wavin

CONNECT TO BETTER

Application manual

Sentio

New generation control system underfloor heating & cooling

Version 1.0 (2) | July 2018

Sentio

Mexichem
Building & Infrastructure

1. Content

CONNECT TO BETTER

2. Introduction

CONNECT TO BETTER

Congratulations with purchasing this Sentio underfloor heating and cooling control system! We wish you a convenient installation and commissioning of the system. As a help we prepared this manual for you. Please read through this guide before beginning any installation works or operating the controls for your own safety and the best possible result. Enjoy Sentio! It is important that the contents of purchased products are checked upon delivery, and that any damaged or missing items are reported immediately.

The Sentio 16-zone control system can be used with both wired and wireless thermostats and sensors to control the room temperature, as part of a heating and cooling system.

Please make sure that you are permitted and competent to carry out electrical installation and/or servicing work to such kind of systems to open the control unit or make any modifications. Such in accordance with (local) regulations whom might differ from country to country. This system complies with all relevant EU-laws & regulations.

2.1. How to use this manual

This manual is set up in a way that it will guide you through your installation process. Sentio is a climate control system that offers a wide range of possible combinations with heat/cold sources, peripherals or building structures.

You get a general overview about the system`s components and how to install and connect them. All latest information regarding can be found on the Wavin website www.wavin.com.

You can then choose the specific chapter reflecting your situation. This will give you further information on how to set up your system.

It is prohibited to make any changes and/or modifications not specified in this manual. Furthermore the installer shall take care that all power supplies are locked (switched off) before starting installation/wiring works.

Sentio

2.2. Overview of available components

Component	Art. code
Wired Thermostat	3077000
Wired Thermostat & Actuator	3077024
Wireless Thermostat	3077001
Wireless Thermostat & Actuator	3077025
Wired Temperature/Humidity Sensor	3077002
Wired Temperature/Humidity Sensor & Actuator	3077027
Wireless Temperature/Humidity Sensor	3077003
Wireless Temperature/Humidity Sensor & Actuator	3077028
Wireless Thermostat with Infrared Floorsensor	3077004
Wireless Thermostat with Infrared Floorsensor & Actuator	3077026
Wallbox Frame for Thermostat or Sensor	4063803
Central Control Unit (CCU), 8 input/16 output, no cable	4063796
Central Control Unit (CCU), 8 input/16 output, F plug	4063797
Central Control Unit (CCU), 8 input/16 output, G plug	4063798
Central Control Unit (CCU), 8 input/16 output, K plug	4064446
Extension Unit (EU-A) for Central Control Unit, additional 8 input	4063800
Extension Unit (EU-VFR) for Central Control Unit, 6 Voltage Free Relays	4063801
Commissioning Touch Screen (LCD-200)	4063802
Wired Outdoor Sensor	4063806
Wireless Outdoor Sensor	4063807
External antenna (3pin)	4063809
Wired Floor Sensor	4063810
Pipe sensor, strap on	4064150
Actuator 24V NC VA50	4054937
Sentio Connection cable for PC (Windows)	4064828
Sentio Servo motor 3-pos., 24V	4064829

2.3. Components

Central Control Unit, Extension Unit A, Extension Unit VFR

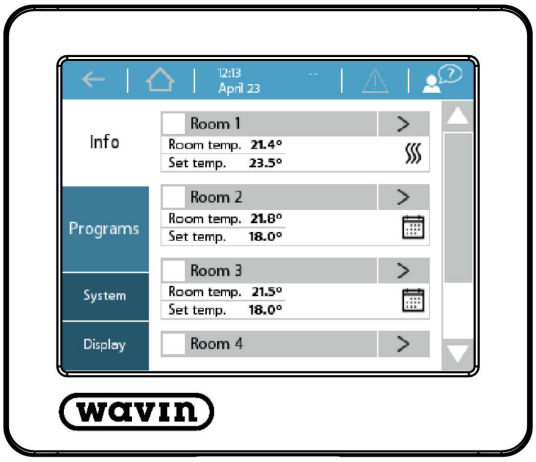
The Central Contol Unit (CCU) for heating and cooling is the heart of the Sentio System. By choosing one of the pre-set profiles it takes control over the heating and cooling system. The CCU can be used with up to 24 wired or wireless thermostats or sensors (inputs) and up to 16 thermal actuators (outputs) to control up to eight different zones. Furthermore, it contains five temperature inputs and two outputs, two voltage free relays (230V) and two pump relays.

The CCU can be mounted directly on a wall and comes provided with built-in water leveller and screws and dowels. Alternatively, the CCU can be mounted on a 35 mm DIN-rail.

The CCU's possible range of applications can be enlarged by combining it with extension units to connect to eight extra outputs (EU-A) to control up to eight additional zones or up to six extra voltage free relays (EU-VFR). The maximum amount of outputs is limited to control 16 thermal actuators.

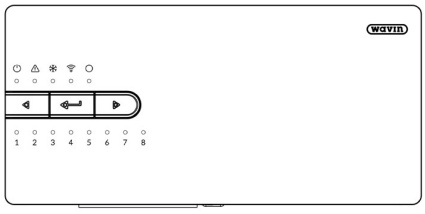
The CCU must be connected to the corresponding peripherals (e.g. thermostat) that provide the demanded information about the zones to be controlled. The heating/cooling usually is controlled via the set room temperature but also floor temperature and humidity can be used as limitations.

Commissioning Touch Screen / PC

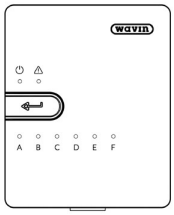


The touch screen can be used for a comfortable commissioning of the Sentio system. One touch screen can be used for several CCUs. It is not necessary for the daily use of the Sentio system to have a touch screen, although it is offering extra insights of the system behaviour. It is only required for the set-up of the system. The touch screen is connected via an Ethernet cable (included in packaging) to the CCU.

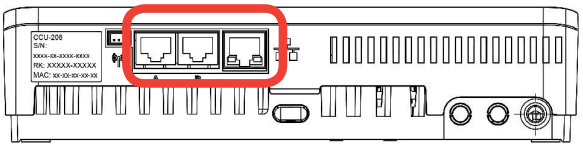
Alternatively, the commissioning can be done via the PC. The CCU-200 can be commissioned via a laptop. this is done by plugging into the USB connection on the control unit. The same functionalities are available on the laptop as the touchscreen. The tool for the commissioning via the PC can be downloaded via www.wavin.com.



Central Control Unit (CCU).



Extension Unit A (EU-A).

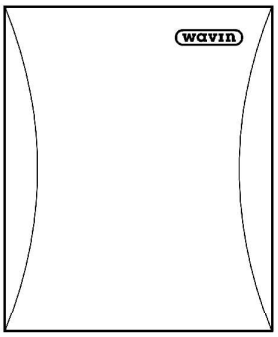


Bottom Central Control Unit, incl. RJ45 ports to connect the touch screen/PC and LAN connection.

External Outdoor Temperature Sensors

There are two different types of external temperature sensors available. A wired and a wireless one. Both cover the same range of application and only differ by the way how they are connected to the CCU.

An external temperature sensor is needed when any temperature within the whole underfloor heating/cooling system needs to be controlled by considering weather compensation. Therefore Wavin offers this option in order to ensure a most efficient working system and to reduce energy consumption. The outdoor sensor shall be installed at the north side of the building, protected against solar gain.



Wired/Wireless Outdoor temperature sensor. Wireless sensor incl. 2x CR123A-batteries.

External Antenna

The Sentio system makes use of radio transmission signals and the frequency is reserved for similar applications which might imply interferences. However this chance is very small. Sometimes it is not possible to establish a problem free radio communication. To enlarge the range that is covered by the wireless connection between the CCU and the peripherals an external antenna can be used.

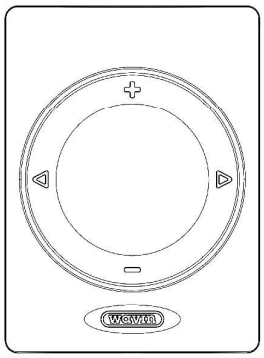
Thermostat / Sensor

Thermostats and Sensors provide the necessary information about the rooms that have to be controlled by the CCU.

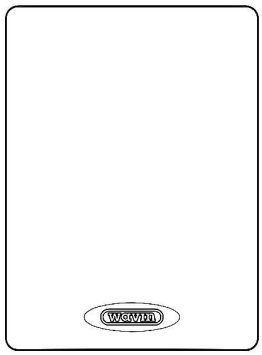
The Sentio system includes both wired and wireless versions. Wired peripherals can be connected via a BUS cable to the CCU. Furthermore, a floor temperature sensor can be connected to the wired thermostats and sensors. The wireless thermostat is also available with an infrared sensor that measures the floor temperature.

Thermostats and sensors measure the room temperature, the humidity and if needed the floor temperature. Via the thermostats the room temperature can be set and the room`s status is shown. Also, some settings can be changed or set by the end-user or for deeper settings by the installer. When the CCU is connected to the internet all information can be monitored via the Sentio app and the same settings can be done via the app. If a touch screen is connected to the CCU the same (and more) settings are accessible.

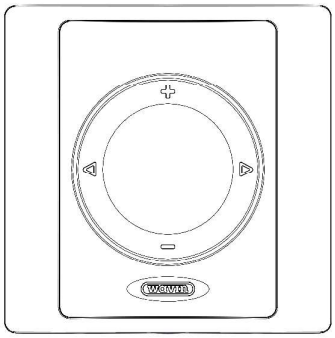
Only Sentio thermostats and sensors can be used with a Sento control unit. Products of other providers are not compatible.



Thermostat.



Sensor.



Thermostat in wallbox frame

When a wall box frame (60 mm type) is used a dedicated frame is available in order to host the thermostat/sensor and to cover the full wall box frame. The frame is suitable for all offered thermostats and sensors, also for the ones with floor sensor.

Floor Sensor

A floor sensor can be mounted to the wired thermostats/sensors in those cases that the floor temperature shall be monitored and /or controlled in order to prevent damages to the floor due to too high temperatures. Floor sensors are available for the Sentio system.

Thermostats and sensors measure the room temperature, the humidity and if needed the floor temperature. Via the thermostats the room temperature can be set and the room`s status is shown. Also, some settings can be changed or set. When the CCU is connected to the internet all information can be monitored via the Wavin Sentio app and the same settings can be made via the app. If a touch screen is connected to the CCU the same (and more) settings are accessible.

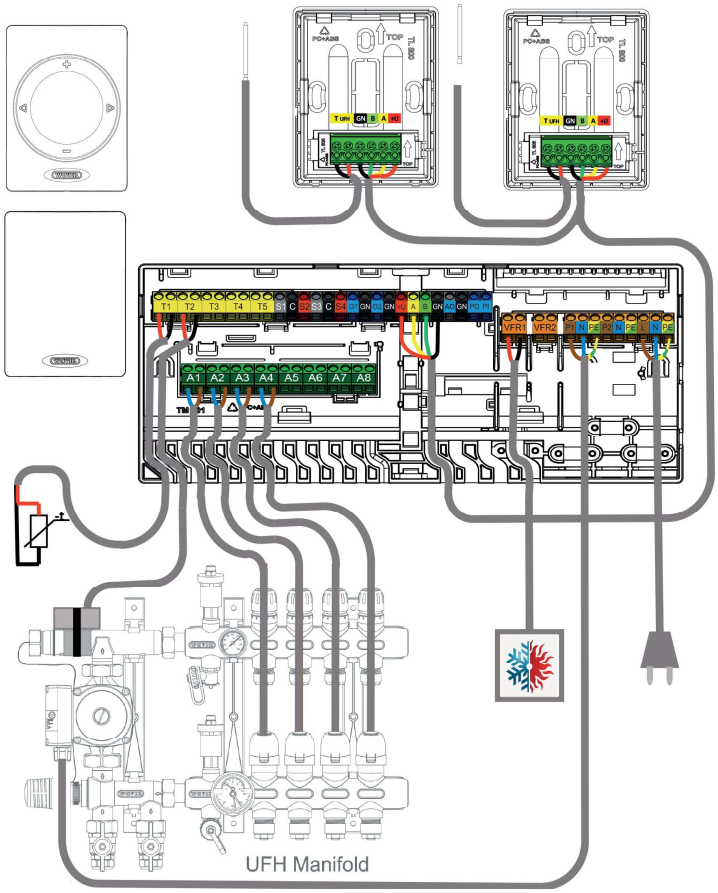
Mixing Unit and Actuators

The CCU gives the required signals to the components of the mixing unit (e.g. circulation pump) and the actuators. The circulation pump will be activated when any channel has a heat/cold demand. The actuators on the manifold have to be 24V NC thermoactuators. The CCU`s and EU-A's terminals are designed to connect max. two actuators per output. The maximum no. of actuators per CCU, incl. EU-A, is limited to 16 actuators.

With one CCU in total two complete mixing units can be controlled.

From the mixing unit the inlet temperature is measured via an inlet temperature sensor and connected to the CCU. In case a profile is selected with ITC (Inlet Temperature Control) functionality also an outlet temperature sensor is required and to be connected to the CCU.

The inlet temperature sensor acts as a high temperature cut-off device and protects the system against too high temperatures.



Terminal cable set-up.

Technical Data	Actuators
Operating voltage	24V AC/DC, +20%...-10%
Max. inrush current	< 300mA during 2 min. max.
Operating power	1W[1]
Stroke (actuator travel)	5mm
Actuating force	100N ±5%
Fluid temperature	0°C – 100°C
Type of protection	IP 54 / II
CE conformity according to	EN 60730
Connecting cable	2x 0.75 mm²
Cable length	1m
Surge protection according to EN 60730-1	Min. 2.5kV

[1] Measured with precision reference instrument LMG95

3. Connect

General

Considerations where to place the CCU including that EUs can be installed in different ways at different locations. All components must be installed and grounded in compliance with the local regulations.

3.1. Central Control Unit and Extension Units

Mounting of the Central Control Unit and Extension Units

Identify a suitable location to mount the Central Control Unit (CCU) or Extension Unit (EU). It should be mounted:

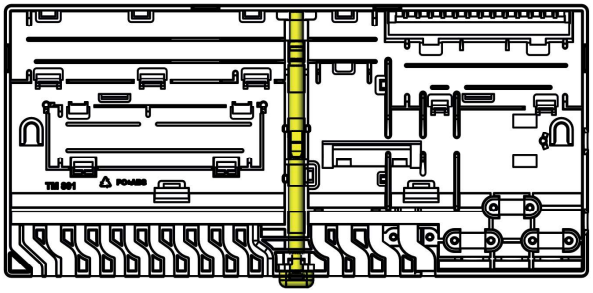
- In a dry, indoor environment with a relative humidity of no more than 85%.
- Where it will not be exposed to temperatures less than 0°C or greater than 40°C.
- Not inside metal cabinet, as this will harm wireless communication.
- Above the manifold, within cable reach of the valve actuators and the circulator on the control pack
- The CCU can be mounted to the wall using its integrated water leveller.
- Alternatively, CCU and EUs can be mounted on a 35 mm DIN Rail.

A 230V AC 50Hz power supply is needed for the CCU and has to be available. When the Sentio app shall be used the CCU needs to be connected to the internet via a LAN cable. When EUs are used, and the items will not be mounted on a DIN-rail connect them with the attached connection elements. The connecting element ensures a firm connection while maintaining a predefined distance between the base plates of CCU and EUs.

Open/Close Central Control Unit and Extension Units

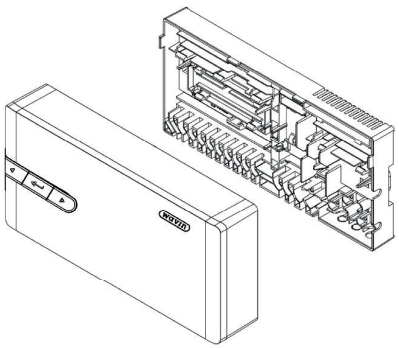
To mount CCU and EUs they must be opened first. They are secured against opening itself by a fixation system (locking-pin). Use a screw driver to move the locking-pin down. You will hear a “click”. Upon delivery the CCUs and the EUs are not fully closed and can be opened easily.

You can open the unit by moving the top plate upwards (unit laying in front of you) or ahead (mounted on the wall). To close the units later again, put the top plate on again. Push firmly on the locking-pin by hand until you hear a clear a “click” again.

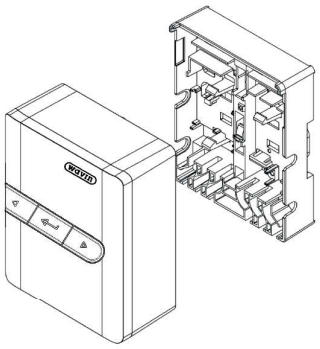


CCU back plate incl. locking-pin.

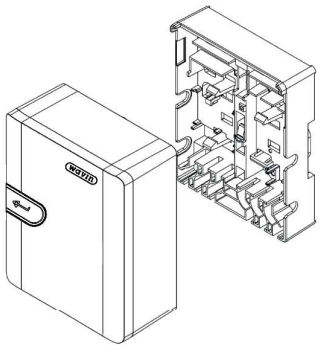
When EUs are used, and the items will not be mounted on a DIN-rail, connect them with the attached connection elements to ease the installation and to ensure a firm and stable positioning. The connecting element ensures a predefined distance between the base plates of CCU and EUs and helps to keep water level balance



CCU Exploded view.



EU-A Exploded view.



EU-VFR Exploded view.

Mounting CCU and EUs on the wall

To mount the units on the wall, use the attached screws (and plastic dowels). Screws – diameter 4.0 mm length 40.0 mm; Dowels – for 8 mm drilled hole.

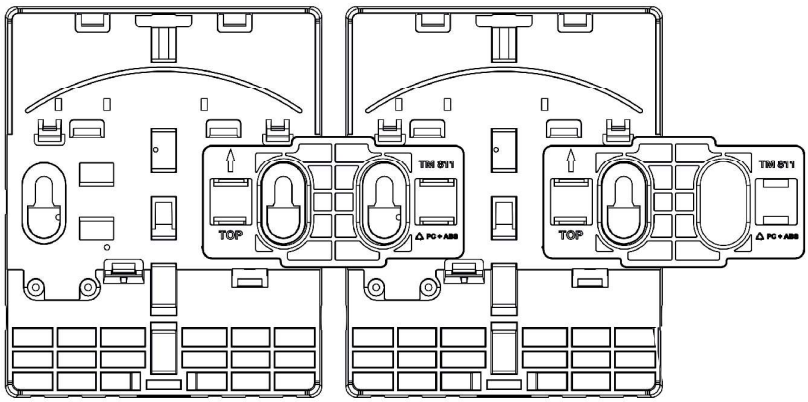
To ensure a proper wall mounting the water leveller, integrated to the CCU, can be used. Connect the EUs with the connection elements to ease the installation and to ensure a firm and stable positioning.

By using the connecting element (supplied with the EUs), it is possible to mount the units with one screw per item instead of two.

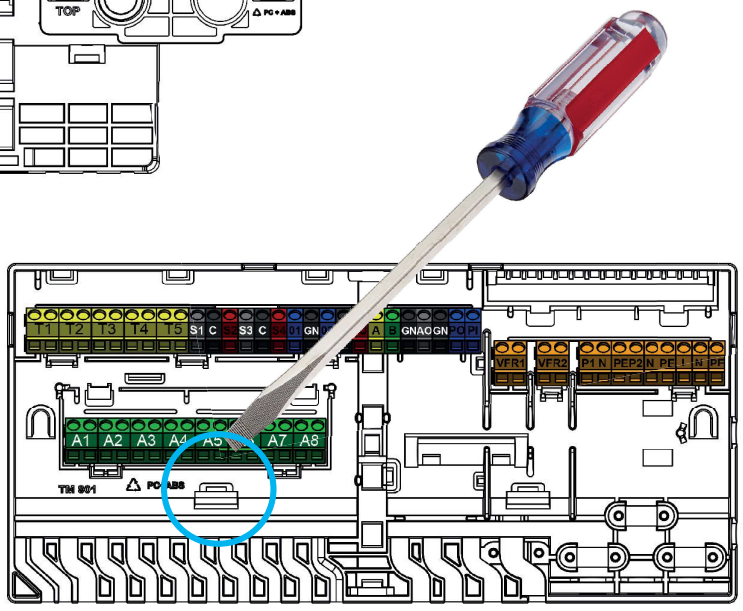
Mounting / Demounting CCU and EUs on a DIN-rail

The units' base parts are suitable to be mounted on a 35 mm DIN-rail (type O, EN 50022). They can be clicked on a mounted DIN-rail or the DIN-rail can be inserted in from the side. The connection elements cannot be used when the units are mounted on a DIN-rail.

The CCU has two and the EUs have one pair of locks for the DIN-rail. A screw driver can be used to unlock and release the units again for demounting from the DIN-rail.

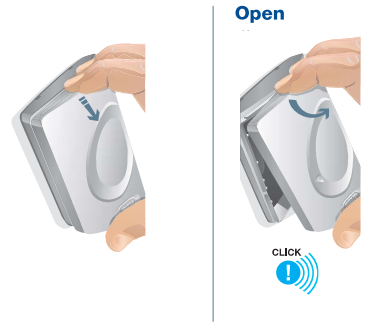


EUs connected with connection element.

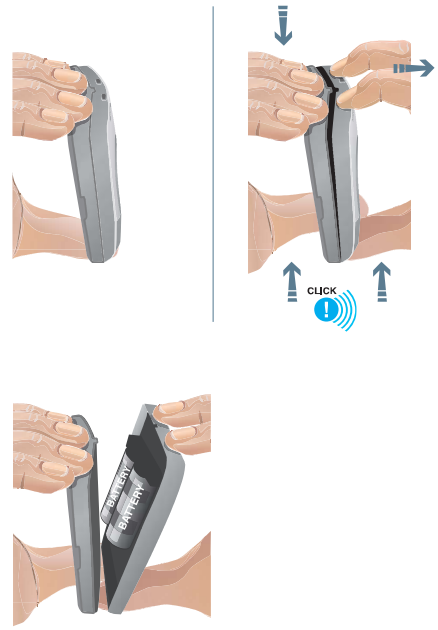


Demounting CCU and EUs from a DIN rail

Wall mounted



Hand held



3.2. Room thermostats and sensors

Opening/Closing thermostats and sensors

Upon delivery the thermostats and sensors are not fully closed and can be opened easily. The below described procedure for installation to a wall shall be followed. Do not use any tools for opening as this will damage the products.

Identifying a suitable location

Identifying a suitable location to mount the thermostats requires careful planning. It is critical to achieve energy efficient control of the heating system. It is recommended that you discuss it with the property owner or specifier to understand for their preferences.

