the relative humidity can be up to 40%.

Instruments with indicator needles react slower than electrical measuring and display systems used for the control.

Dimensions of temperature sensor, humidity sensor as well as the combined temperature and humidity sensor

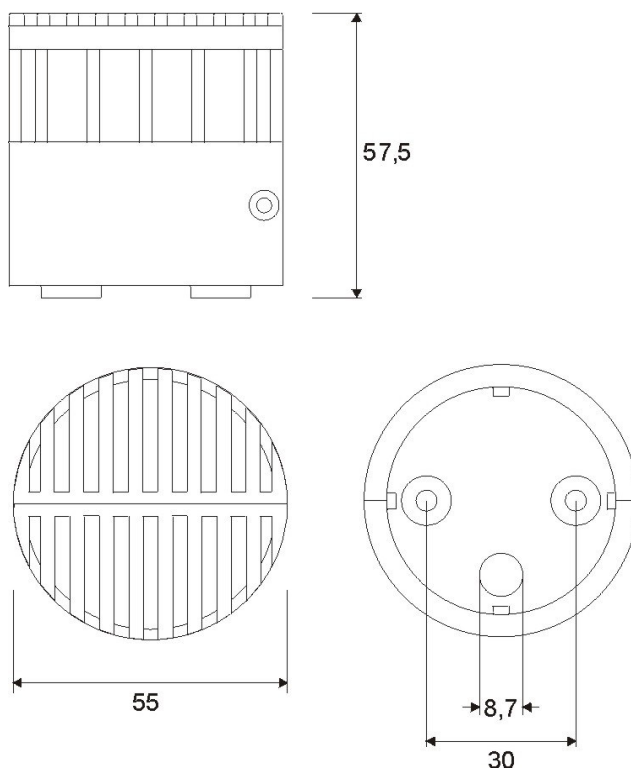


Figure 5: Dimensions of the sensors

5.8.1 Temperature sensor

The following temperature sensor variants are available:

- Oven sensor for temperature (FCU-SENSOR-OVEN-A)
- Bench sensor for temperature (FCU-SENSOR-BENCH-A)
- Combined bench sensor for temperature and humidity (FCU-SENSOR-HUMIDITY-BENCH-A)

Installation site

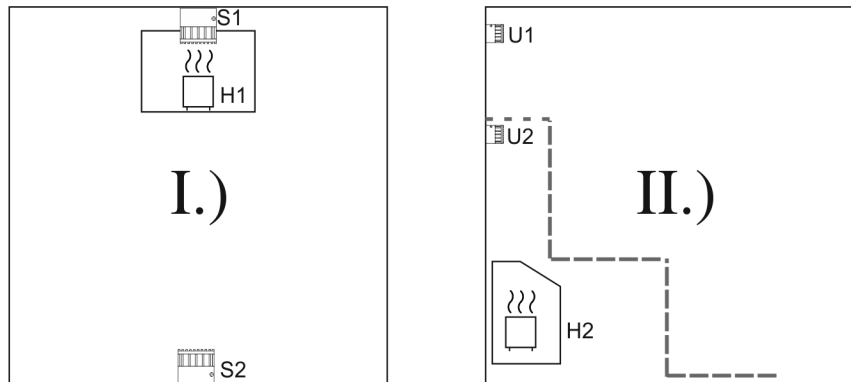


Figure 6 : Installation site of oven sensor / bench sensor / combined bench sensor

Oven sensor - Temperature

- **I.) Floor-standing- or Wall-mounted heater**
Unless a different position is specified by the oven manufacturer, install it on the wall behind the sauna oven (centre sauna oven), 20 cm below the ceiling.
- **II.) Underbench heater**
1-Sensor-System-U1: Unless a different position is specified by the oven manufacturer, install it on the wall behind the sauna oven (centre sauna oven), 20 cm below the ceiling and additionally install one STB (Safety-Temperature-Limiter) **U2** 5cm below the grating of the airshaft.
2-Sensor-System-U2: Unless a different position is specified by the oven manufacturer, install it on the wall behind the sauna oven (centre sauna oven), 5cm below the grating of the airshaft.

Bench sensor for temperature

- Install the bench sensor at shoulder height of the topmost bench:
- **I.)** on the opposite side of the oven (S2)
II.) same side, offset to the Underbench oven (U1) or adjacent wall.
- This position for the sensor is only a recommendation for standard cabins.
- **Attention:** The system installer has to consider cabin-specific conditions, such as the position of the steam outlet, the supply and outlet air, the door (s), the shape of the ceiling, etc., and mount the sensor at the appropriate place for this cabin!.

Combined bench sensor for temperature and humidity

- Install the combined sensor for temperature and humidity like the bench sensor.

For all sensors

- Ensure unrestricted air circulation.
- Do not install the sensors in the immediate vicinity of the door or a window.

Limiter sensor for IR

- The limiter sensor for the IR system is only required if the manufacturer of the IR system a maximum temperature for their system dictates, which is smaller than our room temperature of max. 70°C or limiter temperature of 130°C.
- If a sensor is needed, it shall be installed according to specifications of the IR system manufacturer.