Generally, thermostats should be mounted:

- In a dry, indoor location
- Approximately 1.2 m to 1.5 m above the floor level
- In an area with good air circulation
- Away from:
  - Draughts caused by adjoining rooms or windows
  - Dead air spots such as those behind a door
  - Radiant heat such as direct sunlight
  - Convection heat from a heat emitter
- Avoid mounting wireless thermostats directly on or against metal surfaces or bases which may impair radio communication

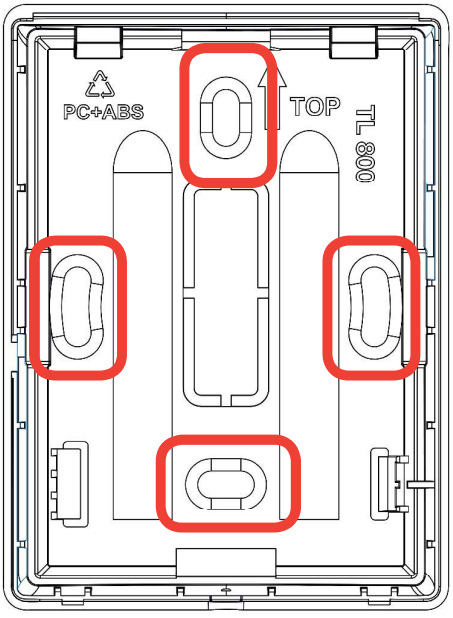
The floor sensor is normally positioned about 1.5 m from the wall and directly aligned to the thermostat / sensor. The floor must be installed between 2 pipes.

Mounting wireless thermostats / sensors without a frame

1) Open the thermostat to mount the back plate on the wall

2) Check the “TOP” indication and use the supplied screws. Ensure that the wall is flat. Always use at least two screws to ensure a firm mounting of the back plate. These two screws shall be opposite each other.

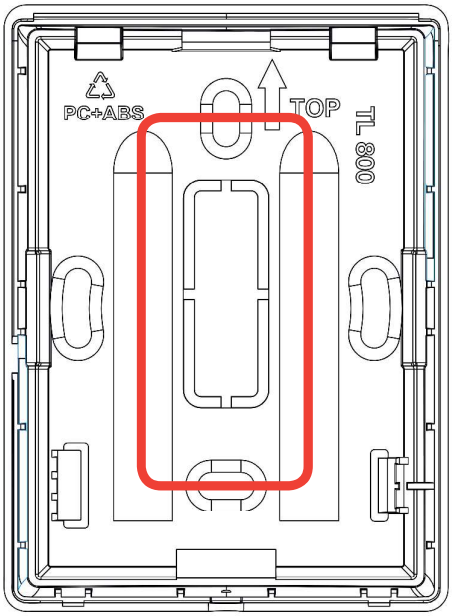
3) Now the base plate of the thermostat/sensor is ready to mount the top part.
One of the options to enrol a wireless thermostat/sensor to the CCU/EU is to add batteries after having chosen the enrolment function at the CCU (please see in the chapter “enrolling”). When you want to use this way, please do not close the thermostat/sensor. Otherwise please add two A++ batteries to the top-part of the thermostat/sensor and consider their correct direction. Then position the top end of the front plate on the back plate (TOP to TOP, signed by arrows on both plates). Once the top is positioned, the front plate can be connected to the back plate by pushing on the WAVIN logo till a ‘click’ is heard.



Back plate thermostat/sensor.

Mounting wired thermostats / sensors without a frame

1) Open the thermostat and remove the foreseen space for the cable at the predetermined breaking points.



Back plate thermostat/sensor.

2) Check the “TOP” indication and use the supplied screws. Ensure that the wall is flat enough. Always use at least two screws to ensure a firm mounting of the back plate. These two screws shall be opposite each other’s. The BUS cable must be guided through the foreseen whole.

3) Connect the BUS cable to terminal block, please see instruction in paragraph page 21.

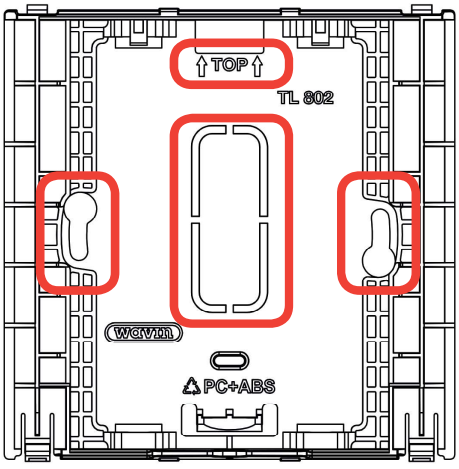
4) Now the base plate of the thermostat/sensor is ready to mount the top part. Position the top end of the front plate on the back plate (TOP to TOP, signed by arrows on both plates). Once the top is positioned, the front plate can be connected to the back plate by pushing on the WAVIN logo till a ‘click’ is heard.

Mounting thermostats / sensors when wall-box is used

When using a frame, the frame`s base plate must be mounted on the wall box (60 mm) and the thermostat/sensor later will be clicked in.

1) Open the frame to mount the back plate on the wall. If the frame shall be used for a wired thermostat/sensor, remove the foreseen space for the cable at the predetermined breaking points.

2) Check the “TOP” indication and use the supplied screws. Ensure that the wall box is mounted correctly. Always use two screws to ensure a firm mounting of the back plate. These two screws shall be opposite each other’s. The BUS cable must be guided through the foreseen wholes.



Back plate wall-box frame.

3) Now the base plate is mounted, and the thermostat/sensor can be added.
Wireless ones can be pushed in upright and the snap will connect frame and thermostat/sensor.

When a wired thermostat/sensor is used first the foreseen space for the cable must be removed from the thermostat`s/sensor`s backplate at the predetermined breaking points and the BUS cable must be guided through the foreseen hole. Then the thermostat/sensor can be pushed in upright, too, and the snap will connect frame and thermostat/sensor.

3.3. Accessories

Mounting the External Antenna

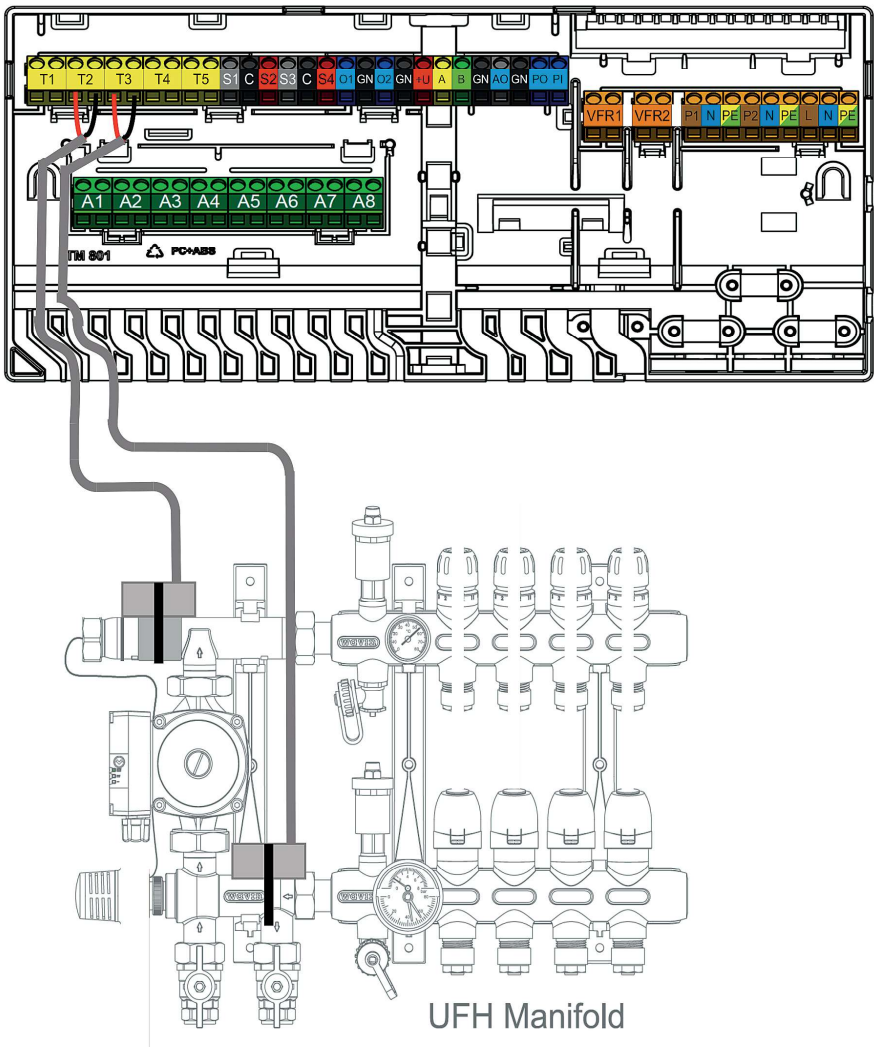
The external antenna, when used, shall be installed closed to the CCU taking the connected cabel`s length into consideration in order to improve the radio signal strength. The installer shall determine the best possible location in order to ensure the most powerful signal and avoid for example thick walls and steel constructions.

Mounting the Outdoor Temperature Sensor

The outdoor sensor that is used for weather compensation and has an influence on the heating curve (only for condensing boilers and ITC regulation) shall be mounted on a north wall away from solar.

Within the Sentio system a wireless and wired (BUS system) outdoor sensor is available as per paragraph 2.3

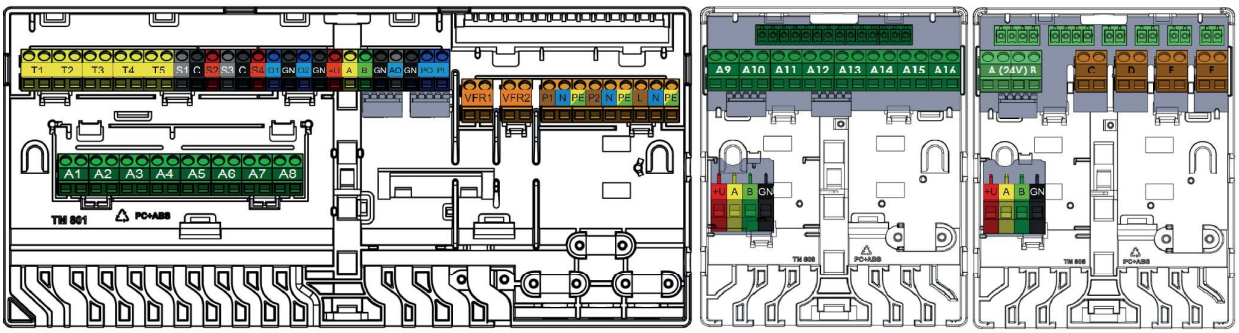
Mounting Inlet/Outlet Temperature Sensor on the Mixing Unit



Mounting inlet/outlet sensors on a mixing unit and wired connection with CCU.

3.4. Wiring of the System

Terminals CCU and EUs



Terminals CCU and EUs.

CCU Input/Output List

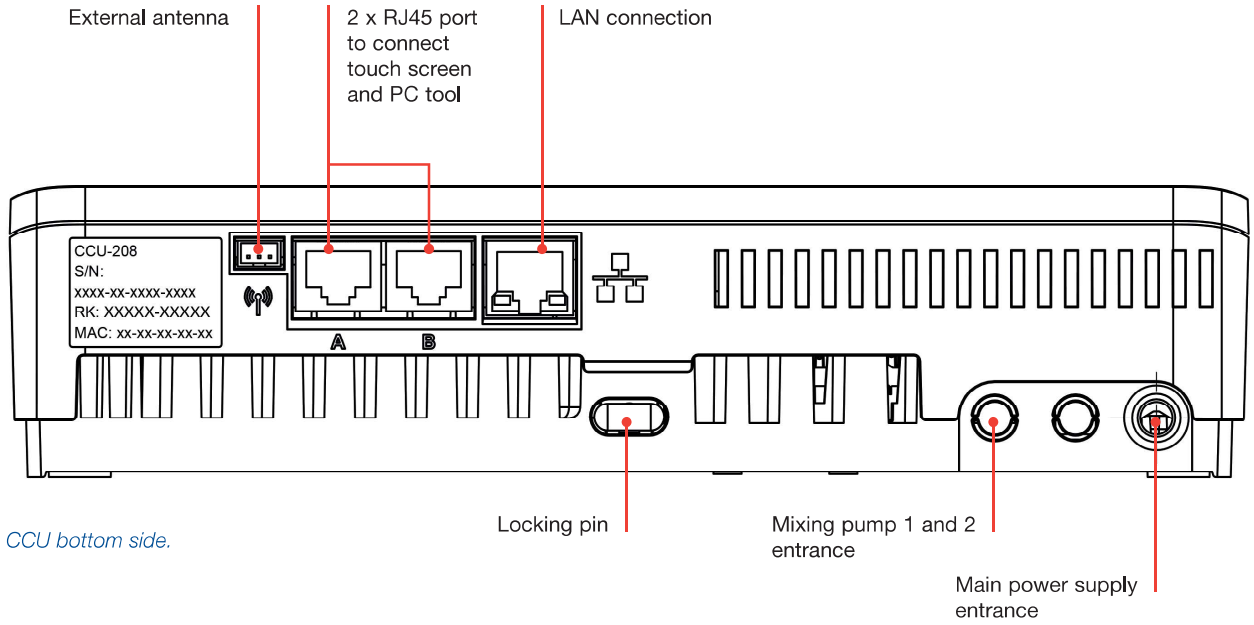
Purpose	Number of terminals	Label	Color	Description
Thermoactuator 1-8	2/actuator	A1-A8		Electronic output intended for 1 or 2 pcs of thermal actuator 24V 1W/pc
Temperature sensor 1	2	T1		Input for NTC-10kΩ temperature sensor, default outdoor temperature sensor (not being Sentio outdoor temperature sensor)
Temperature sensor 2/4	2/sensor	T2/T4		Input for NTC-10kΩ temperature sensor, default inlet temperature sensor mixing units
Temperature sensor 3/5	2/sensor	T3/T5		Input for NTC-10kΩ temperature sensor, default outlet temperature sensor mixing units
ITC Servo output 1 24V 2W	3	S1		0-10V output or S+ output for 3point for servo , maximum load 24V 2W
		C		Common terminal for servo ITC1
		S2		+24V for 0-10V servo or S- signal for 3point servo maximum load 24V 2W
ITC Servo output 2 24V 2W	3	S3		0-10V output or S+ output for 3point for servo maximum load 24V 2W
		C		Common terminal for servo ITC2
		S4		+24V for 0-10V servo or S- signal for 3point servo maximum load 24V 2W
General Purpose I/O1	2	IO1		ON/OFF universal Input / Output. Input 5V 5mA, output = O.C. 100mA
		C		Common terminal for GPIO1
General Purpose I/O2	2	IO2		ON/OFF universal Input / Output. Input 5V 5mA, output = O.C. 100mA
		C		Common terminal for GPIO2
ROXI BUS connection wired Sentio components	4	+U		+ 24V for ROXi BUS, maximum output current controlled by power management
		A		A data signal for ROXi BUS
		B		B data signal for ROXi BUS
		GN		Ground for ROXi BUS
Analog output 0-10V	2	AO		Analog output 0-10V / "+"
		GN		Common terminal for AO, PO, PI / "-"
PWM - out	1	PO		PWM output 100Hz-5kHz, using common terminal C with analogue output AO 3)
PWM – in	1	PI		PWM input 100Hz, using common terminal C with analogue output AO 3)
Voltage Free Relay 1	2	VFR1		ON/OFF voltage free relay, AC 24-230V, 1A,
Voltage Free Relay 2	2	VFR2		ON/OFF voltage free relay, AC 24-230V, 1A,
Mixing Pump 1	3	P1		ON/OFF output for circulation pump1, AC 230V 1A, switched to Mains L
		N		Neutral for Pump1, connected to mains N
		PE		PE for Pump1, connected to mains PE
Mixing Pump 2	3	P2		ON/OFF output for circulation pump2, AC 230V 1A, switched to mains L
		N		Neutral for Pump2, connected to mains N
		PE		PE for Pump2, connected to mains PE
Mains / Power supply	3	L		Main power input – Live
		N		Main power input – Neutral
		PE		Main power input – PE

EU-A Input/Output List

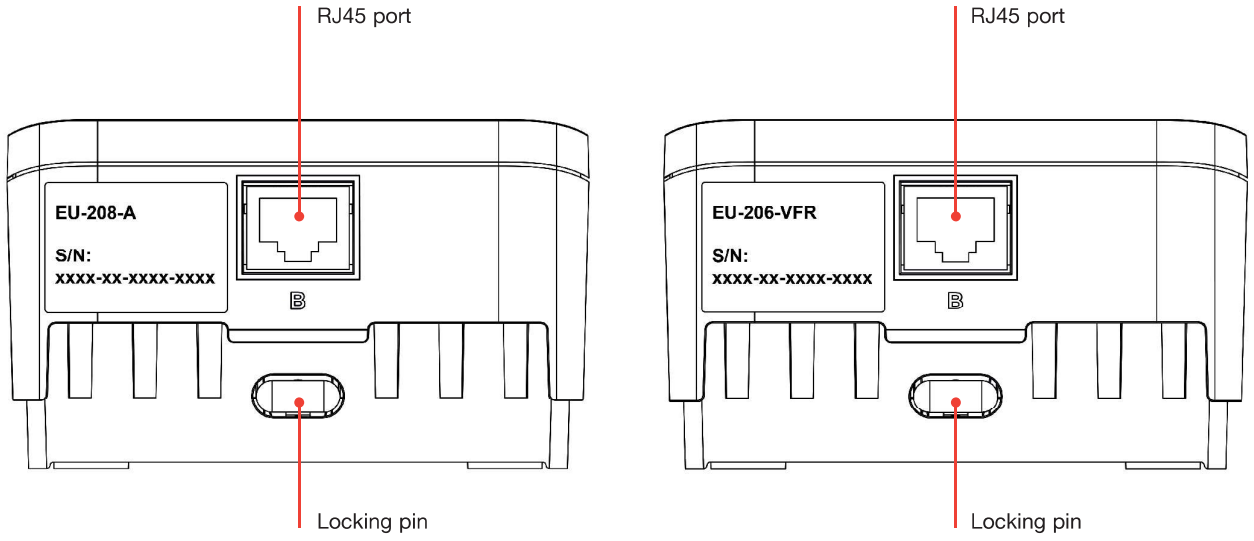
Purpose	Number of terminals	Label	Color	Description
Thermoactuator 9-16	2/actuator	A9-A16		Electronic output intended for 1 or 2 pcs of thermal actuator 24V 1W/pc
ROXI BUS connection wired Sentio components	4	+U		+ 24V for ROXi BUS, maximum output current 0.1A
		A		A data signal for ROXi BUS
		B		B data signal for ROXi BUS
		GN		Ground for ROXi BUS

EU-VFR Input/Output List

Purpose	Number of terminals	Label	Color	Description
VFR relay A/B	2/VFR	A/B		Voltage free relay output, DC/AC 24V, 1A each, Intended for similar voltage loads, cannot be combined High and Low voltage.
VFR relay C-F	2/VFR	C-F		Voltage free relay output, AC 24-230V, 1A each,
ROXI BUS connection wired Sentio components	4	+U		+ 24V for ROXi BUS, maximum output current 0.1A
		A		A data signal for ROXi BUS
		B		B data signal for ROXi BUS
		GN		Ground for ROXi BUS

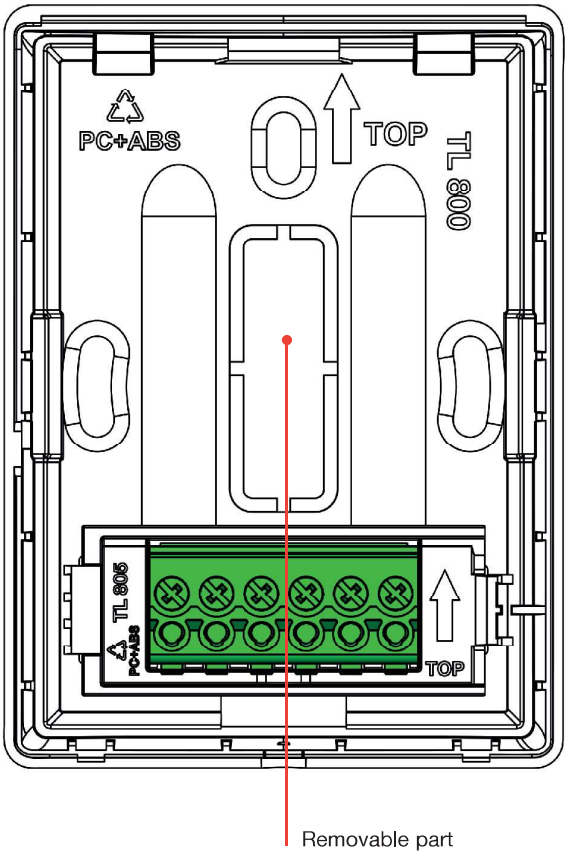


CCU bottom side.



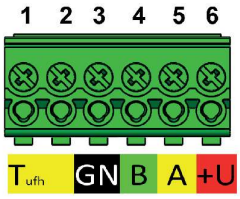
EUs bottom side.

Terminals Wired Thermostat/Sensor



Terminal block description

1	External temperature sensor
2	External temperature sensor
3	GND (BUS Roxi)
4	B channel (BUS Roxi)
5	A channel (BUS Roxi)
6	+U (BUS Roxi)



Terminals wired thermostat/sensor.

Connecting Components

Connecting CCU and EUs

There are three different ways how to do the physical connection of the CCU and the EUs. The preferred way is the internal connection via the interconnection cables provided with the CCU/EUs. But in those cases, in which two mixing units are installed the EU can be located next to the 2nd mixing unit and connected to the CCU via the BUS or via UTP/RJ45 cable.

The following interconnections are possible:

- **Local internal**: Internal cable (included in supply of EU) inserted to internal connectors (all internal connectors have the same function, see picture).
- **Local external**: Ethernet patch cable with 4 twisted pairs (UTP) with wires AWG24 max. 97miliOhms/m inserted to external RJ connectors signed “B”. Cable length significantly depends on number connected thermos actuators - see table below.
- **Remote**: Use cable recommended type CC-01 connected to BUS terminals. Cable length significantly depends on number connected thermal actuators - see table below.