5.8.2 Humidity sensor

Following variants of the humidity sensor are available:

- Bench sensor for humidity (FCU-SENSOR-HUMIDITY-A)
- Combined bench sensor for temperature and humidity (FCU-SENSOR-HUMIDITY-BENCH-A)

Installation location

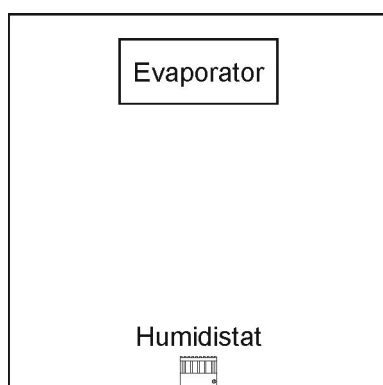


Figure 7: Installation location for humidity sensor/combined bench sensor

Humidity sensor

- Install the humidity sensor on the wall on the opposite side of the evaporator at approximately 1,35 ... 1,60 m height; this position of the sensor is only a recommendation for standard cabins.
- **Attention:** The system installer has to consider cabin-specific conditions, such as the position of the steam outlet, the supply and outlet air, the door (s), the shape of the ceiling, etc., and mount the sensor at the appropriate place for this cabin!.

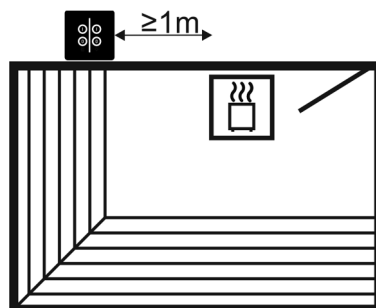
Combined bench sensor for temperature and humidity

- Install the combined sensor for temperature and humidity like the bench sensor.

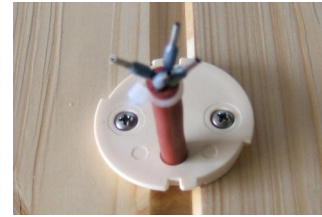
5.9 Installing External Main-Switch FCU-EXT-MAIN-SWITCH

Installation location

The external main-switch can be installed directly on the outer side of the cabin or at another location, however not within the cabin



Installation and electrical connection



1. Lead the heat resistant signal cable for the sensor through the cable aperture provided and through the bore of the securing plate.
2. Place the cable clip as cord grip.
3. Screw the securing plate with the screws provided. It is important to ensure that the marking, on the back side, is aligned to the top. When the mounting plate is fixed wrongly, pent-up water can not drain.



4. Depending on the sensor used, connect the signal cable to the board as per the circuit diagram as given in figure 7 or figure 8.



5. Insert the board in one half of the casing. Pay attention to the indentation in the sensor plate.
6. Push the casing half with the board sideways on the securing plate. Pay attention to the indentation in the securing plate.



7. Push the other casing half sideways on the securing plate.
8. Screw on the casing halves with the screws provided.

5.10 Installation of internal display in cabin



Attention!

Damage of the cabin interior display by too high temperature!

Therefore:

- Do not install the internal display directly over or next to the oven.
- Do not install the internal display in front of the infrared heater.
- Cabin interior display must be installed vapor-tight. (Seal with silicone)

Installation

Install internal display on a maximum height of 1,6 m.

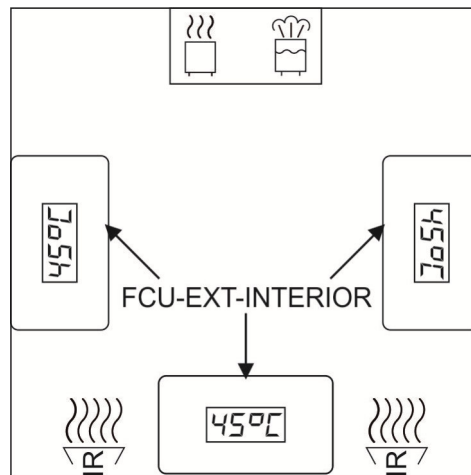


Fig. 8: Location cabin interior display

Dimensions

A double flush mounted socket is provided for the installation of the FCU-EXT-INTERIOR-DISPLAY(-T).

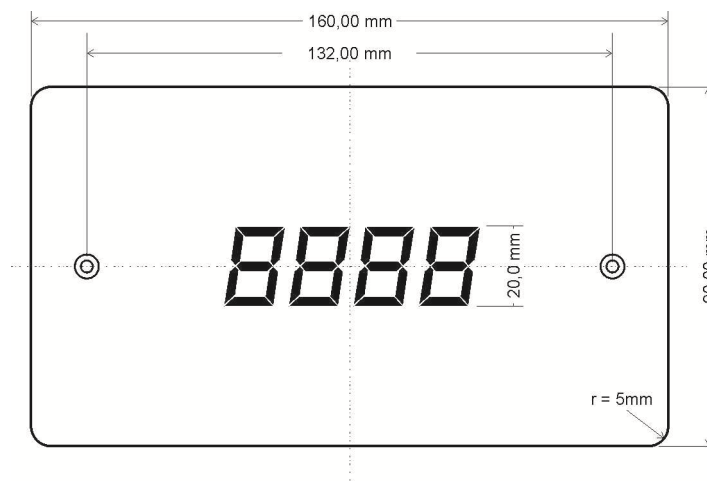


Figure 9: Dimensions of interior display

Installation of the double flush mounted socket

Installation opening of the flush mounted socket for installation of the internal display:

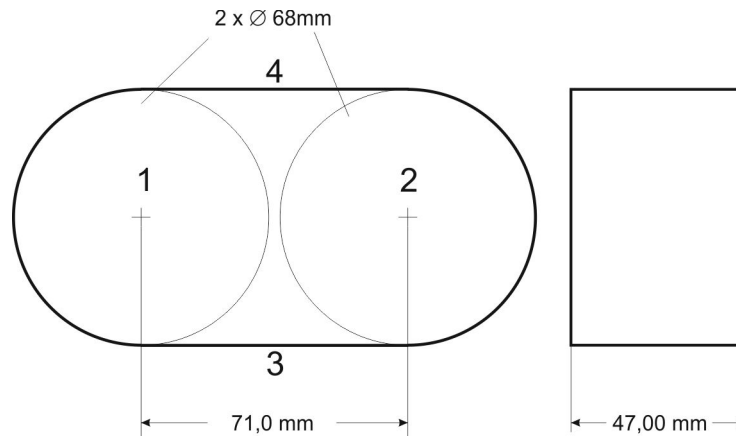


Fig. 10: Mounting hole of the double flush mounted socket

- 1-2: Drill with box drill
- 3-4: Saw out the left standing center bars with a jigsaw

Electrical Connection

Connect the RJ45-connector of the internal display with a patch cable to the control device.

Electrical connection diagram

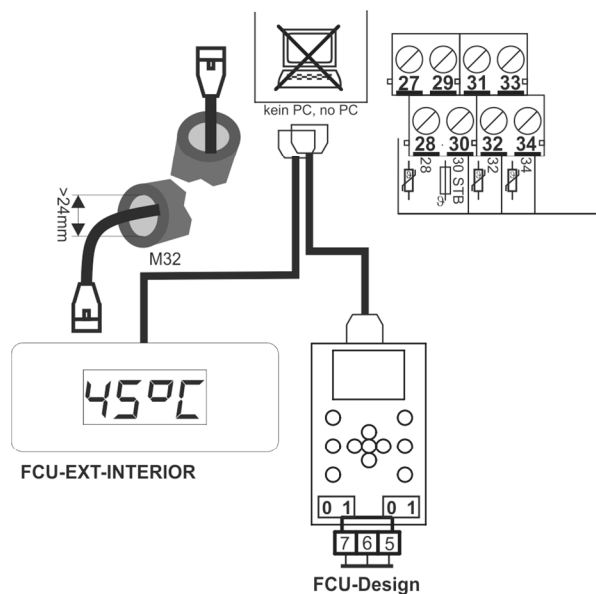


Figure 11: Connection interior display

The electrical lines for FCU-EXT-INTERIOR-DISPLAY(-T) and FCU-DESIGN are plugged on top of each other in the Double-RJ45-Connector. Which lines will be put up or down does not matter. Both sockets are the same.

6 Electrical connection

6.1 Safety

Electric potential



DANGER!

Danger to life due to electric potential!

Contact with live components can be fatal.

Damage of the insulation of the individual components can be dangerous to life.

Therefore:

- For switching off the mains, the power supply cable must be equipped with a fuse with a contact opening width corresponding to the requirements of the excess voltage category III for total disconnection.
- Disconnect the unit from the mains before carrying out any work on it (switch off the fuse in the distribution box) and secure against restarting. Check for zero potential. The control device should be disconnected from the mains before opening the casing.
- In case of damage to the insulation, switch off the power supply immediately and carry out the repair.
- Work on electrical unit should be carried out by certified electricians only.
- Never bypass fuses or put them out of operation.
- While replacing fuses, pay attention to correct current specifications.
- Keep moisture away from live components, since it can lead to short circuit.



WARNING!

If a short circuit occurs in a 230V/400V load, the relay contact can be welded by the high short-circuit current. Is turned on before removing the short circuit, the safety relay can be also welded. This can lead to the continuous operation of the load. Turn off the circuit breaker in the junction box. Send the unit back to the factory for check/repair.

Electro-magnetic damage



ATTENTION!

Electro-magnetic interferences can lead to malfunctions of the control device and to destruction of the components!

The control device is permitted for operation at home and at commercial facilities. Operation under different electro-magnetic conditions can lead to damage or malfunctions.

Malfunctions due to electro-magnetic interferences are disturbances, which affect the device from outside.

Pay attention to the following points:

- Lay the signal cables separate from the power supply cables and cables to the electrical consumers.
- Electrical consumers like e.g. illuminants, pumps, relays and contactors, which are connected to the control device should not emit impermissibly high interferences. If you connect inductors like e.g. a magnet valve, relay, transformer, throttle or engine, the interferences of the consumers must be suppressed.