Cable Length for EU-208-A

Cable type	AWG	Resistance Ω /km	Number of actuators	Max. allowable cable length
CC-01 1x2x20 AWG 0,5 mm² 1x2x24 AWG 0,2 mm²	20	38	4 8	30 m 15 m
Copper 1 mm²	17	18	4 8	70 m 30 m
Copper 1,5 mm²	15	12	4 8	100 m 50 m

Cable Length for EU-206-VFR

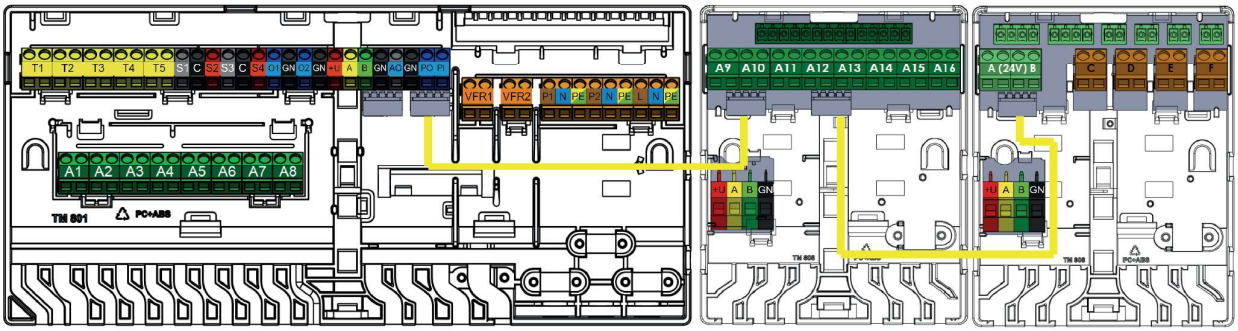
Cable type	AWG	Resistance Ω /km	Max. allowable cable length
CC-01 1x2x20 AWG 0,5 mm² 1x2x24 AWG 0,2 mm²	20	38	100 m
Copper 1 mm²	17	18	200 m

The maximum allowable voltage drop on the power supply is 3V ($U_{min.}$=21V). The maximum allowed data communication distance is 200 m. This is the maximal allowed sum of all cable length in the installation.

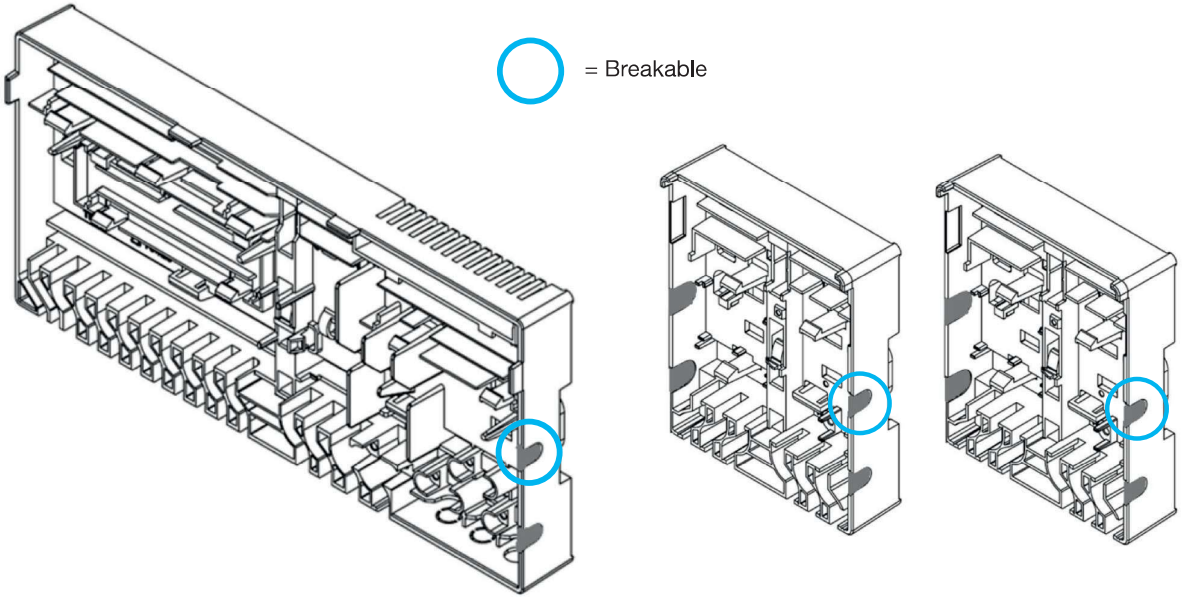
Interconnection Cable

When the interconnection cable is used, it is necessary to break out the breakable parts in the CCU`s and in EUs` top plate. From the backplate nothing has to be removed.

- The interconnection cable is equipped by two grommets to ensure to protect broken holes in plastic against water and uncontrolled movements of the cable.



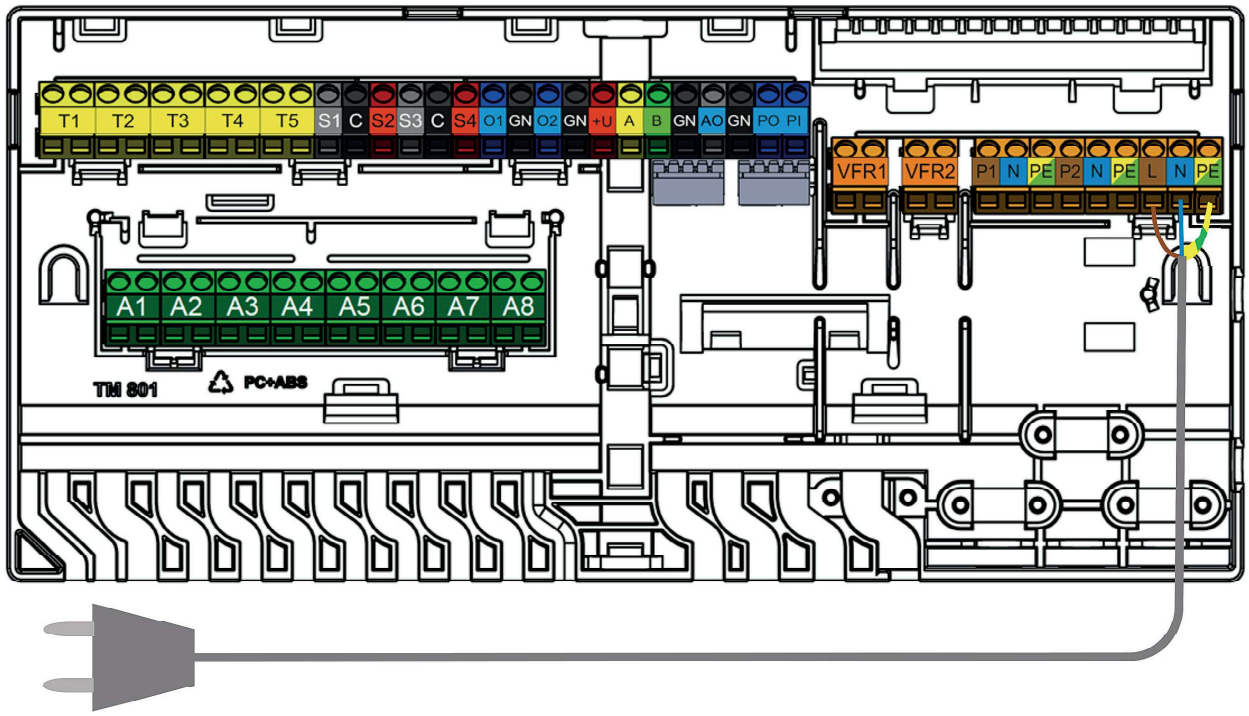
Interconnection cable connections.



Breakable parts at the top plates when using interconnection cables.

Connecting a Power Supply Cable

- The CCU requires a 230V AC 50Hz power supply.
- The maximum load by the CCU is 2,3A.
- The combined load from the CCU, Circulator mixing pump(s) and heat source when powered by the CCU should not exceed 13A.
- The power supply for all interconnected devices, including the heat source and any 3rd party controls, should be isolated from a single point to prevent the risk of electric shock.
- The power supply should not be connected until all wiring within the CCU and any interconnected devices is completed.



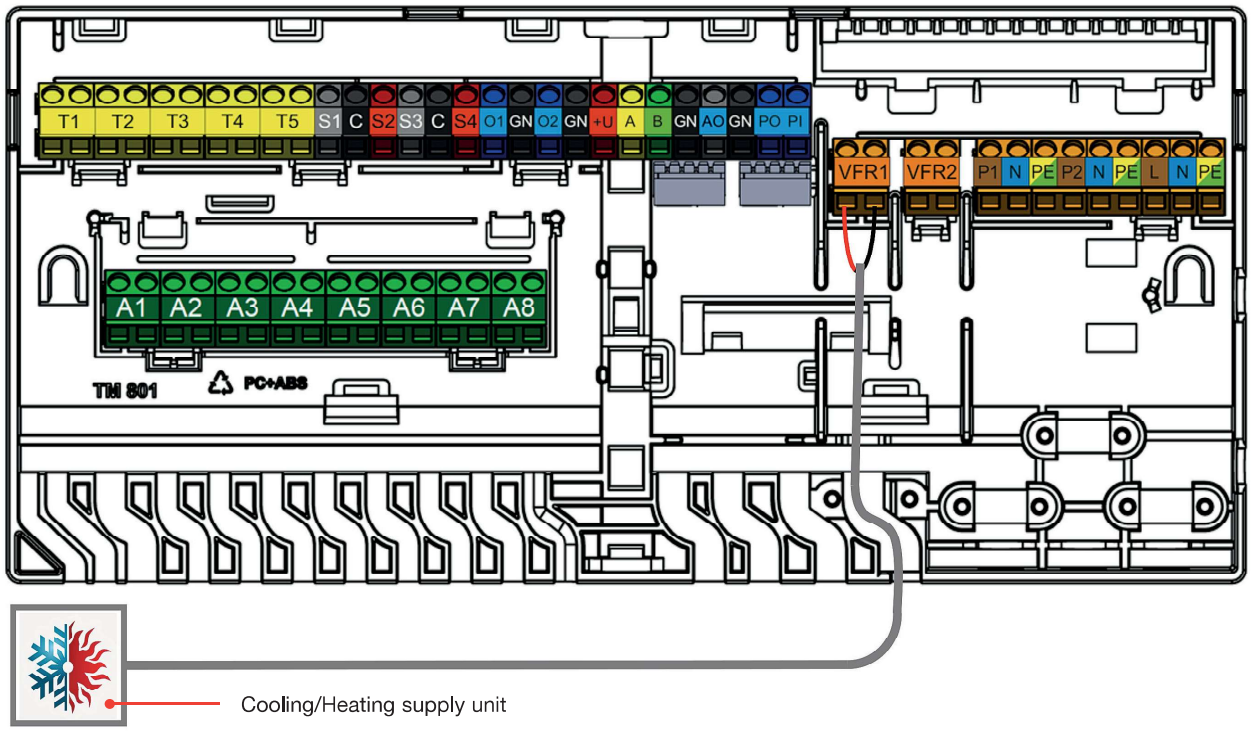
Connecting a power supply cable.

Connecting a Heating or Cooling Source

When connecting to a heating or cooling source the most simple way is to use one of the two Voltage Free Relays (VFR) that are available in the CCU. At the moment the system requires heat or cold this external unit will be switched on until heat/cold demand is not present anymore.

Before using this signal the installer shall check if the external source is suitable to be controlled via ON/OFF control and if so what terminals shall be used.

Contact the supplier in case of questions and validate the connection during the commissioning phase.

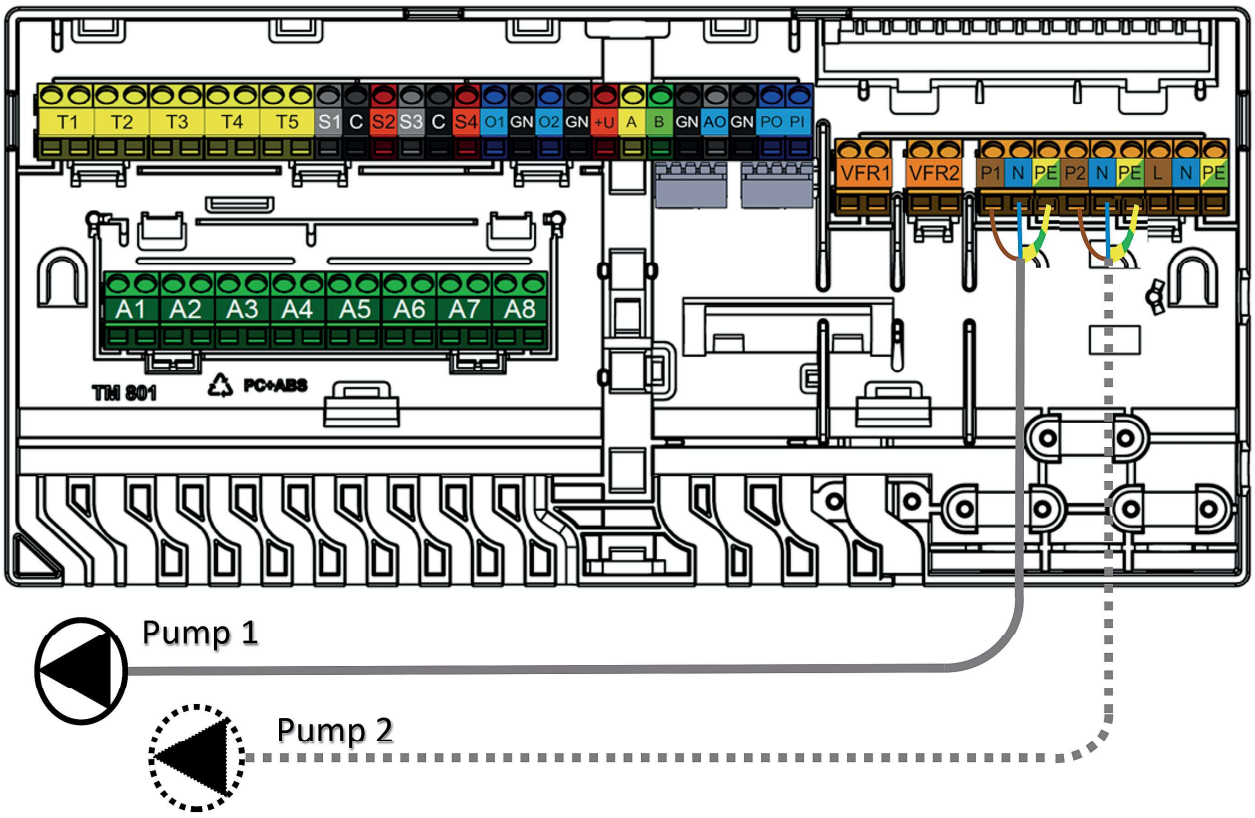


Connecting a heating or cooling source
(example, depending on choosen profile).

Connecting Circulation Pump/s

The Sentio system provides two switched power supplies out to circulation pumps that activate when any channel has demand.

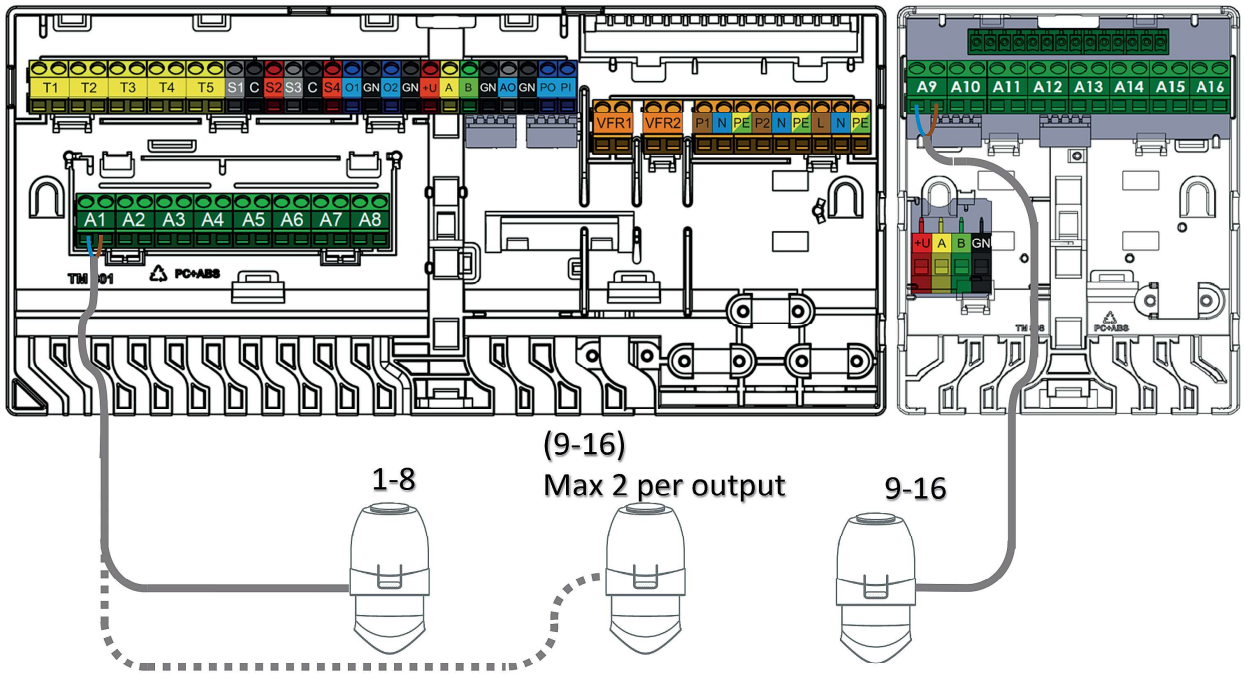
- The CCU is able to control two mixing units. Two connections for pumps are foreseen.



Connecting a circulation pump.

Connecting 24V Actuators

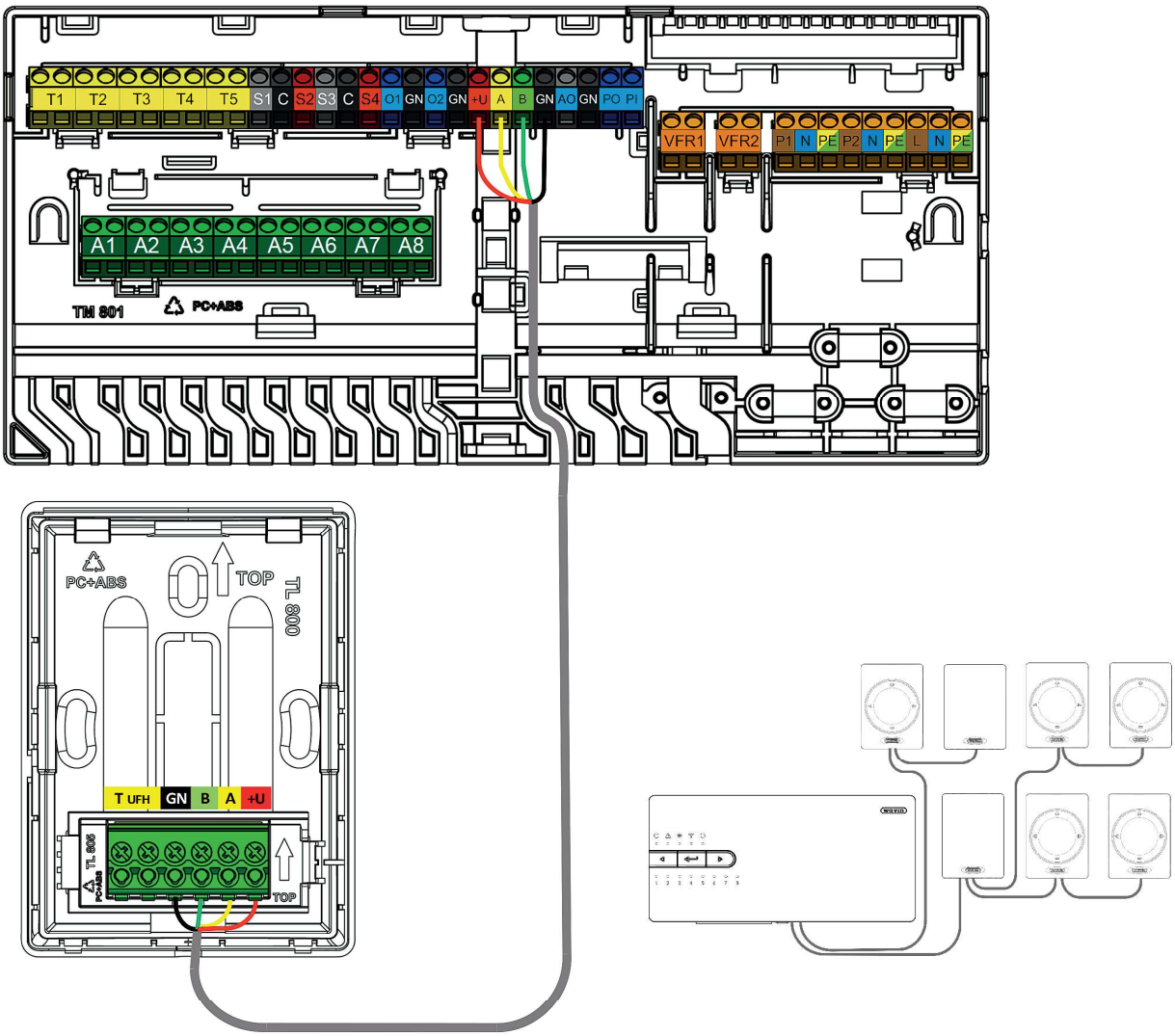
- Install the actuators on the manifold by removing the manual valve cap from the return ports and then pressing the actuator down onto the collar by hand until it clicks into place.
- Wavin Actuators are supplied open and will not close until they have been activated for 10 minutes. If an output has not been activated within two hours after starting the CCU, it will automatically activate the channel to close the actuator. The outputs will be periodically activated every seven days within a two hours timeslot if ther is no activation in between.
- The CCU`s and EU`s terminals are designed to connect maximum two actuators per channel.
- If a thermostat needs to control multiple outputs/actuators, it should be set to operate multiple outputs during the enrolling/pairing process later.
- If the load on a single thermoactuator output exceeds 0,5A, the CCU will switch off this output supply and the output LED will indicate an overload (overload protection).
- If the total load on the Control Centre reaches its maximum (also caused by initial higher load at 'cold state' phase) it will begin sequentially switching the outputs off to prevent overloading. This is also used after start-up due to e.g. power failure.



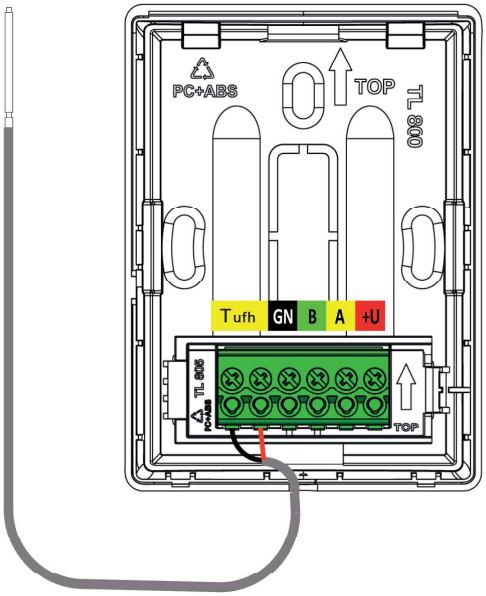
Connecting 24V actuators.

Connecting Wired Room Thermostats and Sensors

- Thermostats require a 4 core UTP Data Cable similar as for EU connection (so CC-02 like TP/TS or CC01).
- Maximum supported cable length is 200 m.
- Minimum wire diameter 0,5 mm, minimum wire cross section 0,2mm².
- Do not use mains power cable to connect thermostats.
- Use of a branching radial circuit will minimize cable usage.
- If preferred, each thermostat can use a dedicated cable, however it may be necessary to use a 3rd party junction box at the CCU to connect them all together before connecting to the CCU itself.



Connecting wired room thermostats and sensors via a BUS cable.



Connecting wired floor sensor.

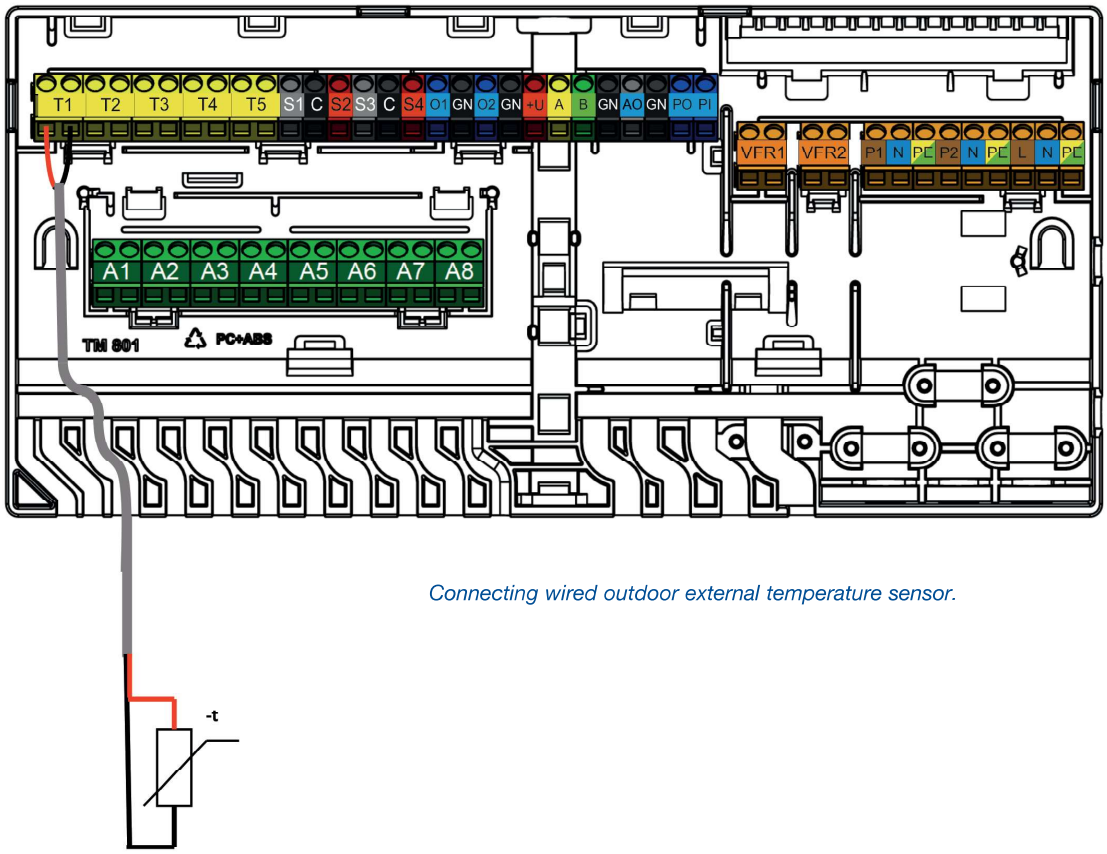
Connecting Wired Floor Sensor

It is possible to connect a wired floor sensor to the wired thermostat/ sensor. For connecting the Floorsensor make use of the yellow coded terminals labled as T^{ufh}.

Connecting Wired Outdoor External Temperature Sensor

The wired external temperature sensor always has to be connected to the terminals “T1”. If no external temperature sensor is needed or a wireless one is used these terminals cannot be used for other purposes.

Once the dedicated Sentio wireless outdoor temperature sensors are used no cabling is required and the enrolling process as per paragraph 4.4 shall be followed. If a wired Sentio outdoor sensor is used it is connected via the BUS cable and enrolled according to the process as per paragraph 4.4



Connecting wired outdoor external temperature sensor.

Connecting Inlet/Outlet Temperature Sensors

Depending on the choosen profile the Inlet/Outlet temperature sensors that are mounted on the mixing unit shall be connected by default to the terminals T2/T4 (Inlet) and T3/T5 outlet as per the CCU Input/Output list on page 18. In paragraph 3.3 the wiring scheme is shown.

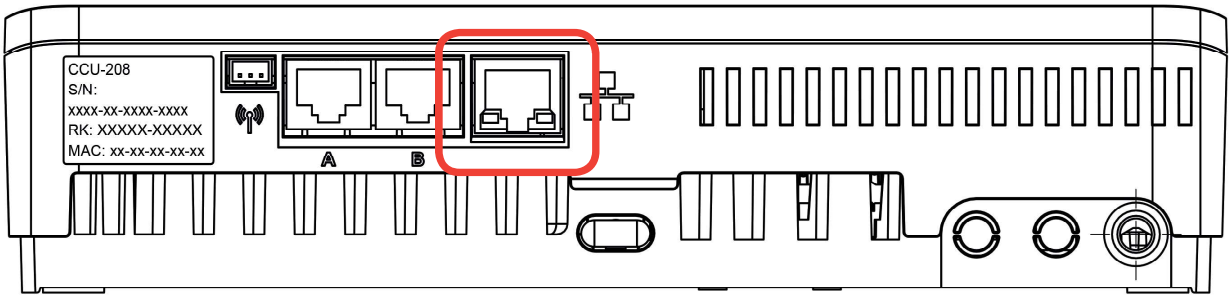
If no Inlet/Outlet temperature sensor is used, this terminals can not be used for other purposes.

Connecting the Commissioning Touch Screen / PC

The touchscreen can be connected via the Ethernet cable that is supplied with the touchscreen. The screen has to be connected to one of the RJ45 ports (A or B) on the bottom of the CCU or the EUs. The touchscreen has to be enrolled to the unit. This is described later in this manual.

For the PC commissioning tool the Sentio Connection Cable is needed. It has to be added to one of the RJ45 ports as the touch screen.

Connecting to the LAN



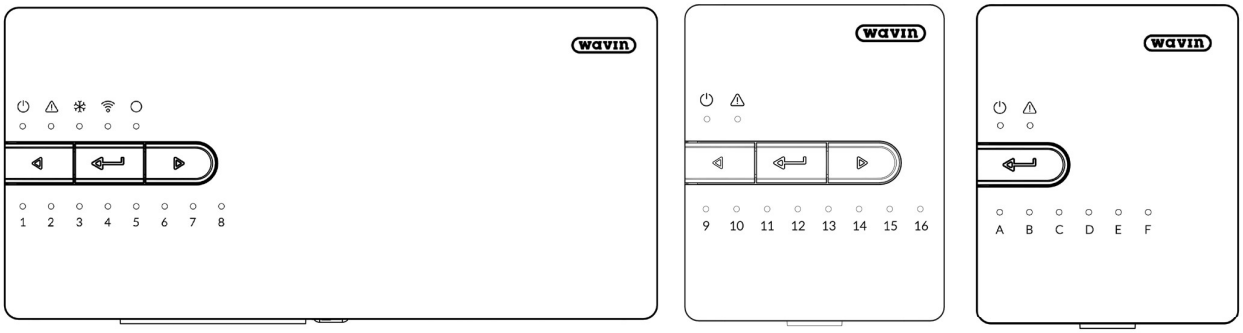
Connecting to the LAN.

Via an Ethernet cable (not supplied with the control unit) the control unit can be connected to the internet. Connect it to the network or router of the house or an extra one. To ensure a secure and stabile internet connection is not a part of the Sentio features. These must be provided on site.

4. Set

4.1. User Interfaces

4.1.1. User interface for the Control Unit (CCU) and the Expansion Untis (EUs)



CCU | EU 208-A | EU 206-VFR

The CCU can be used for heating and cooling buildings systems. The settings of the CCU can be made by using the touch screen or the PC. But basic settings and diagnostics can also be made by buttons and LEDs on the units. See paragraph 7.1 for a Frequently asked Questions & Answers table.

Buttons on the CCU and EUs

Basic settings can be made via the CCU and EUs. Three different buttons ensure this functionality.

Sign	Button	Function
◁	Left arrow	Select a channel by moving it to the left
↵	Enter	Reset a channel, enter, turn on the learn mode to connect to the app, factory reset
▷	Right arrow	Select a channel by moving it to the right

The LEDs on the units give an information about the systems status on a short glance. First diagnostics usually can be done by considering the information shown by the LED as well as using them .

LED	Function	Light	Meaning
⏻	Status	Off	No power supply of the unit
		Green On	Power on – everything ok
		Red On	Bootloader is working
⚠	Error	Yellow Flash	Error, e.g. connection to peripheral lost
		Yellow slow flash	Bootloader is working / preparing for update
		Yellow fast flash	Update is running
❄	Cooling	Blue On	Cooling is active
	LAN status	Green On	Connection to LAN and cloud service
		Green Flash	Connected to LAN but no cloud service
		Green fast flash	Learn mode active for registrating unit to the app
◎	Peripherals enrolling	Green On	Global peripherals enrolled
1 – 16	Actuator channels	Red On	Heating
		Green On	Idle – no heating / no cooling
		Blue On	Cooling
		Red flashing	Enroling mode (peripherals can be connected)
		Red fast flashing	Output error
		Green flashing	Missing periphery
		Green/red	Heating is blocked, e.g. because outdoor temperatur is to high
		Green/blue	Cooling is blocked, e.g. because outdoor temperaute is to low
A – F	VFR channels	Green On	Device enrolled to VFR

4.1.2. User Interface for the Room Thermostats and Sensors

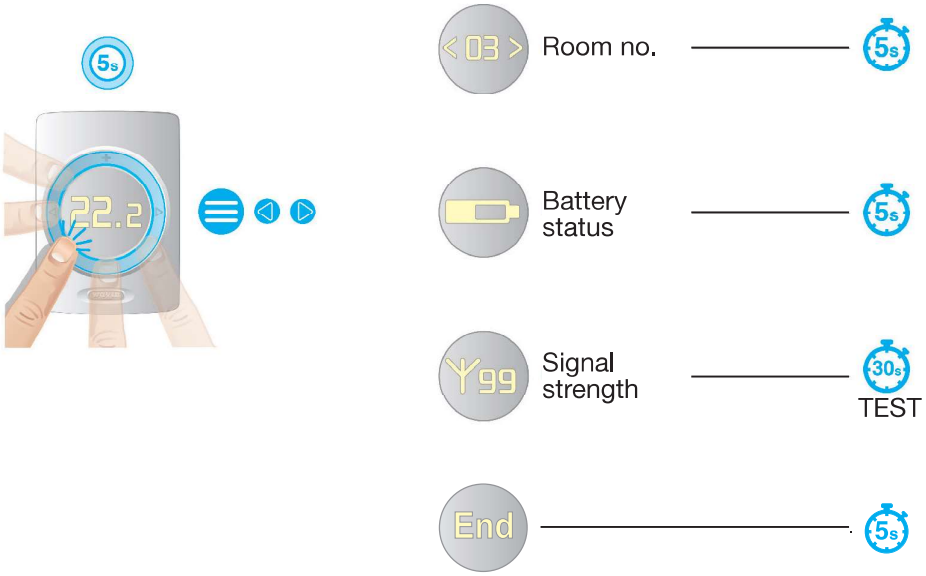
Detailed information about the daily use of the thermostats and sensors can be taken out of the manuals attached to the component`s package and shown in the Appendix Paragraph 7.2 and 7.3 of this document. In Paragraph 7.4 detailed information regarding the thermostat symbols is listed.

4.1.3. Installer Interface Room Thermostats and Sensors

By setting up a system it usually is necessary to adjust some thermostat settings in order to optimize the application. This will make the system more efficient and/or improves the comfort. These advanced settings can have influence on the system`s way of working and are therefore intended to be set by the installer only. Three different levels are differed.

Advanced Information

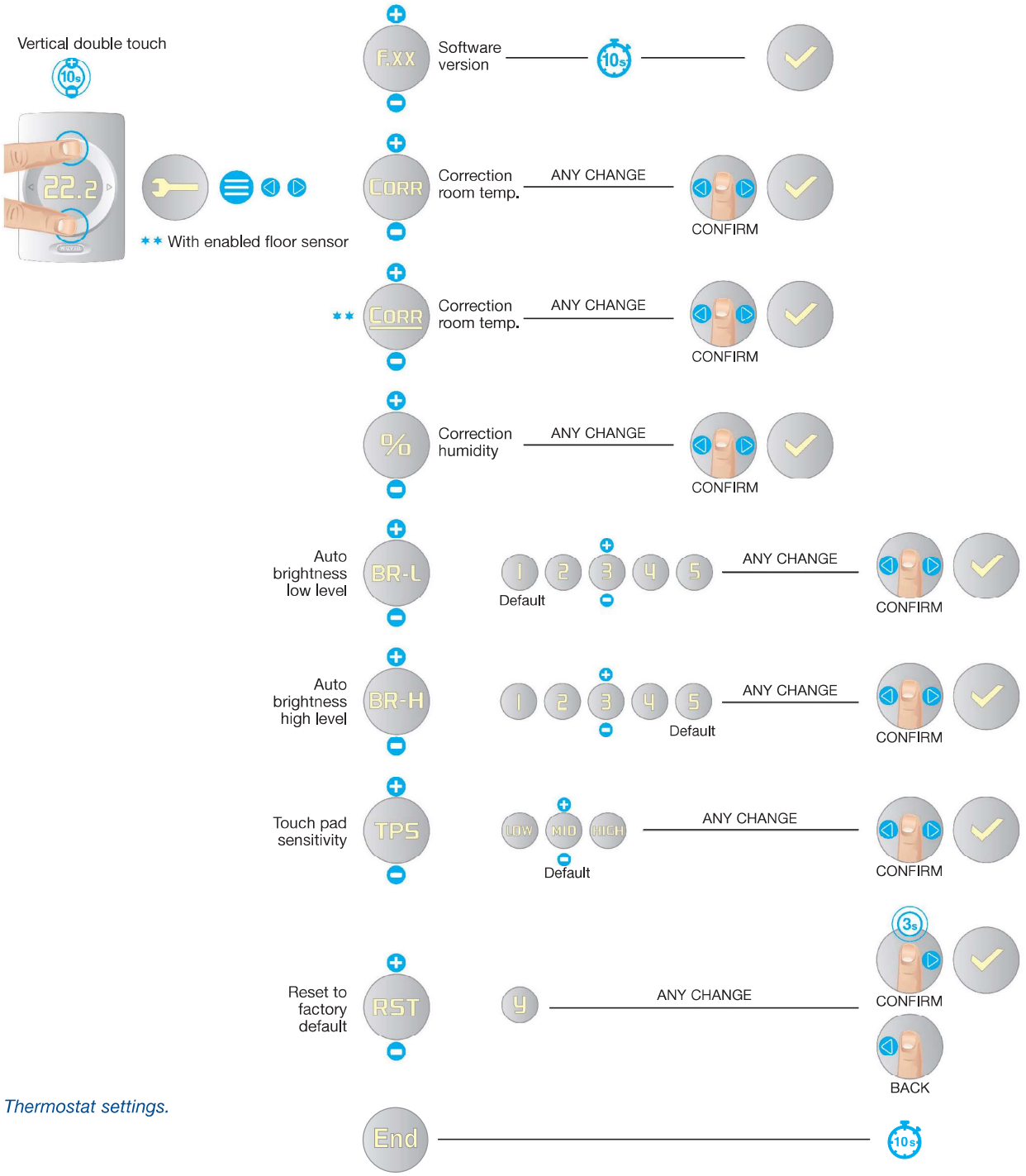
In this level you get information about the thermostat`s status.



Common Settings

To align all thermostats and reduce the impact of the specific circumstances of their location the temperature display of air temperature, floor temperature and humidity can be adapted following the procedure pictured below. Furthermore, the sensitivity of the touchpad can be adapted to the local circumstances, too. It can be set to three different levels (low, medium, high).

Description	Adaptable Range	Step Size	Default Setting
Correction or room temperature sensor	± 5,0 °C	0,1 °C	0,0 °C
Correction of floor temperature sensor	± 5,0 °C	0,1 °C	0,0 °C
Correction of room humidity sensor	± 5,0 %	1 %	0,0 %
Auto brightness level	1 - 5	1	1 (low), 3 (high)
Touchpad sensitivity	1 - 3	1	2 = Med



Thermostat settings.

Thermostat Settings

Via the thermostat you can adapt general settings for the area controlled by the individual thermostat and some further features of the thermostat. All the options described in the following can be adapted according to the procedure pictured below. It can be chosen which temperature is leading concerning the temperature regulation. It is pre-set that the air temperature is leading. But if e.g. sensitive floors are used it can be adapted to floor temperature as leading or that both temperatures are taken into consideration.

Room temperature regulation in heating mode

In heating mode and with room thermostats/sensors with floor sensors, it is possible to select between three types of room temperature regulation.

1. Regulation upon the air temperature
2. Regulation upon the air temperature with floor temperature limits
3. Regulation upon the floor temperature

1. Air temperature regulation:

- Manual, Eco, Comfort, Extra comfort, Holiday and Standby mode.
- The floor sensor is not enabled
- The room temperature is controlled only by the air temperature sensor inside the room thermostats/sensor

2. Air + Floor temperature regulation:

Manuel, Comfort, Extra comfort and Holiday mode

- The floor sensor is enabled
- The floor temperature has priority over the room temperature
- As long as that the floor temperature is between the “Low floor temp limit” and the “high floor temp limit” the room temperature is controlled only by the air temperature sensor inside the room thermostats/sensor
- If the room temperature is reached but the floor temperature is below the “low floor temp limit” the system shall continue heating until the “low floor temp limit” is reached
- If the room temperature is not reached but the floor temperature is over the “high floor temp limit” the system shall stop heating. The system shall start heating again when the floor temperature is below the “high floor temp limit”

Eco and Standby mode

- The floor sensor is enabled
- The “low floor temp limit” is suppressed
- The floor temperature has priority over the room temperature
- As long as that the floor temperature is below the “high floor temp limit” the room temperature is controlled only by the air temperature sensor inside the room thermostats/sensor
- If the room temperature is not reached but the floor temperature is over the “high floor limit” the system shall stop heating.

The system shall start heating again when the floor temperature is below the “high floor temp limit”

3. Floor temperature regulation

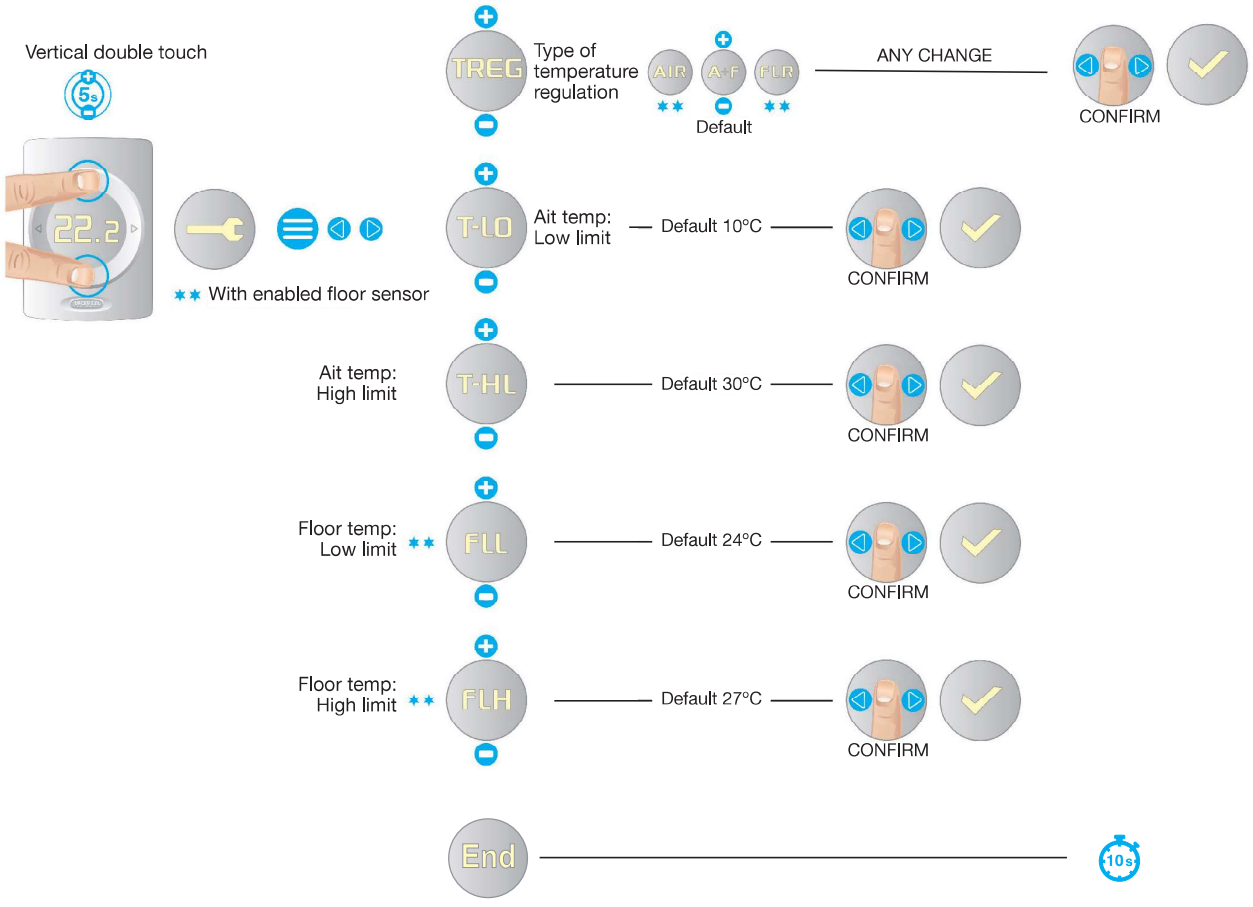
- Manual, Eco, Comfort, Extra comfort and Hotel mode
- The floor sensor is enabled
- The room temperature is controlled only by the floor sensor
- The air temperature is not used for temperature control. It is shown on room thermostat display, in the LCD-200 and app as an information
- The set temperature for the floor temperature cannot be set lower than “low floor limit” +1 °C
- The set temperature for the floor temperature cannot be set higher than “high floor limit”-1 °C

Description	Menu	Setting options	Factory default	Notes
Type of temperature regulation	TREG	AIR (OFF)	AIR	Regulation based on the air temperature
		A+F (ON)		Regulation based on the air temperature and floor limits
		FLR (REG)		Regulation based on the floor temperature
Allowed range of user air temperature settings	T-LO	+6°C toT-HI	10.0 °C	1°C step
	T-HI	T-LO to +40°C	30.0 °C	
Floor temperature limit low (min)	FL-LO	6°C to 40°C	22°C	step 0.5°C, 22°C = comfort on tiles floor Used in heating: Eco, Comfort and Extra Comfort Not used in: Cooling
Floor temperature limit high (max)	FL-HI	6°C to 40°C	27°C	step 0.5°C, 27°C = floor hygienic limit Rule: FL-LO < FL-HI Used in heating: Eco, Comfort and Extra Comfort Not used in: Cooling.