6.2 Connecting the control device, consumers and sensor

1. Connect the power line to the sauna control as per the electrical circuit diagram.
2. Connect the 203/400V consumers to the sauna control as per the electrical circuit diagram.
3. Connect the sensor to the sauna control as per the following figures.
4. Place the shielding on the PE as per the circuit diagram. Do not place the shielding on the PE if there are disturbances/interferences.

In this process pay attention to the following points:

- Observe the technical data for power lines, cables to the electrical consumers and the signal cables.
- Lay the cables in such a way that they are not accessible to the user of the cabin. If this is not possible then the cables should be provided with cord grip.
- Lay all the neutral cables on the bus bar N.
- Lay all the grounding conductors on the bus bar PE.

Electrical circuit diagrams for sensor

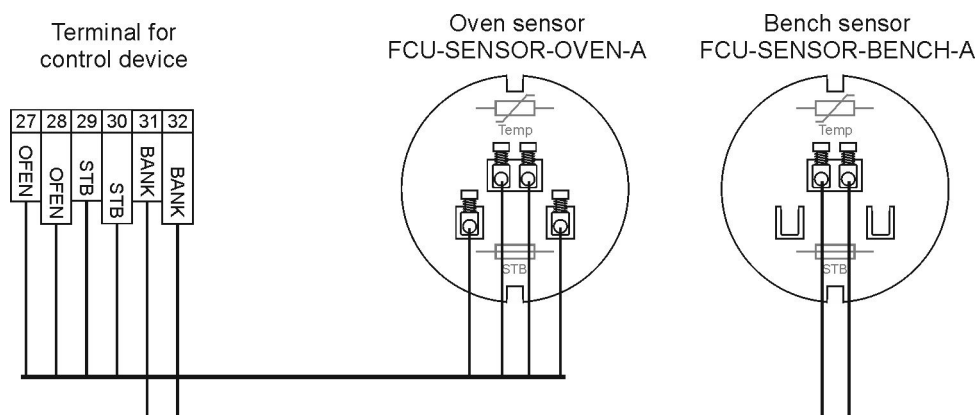


Figure 12: Connection of oven sensor for temperature and bench sensor for temperature

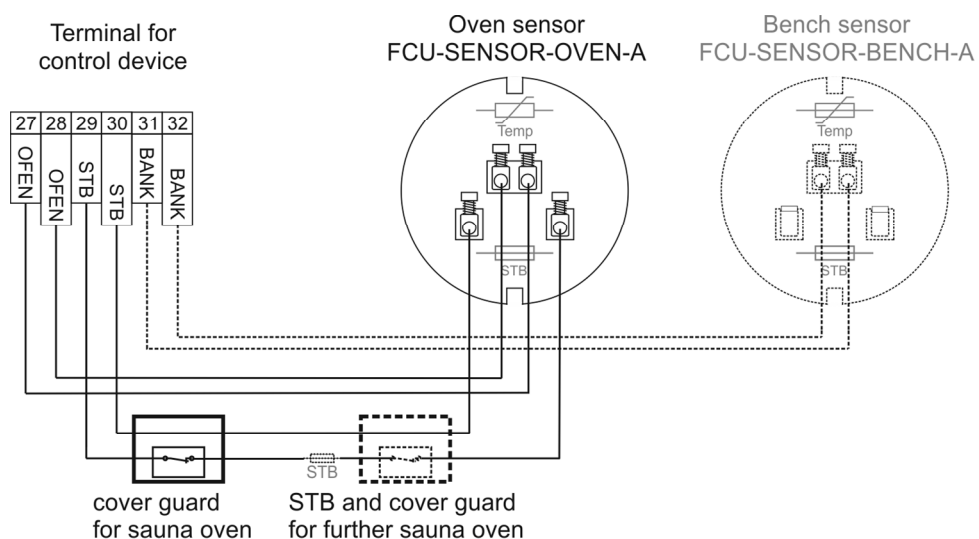


Figure 13: Connection of cover guard for sauna oven (detailed installation and connection Instructions, refer the documentation provided by the manufacturer)

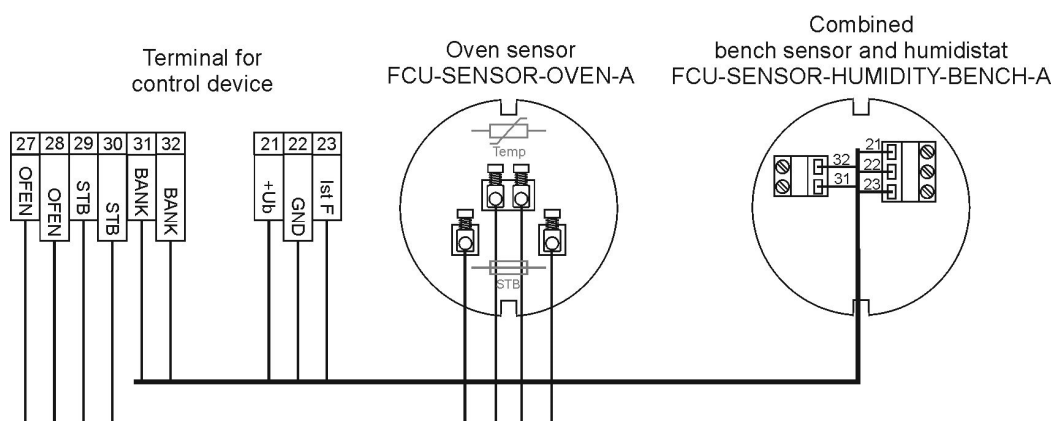


Figure 14: Connection of oven sensor for temperature and bench sensor for temperature and humidity

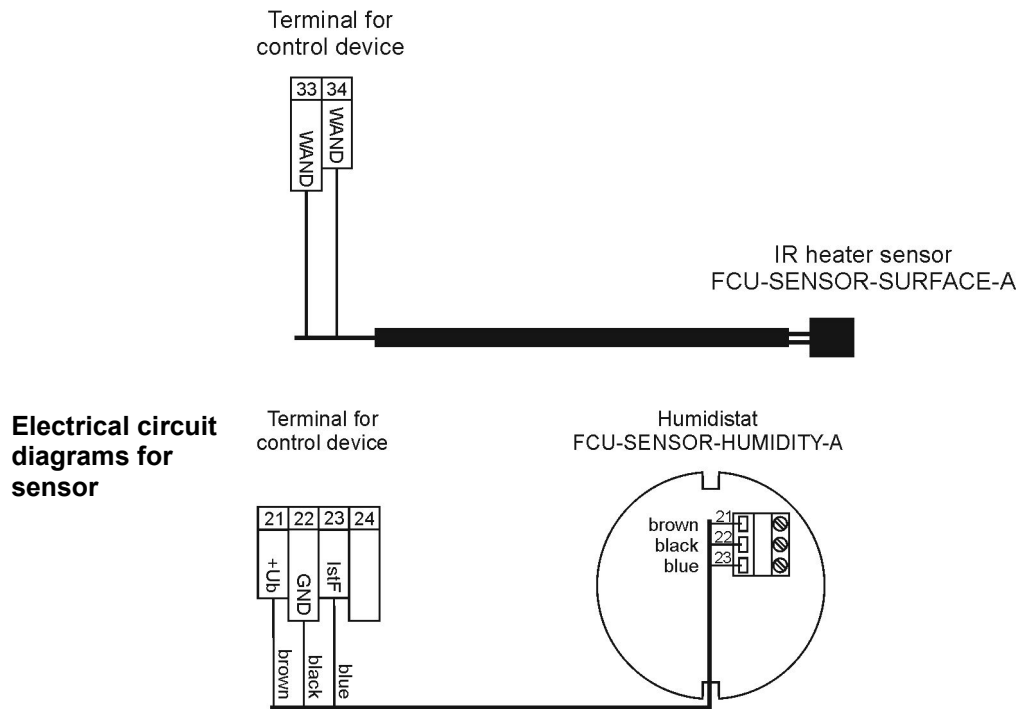


Figure 15: Connection of bench sensor for humidity

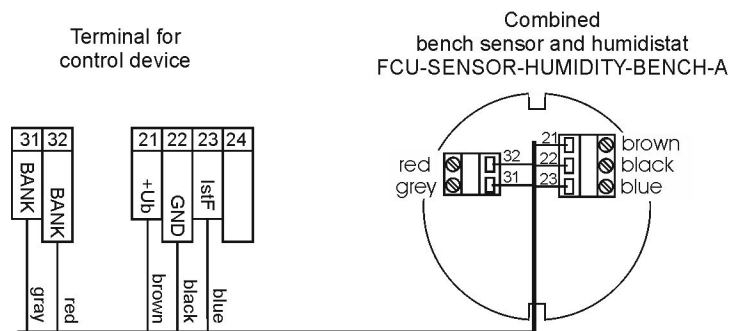


Figure 16: Connection of combined bench sensor for temperature and humidity

Electrical circuit diagrams for External Main-switch

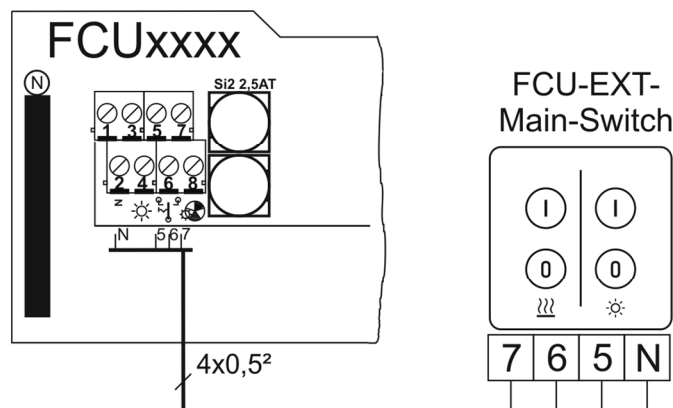


Figure 17: Connection of external Main-switch

6.3 Electrical circuit diagram

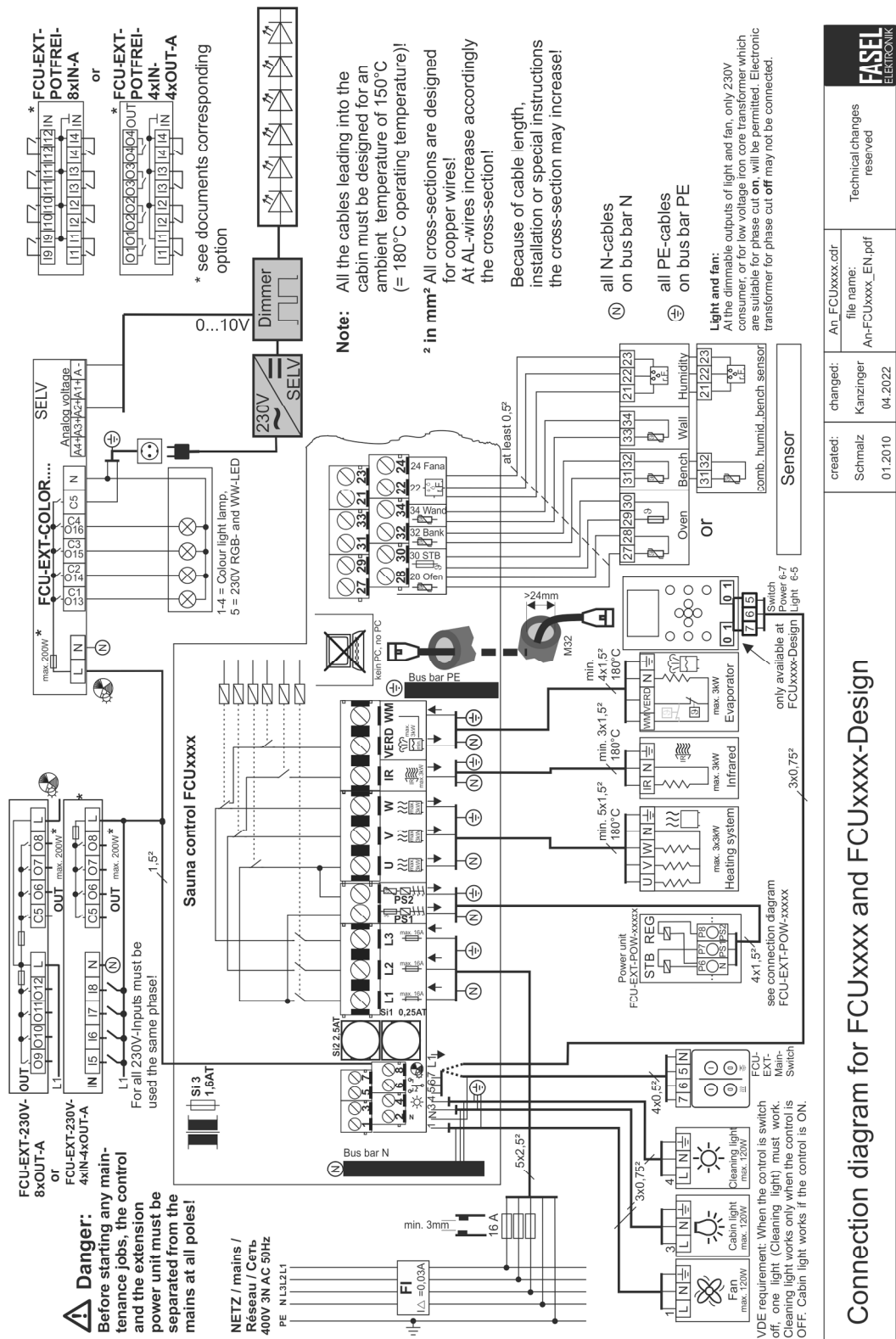


Figure 18: Electrical circuit diagram

6.4 Checking the electrical connection

After the sauna control device and the sensor are electrically connected the following points should be checked:

- Does the voltage supply match the specifications on the nameplate?
- Have the cable specifications given in Table 2, page 10 and the electrical circuit diagram Figure 18, page 30 been followed?
- Is the control device connected according to the electrical circuit diagram?
- Are the sensors (temperature and humidity) connected as per section 0, page 19 ff?

7 Commissioning

7.1 Safety instructions

Electric potential



DANGER!

Danger to life due to electric potential!

Contact with live components can be fatal.

Damage of the insulation of the individual components can be dangerous to life.

Therefore:

- For switching off the mains, the power supply cable must be equipped with a fuse with a contact opening width corresponding to the requirements of the excess voltage category III for total disconnection.
- Disconnect the unit from the mains before carrying out any work on it (switch off the fuse in the distribution box) and secure against restarting. Check for zero potential. The control device should be disconnected from the mains before opening the casing.
- In case of damage to the insulation, switch off the power supply immediately and carry out the repair.
- Work on electrical unit should be carried out by certified electricians only.
- Never bypass fuses or put them out of operation.
- While replacing fuses, pay attention to correct current specifications.
- Keep moisture away from live components, since it can lead to short circuit.