The minimum and maximum allowed air and floor temperature for the controlled area can be set via the thermostat, too. This can also be pre-set via the Sentio app or the touch screen.

The thermostats and sensors are equipped with an ambient light sensor that provides an appropriate display intensity in accordance with the ambient light and ensures a good visibility on direct day light and not too intense light in darkness. This display dimming can be adapted to the personal preferences and local specifics. Five different levels of light are available. One is the lowest, five the highest. You can as well adapt the lowest level as the highest level that fit to the individual preferences. When lowest and highest level are the same no adaption takes place.
Furthermore, all thermostat settings can be reset to the factory defaults. During the reset also the connection to the CCU is checked. If there is no response from the CCU, e.g. the thermostat is located too far away or the CCU is powered off, the thermostat is set back to the not enrolled status.

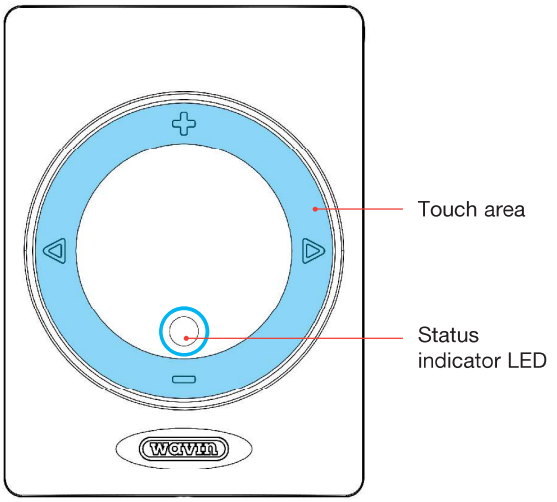
If a thermostat shall be connected to another CCU it has to be reconnected from the CCU it is currently registered to. If no touch screen is available it can be done via a reset of the thermostat but without a connection to the CCU it is currently registered to. Unenrolling of thermostat can be done without LCD-200 via buttons on CCU or EU. It is better way (similar as on AC-116).



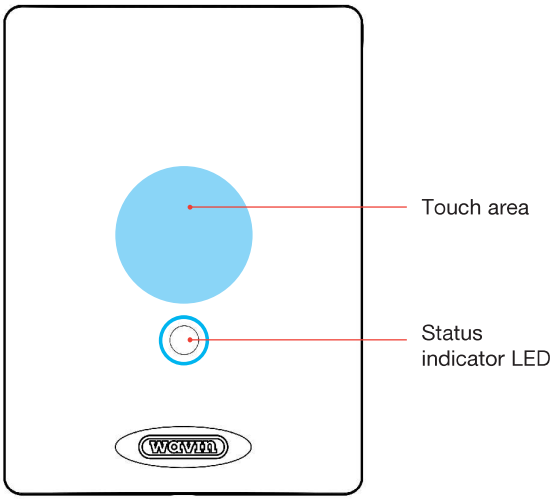
Thermostat settings.

Status Indicator and Symbols for Warnings and Errors

Both the thermostat and the sensor are equipped with an status indicator.
By touching the touch area an LED shows the current status.



Touch area and status indicator thermostat.

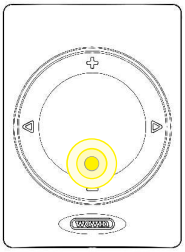


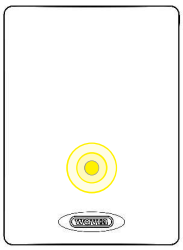
Touch area and status indicator sensor.

Status	Awake mode (after touching the touch area)	
	Colour	Lighting style
Not enrolled	Yellow	Fast flashing
Warning	Yellow	Slow flashing
Low battery	Yellow	Fast double flash
CCU not responding	Red	Fast flashing
Error	Red	Fast flashing
Idle – no heating / no cooling	Green	On
Heating	Red	On
Cooling	Blue	On
Heating blocked	Red-green	Alternately
Cooling blocked	Blue-green	Alternately

Warning

Warnings – yellow LED





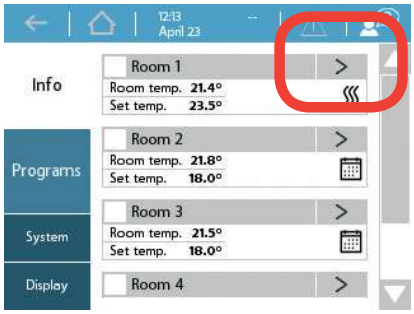
SIGN	MEANING	RECOMMENDED ACTION
	General warning	Check the system for abnormalities
	Low battery	Replace batteries
	Floor heating blocked by floor security limit (overheating)	Reduce the allowed inlet temperature or the set room temperature (depending on the general system settings)
	Heating/cooling blocked by window	Close windows
	Cooling blocked by dew point reasons	The humidity and temperature conditions in the room would have negative impact on the building. Therefore, cooling is stopped. Choose a higher room or inlet temperature (depending on the general system settings)
	Too low air temperature	The current temperature is out the set spectrum of allowed temperatures. Choose a higher one.
	Too high air temperature	The current temperature is out the set spectrum of allowed temperatures. Choose a lower one.

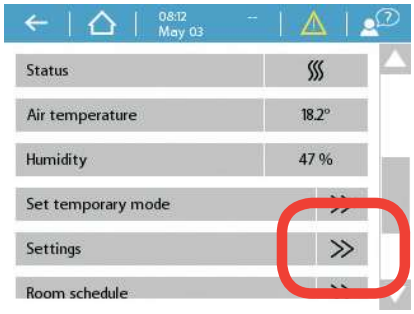
4.1.4. Hotel Mode

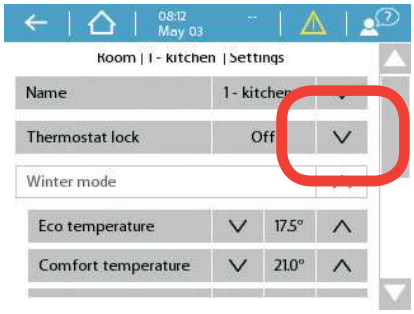
A special mode is available for facilities where users shall only be able to adapt the temperature but nothing else as e.g. in hotels.

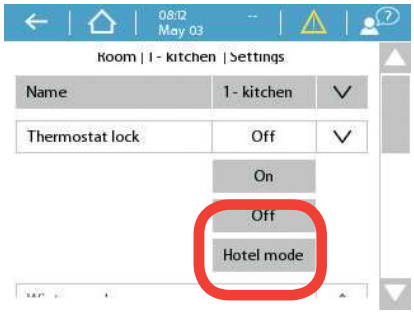
In this case the room controller can be set to the Hotel mode in the central control unit e.g. via the touch screen.

In this room mode the thermostat user interface significantly changes its behaviour. It is only possible to see and to set the room temperature. Other selections are suppressed.



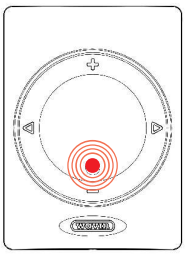


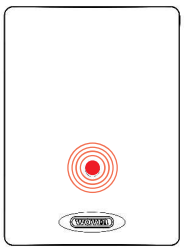




Error

Errors – red LED





SIGN	MEANING	RECOMMENDED ACTION
	General error	Check the system for abnormalities
	Lose of connection wireless	Check if there are radio interferences, local drops or other items disturbing the connection.
	Lost connection bus powered device	Check the bus connections
	Enrol process not successful	Check if there are interferences disturbing the connection, locate the peripheral nearby the CCU

In the touch screen the hotel mode can be set via the room settings – Thermostat lock – Hotel mode.

4.2. Commissioning

After finishing the CONNECT part the system is connected regarding wiring and ready to move to the next, SET part of the installation. The next step is to commission the system. During the commissioning you will setup the hardware profile, enrol all the thermostats/sensors and make all the necessary settings of the system.

For commissioning you can use the touch screen or connect a laptop to the CCU. For this option the separately available Sentio Connection Cable is needed. The software (Windows) can be downloaded from the Wavin website. Please go to www.wavin.com and search for Sentio.

When using the ITC functionality, not included in this manual yet, it is recommended to have a dedicated touch screen for the system to improve the monitoring of the system.

Power Up

Before connecting the system to the mains, please check that all control units are connected and firmly closed. Connect the plug to the mains and switch on the power.

4.3. Select a Profile

The system will now start up and if you have connected a Sentio touch screen or a laptop via the Sentio Connection cable, you will be able to use either the touch screen or the Sentio PC-software at the laptop to do the rest of the system`s setup.

In the touch screen/software go to menu "System" – "Hardware profile". Here you can choose the hardware profile best describing your system . In the below table you find a list with all available profiles (this list will be updated frequently and therefore also check the Sentio website for the latest available manual with updated list of profiles). Choose the desired profile and press the "Next" button. The system will restart, and you are ready to enrol new peripheries if applicable.

Profile no.	Short application description	Full description in chapter
1.0	UFH together with district heating:	4.7
1.0.1	UFH together with district heating & DHW	4.7
1.1	UFH together a with a boiler / heat- pump (On/OFF control):	4.6 / 4.8
1.1.1	UFH together with boiler / heat pump & DHW	4.6 / 4.8
1.2	UFH together with a condensing boiler (0-10V control):	4.8
1.3.1	UFH together with district heating, and 1 ITC-loop:	4.7
1.3.2	UFH together with district heating, and district heating, 2 ITC-loops	4.7
2.2.1	UFH together with a boiler / heat pump (ON/OFF or analogue) and 1 ITC-loop	4.6 / 4.8
2.2.2	UFH together with a boiler / heat pump (ON/OFF or analogue) and 2 ITC-loops	4.6 / 4.8
3.3.0	UFH/UFC together with a heat pump, manual change-over between heating and cooling:	4.6
3.3.1	heat pump, automatic change-over between heating and cooling:	4.6
3.3.2	UFH/UFC together with a heat pump, 1 ITC-loop and manual change-over between heating and cooling	4.6
3.3.3	UFH/UFC together with a heat pump, 1 ITC-loop and automatic change-over between heating and cooling	4.6

4.4. Components to the System

Before the system can run, all bus-wired or wireless peripherals, that will give the system its input values, have to be enrolled.

The peripherals are divided into two groups:

1. Global peripherals
2. Local peripherals

Global peripherals are peripherals, whose values are used to control the entire system or peripherals there are used for connecting the different parts of the system.

List of Global Peripherals:

- Extension Unit A (EU-A)
- Extension Unit VFR (EU-VFR)
- External outdoor temperature sensor
- Touch screen

Local peripherals are peripherals, whose values are used to regulate a single room

List of Local Peripherals:

- Room thermostats
- Room sensors

Enrolling Global Peripherals

Global peripherals shall be enrolled but some of the global peripherals will automatically enrol during the start-up of the system. If there is only one of each of the below mentioned peripherals in a system, the peripheral will be automatically being enrolled during the installation

- Extension Unit A (EU-A)
- Extension Unit VFR (EU-VFR)
- Wired external outdoor temperature sensor
- Touch screen

Enrolling Extension Units

If you have to enrol an extension unit (EU-A or EU-VFR), this is ususally done automatically, please follow the below steps:

1. Press the left arrow button once at the CCU and the" global peripherals enrolling"- LED will start flashing red

2. Press the "Return" button at the Extension unit to enrol it. The "global peripherals enrolling"- LED at the CCU will stop flashing red, and be steady green.

If you have to enrol more than one extension unit, please repeat the above process.

An alternative way of enrolling EUs is enrolling them via their serial number. The number you find on the sticker on the unit.

At the touch screen or the PC tool go to the menu "System" – "actions"- "Enrol components"- Global component". Press the Next button and tap in the serial number of the EU. After tapping in the serial number press "Next" and the unit is enrolled.

Enrolling a Wireless External Outdoor Temperature Sensor

To enrol a wireless external outdoor temperature sensor, please follow the below steps:

1. Press the left arrow button once at the CCU and the "peripheral enrolling"-LED will start flashing red.

2. Insert the batteries into the external outdoor temperature sensor. The "peripheral enrolling"-LED at the CCU will stop flashing red, and be steady green. If the batteries are already inserted press the red button next to the batteries instead of inserting them.

An alternative way of enrolling the external outdoor temperature sensor is enrolling it via its serial number. The number you find on the sticker on the unit.

At the touch screen or the PC tool go to the menu “System” – “actions”- “Enrol components”- Global component”. Press the Next button and tap in the serial number of the external outdoor temperature sensor. After tapping in the serial number press “Next” and the sensor is enrolled.

After you have enrolled a touch screen you have to give the information to the system that an external temepratur sensor is used. Please go to the menue “System” - “Hardware profile” - “Set outdoor temperature source” and turn the shift to “On”

Enrolling a Wired External Outdoor Temperature Sensor

To enrol a wired external outdoor temperature sensor, please follow the below steps:

1. Press the left arrow button once at the CCU and the “peripheral enrolling”-LED will start flashing red.

2. Assemble the outdoor sensor. Closing it and in consequence connectiong it via the bus cable with the CCU will cause the learning and the CCU will realise the sensor. The “peripheral enrolling”-LED at the CCU will stop flashing red, and be steady green.

An alternative way of enrolling the external outdoor temperature sensor is enrolling it via its serial number. The number you find on the sticker on the unit.

At the touch screen or the PC tool go to the menu “System” – “actions”- “Enrol components”- Global component”. Press the Next button and tap in the serial number of external outdoor temperature sensor. After tapping in the serial number press “Next” and the sensor is enrolled.

Enrolling a Touch Screen

If you have to enrol a touch screen, which usually is done automatically, please follow the below steps:

1. Press the left arrow button once at the CCU and the “peripheral enrolling”-LED will start flashing red.

2. Press the “Learn” button at the touch screen. The “peripheral enrolling”-LED at the CCU will stop flashing red, and be steady green.

An alternative way of enrolling a touch screen is enrolling it via its serial number. The number you find on the sticker on the unit.

At the touch screen or the PC tool go to the menu “System” – “actions”- “Enrol components”- Global component”. Press the Next button and tap in the serial number of the touch screen . After tapping in the serial number press “Next” and the touch screen is enrolled.

Enrolling Local Peripherals

Before the system can function, the local peripherals shall be enrolled to the CCU or an EU-A.

Rules for Enrolling Local Components

You can enrol up to 24 wired or wireless components to the CCU. Multiple components can be enrolled to the same channel, bearing in mind that the first enrolled components must be a thermostat. By enrolling one thermostat to more channels, you connect the channels and they act like one channel. If you later enrol another thermostat/sensor to one of the connected channels, the thermostat/sensor will be enrolled to all the connected channels.

Enrolling of Wireless Room Thermostats

Wireless room thermostats can be enrolled in several different ways depending on your wish.

Please follow the below steps to enrol wireless thermostats **without** using the touch screen:

1. Select the channel you want to enrol the thermostat to by repeatedly pressing either the left or right button at the CCU or the EU-A until the corresponding LED starts flashing red.

2. Insert the batteries into the room thermostat. When the room thermostat is enrolled to the control unit the room thermostats show “Enrolment OK” icon followed by the “channel number”.

   or

3. Touch and hold the room thermostat´s touch area until the room thermostat shows the "Enrolment OK" icon followed by the "Channel number".

When the thermostat is enrolled the corresponding LED, stops flashing red and turns into steady red or green.

Please follow the below steps to enrol wireless thermostats using the touch screen:

1. At the Sentio Touch screen or in the PC-software go to the menu "System" – "actions"- "Enrol components"- Component to a new room". Select here to which CCU or EU you want to enrol the thermostat to and at what channel or channels. The corresponding LED at the CCU or EU starts flashing red.

2. Press next button. At the display you can now tap in the thermostats serial number. You can find the serial number on a sticker in the left battery bay (seen from behind) at the thermostat. Press the "Next" button at the touch screen.

When the thermostat is enrolled the corresponding LED stops flashing red and turns into steady red or green.

Enrolling of Wireless Room Sensors

Wireless room sensors can be enrolled in several different ways depending on your wish.

Please follow the below steps to enrol wireless sensors **without** using the touch screen:

1. Select the channel you want to enrol the sensor to by repeatedly pressing either the left or right button at the CCU or the EU-A until the corresponding LED start flashing red.

2. Insert the batteries into the room sensor. When the room sensor is enrolled to the CCU the LED at the room sensor turns into steady red or green.

or

3. Touch and hold at the room sensor´s touch area until the room sensor´s LED turns into steady red or green.

When the sensor is enrolled the corresponding LED stops flashing red and turns into steady red or green.

Please follow the below step to enrol wireless sensors using the touch screen:

1. At the touch screen or the PC tool go to the menu "System" – "actions"- "Enrol components"- Component to a new room". Select here to which CCU or EU you want to enrol the sensor to and at what channel or channels. The corresponding LED at the CCU or EU starts flashing red.

2. Press next button. At the display you can now tap in the sensors serial number. You can find the serial number on a sticker in the left battery bay (seen from behind) at the sensor. Press the "Next" button at the touch screen. When the sensor is enrolled the corresponding LED, stops flashing red and turns into steady red or green.

Enrolling of Wired Room Thermostats

Wired room thermostats can be enrolled in several different ways depending on your wish.

Please follow the below steps to enrol wired thermostats without using the touch screen:

1. Select the channel you want to enrol the thermostat to by repeatedly pressing either the left or right button at the CCU or the EU-A until the corresponding LED start flashing red.

2. Power up the actual thermostat by closing it completely. When the room thermostat is enrolled to the CCU the LED at the room thermostats shows the "Enrolment OK" icon followed by the "Channel number".

or

3. Touch and hold at the room thermostat´s touch area until the room thermostat shows the "Enrolment OK" icon followed by the "Channel number.

When the thermostat is enrolled the corresponding LED, stops flashing red and turns into steady red or green.

Please follow the below step to enrol wireless thermostats using the touch screen:

1. At the touch screen or the PC tool go to the menu “System” – “actions”- “Enrol components”- Component to a new room”. Select here to which CCU or EU you want to enrol the thermostat to and at what channel or channels. The corresponding LED at the CCU or EU starts flashing red.

2. Press next button. At the display you can now tap in the thermostats serial number. You can find the serial number on a sticker at the backside of the front part of thermostat. Press the “Next” button at the touch screen.

When the thermostat is enrolled the corresponding LED, stops flashing red and turns into steady red or green.

Enrolling of Wired Room Sensors

Wired room sensors can be enrolled in several different ways depending on your wish.

Please follow the below steps to enrol wired sensors **without** using the touch screen:

1. Select the channel you want to enrol the sensor to by repeatedly pressing either the left or right button at the CCU or the EU-A until the the corresponding LED start flashing red.

2. Power up the actual sensor by closing it completely. When the room sensor is enrolled to the control unit the LED at the room sensor turns into steady red or green.

or

3. Touch and hold at the room sensor´s touch area until the room sensor´s LED turns into turns into steady red or green.

When the sensor is enrolled, the corresponding LED stops flashing red and turns into steady red or green.

Please follow the below step to enrol wired sensors **using** the touch screen:

1. At the Sentio touch screen or the PC tool go to the menu “System” – “actions”- “Enrol components”- Component to a new room”. Select here to which CCU or EU you want to enrol the sensor to and at what channel or channels. The corresponding LED at the CCU or EU starts flashing red.

2. Press next button. At the display you can now tap in the thermostats serial number. You can find the serial number on a sticker at the backside of the front part of thermostat. Press the “Next” button at the touch screen.

When the sensor is enrolled, the corresponding LED stops flashing red and turns into steady red or green.

Remove Components

If a peripheral, global or local, has to be replaced or you want to setup the system in a different way, you need first to delete the peripheral from the system. To delete a peripheral, please follow the below steps:

Global Peripherals

If you delete a global peripheral it can affect the functionality of the complete system. If you delete e.g. an EU-A from the CCU, all the outputs of the thermostats/sensors that prior to this have been enrolled to the EU-A will be offline.

If you have to delete an EU-A or EU-VFR using the touch screen or the PC tool, please follow the below steps:

1. At the touch screen or the PC tool go to the menu "System" – "Actions" – "Remove components" – "Global component".

2. Chose the extension unit or the units you want to delete and press the "remove" button.

If you don´t have a Sentio touch screen it is still possible to delete global peripherals.

WARNING: By deleting a global peripheral as described below, ALL their enrolled peripherals will be off-line and this will have impact on the functionallity of the whole system.

1. Press the left arrow button once at the CCU and the "peripheral enrolling"-LED will start flashing red.

2. Press and hold the "Enter" button at the CCU for approx. 3 sec. and the "peripheral enrolling"-LED will stop flashing and will be turned off.

Local Peripherals

If you delete a local peripheral, it will only affect the channel it is enrolled to. If the local peripheral is enrolled to more than one channel and you delete it, it will be deleted from all the channels it is enrolled to.

If you have to delete a single local peripheral (room thermostat/room sensor) from a room, using the touch screen or the PC tool, please follow the below steps:

1. At the touch screen or the PC tool go to the menu "System" – "Actions" – "Remove components" – "Component associated to a room".

2. Chose the peripheral you want to delete and press the "Next" button.

If you have to delete all local peripherals (room thermostat/room sensor) from a room, using the touch screen or the PC tool, please follow the below steps:

1. At the touch screen or the PC tool go to the menu "System" – "Actions" – "Remove components" – "Room and associated components".

2. Chose the room or rooms you want to delete and press the "Next" button.

4.5. Sentio Applications

4.5.1. Heating & Cooling Services

Why using Sentio & Hydronic Underfloor Heating as an Application

Underfloor heating is a form of central heating (can be combined with cooling) which achieves indoor climate control for thermal comfort using conduction, radiation and convection. The terms radiant heating are commonly used to describe this approach because radiation is responsible for a significant portion of the resulting thermal comfort but this usage is technically correct only when radiation composes more than 50% of the heat exchange between the floor and the rest of the space

The Sentio system is developed dedicated for this heating and cooling of residential and non-residential area's based upon zone-control. In each room a thermostat or sensor is installed that measures the temperature. Based upon this actual temperature and the desired (SET) temperature the Sentio system takes care for heating (and if the system is equipped with cold water supply also for cooling) of this room.

Heating a room with an underfloor heating system is rather efficient and more and more commonly accepted as it is able to create comfort based upon low temperature (LT) heating water. In general the water`s temperature is below 50°C. Due to the large contact area the air in the room is heated steadily without creating any airflow (like with high temperature systems). Therefor less movement of dust inside the room.

Conditions of Use

The profiles for underfloor heating are based upon the following conditions:

- The underfloor heating system is connected to a manifold and/or mixing unit
- The underfloor heating pipe is suitable for hydronic heating (water or mixture with water)
- The underfloor heating system is designed (pipe size, pipe design, etc.) in such a way that it creates enough heating capacity for a comfortable indoor climate based upon applicable standards
- The underfloor heating system is installed by qualified installers

How to Connect

The Sentio system comprises the underfloor heating system (pipes/insulation/ etc, see wavin.com) and the complete mixing unit (including manifold). The zone-control is installed based upon the design of the underfloor heating system (see chapter 1) and in each room a thermostat or sensor is located and connected to the corresponding manifold output connection. More than 1 output connection can be linked to one room and to one thermostat/sensor.

How to Set

The most important aspect is to ensure that each room has its own thermostat/sensor that is connected (wired or wireless) with the central control unit of the Sentio system. It is important to notice that it is crucial that the underfloor heating zones per room are correctly enrolled/connected to the thermostat/sensor in that room. If this is not the case heat-demand in a certain room can result in heating another room. Therefore during the commissioning this aspect shall be checked carefully before the system is handed over to the end-user.

Selection of profile and parameter settings to be done by the installer. Future settings are possible via the touch screen (optionally available for the end-user) or via the installer.

NOTE: The installation and commissioning of the underfloor heating system is the responsibility of the installer. Once installed and commissioned Wavin does not advise to change the parameter settings unilaterally.

How to Go

The Sentio system can be controlled via the thermostats/ sensors in each room, via the Sentio app and if required via the touch screen. Once installed the end-user can control the indoor climate comfort in each room.

4.5.2. Sentio & Underfloor cooling (UFC)

Why using Underfloor Cooling as an Application

Underfloor cooling is a form of central cooling which achieves indoor climate control for thermal comfort using conduction, radiation and convection. The terms radiant cooling are commonly used to describe this approach because radiation is responsible for a significant portion of the resulting thermal comfort but this usage is technically correct only when radiation composes more than 50% of the cooling exchange between the floor and the rest of the space. Compared to central heating (in many cases heating & cooling is combined in one system) the design of central underfloor cooling shall be in such a way that cooling capacity is sufficient. Compared to underfloor heating this implies larger diameter, pipes laid closer to each other or a combination of but in principle and more pipe length/meter underfloor cooling system.

In combined heating/cooling systems the cooling efficiency is lower compared to the heating efficiency. This is caused by the smaller temperature difference between inlet and outlet water temperature that can be achieved. Underfloor cooling is limited by several factors and one of them is the relative humidity in relation with the actual room temperature. This is resulting in a dew-point temperature that limits the cooling water temperature especially during periods in which high humidity and high air temperature exists. This limits the cooling capacity.

The Sentio system is developed for this type of cooling of residential and non-residential area's based upon zone-control. In each room a thermostat or sensor is installed that measures the temperature. Based upon this actual temperature and the desired (SET) temperature the Sentio system takes care for cooling in this room.

Cooling a room with an underfloor cooling system is rather efficient and more and more commonly accepted as it is able to create comfort based upon chilled/cold water. Due to the large contact area the air in the room is cooled steadily without creating any airflow (like with high temperature systems). Therefor less movement of dust inside the room.

Conditions of Use

The profiles for underfloor cooling are based upon the following conditions:

- The underfloor cooling system is connected to a manifold and/or mixing unit
- The underfloor cooling pipe is suitable for hydronic heating (water or mixture with water)
- The underfloor cooling system is designed (pipe size, pipe design, etc) in such a way that it creates enough cooling capacity for a comfortable indoor climate based upon applicable standards. In combination with underfloor heating the capacity of the cooling system will be lower.
- The underfloor cooling system is installed by qualified installers
- The Sentio system is able to deal with manual switch over between heating and cooling (e.g. based upon seasonal effects) or automatically.

How to Connect

The Sentio system comprises the underfloor cooling system (pipes/insulation/ etc, see wavin.com) and the complete mixing unit (including manifold). The zone-control is installed based upon the design of the underfloor cooling system (see chapter 1) and in each room a thermostat or sensor is located and connected to the corresponding manifold output connection. More than 1 output connection can be linked to one room and to one thermostat/sensor.

How to Set

The most important aspect is to ensure that each room has its own thermostat/sensor that is connected (wired or wireless) with the central control unit of the Sentio system.

Selection of profile and parameter settings to be done by the installer. Future settings are possible via the touch screen (optional available for the end-user) or via the installer. It is important to notice that it is crucial that the underfloor heating zones per room are correctly enrolled/connected to the thermostat/sensor in that room. If this is not the case heat-demand in a certain room can result in heating another room. Therefore during the commissioning this aspect shall be checked carefully before the system is handed over to the end-user.

NOTE: The installation and commissioning of the underfloor cooling system is the responsibility of the installer. Once installed and commissioned Wavin does not advise to change the parameter settings unilaterally.

How to Go

The Sentio system can be controlled via the thermostats/sensors in each room, via the Sentio app and, if and if required, via the touch screen. Once installed the end-user can control the indoor climate comfort in each room.

4.6. Sentio & Heat-pump

Why Connect Sentio & Heat-Pump

The Sentio system offers the option to use a heat-pump as heating/cooling source. In principle all kind of heat-pumps can be used as long as the communication interface matches with Sentio standards for control.

Connecting a heat-pump as heat source is only possible for low temperature heating system (hydronic radiant systems, underfloor heating system) as the maximum temperature is limited. For high temperature systems other heat sources are required.

The Sentio system will be in control of the heat-pump to create enough heating/cooling capacity based upon the Sentio zone-control requirements

When connecting a heat-pump the interfacing with the Sentio system requires some attention. As a heat-pump requires a certain minimum capacity either a buffer shall be installed (in line with the warm water supply) or the underfloor heating system acts as a kind of buffer.

A heat-pump that offers passive cooling option can be used as cooling source for the underfloor heating system. To make use of this option the Sentio profile dedicated for this shall be selected during SET phase.

Cooling via an underfloor heating system requires certain attention and has limitations. First of all, it is less efficient as heating as the temperature differences between the inlet cooling temperature and the outlet temperature are relatively small compared to heating. Furthermore, the inlet cooling water temperature is limited by the dew point (based upon room temperature and relative humidity.

The Sentio system offers two standard profiles for switching between heating and cooling.

1) Manual changeover done by the user (choice of summer/ winter mode).

2) Automatic changeover based upon outdoor temperature, required room temperature and a predefined dead bend.

Conditions of Use

When using the heating/cooling option it is important to understand that an underfloor heating/cooling system reacts slow. This implies that switching the system from heating to cooling and vice versa requires a certain responding time. Also, the heat-pump shall be able to stabilize after switching. Therefore, the software of this profile is designed in such a way that the frequency of switching is limited based upon the specifications of the heat-pump supplier.

In general, Wavin advices not to switch between heating/cooling several times per day as the response time will be slow.

How to Connect

The communication between the heat-pump and the Sentio controller can be realized via the two voltage free relays (VFR), Analogue signal. Development is ongoing to make available communication via Modbus RTU or PWM.

When using a heat-pump it is required to make use of an outdoor temperature sensor (beside the outdoor sensor of the heat-pump) in order to optimize the system. Such an outdoor temperature sensor shall be installed as per the description in the CONNECT chapter.

How to Set

The setting of the correct profile to communicate with the heat-pump can be made via the touch screen or the PC tool as described in the SET part of this manual (software can be downloaded via the website and the USB connection cable can be ordered from Wavin).

For Sentio in combination with a heat pump the profiles 1.1, 2.2.1, 2.2.2, 3.3.0 and 3.3.1 can be used. For profile description see paragraph 4.9

How to Go

The Sentio system can be controlled via the thermostats in each room, via the Sentio app and if required via the touch screen. For this profile we strongly recommend including the touch screen within the Sentio system as it will give more freedom for the end-user to monitor the system.

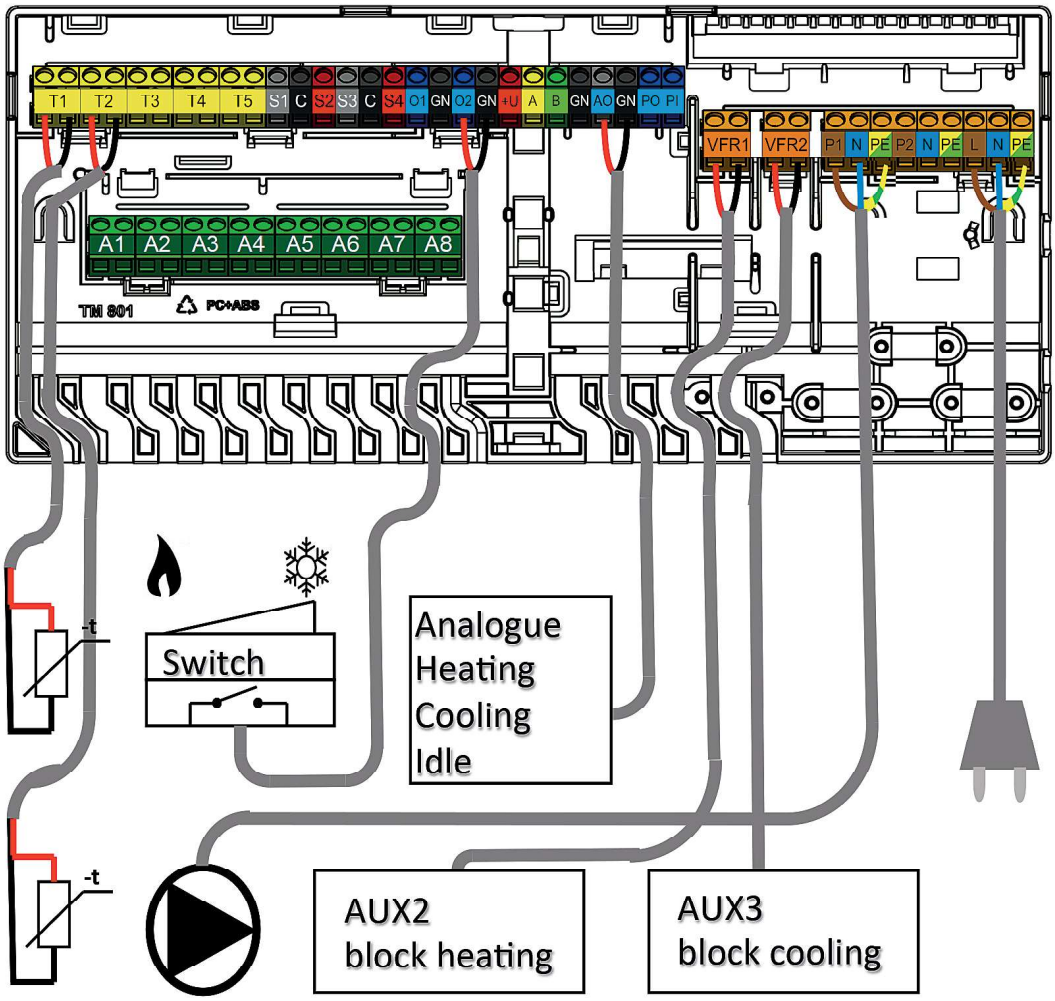
NOTE: Not all heat-pump are yet compatible with the Sentio system. Therefore a check with the heat-pump supplier is required or Wavin shall be contacted to check this. At this moment all heat-pumps supplied by Nibe are compatible with Sentio.

The installation and commissioning of the Nibe heat-pump is the responsibility of the installer. In most cases Nibe will install and commission the heat-pump themselves. Contact Nibe (www.nibe.com) for this.

For the Nibe heat-pump a direct analogue signal will be used in order to control heating & cooling demand.

Connection on the Sentio CCU module is the 0-10V connection terminals coded A0 - GN:

Below the connection schema:



4.7. Sentio & District Heating

Why Connect Sentio & District Heating

The Sentio system enables the use of so called Inlet Temperature Controller (ITC) functionality that enables it to be used for district heating systems. By using this ITC functionality it is possible to comply to the requirements when using district heating as heating source for underfloor heating. It contributes to a very efficient way of heating.

For district heating it is typical that relative hot water (e.g. 80'C) is supplied to residential buildings and used for a) hot tap water and b) underfloor heating.

Sentio can be used in combination with district heating for underfloor heating applications as the ITC functionality controls the inlet and outlet temperature of the mixing unit and ensures that the inlet temperature is not above the pre-set maximum and that the return water temperature is below a pre-set maximum.

ITC embedded in the Sentio CCU controls a linear servo motor which is installed in the mixing unit (instead of the common used manual thermostat) of an underfloor heating system. The ITC regulates hot water supply temperature supplied by e.g. district heating system.

Depending on the outdoor temperature, selected heat curve and the water temperature in the return line, the central control unit controls the servo valve to achieve the desired temperature.

The ITC can also be used instead of a manual thermostat in order to automatically control the inlet and outlet temperature based upon the required heat demand.

As the Sentio system can handle two mixing units at the same time it is also able to deal with two ITC groups simultaneously.

Conditions of Use

When applying the ITC functionality it is mandatory to include an external outdoor temperature sensor and an inlet & outlet temperature sensor on the mixing unit.

Within the settings for the ICT loop via the PC/touchscreen the parameter settings of the ITC shall be checked and adjusted only when necessary.

At the moment 2 ITC's are used the outputs/rooms associated to each ITC loop shall be defined.

How to Connect

The connection between the district heating supply and discharge pipes and the mixing unit shall be made by the installer. The ITC servo motor is connected to the mixing unit at the same position as the manual thermostat. In the Sentio article list this servo motor is listed.

Connection of the servo motor(s) with the CCU is via the ITC terminal connections as explained in the CONNECT part of this manual.

The inlet temperature sensor are mounted on the inlet of the brass/RVS part just before the inlet manifold unit and connected to the CCU as per the information from the CONNECT part. The outlet temperature sensor is connected to the brass/RVS outlet side of the return manifold and wired to the CCU as per the CONNECT part of this manual.

How to Set

The ITC settings shall be checked and adjusted via the touch screen or the PC tool.

Under 'system' ➔ 'ITC' the settings can be found.

Via the hardware profile for this application ITC type can be selected and adjusted whenever required. For Sentio in combination with a district heating system the profiles 1.0, 1.3.1 and 1.3.2 can be used. For profile description see paragraph 4.9.

An important aspect is to ensure that each room has its own thermostat/sensor that is connected (wired or wireless) with the central control unit of the Sentio system.

Selection of profile and parameter settings to be done by the installer. Adjustment of the settings are possible via the touch screen (optionally available for the end-user) by the installer. It is important to notice that it is crucial that the underfloor heating zones per room are correctly enrolled/connected to the thermostat/sensor in that room. If this is not the case heat-demand in a certain room can result in heating another room. Therefore during the commissioning this aspect shall be checked carefully before the system is handed over to the end-user.

NOTE: The installation and commissioning of the underfloor cooling system is the responsibility of the installer. Once installed and commissioned Wavin does not advise to change the parameter settings unilaterally.

How to Go

The Sentio system can be controlled via the thermostats/sensors in each room, via the Sentio app and if required via the touch screen. Once installed the end-user can control the indoor climate comfort in each room.

4.8. Sentio & Boiler

Why Connect Sentio & Boiler

The Sentio system offers the option to connect directly to a boiler in order to support heating. Connecting to a boiler will be the most common application for a hydronic heating system.

The Sentio system will be in control of the chiller in order to create enough heating capacity based upon the Sentio zone-control requirements.

In principle all kind of boilers are compatible with the Wavin Sentio system as long as the control of it can be via a voltage free relays (24V-230V), via ON/OFF regulation or for the modern condensing boilers via a 0-10V analogue signal.

When a boiler is installed in combination with a chiller, for heating & cooling regulation, chapter 3 shall be checked as this requires a complete different system and profile.

Conditions of Use

When using the Sentio system to control a boiler is it important that the boiler settings are set for hydronic underfloor heating systems. In general, the inlet water temperature for the mixing unit can be reduced to about <50° C in order to optimize energy usage but also to prevent a too high water temperature in the hydronic heating system.

How to Connect

The communication between the boiler and the Sentio controller can be realized via the two voltage free relays (VFR).

When using a (condensing) boiler it is strongly recommend to make use of an external outdoor temperature sensor in order to optimize the heating system. Such an outdoor temperature sensor shall be installed as per the description in the CONNECT chapter.

How to Set

The setting of the correct profile in order to communicate with the boiler can be made via the touch screen or via the PC tool (software can be downloaded via the website and the Sentio connection cable can be ordered from Wavin).

For Sentio in combination with a boiler the profiles 1.1, 1.2, 2.2.1 and 2.2.2 can be used.

How to Go

The Sentio system can be controlled via the thermostats in each room, via the mobile Sentio APP and if required via the touch screen display. For this profile the touch screen display is a helpful tool to within the Sentio system as it will give more freedom for the end-user to monitor the system.

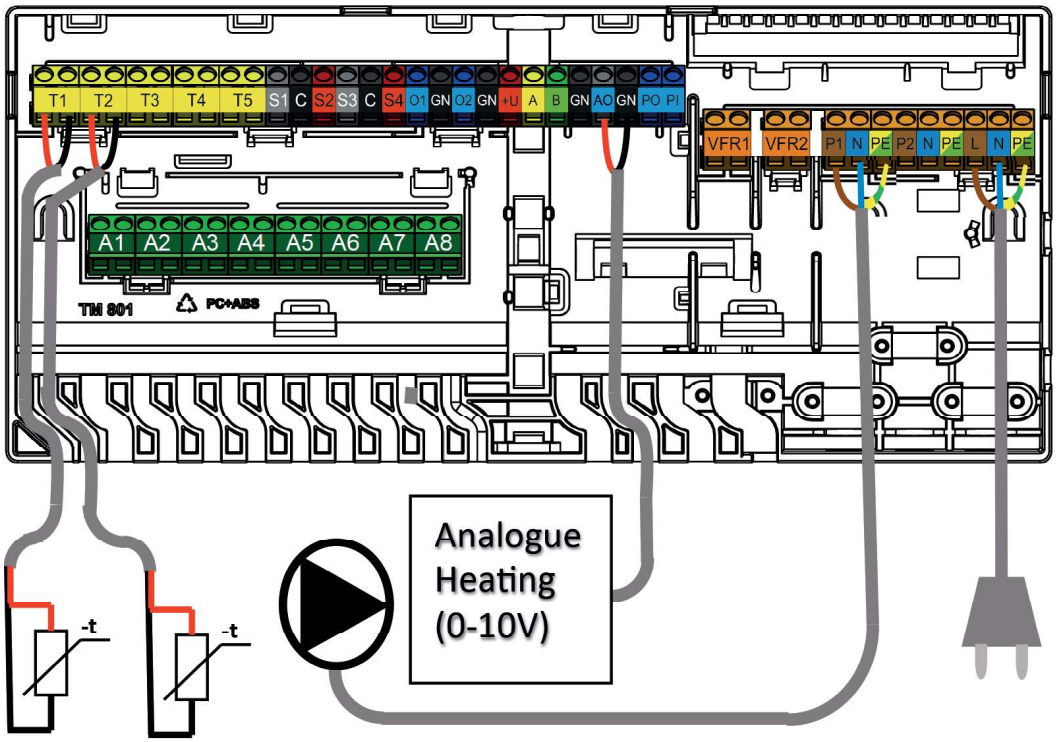
Compatible Boilers

In principle all boilers that can be controlled via ON/OFF signalling or via a 0-10V analogue signal are suitable to be controlled by Sentio.

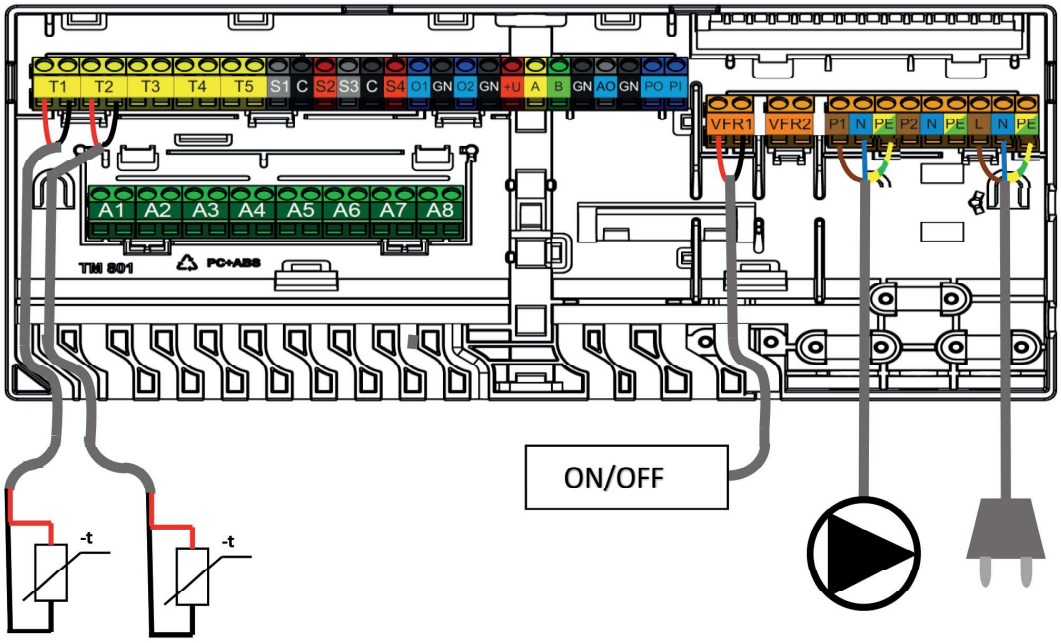
NOTE: The installation and commissioning of the boiler is the responsibility of the installer. In most cases the boiler supplier shall install and commission the boiler.

For controlling a standard boiler most often an ON/OFF signal is required. Sentio offers two of these signal via the CCU unit. A more energy friendly way of control is via a proportional (analogue) signal in combination with an outdoor temperature sensor. For this a more modern, condensing type of boiler is required.

In order to ensure a high efficiency of this condensing boiler the outlet water temperature of the mixing unit shall be regulated in order to ensure this efficiency. Therefore Wavin advices to use the Inlet Temperature Control (ITC) to control this.



Connections Condensing Boiler.



Boiler ON/OFF.

Setting Profiles in Detail

The Sentio system offers the option to connect directly to a boiler in order to support heating. Connecting to a boiler will be the most common application for a hydronic heating system.

The Sentio system will be in control of the chiller in order to create enough heating capacity based upon the Sentio zone-control requirements. In principle all kind of boilers are compatible with the Wavin Sentio system as long as the control of it can be via a voltage free relays (24V-230V), via ON/OFF regulation or for the modern condensing boilers via a 0-10V analogue signal.

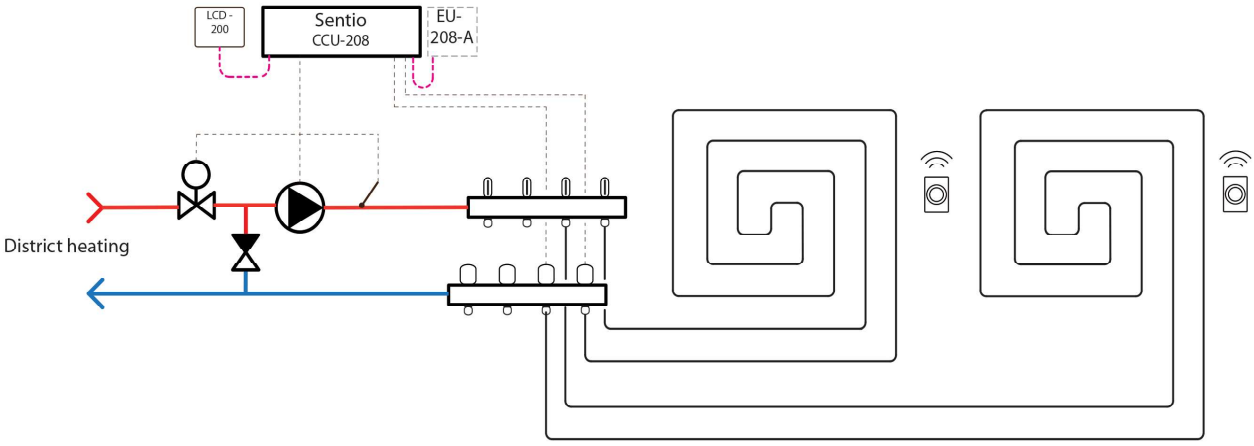
When a boiler is installed in combination with a chiller, for heating & cooling regulation, chapter 3 shall be checked as this requires a complete different system and profile.

4.9. Profiles description

Profile 1.0 - Underfloor Heating Together with District Heating

Profile 1.0 is the default profile and used for a standard under floor heating systems without Inlet Temperature Control.

- If more than 8 outputs are required an extension unit (EU-A) shall be added to the system
- It is possible to control up to 2 standard pumps, On/Off
- Both wired and wireless room thermostats and sensors can be used
- By connecting one (two) temperature sensor to the CCU, it is possible to protect your system against a too high inlet temperature. This can be done separately for the two different manifolds
- It is optional to install the Sentio touch screen.



Wiring for profile 1.0

All the wiring shall be done according to the drawing in paragraph 4.7.
If you must use an extension unit you have to remember also connecting these two.

Setup of Profile 1.0

To be able to setup/adjust the settings for the Sentio system you need either the Sentio touch screen or the Sentio connection cable for PC. If you only want to control one circulation pump, then this profile can be used without making any further settings.

If you have two manifolds, you need to setup the system to "tell" the system which loops control which pump. Please follow the below steps to do this setup:

- At the touch screen or in the PC tool go to the menu "System" - "Functions" - "Heating/Cooling circuits" - "Heating circuit 1(2)" - "Room assignment for this circuit". Select the rooms you want to control the pump.

  Please repeat the above step for the other manifold.

Below you can find, some of the most often used settings for this profile. If you want to see the full list of possible settings for this profile, please refer to the manual for the Sentio Touch screen.

The High Temperature Cut Off feature is activeated ad default. If it was deactivated and you want to turn it on again please follow the below steps:

- At the touch screen or in the PC-tool go to the menu "System" - "Functions" - "Heating/Cooling circuits" - "Heating circuit 1(2)" - "Cut-Off temperatures" Enable the High Temperature Cut-Off and set the desired Cut-Off temperature.

  If you have more than one manifold you must setup the High Temperature Cut-Off for both manifolds.

As standard the start signal to the pump is delayed by 5 minutes, to allow the actuators to open, before the pump starts. If you need either to shorten or lengthen this delay, please follow the below steps to do the changes:

- At the touch screen or in the PC-tool go to the menu "System" - "Hardware profile" – "Configure required inputs and output" – "Voltage free relays" – "Boiler/Heat pump" and change the "Delay start" value" to the value you need.

  If you have more than one pump, you must set up the "Start delay" for both pumps.

As standard the stop signal to the pump/s is delayed by 3 minutes, to allow the actuators to close, before the pump stops. If you need either to shorten or lengthen this delay, please follow the below steps to do the changes:

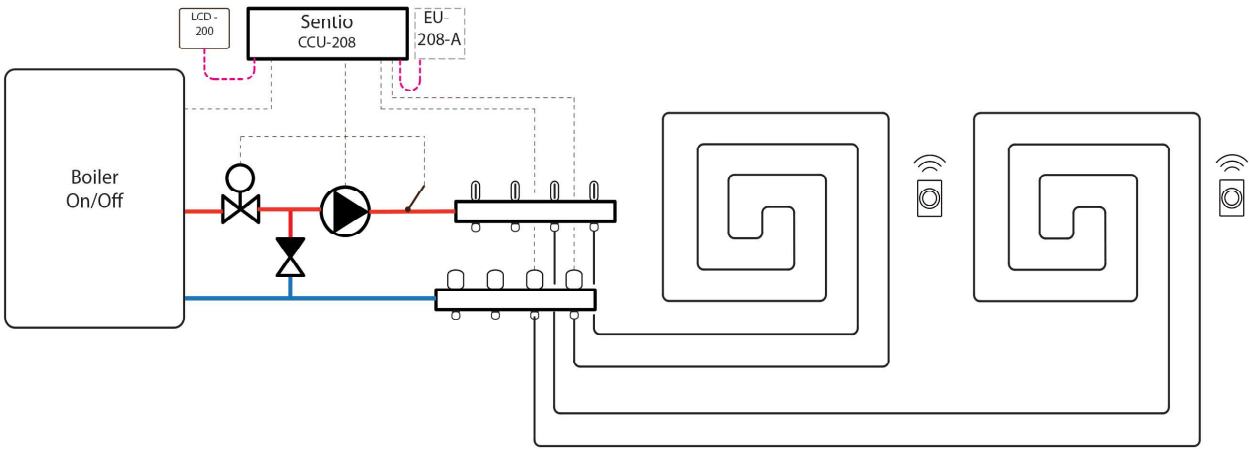
- At the touch screen or in the PC-tool go to the menu "System" - "Hardware profile" - "Configure required inputs and outputs" - "Relays" - "Pump 1(2)" and change the "Delay stop" value" to the value you need.

  If you have more than one pump, you must set up the "Stop delay" for both pumps.

Profile 1.1 - Underfloor Heating Together with a Boiler / Heat-Pump (On/Off)

Profile 1.1 is a profile used for a standard under floor heating systems without Inlet Temperature Control and with the possibility to give a signal to a boiler/heat pump if there is a heat demand or not.

- If more than 8 outputs are required an extension unit (EU-A) shall be added to the system.
- It is possible to control up to two standard pumps, On/Off.
- Both wired and wireless room thermostats and sensor(s) can be used.
- By connecting one (two) temperature sensor to the Control Centre, it is possible to protect your system against a too high inlet temperature. This can be done separately for the two different loops.
- It is optional to install the Sentio touch screen.



Wiring for profile 1.1

All the wiring shall be done according the drawing in paragraph 4.8. If you use an Sentio Extension unit you have to remember also connecting these two.

Setup of Profile 1.1

To be able to setup/adjust the settings for the Sentio system you need either the Sentio touch screen or the Sentio Connection cable for PC.

If you only want to control one circulation pump, then this profile can be used without making any further settings.
If you have two manifolds, you need to setup the system to "tell" the system which loops controls what pump. Please follow the below steps to do this setup:

- At the touch screen or in the PC tool go to the menu "System" - "Functions" - "Heating/Cooling circuits" - "Heating circuit 1(2)" "Room assignment for this circuit". Select the rooms you want shall control the pump.

Below you can find, some of the most often used settings for this profile. If you want to see the full list of possible settings to this profile, please refer to the manual for the Sentio Touch screen.

If you want to use the High Temperature Cut-Off feature, you need to activate the functionality. Please follow the below steps to activate and setup the High Temperature Cut-Off:

- At the touch screen or in the PC tool go to the menu "System" - "Functions" - "Heating/Cooling circuits" - "Heating circuit 1(2)" "Room assignment for this circuit". Enable the High Temperature Cut-Off and set the desired Cut-Off temperature.

  If you have more than one manifolds you must set up the High Temperature Cut-Off for both manifolds.

When there is a heat demand to the boiler/Heat pump, the boiler relay will be "closed". If you need the relay to be "open" during a heat demand you can change the settings as explained below:

- At the touch screen or in the PC tool go to the menu "System" - "Hardware profile" – "Configure required inputs and output" – "Relays" – "Voltage free relays" – "Boiler/Heat pump" and change the "Not inverted value" to "Inverted". Now the relay will be "Open" when there is a heat demand.

As standard the start signal to the boiler/heat pump is delayed by 5 minutes, to allow the actuators to open, before the boiler starts. If you need either to shorten or lengthen this delay. Please follow the below steps to do the changes:

- At the touch screen or in the PC tool go to the menu "System" - "Hardware profile" – "Configure required inputs and output" – "Voltage free relays" – "Boiler/Heat pump" and change the "Delay start" value" to the value you need.

As standard the start signal to the pump/s is delayed by 5 minutes, to allow the actuators to open, before the pump starts. If you need either to shorten or lengthen this delay. Please follow the below steps to do the changes:

- At the touch screen or in the PC tool go to the menu "System" – "Actions"- "Hardware profile" – "Configure required inputs and output" – "Relays" - "Pump 1(2)" and change the "Delay start" value" to the value you need.

  If you have more than one pump, you must set up the "Start delay" for both pumps.

As standard the stop signal to the pump/s is delayed by 3 minutes, to allow the actuators to close, before the pump stops. If you need either to shorten or lengthen this delay. Please follow the below steps to do the changes:

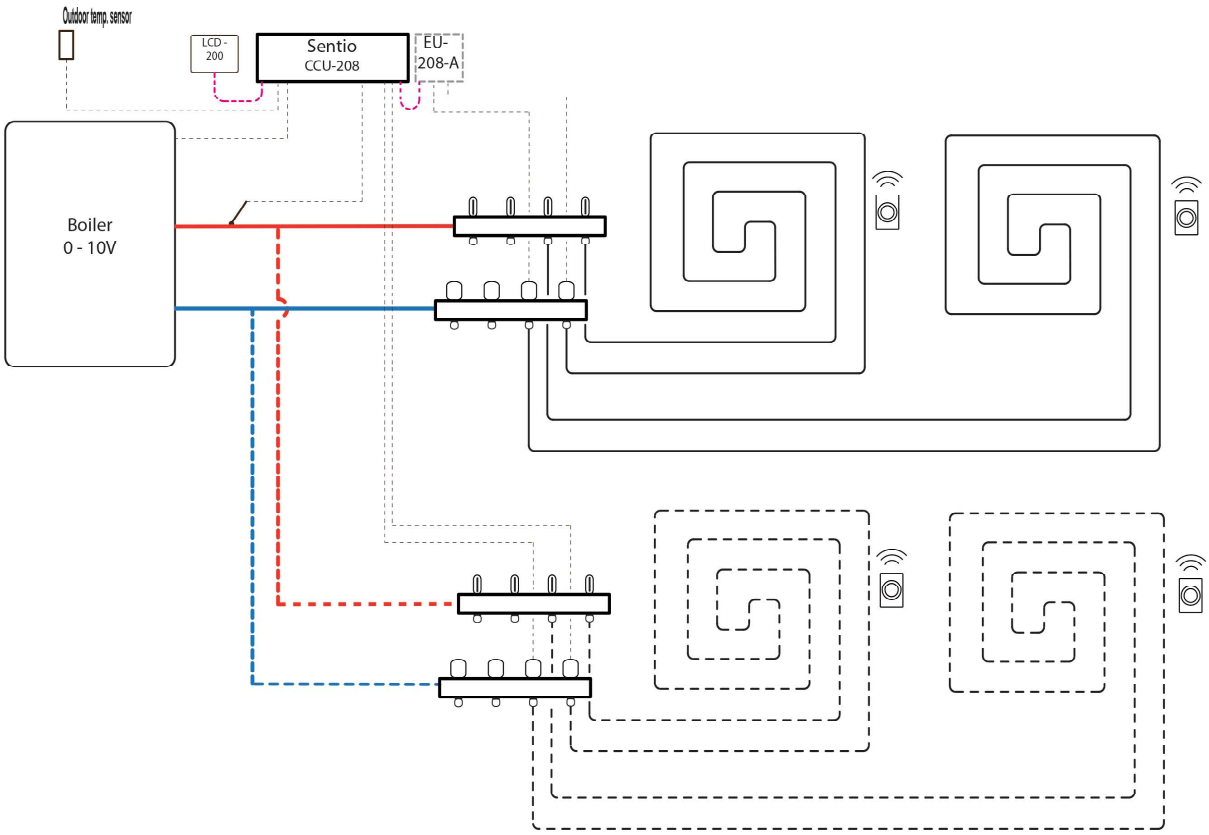
- At the touch screen or in the PC tool go to the menu "System" - "Hardware profile" – "Configure required inputs and output" – "Relays" - "Pump 1(2)" and change the "Delay stop" value" to the value you need.

  If you have more than one pump, you must set up the "Stop delay" for both pumps.

Profile 1.2 - Underfloor Heating Together with a Condensing Boiler (0-10V Control)

Profile 1.2 is a profile used for a standard under floor heating systems without Inlet Temperature Control and with the possibility to give an analogue (0-10V) signal to a boiler/heat pump, reflecting the desired set temperature.

- If more than 8 outputs are required an extension unit (EU-A) shall be added to the system.
- It is possible to control up to 2 standard pumps, On/Off
- Both wired and wireless room thermostats and sensors can be used
- By connecting a temperature sensor to the CCU it is possible to protect your system against a too high inlet temperature
- It is optional to install the touch screen



Wiring for profile 1.2

All the wiring shall be done according to the drawing in paragraph 4.8.
If you use an extension unit you have to remember also connecting these two.

Setup of Profile 1.2

To be able to setup/adjust the settings for the Sentio system you need either the touch screen or the connection cable. Before you can use this profile you need to setup some settings. Please follow the below steps to set up the required parameters:

- At the touch screen or in the PC tool go to the menu "System" – "Hardware profile" – "Set outdoor temperature source: Choose whether you have connected the outdoor temperature thermometer to the "T1" connectors, or you have enrolled a wireless or wired BUS outdoor temperature sensor to the CCU. If you have used a wireless or wired external outdoor temperature sensor, you must change the "Use external sensor" settings to "On".

  Press the small "home icon in the top of the screen to go back to the main screen.

- At the touch screen or in the PC tool go to the menu "System" - "Functions" - "Heating/cooling circuits" - "Heating circuit 1(2)" - "Heat curve settings".
  Please choose the type of heat curve you want or setup your own type, by choosing "Manual". For more detailed information to setup and fine tune the heat curve please refer to the manual for for the touch screen.

  Press the small "home icon in the top of the screen to go back to the main screen.

- At the touch screen or in the PC tool go to the menu "System" - "Functions" - "Heating/cooling circuits" - "Heating circuit 1(2)" - "Setup analogue output"

  - At the row "Temperature threshold" you have to setup the outdoor temperature where the CCU stops the heat demand to the boiler.

  - Specify the lowest voltage your boiler can accept and at which inlet temperature this represents.

  - Specify the highest voltage your boiler can accept and at which temperature this represents.

  For more detailed information to setup and fine tune the analogue output please refer to the manual for the touch screen.

Below you can find, some of the most often used settings for this profile. If you want to see the full list of possible settings to this profile, please refer to the manual for the touch screen.

If you want to use the High Temperature Cut-Off feature, you need to activate the functionality. Please follow the below steps to activate and setup the High Temperature Cut-Off:

- At the touch screen or in the PC tool go to the menu "System" - "Functions" - "Heating/cooling circuits" - "Heating circuit 1(2)" - "Cut-off temperatures".
  Enable the High Temperature Cut-Off and set the desired Cut-Off temperature.

As standard the start signal to the boiler is delayed by 5 minutes, to allow the actuators to open, before the boiler starts. If you need either to shorten or lengthen this delay. Please follow the below steps to do the changes:

- At the touch screen or in the PC tool go to the menu "System" - "Hardware profile" - "Relays//Pump 1(2)" and change the "Delay start" value" to the value you need.

NOTE: If you want to set up one of the other implemented profiles please contact Wavin for further information.

NOTE: By doing the wiring for the analogue signal please please take care for the correct use of the wires and terminals.
A0 (0-10V output): "+"
GN (Ground – neutral): "-"

5. GO

When using zone-control in residential applications each zone can be controlled via the thermostat in that particular room. An alternative is to control each room from a distance (so no need to be present in the room) via the Wavin Sentio app.

5.1. Using the Sentio App

Go to the Google Play or iOS App Store and download the Sentio app. After the registration process the app is ready for use.

After installing and commissioning of the total system the registration of the CCU to the app can be done and the app can be configured based upon the requirements of the end-user.

The End-User can decide to grant access to the CCU to other people as well. Granting access to other people also implies that more than one person simultaneously can adjust the required settings.

The Sentio app enables you to take control of your Sentio system and to adjust the settings.

The features are beyond the settings that can be made via the thermostat and are adapted to the daily use demand. General changes of the system can only be made via the touch screen or the PC tool.

At the start screen you can add widgets for an easy access and adaption of the different rooms. Each user can select different rooms, so that you have an easy overview and access to the rooms that are important for you.

For a fast temperature choice three comfort levels are predefined in the app. Eco (18°C), comfort (21°C) and extra-comfort (23°C). In the settings you can adapt the preset temperatures according to your demand.

The room thermostats can be blocked/unblocked via the app. You can add schedules via the app, chose temporary modes e.g. for holiday and adapt the pre-set temperatures for the system.

5.2. Maintenance

The Wavin control unit for underfloor heating/cooling requires no planned maintenance. The control unit, extension units and thermostats/sensors can be cleaned with a damp cloth. Do not use cleaning products!

It is important to ensure that the control unit and extension units are not blocked/covered by anything. This in order to ensure proper cooling of the units and to avoid damaging.

Furthermore, to ensure a normal functioning of the temperature and humidity sensor the opening of the thermostat/sensors on the bottom side shall not be covered.

Where appropriate, it is recommended to replace the thermostat`s batteries at the beginning of each heating season.

If circuits in operation are not activated for 7 days, their outputs are energized for 15 minutes to prevent the associated thermo-motors from jamming.

If no circuits are activated for 7 days, the heat source and circulation pump are activated for 10 minutes to prevent jamming.

If communication between the control unit and all thermostats connected to a specific channel fails, that channel is activated every hour for 15 minutes.

6. Copyright & Disclaimer

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You shall comply with all copyright laws and regulations applicable. Furthermore, you shall inform Wavin immediately and in full of any actual, expected or envisaged infringement of Wavin's IPR that comes to your attention.

When designing with, installing and/or using the Wavin Sentio system, you should fully comply with:

- the safety measures as set out in this manual or otherwise communicated with you in regard to (the installation and/or use of) the Wavin Sentio;
- all applicable laws and regulations of any jurisdiction regarding safety;
- the installation instructions provided by Wavin and other applicable instructions;
- the installation instructions provided by 3rd Parties of components used in combination with the Wavin Sentio system.

Furthermore, you should take care that Wavin Sentio, the components thereof and the components to which the Sentio shall be connected are:

a) Stored in such a way that they are not exposed to e.g. moisture, temperature, pressure, voltages, etc. that are outside the allowed range/tolerances/limits mentioned on the products via stickers/labels/printing or stated in any manual/instruction/video as supplied by Wavin
b) Checked/inspected before they are installed and put into operation in order to judge if they do not show signs of damage or mishandling of any kind
c) Designed, selected, installed and commissioned by a competent and licensed designer and installer who works in full compliance with up-to-date technical manuals, installations instructions provided by Wavin (available at the time of installation) as well as in compliance with all applicable building and plumbing regulations, codes and other requirements and guidelines
d) Used only in combination with compatible products approved and specified by Wavin suitable for the application being heating/cooling
e) Used only in combination with potable water supply systems
f) Not combined/connected to or used in any other way with non-Wavin products, parts or components except for those approved or specified by Wavin
g) Located, installed and commissioned and used during its lifetime without being relocated from this original installation location, modified, repaired or changed.

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7. Appendix

7.1. Frequently Asked Questions

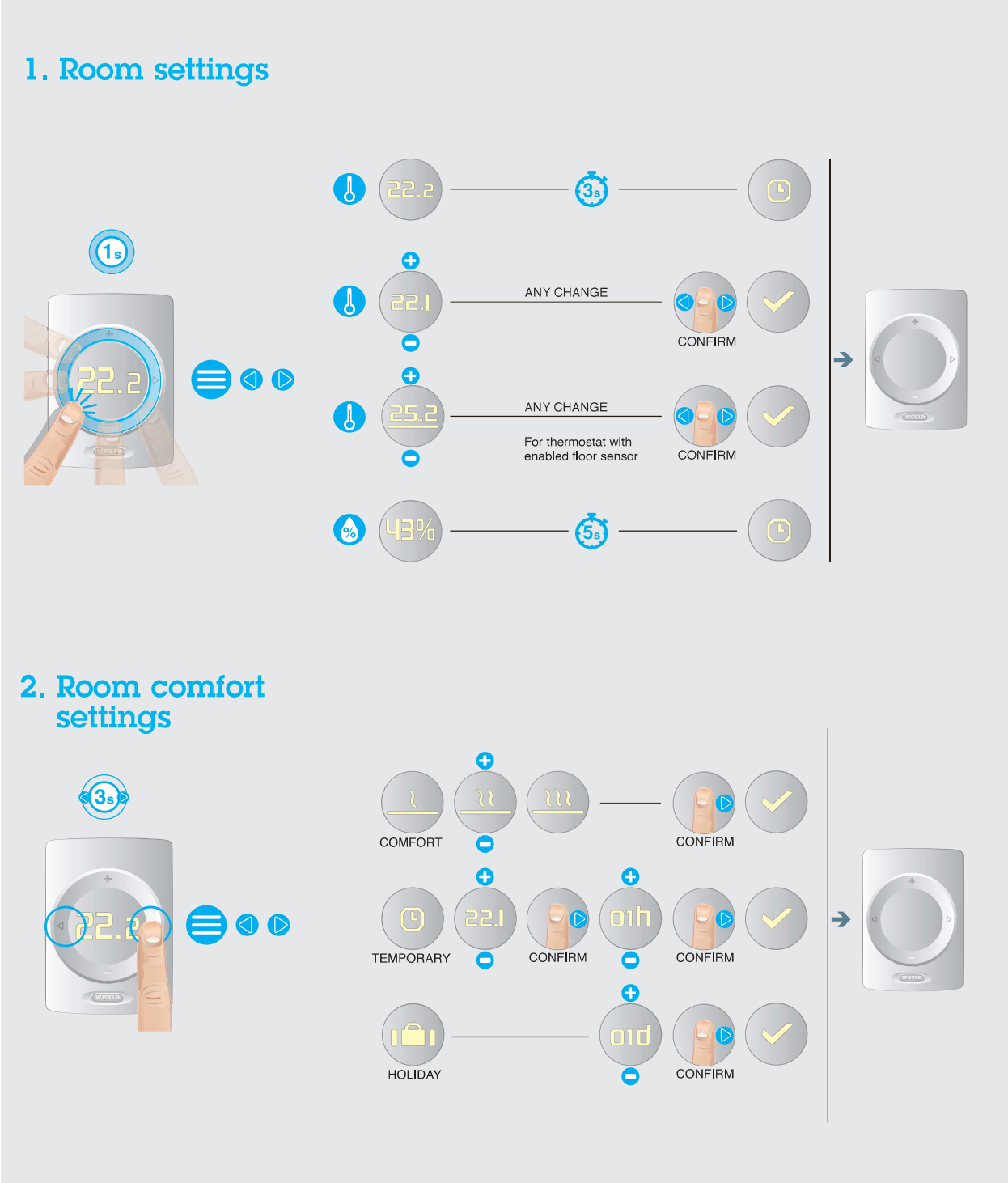
Before you view this overview, it is recommended that you read this installation manual thoroughly. Read in particular the above paragraph on maintenance and view the LED lights of the control unit on the basis of the overview of the LED lights in 'User Guide – general'. You may find an explanation for the symptom without further investigation.

SYMPTOM	PROBLEM	SOLUTION
The LED voltage light on the control unit does not alight	No power supply to control unit.	Check that the power supply of the control unit is switched on. Check the fuse inside the control unit.
The LED light on the control unit of a channel shows overload	More than the max 2 thermo-actuators or other device connected to the output	The connected device consumes too much power. Connect max. 2 thermo-actuator to separate channels.
	The power consumption of the device it too high	Check that the connected device operates with 24 V/DC with a load of no more than 1W/0.4 A. Replace the connected thermo-actuator in case of bad/damaged/broken wiring.
The LED display of the thermostat/sensor does not 'awake' at touching.	No input of that particular room/zone to the control unit.	Fault in wired connection between the control unit and the wired thermostat/sensor.
	Wrong type of BUS cable is used or BUS cable connected in a wrong way.	The symptom "The LED voltage light does not light up" above for the wired components.
	The batteries are empty for the wireless thermostats and sensors	Check for correct connections at the control unit and the wired thermostat/sensor, and check if the wiring is of the correct type and in good condition (not twisted or damaged) and well connected to the control/extension unit.
		Replace the batteries.

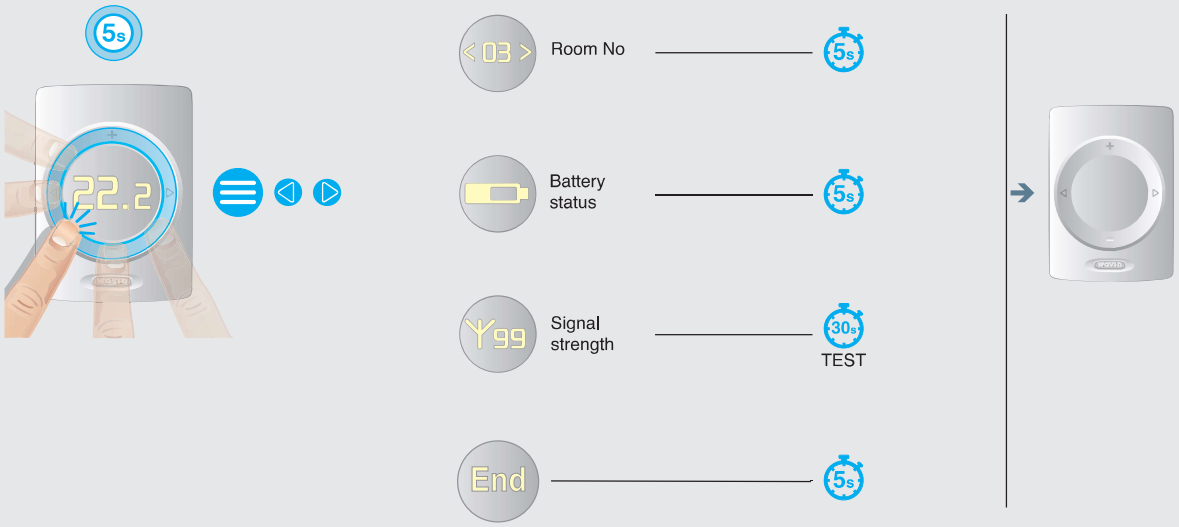
SYMPTOM	PROBLEM	SOLUTION
Connection with thermostat/sensor lost / temporary interrupted.	Fault in wired connection between the control unit and the thermostat/sensor. Use of incorrect cable type. Weak wireless signal.	◦ Check for correct connections at the control unit and the thermostat/sensor and check if the cable is connected correctly. ◦ Check for continuity from one end of the wire to the other end and make sure there is no short circuit between individual wires. ◦ Check that the thermostat or control unit is not mounted on a metal surface or housing. ◦ Check for non-certified wireless products within the range of their control system. ◦ Try the thermostat at a different location in the room where the temperature control is needed. ◦ In case situation continues an external antenna is available to improve the signal strength.
Thermostat/sensor cannot be enrolled/ connected to the control unit.	The control unit does not receive the link signal. The thermostat does not send a link signal. Another problem.	◦ Check that the LED light of the output channel indicates that the control unit is ready to be paired (chapter 4.1.1). ◦ Place the batteries inside the wireless thermostat/sensor, check correct battery position and start enrolling proves (chapter 4.4). ◦ See symptom “Connection with thermostat lost / temporarily interrupted” ◦ Try to enrol manually (chapter 4.4)
One or more rooms become overheated.	Thermostats/sensors control the wrong outputs.	◦ Reset incorrectly linked outputs and connect them to the correct thermostats. ◦ Label the output on the manifold and check corresponding thermostats/sensors in the room.

7.2. Sentio Thermostat

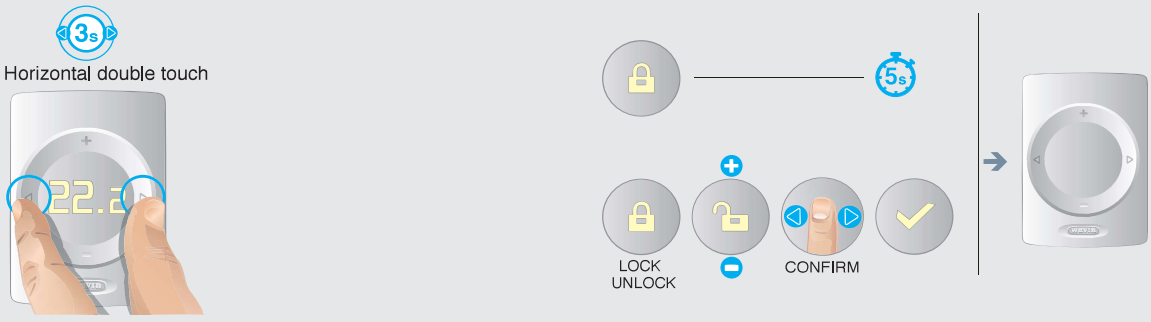
Via the room thermostat different settings can be made and information about the room are provided.



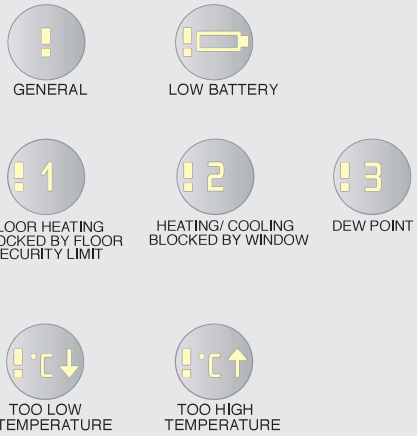
3. Advanged settings



4. Lock | Unlock

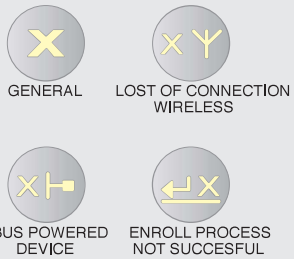


5. Warning



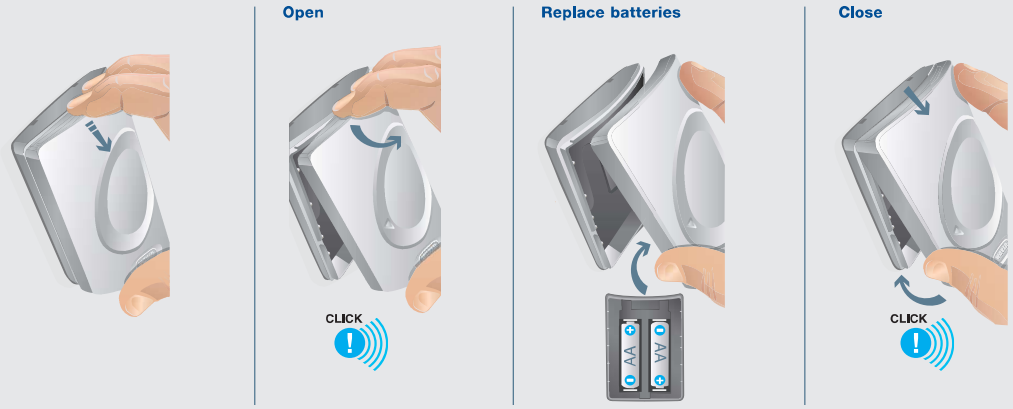
→ **Check manual**

6. Error

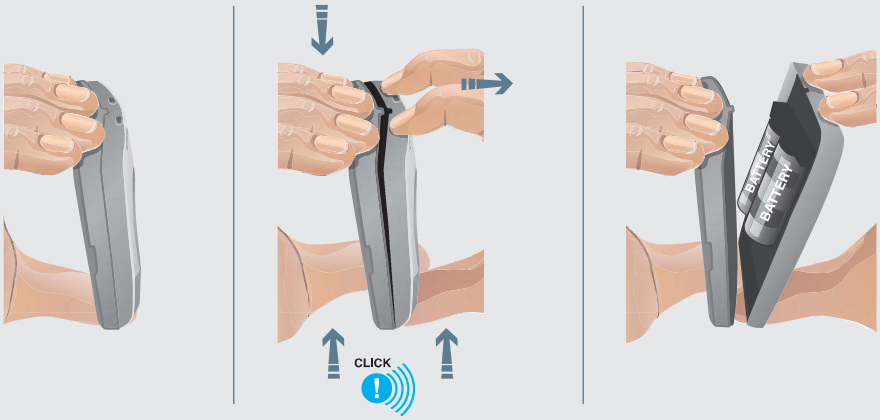


→ **Check manual**

7a. How to replace the batteries | Wall mounted | wireless



7b. How to replace the batteries | Hand Held | wireless



7.3. User Manual Sentio Sensor

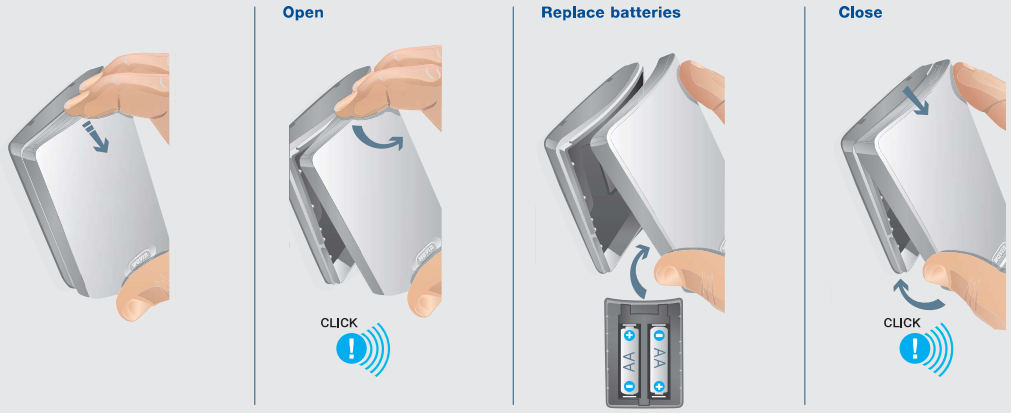
1. Warning

→ Check manual

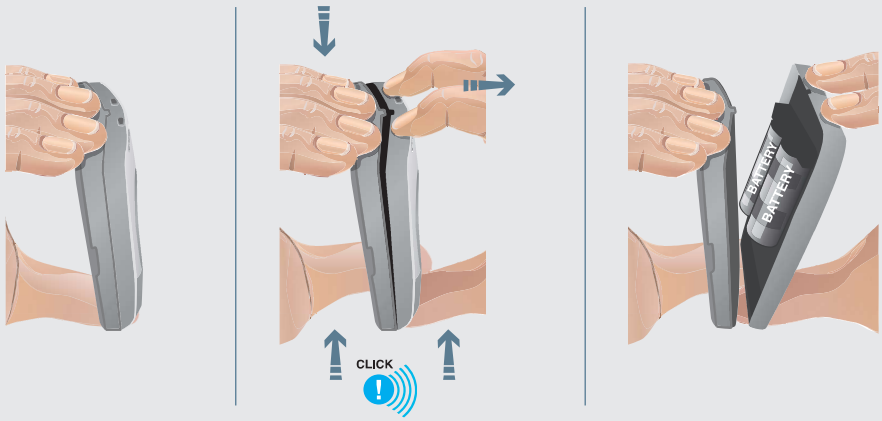
2. Error

→ Check manual

3a. How to replace the batteries | Wall mounted | wireless

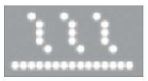
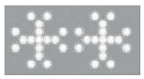
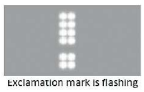
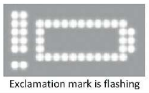
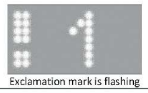
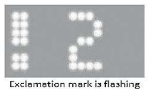
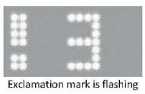
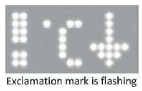
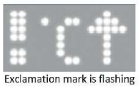


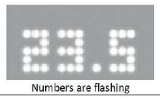
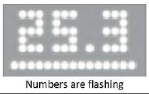
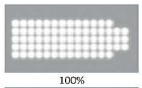
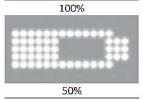
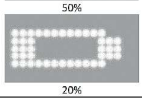
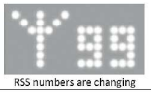
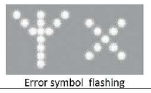
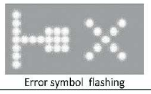
3b. How to replace the batteries | Hand Held | wireless

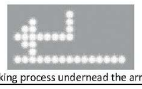
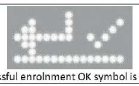
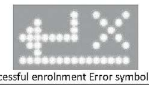
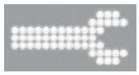


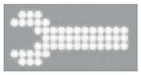
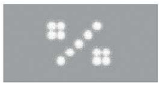
Annex

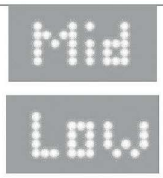
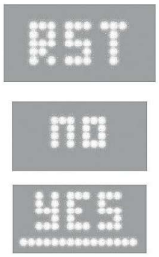
7.4. List of symbols (thermostat)

Abreviation	Description	Heating	Cooling
[ECO]	Economic mode		
[CMF]	Comfort mode		
[XCMF]	Extra comfort mode		
[WAR]	Warning - general	 Exclamation mark is flashing	
[WLB]	Warning - Low battery <10% Battery symbol	 Exclamation mark is flashing	
[WFL]	Warning, floor heating blocked by floor security limit	 Exclamation mark is flashing	
[WOW]	Warning, heating / cooling blocked by window	 Exclamation mark is flashing	
[WDP]	Warning -Dew point		 Exclamation mark is flashing
[WTL]	Too low temperature	 Exclamation mark is flashing	
[WTH]	Too high temperature	 Exclamation mark is flashing	
[TMP]	Temporary mode		
[TMP-CANC]	Temporary mode cancelation		
[HOL]	Holiday holiday symbol		

Abreviation	Description	Heating	Cooling
[TMP-CANC]	Holiday mode cancelation		
[LCK]	Locked		
[ULCK]	Unlocked		
[CRT]	Current room temperature		
[SRT]	Set room temperature	 Numbers are flashing	
[CFT]	Current floor temperature		
[SFT]	Set floor temperature	 Numbers are flashing	
[HUM]	Humidity		
[BAT]	Battery status A space inside the battery symbol is filled in accordance with current battery status.	 100%  50%  20%	
[RSS]	Radio Signal Strength (00 – 99) 00 = no signal 99 = extremely good signal	 RSS numbers are changing	
[ELCW]	Lost of connection For Wireless device	 Error symbol flashing	
[ELCB]	Lost of connection For BUS powered device	 Error symbol flashing	

Abreviation	Description	Heating	Cooling
[ERR]	General Error - Error symbol		
[OK]	Value saved or action was successful - OK symbol		
[REFUSE]	Access refused - No entry symbol		
[ENR]	Enroll symbol - Enroll process is executing.	 During enroll/checking process underneath the arrow is progress bar.	
[ENR-OK]	Successful enroll symbol		
	displayed after successful enroll	 After successful enrolment OK symbol is displaying	
[ENR-KO]	Unsuccessful enroll symbol displayed is CCU not respons	 After unsuccessful enrolment Error symbol is displaying	
[RNR]	Room Number number of room where thermostat is enrolled		
[R-SET]	Installer level 2 Common settings		
[REG] [AIR] [A+F] [FLR]	Type of temperature regulation Options: **Air** = Regulation by air temperature (floor sensor disabled) **Air+Floor** = Regulation by air temperature with floor limits **Floor** = Regulation by floor temperature	   	
[TLO]	Allowed user range for temperature settings Low limit		
[THI]	Allowed user range for temperature settings High limit		
[FLL]	Floor limit low		

Abreviation	Description	Heating	Cooling
[FLH]	Floor limit high		
[L-SET]	Installer level 3 Thermostat settings		
[FWV]	Firmware version From original FW number are displayed two last numbers as FW version.		
[FWB]	Firmware beta version not for production used for FW testing purpose only	 Displayed as consequent item after FW version [FWV] if firmware is intended for testing stage.	
[T-C0]	Correction of room (air) temperature sensor		
[FL-C0]	Correction of floor temperature sensor		
[H-C0]	Correction of room humidity sensor		
[BR-L]	Display brightness Low Selections: 1-2-3-4-5-6		
[BR-H]	Display brightness High Options: 1-2-3-4-5-6		
[TPS]	Touch pad sensitivity Options: Hi – Mid - Low	 	

Abreviation	Description	Heating	Cooling
			
[RST]	Reset to factory def. Options: YES – NO YES is underlined by progress bar For successful confirmation the ">" button must be hold till progress bar is finished.		

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Notes

Notes

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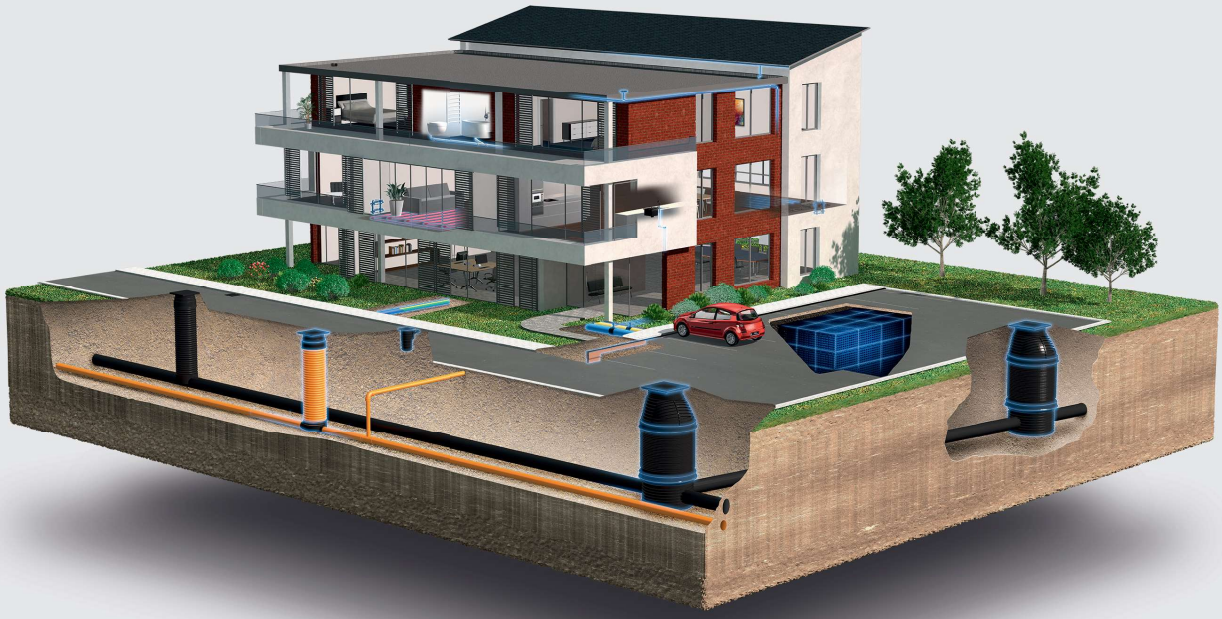

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1805 18-088 - July 2018