WARNING!

If a short circuit occurs in a 230V/400V load, the relay contact can be welded by the high short-circuit current. Is turned on before removing the short circuit, the safety relay can be also welded. This can lead to the continuous operation of the load. Turn off the circuit breaker in the junction box. Send the unit back to the factory for check/repair.

Improper operation



WARNING!
Improper operation can lead to serious injuries

Therefore:

- Read and follow the operating manual.

Danger of fire



WARNING!
Danger of injury due to fire

Objects on the oven or near the oven can cause fire and thus lead to injuries.

Therefore:

- Always keep the oven and its surrounding free of objects.

Health hazards



WARNING!
Danger of injury due to covering of the temperature sensor and/or humidity sensor

Covering the temperature sensor and/or the humidity sensor can lead to increased temperature and humidity. The increased values can lead to health hazards or to serious injuries.

Therefore:

- Do not cover the temperature and humidity sensor.
- Ensure unrestricted air circulation.

7.2 Checks before the initial commissioning

The following points should be checked before the initial commissioning:

- Does the voltage supply match the specifications on the nameplate?
- Have the cable specifications as per Table 2, page 10 and the electrical circuit diagram Figure 18, page 30 been adhered to?
- Is the control device connected as per the electrical circuit diagram?
- Are the sensors (temperature and humidity) connected as per section 0, page 19 ff?
- Have all the neutral conductors been laid on the N- bus bar in the sauna control device?
- Have all the earthing conductors been laid on the PE-bus bar in the sauna control device?
- Have all the screws been tightened correctly?

7.3 Switching on and switching off the sauna control

Read the operating manual and the safety instructions thoroughly and follow them before switching on.

→ See operating manual "Series FCUxx00".

7.4 Functional test of the sauna control device and the electrical consumers

- Check the safety OFF. For this purpose disconnect the STB circuit directly on the oven sensor during the sauna operation. The heating system must switch off automatically. The corresponding message is displayed on the display.
- Check the oven sensor. For this purpose disconnect the oven sensor circuit directly on the oven sensor during the sauna operation. The heating system must switch off automatically. The corresponding message is displayed on the display.
- For the available bathing options "Sauna", "Sauna with humidity" and "Infrared", check whether the phases L1, L2 and L3 have been connected to the appropriate terminals (see circuit diagram).
- Check the electrical consumers like the cabin light, cleaning light and fans. It must be possible to switch on and switch off the electrical consumers through the corresponding operating keys on the sauna control or the operating control.
- Check the rotating direction of the fan.
- Check the function of the electrical consumers, which are connected to the optional inputs and outputs.



NOTE!

Operation of a standard oven:

In case of standard oven, the phases W, V and U are switched off one after the other just before reaching the set temperature. While reheating, the phases U, V and W are switched on one after the other.



NOTE!

Bathing option "Sauna with humidity ":

In case of the bathing option "Sauna with humidity ", the phase W is generally not activated for the heating system. Through the phase VERD/Wb, the evaporator is activated. After this bathing option has ended, the drying program starts automatically (→ see operating manual). With the drying program the phase W is activated again for the oven.



NOTE!

Operation of a foil heating:

In case of foil heating there is no temperature related switching. Phases U, V and W are simultaneously switched on and off.

** Moist operation possible only with the corresponding optional output!*



NOTE!

Operation of a gas oven:

The control device must be configured especially for the operation of a gas oven.

It is possible to connect a gas burner (burner 1) to phase U and gas burner (burner 2) to phase V. Phase W in this variant is meant for the exhaust. Phase V for the burner 2 is switched off at a temperature difference of 5 K below the set temperature.

The exhaust is active while the gas burner is heating.

** Moist operation is possible only with the corresponding optional output.*



NOTE!

Operation of a thermal oil oven:

The control device must be configured especially for the operation of a thermal oil oven.

It is possible to connect a supply fan for heating to phase U and a bypass to phase V. For both outputs is a control signal 0...10V available.

7.5 Functional test of the sensor



NOTE!

- If the sensor or the sensors have not been properly connected then a signal is sounded and an error message is displayed on the display.
→ See also operating manual "Series FCU2x00/FCU3x00/FCU4x00".

- Check the display of the temperature value; therefore press and hold down the keys ◀ and ▶ simultaneously in the menu "set temperature", at FCU5x00 and at the APP in the menu "Basic settings – Info – Sensor". If required, compare the displayed value with the value on a reference temperature measuring device. After approximately 10 minutes of operation the displayed temperature must increase significantly.
- In case of the bathing option "Sauna with humidity" and a connected humidity sensor, check the displayed value of the humidity sensor. If required, compare the displayed value with the value on a reference humidity measuring device. After approximately 10 minutes of operation of the evaporator, the displayed humidity value must increase significantly.
- If two temperature sensors (oven, bench or combined bench sensor) are connected, then after 10 minutes of operation of the heating system, the temperature displayed for the oven sensor should be higher than that of the bench sensor. If required, change the connections in the sauna control.

8 General Information

8.1 Liability limitation

All the details and instructions in this manual have been compiled taking into consideration the relevant standard specifications and stipulations and the state-of-the-art technology as well as our knowledge and experience of many years.

The manufacturer does not take any liability for damages caused by:

- Non-compliance to the operating and installation manual
- Improper use
- Unauthorized alterations
- Technical changes
- Use of unapproved spare parts and consumables.

The actual scope of delivery can deviate from the explanations and the presentation given here in case of special designs, additional orders or technical updates.

Otherwise the obligations agreed upon in the delivery contract, the general business conditions as well as the delivery terms of the manufacturer and the legal regulations valid at the time of concluding the agreement are applicable

Guarantee The guarantee period of the manufacturer starts from the time of dispatch by the manufacturer and is valid for 24 months. The delivery date can be determined from the device number on the nameplate.

The manufacturer does not assume any liability which differs from this regulation. Guarantee claims must be submitted to the sauna manufacturer or dealer.

8.2 Copyright

Handing over the operating and installation manual to a third party without the written consent of the manufacturer is not permitted.



NOTE!

The details, texts, drawings, pictures and other representations in this manual are protected by copyright and subjected to the industrial proprietary laws. Any misuse is liable to punishment.

Reproduction in any manner or form – even as excerpt- as well as use and/or conveying of the content without written consent of the manufacturer is not permitted.

8.3 Scope of delivery

For information on the scope of delivery, pl. see the delivery note.

8.4 Spare parts



CAUTION

Danger of injury due to incorrect spare parts

Incorrect or defective spare parts could lead to damage, incorrect functioning or total breakdown and can impair the safety.

Therefore:

- Use only original spare parts of the manufacturer.
 - Repairs of the sauna control should be carried out only by the technical experts.
-

Obtain spare parts from the installer or the dealer of the sauna unit. For address see the invoice, delivery note or the reverse of the manual.

8.5 Customer service

Your dealer or the installer of the sauna unit can provide technical information on request.

The address you can find on the invoice, delivery note or the reverse of this manual.



NOTE!

For quick processing, before calling note down the data on the nameplate as well as the model, serial number, version etc..

8.6 Light and fan

Light and fan



ATTENTION! Light and fan:

9 At the dimmable outputs of light and fan, only 230V consumer, or for low voltage iron core transformer which are suitable for phase cut **on**, will be permitted.

Electronic transformer for phase cut **off** may **not** be connected.

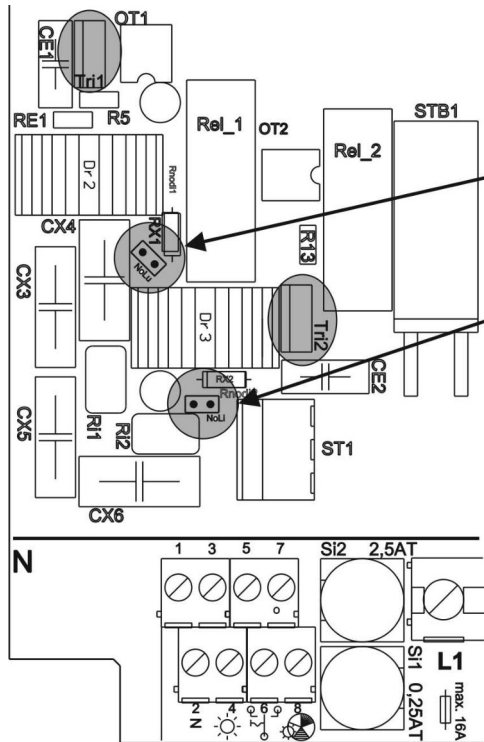
9.1.1 Disable light brightness or fan speed, or exchange triac

ATTENTION



DANGER! Danger to life due to electric potential!

Before starting any maintenance jobs, the control unit must be separated from the mains at all poles!



If light and/or fan are not suitable for phase cut **on**, you can disable this feature.



Fan speed (clamp 1) enabled



Fan speed disabled, only ON/OFF



Light dimming (clamp 3) enabled



Light dimming disabled, only ON/OFF

The jumpers are located only on one side of the pins (as in the picture above) or they are in the by-pack kit of the control unit.



Disable user menu for fan speed / light-brightness per "DIP switch S1"

DIP 4=ON, menu fan speed disabled

DIP 5=ON, menu light brightness disabled

If the light dimming no longer works through a defect in the bulb, then the triac „Tri2“ and possibly the fuse „Si2“ are blown. When replacing the triac (1 spare part is included in the by-pack kit), set the new component in correct position (mark metal flag) into the socket. Make sure that all pins are properly in the socket and then press gently.

If the fan control have been destroyed by a defect, the same applies for triac „Tri1“.



10 ATTENTION! 11 Note ESD protection!

Do not touch on electrical parts because of ESD protection
Take appropriate protections. Touch a grounded piece of metal as a minimum protection.

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Notes:

Address of the contractor/installer or the dealer of the
sauna unit: