Climate Control Zoning System II

installation and operation manual

Table of contents

Foreword

Uponor has prepared this document and all the content included solely for information purposes. The contents of this document (including graphics, logos, icons, text, and images) are copyrighted and protected by worldwide copyright laws and treaty provisions. Modification or use of any of the contents of the document for any other purpose is a violation of Uponor's copyright, trademark and other proprietary rights.

The presumption for the document is all safety measures have been fully complied with and, further, that the Climate Control Zoning System II, including any components that are part of such system, covered by the manual:

• Is selected, planned and installed and put into operation by a licensed and trained installer in compliance with current (at the time of installation) installation instructions provided by Uponor as well as in compliance with all applicable building and plumbing codes and other requirements and guidelines;

• Has not been (temporarily or continuously) exposed to temperatures, pressure and/or voltages that exceed the limits printed on the products or stated in any instructions supplied by Uponor;

• Remain in its originally installed condition and is not repaired, replaced or interfered with, without prior written consent of Uponor;

• Is connected to potable-water supplies or compatible plumbing, heating and/or cooling products approved or specified by Uponor;

• Is not connected to or used with non-Uponor products, parts or components except for those approved or specified by Uponor; and

• Does not show evidence of tampering, mishandling, insufficient maintenance, improper storage, neglect or accidental damage before installation and being put into operation.

While Uponor has made efforts to ensure the document is accurate, Uponor does not guarantee or warrant the accuracy of the information contained herein. Uponor reserves the right to modify the specifications and features described herein, or discontinue manufacture of the Climate Control Zoning System II described at any time without prior notice or obligation. The manual is provided "as is" without warranties of any kind, either expressed or implied. The information should be independently verified before using it in any manner.

To the fullest extent permissible, Uponor disclaims all warranties, expressed or implied, including, but not limited to, the implied warranties of merchantability, fitness for particular purpose and non-infringement.

This disclaimer applies to, but is not limited to, the accuracy, reliability or correctness of the manual.

Under no circumstances shall Uponor be liable for any indirect, special, incidental or consequential damages or loss that result from the use of or the inability to use the materials or information in the manual, or any claim attributable to errors, omission or other inaccuracies in the manual, even if Uponor has been advised of the possibility of such damages.

This disclaimer and any provisions in this document do not limit any statutory rights of consumers.

Overview

Uponor strongly recommends reading this entire installation and operation manual before installing the control system.

Safety symbols

The following symbols are used in this document to indicate special precautions when installing and operating any Uponor equipment.

⚠ **Warning!** Ignoring warnings can cause injury or damage to components.

⚠ **Caution:** Ignoring cautions can cause equipment malfunctions.

Safety measures

Conform to the following measures when installing and operating any Uponor equipment.

• Read and follow all instructions in this document.

• Ensure a trained installer performs all work in accordance with local regulations.

• Do not make changes or modifications not specified in this document.

• Switch off all power supply before starting any wiring work.

• Do not use water to clean Uponor components.

• Do not expose Uponor components to flammable vapors or gases.

Uponor cannot accept any responsibility for damage or breakdown that can result from ignoring these instructions.

Power

⚠ **Warning!** The Uponor system uses 24 VAC, 60 Hz power. In case of emergency, immediately disconnect the power.

Technical constraints

⚠ **Caution:** To avoid interference, keep installation/data cables away from power cables of more than 50 VAC.

Limitations for radio transmission

The Uponor Climate Control Zoning System II uses radio transmission. The frequency used is reserved for similar applications, and the chances of interference from other radio sources are very low.

However, in some rare cases, it might not be possible to establish perfect radio communication. The transmission range is sufficient for most applications, but each building has different obstacles affecting radio communication and maximum transmission distance. If communication difficulties exist, Uponor recommends relocating the antenna to a more optimal position and ensuring radio sources are at least 16" (40 cm) apart for solving exceptional problems.

Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Note: *The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.*

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• *Reorient or relocate the receiving antenna.*

• *Increase the separation between the equipment and receiver.*

• *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*

Consult the dealer or an experienced radio/TV technician for help.

Proper disposal of waste electrical and electronic equipment

⌧ This marking shown on the product or its literature indicates it should not be disposed with other household waste at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this form from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Contact your installer or local government office for details about environmentally safe recycling.

Chapter 1
System overview

The Uponor Climate Control Zoning System II is for use with underfloor heating installations and combines comfort, user friendliness and temperature control for each individual room of a home.

The system consists of a base unit, thermostats and actuators. The base unit manages the operation of the actuators when the thermostats detect a demand for the heating.

The system is controlled by different types of thermostats. Designed for maximum comfort, the thermostats communicate with the base unit by radio link. It is possible to mix the different types of thermostats in the same installation.

System example

The illustration below shows the system with several installation options and thermostats.
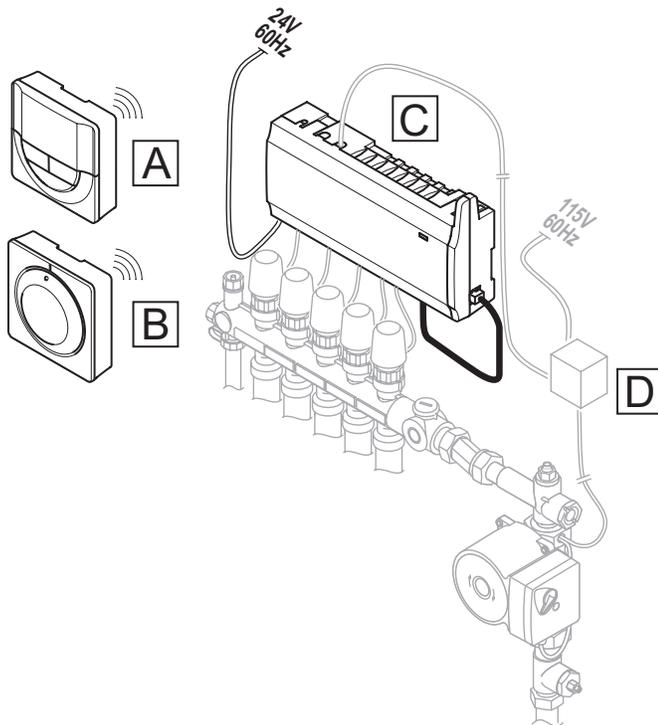
Figure 1-1: Installation options

Item	Part no.	Description
A	A3800167	Wireless Digital Thermostat (T-167)
B	A3800165	Wireless Dial Thermostat (T-165)
C	A3801165	Wireless Base Unit, 6 zones (X-165)
D	A3010100/ A3080301	External relay for pumps
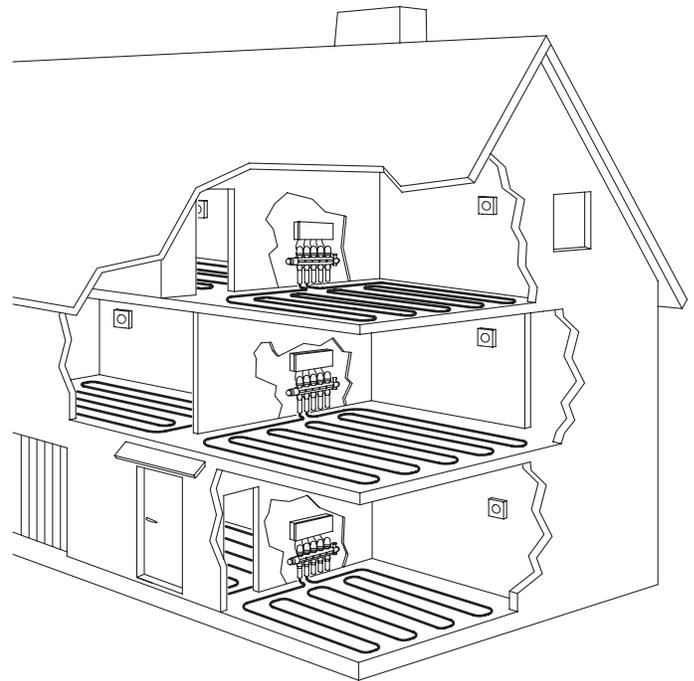
Figure 1-2: Installation examples

Note: The floor sensor can connect to both digital and dial thermostats.

System components

Item	Part no.	Description
A	A3801165	Wireless Base Unit, 6 zones (X-165)
B	A3801160	Wireless Base Unit Expansion Module, 6 zones (M-160)
C	A3800167	Wireless Digital Thermostat (T-167)
D	A3800165	Wireless Dial Thermostat (T-165)
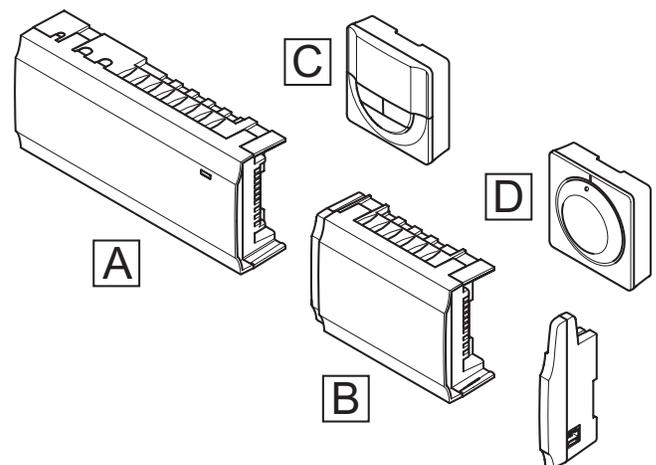
Figure 1-3: System components

Base unit

The base unit operates the actuators, which in turn affect the flow of the supply water, to change the indoor temperature using information transmitted from registered thermostats and system parameters.

Up to six channels and eight actuators can be operated by the base unit, which is typically located near the radiant manifolds.

The radiant illustration below shows the base unit with the antenna and actuators.
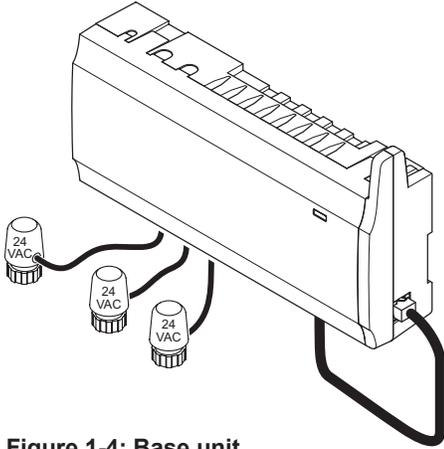
Figure 1-4: Base unit

⚠ **Caution:** Only 24 VAC Uponor actuators are compatible with the controller.

Main characteristics

- Autobalancing energy-management function
- Electronic control of actuators
- Connection of maximum eight actuators
- Two-way communication with up to six room thermostats
- Separate relays for control of pump and boiler
- Valve and pump exercise
- Logging, backup and updates via microSD card

Options

- Expand base unit with optional expansion module (A3801160) which adds an extra six channels and six actuator outputs
- Modular placement (detachable antenna)
- Cabinet or wall mounted (with mounting bracket or supplied screws)
- Free placement and orientation when installing the base unit (except the antenna which must be installed vertically)

Components
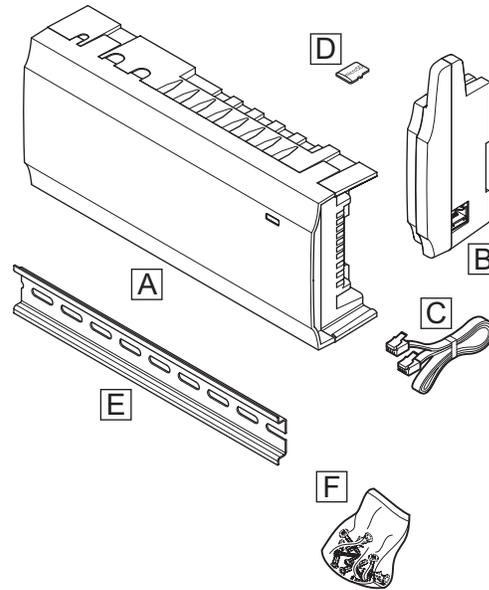
Figure 1-5: Base unit components

Item	Description
A	Wireless Base Unit (A3801165)
B	Antenna
C	Antenna connection cable
D	MicroSD card
E	Mounting bracket
F	Mounting hardware

Thermostats

The thermostats communicate with the base unit through radio transmissions and can be used individually or in combination. All the thermostats use AAA batteries.

> **!** **Important!** The thermostat is affected by the temperature of the surrounding surfaces as well as the ambient air temperature.

Dial thermostats

Main characteristics

- Adjust temperature setpoint with large dial
- 70ºF (21°C) position is marked on the dial
- LED ring indication when twisting the dial (changing temperature setpoint)
- Setpoint range is 41°F to 95°F (5°C to 35°C)
- LED in lower-right corner indicating whether a heating demand exists
- Can be placed up to 98 ft. (30 m) away from the controller
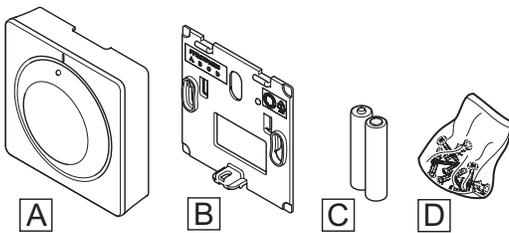
Components

Figure 1-6: Dial thermostat components

Item	Description
A	Wireless Dial Thermostat (A3800165)
B	Wall bracket
C	2 AAA 1.5 V batteries
D	Mounting hardware

Digital thermostats

Main characteristics

- Shows ambient, set temperature or relative humidity on the display
- Temperature settings adjusted using +/- buttons on the front
- Backlit display, dims after 10 seconds of activity
- Displays Celsius or Fahrenheit
- Heating demand as well as low battery indication on display
- Displays software version during power up sequence
- Setpoint range is 41°F to 95°F (5°C to 35°C)
- Room temperature regulation with use of optional external temperature sensors
- Displays optional temperature sensor values if sensors are connected and relevant room temperature regulation is activated
- Relative humidity limit indicated in display
- Can be placed up to 98 ft. (30 m) from the controller
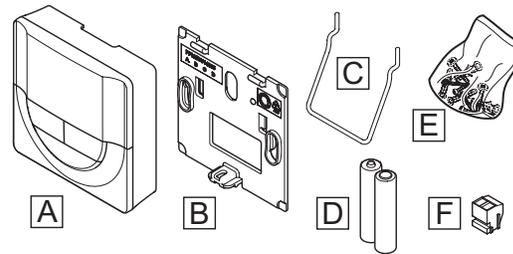
Components

Figure 1-7: Digital thermostat components

Item	Description
A	Wireless Digital Thermostat (A3800167)
B	Wall bracket
C	Stand
D	2 AAA 1.5 V batteries
E	Mounting hardware
F	Connection terminal

Expansion module

Main characteristics

- Adds six channels and actuator outputs to an existing base unit
- Easy plug-in installation on existing base unit with additional wiring needed
- Register up to six extra thermostats to the system
- Electronic control of actuators
- Valve exercise

! **Important!** Only one expansion module is supported per controller.

Components
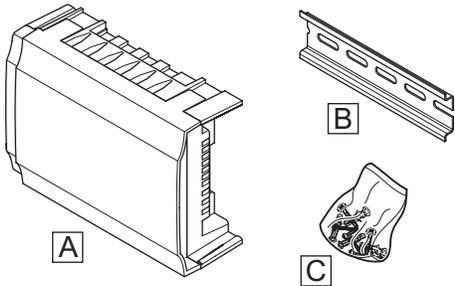
Figure 1-8: Expansion module components

Item	Description
A	Wireless Base Unit Expansion Module (A3801160)
B	Mounting bracket
C	Mounting hardware

Uponor actuators

Uponor actuators are mounted on top of the manifold valves and operated using either on/off signals or pulse width modulation (PWM) signals.

On/off control

When installing a system with on/off control, manual balancing of the system is required.

As soon as the temperature measured at a thermostat is lower (heating mode) than the setpoint temperature, a demand to change the room temperature is created and sent to the base unit. The base unit will open the actuators according to current settings. Once the set temperature is reached, this information is sent and the actuators are closed. The indicator window on the actuator shows, with a white bar, how much it is opened. If the window is completely filled with white it is fully opened, no white bar shown means the actuator is closed.

Time to open and close an actuator is one minute.

PWM control

PWM control is used when the Autobalancing function is active.

When installing a system with PWM control, the system is balanced automatically.
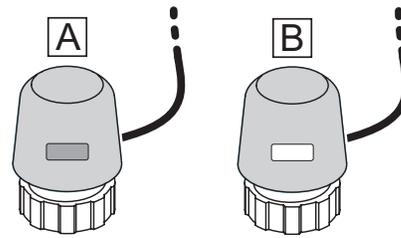
Figure 1-9: Actuator valve status

A   Actuator has closed the valve (empty indicator)

B   Actuator has opened the valve (white indicator)

Autobalancing

The base unit can operate the actuator outputs by either on/off signals or by Autobalancing (on by default), using PWM signals.

Autobalancing is a function where the system calculates the actual energy need of single rooms and adapts the output power of each loop to its length. This means a short loop might get 20% on time while a long loop might get about 60%.

The automatic balancing continues through the seasons and throughout the household's changing lifestyle and usage patterns, removing the need of manual balancing.

This gives more even floor temperatures and faster system reaction times with lower energy consumption than any standard on/off system.

Low hysteresis temperature

Uponor uses a low hysteresis temperature for best performance of the system. It is used for high-control accuracy by deciding when to start and stop heating and cooling, based on information from sensors and setpoint values.

MicroSD card

The system uses a microSD card for cloning automatic backup (settings and thermostat registration data), manual restoration of backup, data logging (room data, controller data, system data and events) and upgrading software.

Chapter 2
Installation setup

Installation procedure

Uponor recommends following the process described below to guarantee the best possible installation results.

Step	Procedure
1	Installation preparation
2	Installing the base unit
3	Connecting the expansion module (optional)
4	Installing themostats
5	Finish installation

Installation preparation

Before starting the installation:

- Verify the contents of the package with the packing list.

- Check whether an external temperature sensor is to be installed with a compatible thermostat.

- Study the wiring diagram in the end of this manual or inside the base unit.
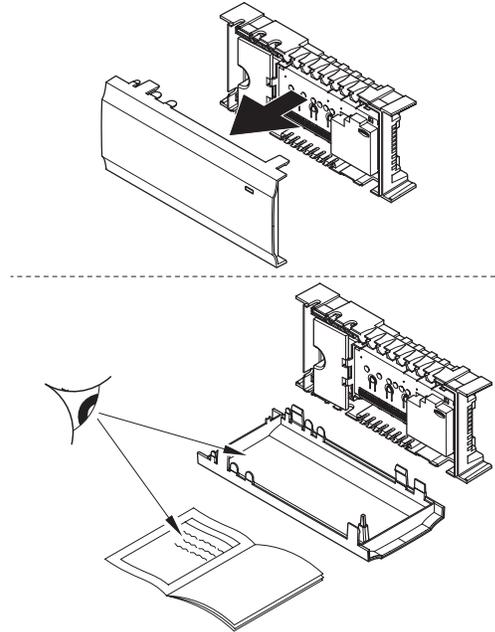
Figure 2-1: Base unit with wiring diagram

Placement

To determine where to best place the Climate Control Zoning System II components, follow these guidelines:

- Ensure the base unit can be installed close to the manifold.
  Note: Each manifold must have its own controller (unless proximity of second manifold allows for it).

- Ensure the base unit is supplied by a 24 VAC, 50 VA transformer.

- Ensure all installed components are protected from running or dripping water.

Installation example

The figure below shows an installation example of the base unit (six channels) with an optional expansion module (six extra channels) using thermostats and actuators.

Thermostats will regulate each room according to their set temperatures.

- Thermostat 01 controls the actuators on channels 01a, 01b, 02a and 02b with an optional AC sensor.
- Thermostat 03 controls the actuators on channels 03 to 05.
- Thermostat 06 controls the actuators on channels 06 and 07.
- Thermostat 08 controls the actuators on channels 08 to 10 with an optional AC sensor.
- Thermostat 12 controls the actuators on channels 11 and 12.

Option A

- External temperature sensor
- Floor temperature sensor

Option B

- Outdoor temperature sensor
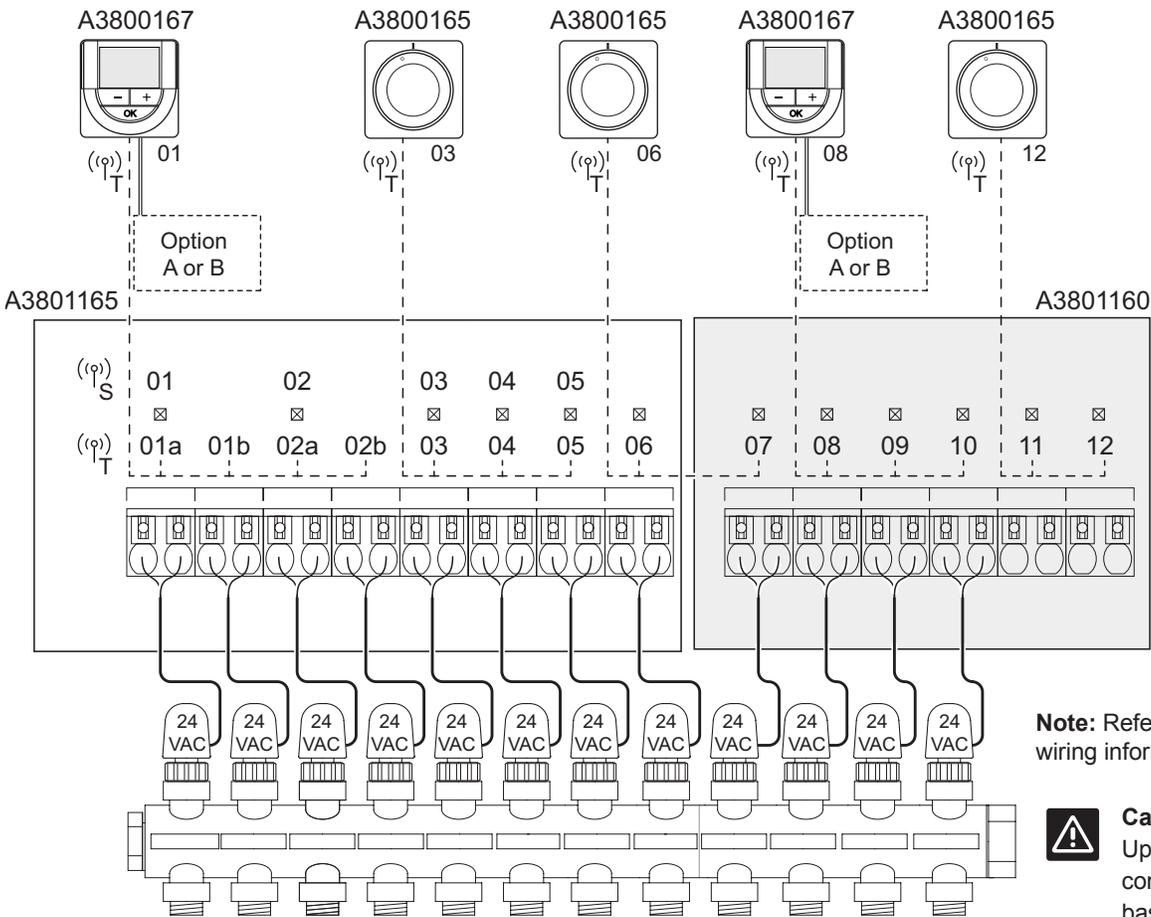
Note: Refer to page 37 for additional wiring information.

Caution: Only 24 VAC Uponor actuators are compatible with the base unit.
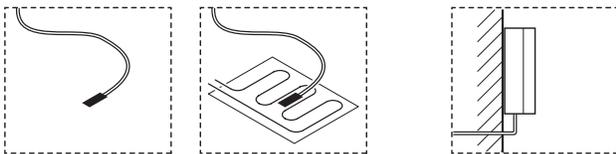
Figure 2-2: Installation example

Chapter 3
Installing the base unit

Placement

- Position the base unit just above the manifold, ensuring 24 VAC, 50 VA power is available.
- Check that the cover of the base unit can be easily removed.
- Check that connectors and switches are easily accessible.

Modular placement

The base unit is designed with the option of modular placement in mind. This means that all major parts are detachable and can be placed separately (some extra wiring may be required depending on placement).
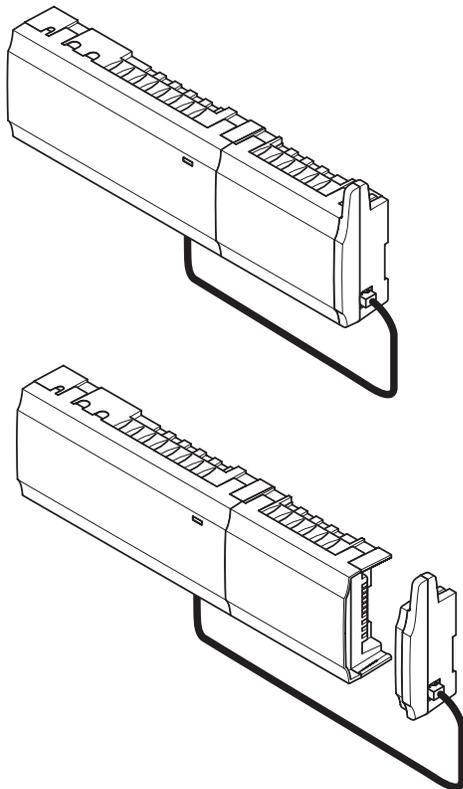
Figure 3-1: Base unit

Attaching and detaching components

The components can either snap on or off without having to remove the covers.
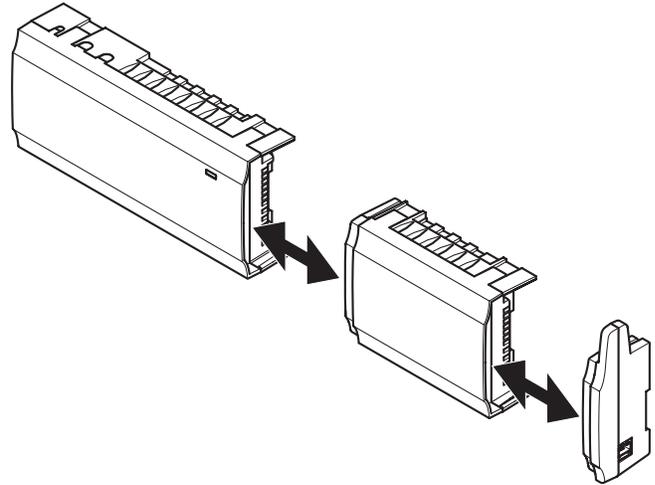
Figure 3-2: Attaching and detaching base unit components

> ⚠ **Caution:** Be sure to attach the expansion module by snapping it into place via the connection pins on the module.

> ❗ **Important!** Wires between transformers and base unit must be disconnected prior to detaching the transformer.

Installing the antenna

The antenna can be attached to the right-hand side of the base unit or to the wall. If the base unit is installed inside a metal cabinet, the entire antenna must be placed vertically outside the cabinet, as illustrated below.
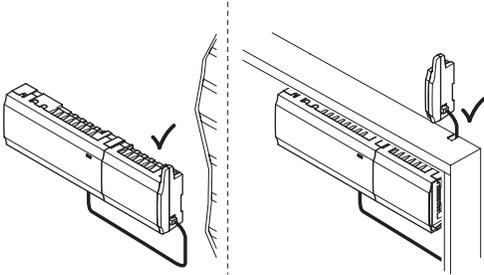
Figure 3-3: Antenna installation options

> **!** **Important!** The antenna must be installed vertically for best coverage.

Attaching the antenna to a base unit

The ilustration below shows the antenna attached to the right-hand side of the base unit.
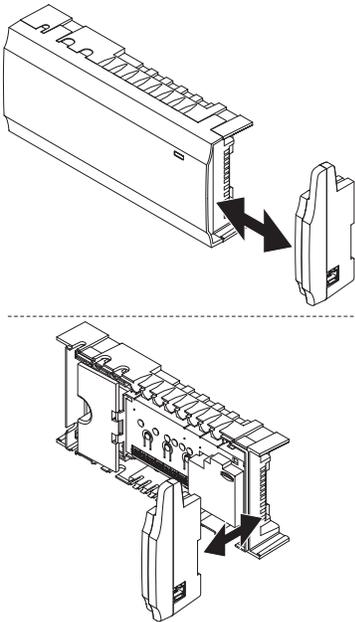
Figure 3-4: Attaching the antenna to a base unit

Attaching the antenna to a wall

The illustration below shows the antenna attached to a wall with screws (A) or double-sided adhesive strips (B).
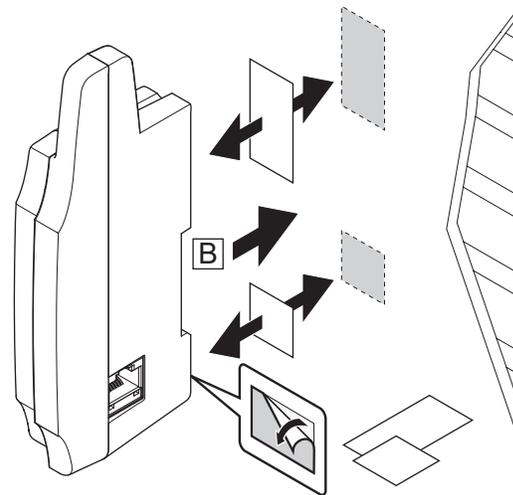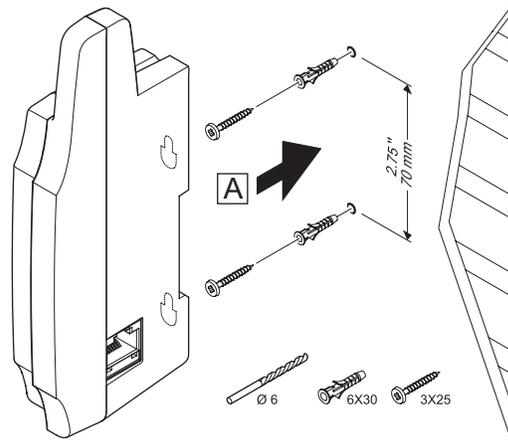
Figure 3-5: Attaching the antenna to a wall

Connecting the antenna cable

Connect the antenna to the base unit using the supplied antenna cable.
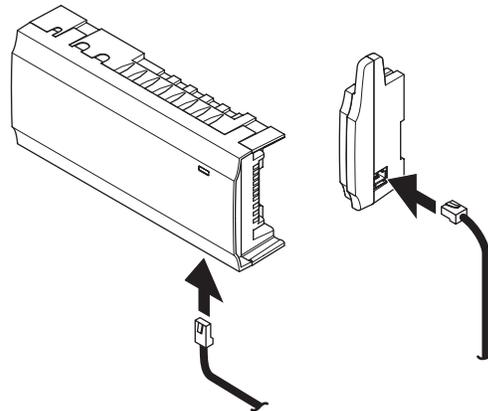
Figure 3-6: Connecting the antenna cable

Attaching the base unit to a wall

The base unit is delivered in a kit that includes screws, wall plugs and a mounting bracket.

Mounting brackets

Attach the mounting bracket to the wall using the screws and wall plugs, then attach the base unit to the mounting bracket.

The figure below shows how to attach (A) and detach (B) the base unit using a mounting bracket.
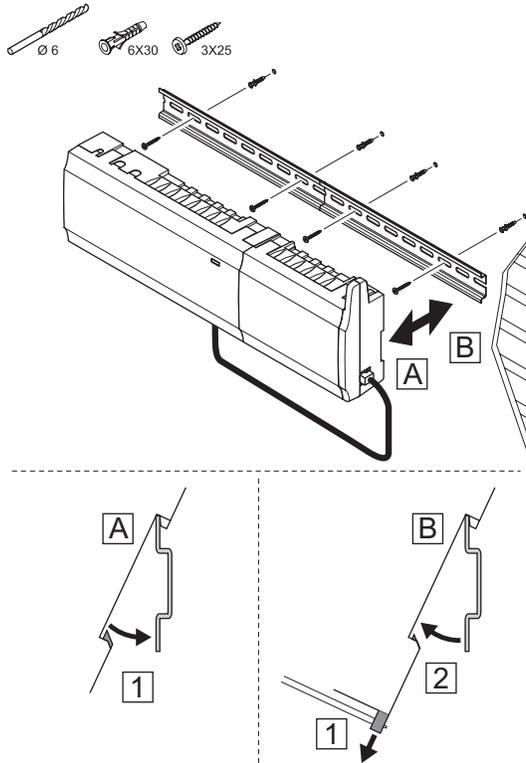
Figure 3-7: Attaching the base unit to a wall

⚠ **Caution:** Make sure the controller cannot slide off the bracket if mounting it in any other position than horizontal.

Screws and wall plugs

The figure below shows base unit mounting hole positions and how to attach it to the wall using screws and wall plugs.
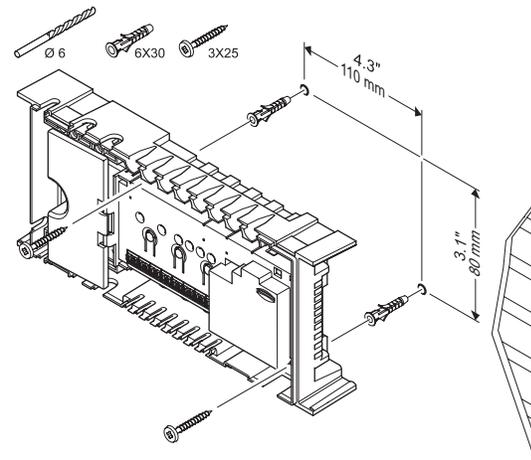
Figure 3-8: Attaching base unit with screws and wall plugs

Connecting the expansion module (optional)

The illustration below shows how to connect the expansion module to the base unit.
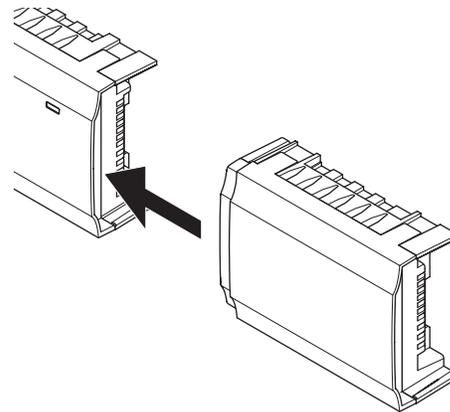
Figure 3-9: Connecting optional expansion module

❗ **Important!** Only one expansion module is supported per base unit.

Removing the expansion module

The illustration below shows how to remove the expansion module from the base unit.
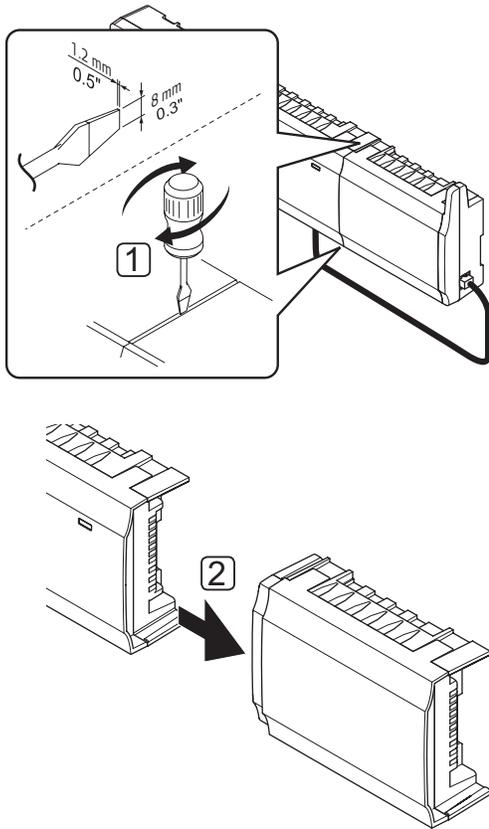
Figure 3-10: Removing the expansion module

1. Place a wide, flat-head screwdriver in the slot between the expansion module and the other unit and twist until the snap-in lock releases. Repeat for the other side.

2. Remove the expansion module. Use caution not to bend the connection pins.

Connecting components to the base unit

Refer to the wiring diagram found at the end of this document. The illustration below shows the inside of the base unit.
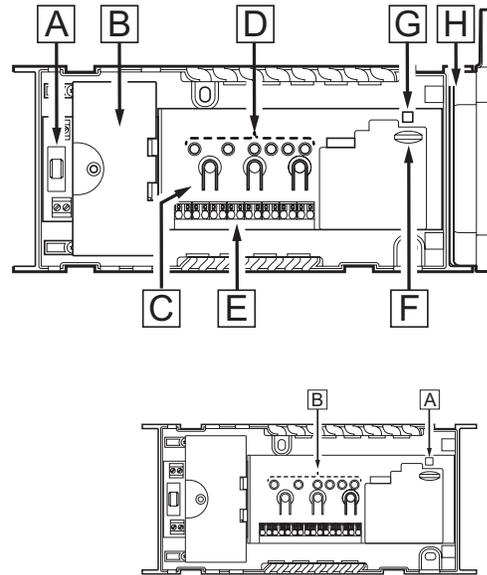
Figure 3-11: Connecting components to the base unit

Item	Description
A	Fuse
B	Optional inputs and outputs for pump management, boiler managment
C	Channel registration buttons
D	LEDs for channels 01 to 06
E	Quick connectors for actuators
F	MicroSD card
G	Power LED
H	Wireless antenna
I	LEDs for channels 07 to 12
J	Wireless Base Unit Expansion Module (A3801160)

Connecting actuators to the base unit

Each thermostat can control one or more channels. To simplify installation and maintenance, Uponor recommends that actuators controlled by the same thermostat wired in sequence to the channels.

Connect the actuators to the base unit as follows.

1. Lead the cables from the actuators through cable entries in the bottom of the base unit frame (see **Figure 3-12**).
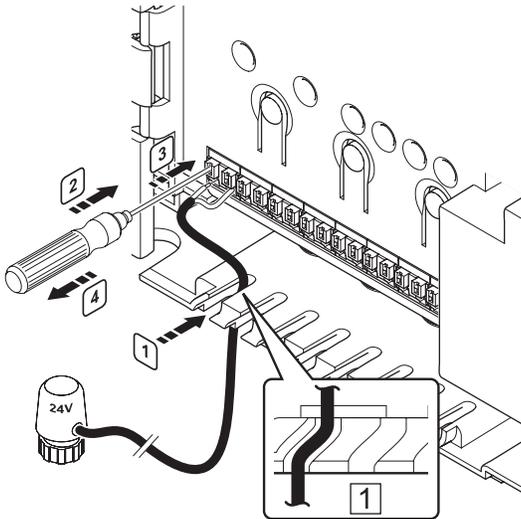
Figure 3-12: Connecting actuators to the base unit

2. Press, without turning, with a thin screwdriver, on the white button of the quick connector.

3. Insert a wire in the quick connector.

4. Remove the screwdriver.

> **!** **Important!** Identify the room supplied by each loop on the manifold and determine which channel it must be connected to.

Connecting a circulation pump to the base unit
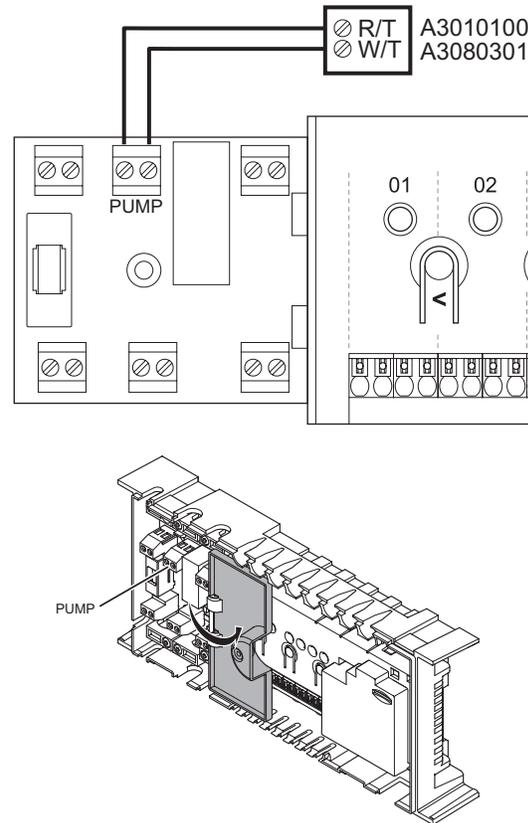
Figure 3-13: Connecting a circulation pump to the base unit

1. Study the wiring diagram in the end of the manual or inside the cover of the base unit, to locate the connector positions.

2. Ensure power is disconnected from both the base unit and the circulation pump.

3. Remove the screw and open the cover for the optional connections compartment.

4. Route the wires to/from the pump relay via a cable entry.

5. Connect the wires to/from the pump relay as shown and connect to the terminals labeled PUMP.

> **!** **Important!** There is no power in the controller to supply the pump. The pump connector in the base unit provides only a dry contact to switch off and on the power connection to the pump.

6. Secure the wires properly inside the enclosure.

7. Close and secure the lid to the optional connections compartment.

A circulation pump is now connected to a relay module and activated.

Connecting a boiler (optional)

The controller includes a boiler relay that can be used to send a signal to either fire the heat source or to open a two-port motorized zone valve positioned on the flow to the underfloor heating manifold. If the relay is used to open a zone valve, the dry contact on the zone valve should be used to fire the heat source.

Alternatively, the boiler relay can be used to send a demand signal to the water temperature controller. The additional contacts on the water temperature controller should then be used to fire the heat source.

The boiler can be connected either on the base unit or by using a wireless relay module.

Connecting a boiler to the base unit

The illustration below shows how to connect a boiler to the base unit.
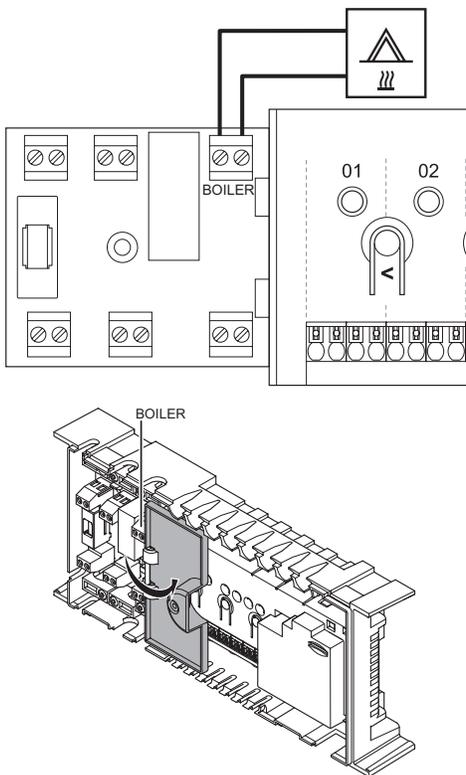
Figure 3-14: Connecting a boiler to the base unit

! **Important!** This connection requires a dry contact sensing input in the boiler.

1. Study the wiring diagram in the end of the manual or inside the cover of the base unit to locate the connector positions.

2. Ensure power is disconnected from both the base unit and the boiler.

3. Remove the screw and open the cover for the optional connections compartment.

4. Route the wires from/to the boiler via a cable entry.

5. Connect the boiler to the connection labeled BOILER.

! **Important!** There is no power in the base unit to supply the boiler. The boiler connector in the controller provides only a dry contact to switch on and off the power connection to the boiler.

Connecting the base unit to AC power

Refer to the instructions below to conclude the installation of the base unit.

1. Check that all wiring is complete and correct.
   • Actuators
   • Heating device
   • Circulation pump

2. Ensure the 24 VAC compartment of the base unit is closed and the fixing screw is tightened.

3. Connect the power cable to a 24 VAC, 50 VA transformer as required by local codes.

Testing actuators

It is possible to manually open or close an actuator connected to a channel when testing the system. Testing an actuator takes about 10 minutes and the base unit automatically returns to run mode when finished.
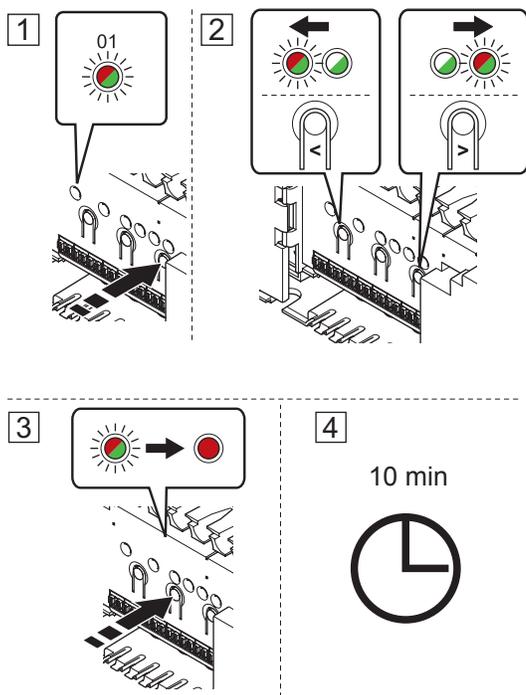
Figure 3-15: Testing actuators

> **Important!** Activated test/cycle mode for a channel is indicated with a lit LED, when in forced mode.

Refer to the instructions below to test the actuators.

1. Enter test/cycle mode by pressing the **>** button while in run mode.

2. Use the **<** or **>** buttons to select a channel. Selected channel is indicated with a LED flashing red.

3. Press the **OK** button to activate test/cycle mode for the selected channel. The LED of the channel turns solid red, which means the base unit opens the actuator on the selected channel, and the system exits to run mode. If the LED keeps flashing, the channel cannot be chosen for forced operation.

   If the LED does not turn solid red, it might be the actuator management delaying the actuator if more than eight channels is opened at the same time. Otherwise refer to the troubleshooting section.

4. Wait for 10 minutes, or enter forced mode again, choose the activated channel and press the **OK** button for the system to end the test.

A test/cycle operation can always be canceled by entering forced mode, selecting the active channel and pressing the **OK** button.

Chapter 4
Installing thermostats and sensors

The following thermostats can be connected to the system:

• Wireless Dial Thermostat (A3800165)

• Wireless Digital Thermostat (A3800167)

Thermostat placement

Refer to the following guidelines when positioning the thermostats:

1. Select an indoor wall and a distance 5 ft. (1.5 m) above the floor.

2. Ensure the thermostat is away from direct solar radiation.

3. Ensure the thermostat will not be heated through the wall by sunshine.

4. Ensure the thermostat is away from any source of heat (e.g. television set, electronic equipment, fireplace, spotlights).

5. Ensure the thermostat is away from any source of humidity and water contact.

6. Ensure the thermostat is positioned at least 1.3 ft. (40 cm) away from the controller to avoid interference.
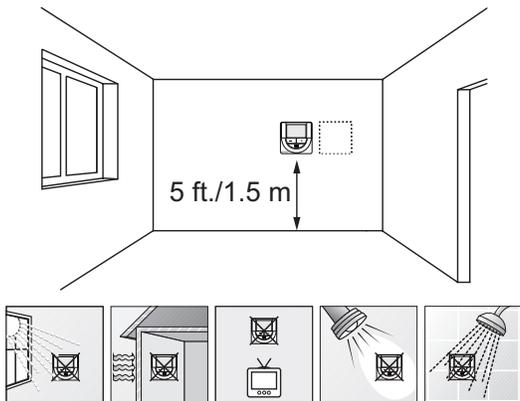
Figure 4-1: Thermostat placement

Labeling thermostats

Label the thermostats, where suitable, with the channel numbers they are to control (e.g. 02, 03). For a system with several controllers, add the ID of each controller (e.g. 1.02, 1.03, 2.02, 2.03).

If the thermostat can connect to an external sensor, add information about sensor type when applicable.

Available thermostat and sensor combinations:

• Room temperature

• Room and floor temperature

• Room and outdoor temperature

• Remote sensor temperature

Inserting batteries

All thermostats use two alkaline 1.5 V AAA batteries which provides about two years of battery life, as long as they are positioned within radio range of the base unit. Ensure the batteries are correctly inserted into the thermostats.

After inserting the batteries, the thermostat will perform a self test for about 10 seconds. The system will block for input and the thermostat LED flashes during this period.

The illustration below shows where to insert the batteries.
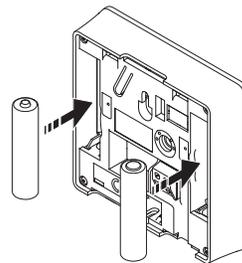
Figure 4-2: Inserting batteries

Connecting an external sensor to a thermostat (optional)

An optional external sensor can be connected to the digital thermostats (A3800167) for extra functionality.

> **!** **Important!** For accurate temperature, attach the outdoor sensor to the north side of the building where it is unlikely to be exposed to direct sunlight. Do not place it close to doors, windows or air outlets.

Connect the sensor to the terminal located at the back of the thermostat, as shown in the illustration below.
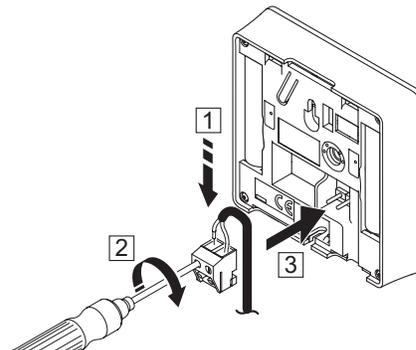
Figure 4-3: Connecting an external sensor

1. Insert the two wires from the sensor cable (non polarized) into the removable connector.

2. Tighten the screws, fixing the wires in the connector.

3. Insert the connector on the input pegs on the thermostat.

Digital thermostats

The external temperature sensor input can be used for either a floor, outdoor or remote temperature sensor. Use the software on the thermostat to select a control mode which corresponds to the use of the sensor and thermostat.
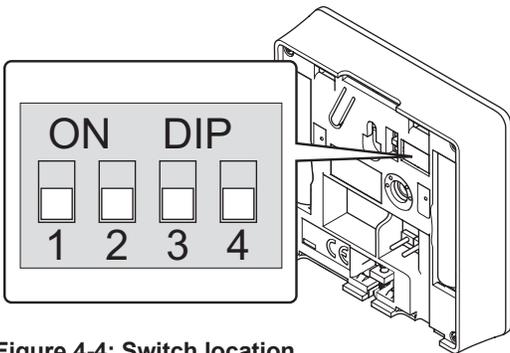
Figure 4-4: Switch location

		Switch			
Function	**1**	**2**	**3**	**4**
Used as a standard room thermostat	Off	Off	Off	Off
Used as a standard room thermostat together with a floor temperature sensor	On	Off	Off	Off
Used as a standard room thermostat, or system device, together with an outdoor temperature sensor	Off	On	Off	Off

⚠ **Caution:** The switches must be set before the thermostat is registered.

⚠ **Caution:** The switches must be set to one of the available functions, otherwise the thermostat cannot be registered.

Attaching a thermostat to a wall

The thermostats come with screws, wall plugs and a wall bracket, allowing several options for attaching to a wall.
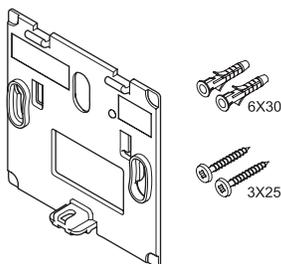
Figure 4-5: Attaching a thermostat to a wall

Using a wall bracket (recommended)

The illustration below shows thermostat mounting hole positions and how to attach it to a wall using a wall bracket.
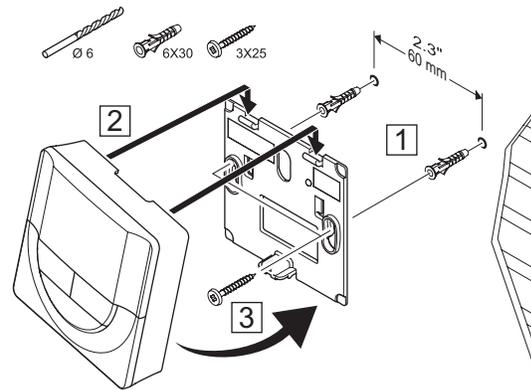
Figure 4-6: Wall bracket installation

Using a screw and wall plug

The illustration below shows how to attach the thermostat to a wall using one screw and wall plug.
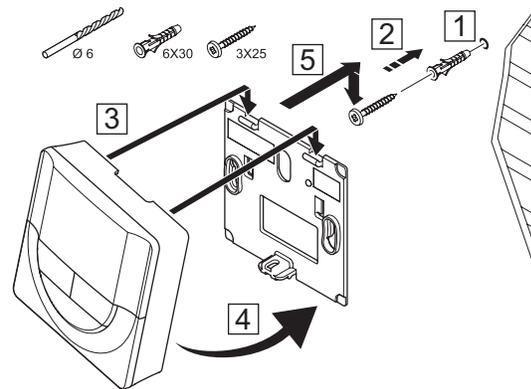
Figure 4-7: Screw and wall plug installation

Using an adhesive strip (not included)

The illustration below shows how to attach the thermostat to a wall using an adhesive strip.
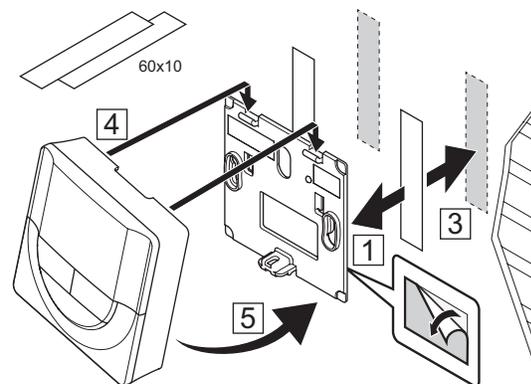
Figure 4-8: Adhesive strip installation

Attaching to a table stand

The illustration below shows how to attach the thermostat to a table stand.
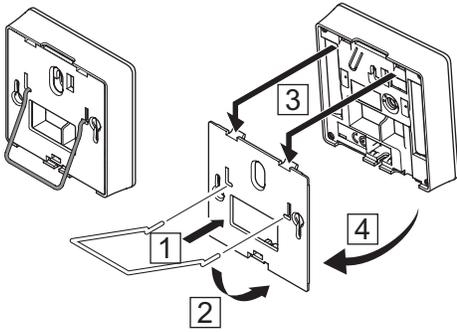
Figure 4-9: Attaching to a table stand

First setup of digital thermostats

Select thermostat control mode

If an external sensor is connected to the thermostat, a control mode must be selected to accommodate the extra functionality of the sensor.

> **!** **Important!** If no button is pressed for about 8 seconds, while in a submenu, the current values will be saved and the software exits to the settings menu. About 60 seconds later, it exits to run mode.

1. Press and hold the **OK** button until the settings icon and menu numbers are displayed in the top-right corner of the display (about 3 seconds).

2. Use buttons **–** or **+** to change the numbers to **04** and press **OK**.

3. Current control mode is displayed (RT, RFT, RS or RO).

4. Use buttons **–** or **+** to change control mode (see list below) and press **OK**.

   RT = Room temperature
   RFT = Room temperature with external floor sensor
   RS = Remote sensor
   RO = Room temperature with remote outdoor sensor

5. Press and hold the **OK** button for about 3 seconds to exit the settings menu.

Temperature setpoint

The thermostats are delivered with a default setpoint of 70°F (21°C).

The illustration below shows how to adjust the thermostat temperature setpoint.
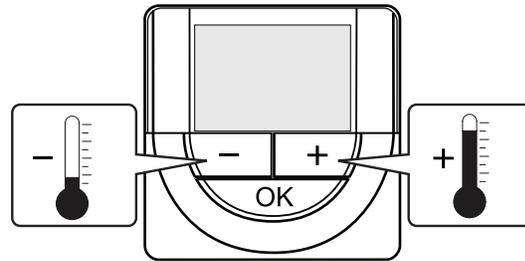
Figure 4-10: Temperature setpoint

To adjust the thermostat temperature setpoint of the current control mode:

1. Press the **–** or **+** button once.

   The screen shows the current setpoint flashing.

Figure 4-11: Current setpoint screen

2. Press the **–** or **+** button repeatedly to adjust the setpoint temperature. It will change with increments of 0.5.

When the new setpoint is set, the screen returns to run mode after a few seconds, showing the room temperature.

Registering thermostats in the base unit

1. Press and hold the **OK** button on the controller until the LED for channel 1 (or the first unregistered channel) flashes red.

2. Use buttons **<** or **>** to move the pointer (LED flashes red) to a preferred channel.

3. Press the **OK** button to select the channel for registration. The LED for the selected channel starts flashing green.

4. Repeat steps 2 and 3 until all channels to be registered with the thermostat are selected (LEDs flashing green).

   Note: Uponor recommends registering all channels to the thermostat at the same time.

5. Select a thermostat.

   Wireless Dial Thermostat (T-165) (A3800165)
   Gently press and hold the registration button on the thermostat, release when the LED on the front of the thermostat starts flashing. The selected channel LED in the controller turns fixed green and the registration is complete.

   Wireless Digital Thermostat (T-167) (A3800167)
   Press and hold both **-** and **+** buttons on the thermostat until the text **CnF** (configure) and a communication icon is displayed. The selected channel LED in the controller turns fixed green and the registration is complete.

6. Repeat steps 2 through 5 until all used room thermostats are registered.

7. Press and hold the **OK** button on the controller until the green LEDs turn off to end registration and return to run mode.
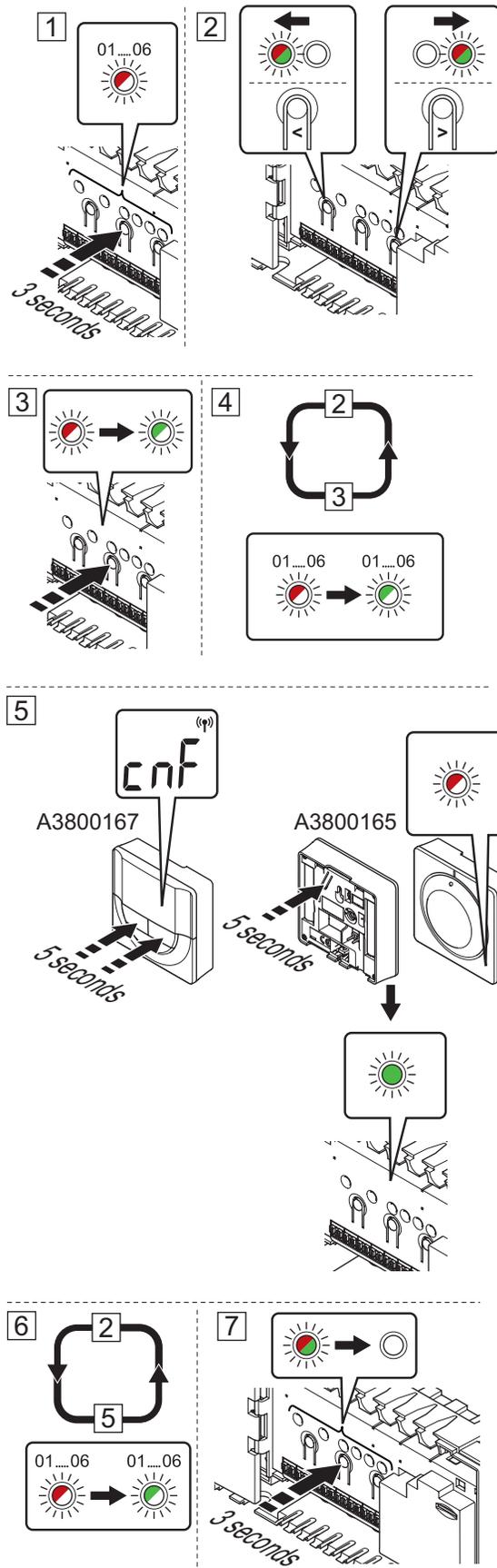
Figure 4-12: Registering thermostats

Finishing installation

1. Ensure the thermostats are working correctly.

   Turn thermostat setpoints to maximum to obtain a heating demand and make sure the actuators are running.

2. Set the thermostats to the defined operating settings.

3. Close the base unit cover.

4. Attach the thermostats to the wall.

5. Print out and complete in the "Installation report" located at the end of this manual.

6. Give the manual and all system information to the user.
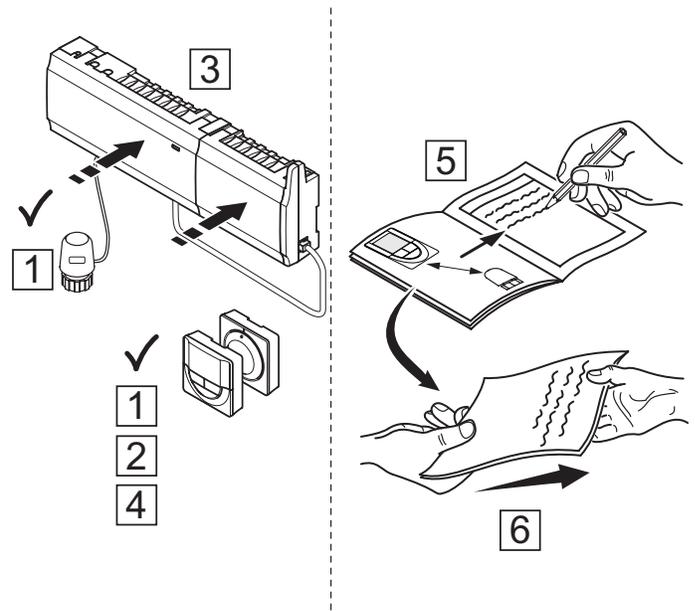
Figure 4-13: Finishing installation

Chapter 5
Operating the base unit

The Climate Control Zoning System II controls the underfloor heating installation according to customer needs.

Sequence of operation

As soon as the temperature measured at a thermostat is lower (heating mode) than the setpoint temperature, a demand to change the room temperature is created and sent to the controller. The controller will open the actuators according to current operating mode and other settings. Once the set temperature is reached, this information is sent and the actuators are closed.

Normal operation

When the system is running in normal mode, the actuators are open when room temperatures are lower than the temperatures set on the thermostats.

Run mode

During normal operation, the controller is in run mode.

Exit to run mode

If the controller is in registration or forced mode, exit to run mode by pressing the **OK** button until the LEDs turn off (about 5 seconds).
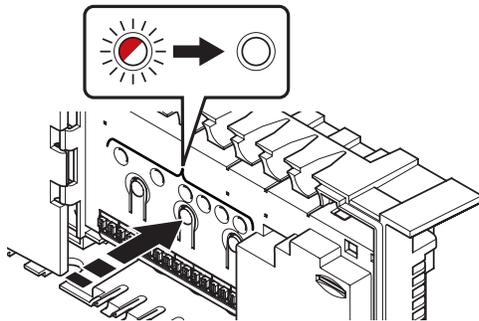
Figure 5-1: Exit run mode

Resetting the base unit

It may be necessary to reset the base unit if problems, such as inaccurate channel registration exist. The following illustration shows the location of the reset button in the base unit.

To reset the controller:

1. Make sure the controller is in run mode. If it is in registration or forced mode, press and hold the **OK** button for about 5 seconds or until the LEDs turn off.

2. Press the **<**, **OK**, and **>** buttons simultaneously (for about 10 seconds) until the power LED flashes, and all channel LEDs turn off. All parameters are erased and run mode has been activated.
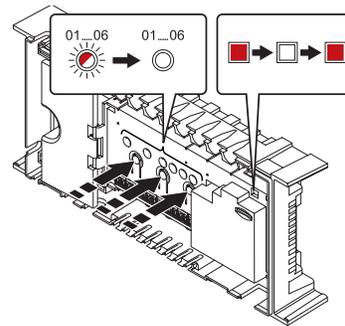
Figure 5-2: Resetting the base unit

3. Installation and registration are required after resetting the controller.

Unregistering channels in the base unit

When a channel is inaccurately registered or if a thermostat registration needs to be remapped, it is possible to remove the current registration from the controller.
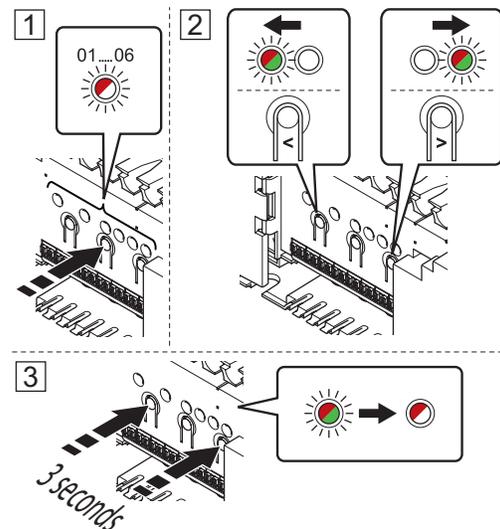
Figure 5-3: Unregistering channels

⚠ **Caution:** Make sure the base unit is in run mode.

Refer to the instructions below to unregister a channel.

1. Press and hold the **OK** button on the base unit until the LED for channel 1 flashes red/green, or the first unregistered channel flashes red.

2. Use buttons **<** or **>** to move the pointer (LED flashes red) to the selected channel (flashes green if registered) to unregister.

3. Press the **<** and **>** buttons simultaneously until the LED for the selected channel starts flashing red (about 3 seconds).

Unregistering all channels

When one or more channels are inaccurately registered,
it is possible to remove all registrations at the same time.

⚠ **Caution:** Make sure the base unit is in run mode.

Refer to the instructions below to cancel all
channel registrations.

1. Press and hold the **OK** button on the base unit until
   the LED for channel 1 flashes red/green, or the first
   unregistered channel flashes red.

2. Press the **<** and **>** buttons simultaneously until the LEDs
   for all channels except one turn off (about 10 seconds).
   The one remaining flashes red.

Chapter 6
Operating dial thermostats

Thermostat components

During normal operation, if there is a demand for heating, a descreet LED on the dial thermostat is lit for about 60 seconds.
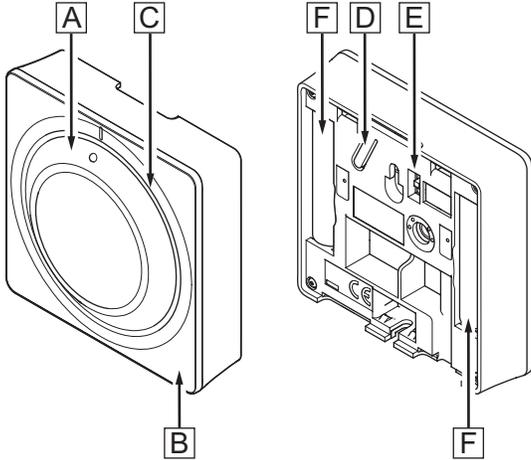
Figure 6-1: Dial thermostat components

Item	Description
A	Room temperature setpoint dial control
B	Heating demand LED
C	Backlight
D	Registration button
E	Disable timer switch (not used)
F	Batteries

Adjusting the temperature

The temperature is changed by adjusting the setpoint on the thermostat to a value between 41°F to 95°F (5°C to 35°C).

Use the dial on the thermostat to adjust the temperature. A backlight will light up when twisting the dial. It shuts off after about 10 seconds of inactivity.

The illustration below shows how to adjust the thermostat temperature setpoint.
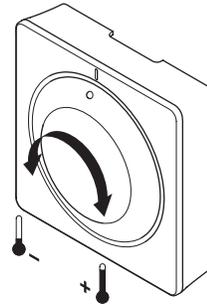
Figure 6-2: Adjusting the thermostat setpoint

To adjust the thermostat temperature setpoint:

• Twist the dial clockwise for a higher temperature.

• Twist the dial counter-clockwise for a lower temperature.

Replacing batteries

Replace the batteries of the thermostat when the LED flashes twice during a heating or cooling demand.

The thermostat will perform a self test, for about 10 seconds, when the batteries have been inserted. The system will be blocked for input and the thermostat LED flashes during this period.

The illustration below shows how to change batteries.
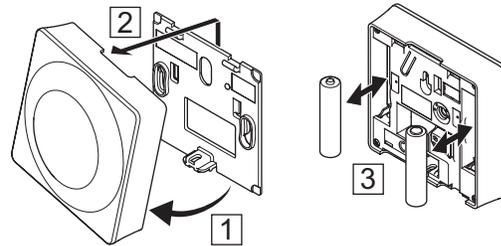
Figure 6-3: Replacing batteries

1. Angle the thermostat from the bracket.

2. Remove it from the wall.

3. Replace the batteries.

Factory reset

Important! Do not factory reset the thermostat if not absolutely needed. A factory reset removes the registration data from the thermostat.

A3800165
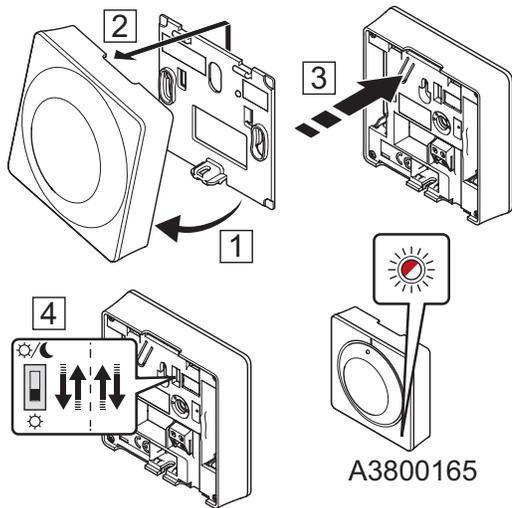
Figure 6-4: Factory reset instructions

Refer to the following instructions to factory reset a dial thermostat.

1. Angle the thermostat from the bracket.

2. Remove it from the wall.

3. Gently press and hold the registration button on the thermostat, release when the demand LED starts flashing.

4. Change the Disable timer switch twice, regardless of starting position.

5. The thermostat is now reset to factory default.

Chapter 7
Operating digital thermostats

Thermostat components

The illustration below shows the parts of the thermostat.
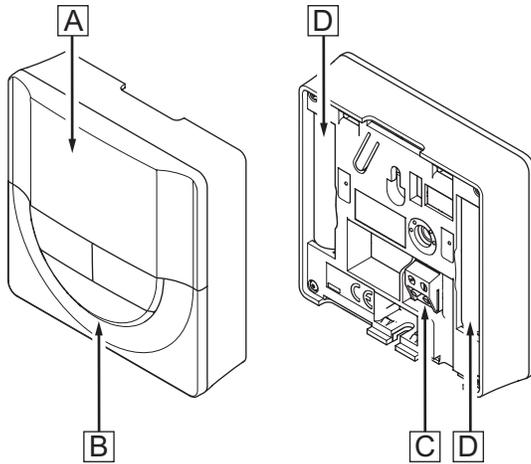
Figure 7-1: Digital thermostat components

Item	Description
A	Display
B	Buttons
C	Terminal for external sensor (non-polarised)
D	Batteries

Display layout

The figure below shows all possible symbols and characters that can be shown on the display.
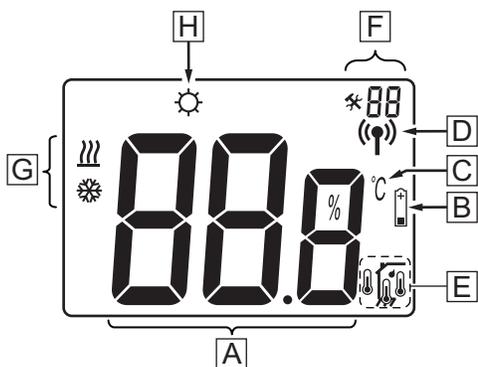
Figure 7-2: Display layout

Item	Icon	Description
A	88ᴮ	Message field using three alphanumerical characters
	-88.8	Temperature reading using a – or + sign, two digital characters, a decimal point and a character showing either 0 or 5
	88 %	Relative humidity reading using two digital characters, indicated with a "%" character
B	🔋	Low battery indicator
C	°C	Temperature unit, shown when the character group A shows a temperature
	°F	
D	((•))	Communication indicator
E	🌡	Indoor temperature indicator Remote sensor temperature indicator (RS mode) The text **Err** and a flashing sensor icon indicates a faulty sensor.
	🌡🌡	Indoor temperature with floor temperature limitation indicator The text **Err** and a flashing floor sensor icon indicates a faulty sensor.
	🌡	Floor temperature indicator The text **Err** and a flashing floor sensor icon indicates a faulty sensor.
	🌡	Outdoor temperature indicator The text **Err** and a flashing outdoor sensor icon indicates a faulty sensor.
F	⚒	Settings menu
	88	Settings menu number
G	♨	Heating demand
H	☼	Comfort mode

Operating buttons

The figure below shows buttons used to operate the digital thermostats.
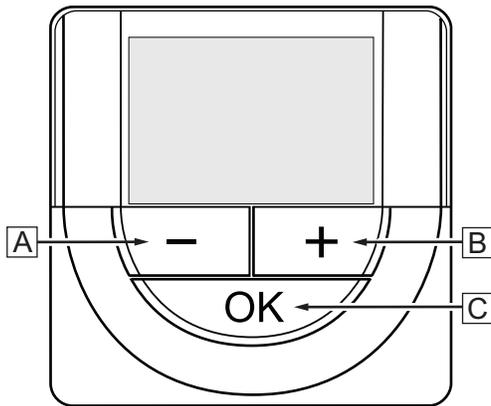
Figure 7-3: Digital thermostat operating buttons

Item	Description
A	The – and + buttons are used to:
B	• Adjust setpoint temperature • Modify parameters in the settings menus
C	The OK button is used to: • Toggle between current status data as well as values of available sensors connected to the thermostat • Enter and exit the settings menu • Confirm a setting

Start up

When starting up, the software version is shown in the display for about 3 seconds. Then the thermostat enters run mode.

Note: The first time the thermostat is started, or after a factory reset, the software requires the time and date to be set.

Adjusting temperature

Change the temperature by adjusting the setpoint on the thermostat.

Use the buttons on the thermostat to adjust the temperature. The display will light up when pushing a button. It shuts off after about 10 seconds of inactivity.

The illustration below shows how to adjust the thermostat temperature setpoint.
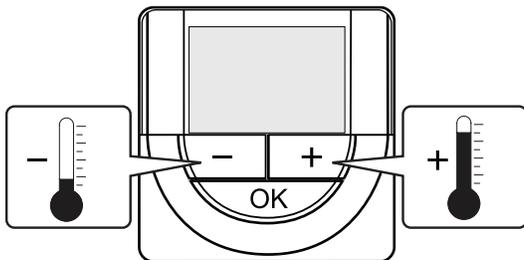
Figure 7-4: Adjusting temperature

To adjust the thermostat temperature setpoint of the current control mode:

1. Press the – or + button once.

   The screen shows the current setpoint flashing.

Figure 7-5: Temperature setpoint screen

2. Press the - or + button repeatedly to adjust the setpoint temperature. It will change with increments of 0.5.

   When the new setpoint is set, the screen returns to run mode after a few seconds, showing the room temperature.

Run mode

During normal operation, the thermostat is in run mode.

While in run mode the display shows specific information.

Settings

This menu sets thermostat parameters.

Note: If no button is pressed for about 8 seconds, while in a submenu, the current values will be saved and the software exits to the settings menu. About 60 seconds later, it exits to run mode.

To enter the settings menu:

1. Press and hold the **OK** button for about 3 seconds.

2. The settings icon and menu numbers is displayed in the top right corner of the display.

3. Use buttons **–** or **+** to change the numbers to locate a submenu (see list below) and press **OK**.

   00 = Program[1]
   02 = Heating/cooling changeover[1, 2]
   03 = ECO mode setback temperature[1]
   04 = Sensor options
   05 = High floor temperature limitation
   06 = Low floor temperature limitation
   07 = Cooling allowed[1]
   08 = Display unit
   09 = Climatic controller integration[1]
   10 = Time and date[1]
   11 = Room temperature calibration

   [1]Not active in this release.
   [2]This menu is not visible if the thermostat is registered to a controller.

4. Change parameters in the submenus.

5. Press and hold the **OK** button for about 3 seconds to exit the settings menu.

Sensor options

The thermostat has four different sensor options that can be set in the settings menu.

• **RT** = Room temperature
• **RFT** = Room temperature with external floor sensor
• **RS** = Remote sensor
• **RO** = Room temperature with remote outdoor sensor

Different types of information can be shown in the display depending on the sensor setting.

Use the **OK** button to toggle between the information available.

RT = Room temperature

1. Room temperature (default)
2. Relative humidity

RFT = Room floor temperature

1. Room temperature (default)
2. Relative humidity
3. Floor temperature

RS = Remote sensor

1. Room temperature (default)
2. Relative humidity

RO = Remote outdoor sensor

1. Room temperature (default)
2. Relative humidity
3. Outdoor temperature

Adding a sensor

If connecting an external sensor, choose the sensor type to accommodate the extra functionality.

Note: If no button is pressed for about 8 seconds, while in a submenu, the current values will be saved and the software exits to the settings menu. About 60 seconds later, it exits to run mode.

1. Press and hold the **OK** button for about 3 seconds.

2. The settings icon and menu numbers are displayed in the top-right corner of the display.

3. Use buttons – or + to change the numbers to 04 and press **OK**.

4. Current control mode is displayed (RT, RFT, RS or RO).

5. Use buttons **–** or **+** to change control mode (see list below) and press **OK**.

   • **RT** = Room temperature
   • **RFT** = Room temperature with external floor sensor
   • **RS** = Remote sensor
   • **RO** = Room temperature with remote outdoor sensor

6. Press and hold the **OK** button for about 3 seconds to exit the settings menu.

High floor temperature limitation

This menu sets the limit on the maximum allowable floor temperature.

To change this setting:

1. Press **OK** and the parameter starts flashing.

2. Use buttons **–** or **+** to change the parameter.
   Default: 78.8ºF (26ºC)
   Setting range: 68ºF to 95ºF (20ºC to 35ºC), 0.5 increments

   ! **Important!** This parameter cannot be set lower than the set value in the **Low floor temperature limitation** settings menu.

3. Press **OK** to confirm the change and return to the settings menu.

Low floor temperature limitation

This menu sets the limit on the minimum allowable floor temperature.

To change this setting:

1. Press **OK** and the parameter starts flashing.

2. Use buttons **–** or **+** to change the parameter.
   Default: 68ºF (20ºC)
   Setting range: 50ºF to 86ºF (10ºC to 30ºC),
   0.5 increments

   ! **Important!** If this parameter is set lower than 60.8ºF (16ºC) the cooling icon will start flashing, warning for risk of condensation in the system.

   ! **Important!** This parameter cannot be set higher than the set value in settings menu **High floor** temperature limitation.

3. Press **OK** to confirm the change and return to the settings menu.

Display unit

This menu sets the temperature display unit.

To change this setting:

1. Press **OK** and the parameter starts flashing.

2. Use buttons **–** or **+** to toggle between Celsius and Fahrenheit.
   DEg ºC: degrees Celsius
   DEg ºF: degrees Fahrenheit

3. Press **OK** to confirm the change and return to the settings menu.

Room temperature calibration

This menu calibrates the room temperature.

To change this setting:

1. Press **OK** and the parameter starts flashing.

2. Use buttons **–** or **+** to change the parameter.
   Default: 0.0 ºC
   Setting range: -6.0 to 6.0 ºC, 0.1 increments

3. Press **OK** to confirm the change and return to the settings menu.

Replacing batteries

Replace the batteries of the thermostat when the low battery icon appears in the display.

The illustration below shows how to change batteries.
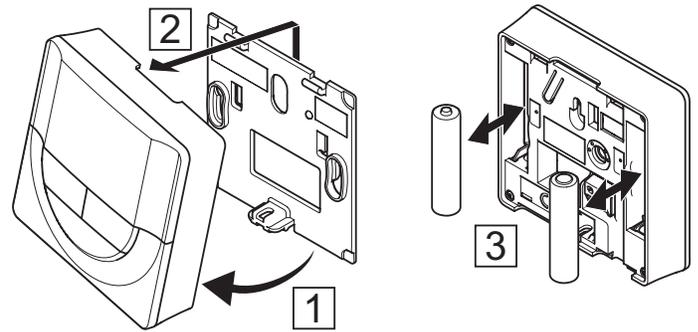
Figure 7-6: Replacing batteries

1. Angle the thermostat from the bracket.

2. Remove it from the wall.

3. Replace the batteries.

Factory reset

Factory reset sets all parameter values to default settings.

! **Important!** Do not factory reset the thermostat if not absolutely needed.

! **Important!** A factory reset removes the registration data from the thermostat.

1. Press and hold the **–**, **+** and **OK** buttons for about 5 seconds until the screen goes blank.

2. The thermostat is now reset to factory default.

Chapter 8

Maintenance

Manual preventive maintenance

The system requires no preventive maintenance except cleaning with a dry, soft cloth.

⚠️ **Warning!** Do not use any detergents to clean the Climate Control Zoning System II.

Automatic preventive maintenance

The system is equipped with an automatic exercise function that consists of a test run designed to prevent the pump and actuators from seizing up due to inactivity.

This exercise is run every six days ±24 hours at random.

• The pump exercise operates only if the pump has not been activated since the last exercise. The pump is activated for 3 minutes during the exercise.

• The actuator exercise operates only if the actuators have not been activated since the last exercise. The exercise consists of opening and completely closing the actuators periodically.

Corrective maintenance

Fallback mode

If a thermostat is malfunctioning or not detected, the controller executes the fallback mode to maintain the temperature in the room until the problem is resolved.

Resetting the controller

If the controller does not work as expected, for example due to a hang-up, it can be reset to solve the problem.

1. Disconnect and reconnect the controller to AC power.

Controller LEDs

Uponor recommends occasionally checking the power LED on the controller for alarms. The power LED flashes continuously for general alarms. Determine which thermostats are issuing alarms by removing the cover. If a channel LED is indicating an error, check the function and batteries of the registered thermostat.

The controller power LED is on during normal operation.

All the channel LEDs are off when there is no current or waiting actuator activity. The LEDs turn on when the corresponding actuators are activated or start flashing when they are awaiting activation.

Up to eight actuators in six rooms can be in the opening process at the same time. If a slave module is installed, the LEDs of the seventh and subsequent actuators flash while they are waiting for the previous actuators to be fully open.

The illustration below shows the position of the controller LEDs.
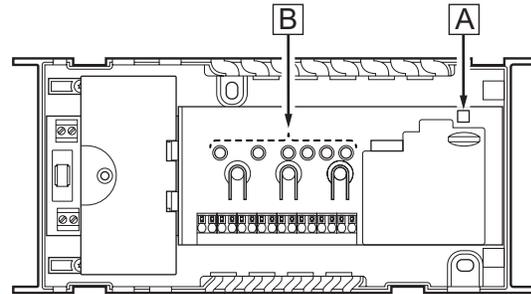
Figure 8-1: Controller LEDs

Item	Description
A	Power LED
B	Channel LEDs

The table below describes the status of the base unit LEDs.

LED	Status
Power	The base unit power LED is always on and flashes when a problem occurs, such as: • Loss of radio transmission from a thermostat for more than 1 hour • Loss of radio transmission from a timer or an interface for more than 15 minutes
Channel during run mode	• Red, on – actuators activated • Red, flashing – thermostat communication error or low battery indication • Off – no demand for heating or cooling
Channel during registering mode	• Red, on – thermostat registered but with communication errors • Green, on – thermostat registered and communication is OK • Red, flashing – selector pointing at channel • Green, flashing – channel selected to be registered • Off – channel not pointed, nor registered
Channel during forced mode	• Red, on – actuators activated • Red, flashing – selector pointing at channel • Off – channel not pointed, nor activated

Restore from backup

If an existing base unit has been replaced, installation data (including thermostat registration data) from the replaced base unit can be reused to setup the base unit.

⚠ **Caution:** Make sure the base unit is powered off before ejecting the microSD card.

❗ **Important!** When replacing a base unit, the microSD card from the replaced unit must be used in the new base unit. Otherwise all registrations must be redone.

❗ **Important!** When a base unit has been replaced, no additional units can be added to the system without redoing the whole installation. Replace the microSD card with the new one again, or format the existing one, and redo the installation procedure with the additional units.
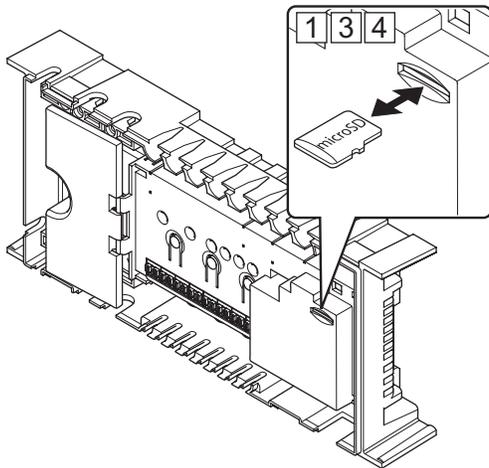
Figure 8-2: Replacing the microSD card

Preparation

1. Eject the microSD card from the malfunctioning base unit.

Restore from backup to new base unit

2. Power off the new base unit.

3. Eject the existing microSD card from the new base unit.

4. Insert the microSD card containing the installation data from the malfunctioning controller into the new one.

5. Power on the new base unit.

The new base unit is now setup with the installation data from the malfunctioning one.

Chapter 9
Troubleshooting

The table below shows problems and alarms that can occur and describes solutions. Note that common issues may be due to incorrectly installed loops or mixed up thermostats. In the case of mixed up thermostats in a system, use the room check function.

General troubleshooting

Problem	Indication	Probable cause	Solutions
Fluctuating floor temperature	Floor temperature is changing abnormally between hot and cold in heating mode.	Supply water temperature is too high.	Check the boiler or pump.
	Room temperature does not match setpoint on the thermostat, and actuators shut on/off on a fixed interval.	Heating fall back function is activated due to lost communication with thermostat.	Check the connection of the room thermostat. Check the batteries in the room thermostat.
	Room temperature does not match setpoint on thermostat.	The thermostat is placed in direct sunlight or close to other heat sources.	Check placement of the thermostat according to installation instructions and change location if needed.
		The thermostat is placed in the wrong room.	Check the placement of the thermostats and change rooms if needed.
The room is too cold	Press – or + buttons to display the temperature setpoint on the thermostat Temperature setpoint is displayed on the interface, in the room information menu.	The thermostat setting is too low.	Change the temperature setpoint.
	The temperature displayed on the thermostat changes after the thermostat is moved.	The thermostat may be influenced by an external heat source.	Change the location of the thermostat.
	See installation report and controller/channel numbering on the thermostat label.	The thermostats of individual rooms are incorrectly registered	Place the thermostat in the correct room or change the thermostat registration in the controller.
	White indicator cannot be seen in the window of an actuator.	An actuator does not open	Replace the actuator Contact the installer.
	Setpoint temperature displayed in the room information menu is lower than the temperature set on the thermostat.	Incorrect minimum/maximum limitation	Change the minimum/maximum limitation in the interface.
The room is too warm (or too cold in cooling mode)	Corresponding loop is warm even after a long period without a heat call.	An actuator is not closing.	Check that the actuator is correctly installed. Replace the actuator. Contact the installer.
The floor is cold	The room temperature is okay, but the floor is cold.	No heat demand from the underfloor heating system. The room is heated by another heat source.	
No communication	Communication error Software versions incompatible	Registration is lost.	Contact the installer.

Table 9-1: General troubleshooting

Troubleshooting after installation

Problem	Indication	Probable cause	Solutions
The system does not start	The power indicator in the controller is off.	There is no AC power to the controller.	1. Check that the controller is connected to AC power. 2. Check the wiring in the 24 VAC compartment. 3. Check that there is 115 VAC power to the transformer.
	There is no 24 VAC power in the wall socket.	Blown controller fuse or faulty wiring	Replace the fuse and/or correct the wiring issue.
Poor radio reception	Repeated radio alarms	The antenna is installed inside a metal cabinet, or too close to other shielding objects. Building structure is unfavorable for radio transmission.	Change the antenna location. If the problem persists, contact the installer.
The thermostat is faulty	Channel LEDs in the controller continue flashing	The antenna is not correctly installed or positioned.	Check the wiring and the antenna connection.

Table 9-2: Troubleshooting after installation

Digital thermostats

An alarm is sent when more than one hour has elapsed since the controller received the last radio signal from the thermostat. The table below shows problems that can occur with digital thermostats.

Indication	Probable cause	Solutions
Battery icon is displayed.	Thermostat battery power is running low.	Replace the batteries.
The display is off.	The batteries are discharged or wrong type of batteries are used.	Replace the batteries.
	The batteries are installed upside down (reverse polarity).	Install the batteries correctly.
Radio transmission icon is displayed but the signals are received only when the thermostat is close to the antenna.	Transmitter working with reduced signal intensity	Force the thermostat to transmit by changing the temperature setpoint. Replace the thermostat.
	New installations in building shield radio signals (for example, metal door safe)	Try to find a new position for the thermostat and/or the antenna, or, if possible, move the shielding object.
No radio transmission icon is displayed on thermostat screen when –/+ buttons are pressed.	The transmitter broken in the thermostat.	Force the thermostat to transmit by changing the temperature setpoint. Replace the thermostat.
Relative humidity icon is displayed.	The relative humidity limit is reached.	Lower the humidity level by increasing the ventilation or temperature setpoint.
The icon for floor temperature sensor flashes.	Faulty temperature sensor	Check the connection of the floor sensor. Disconnect the floor temperature sensor and check it with an ohmmeter. The value must be around 10k ohms.
The icon for outdoor temperature sensor flashes.	Faulty temperature sensor	Check the connection of the outdoor sensor. Disconnect the outdoor sensor and check it with an ohmmeter. The value must be around 10k ohms.
The icon for indoor temperature sensor flashes.	Faulty temperature sensor	Contact the installer or replace the thermostat. Disconnect the remote temperature sensor (if connected) and check it with an ohmmeter. The value must be around 10k ohms.

Table 9-3: Troubleshooting digital thermostats

Dial thermostats

An alarm is sent when more than one hour has elapsed since the controller received the last radio signal from the thermostat. The table below lists problems that can occur with dial thermostats.

Indication	Probable cause	Solutions
The LED on the thermostat flashes twice.	The thermostat battery power is running low.	Replace the batteries.

Table 9-4: Troubleshooting dial thermostats

Base unit alarms

An alarm is sent when more than one hour has elapsed since the base unit received the last radio signal from the thermostat. The table below lists problems that can occur in the base unit.

Indication	Probable cause	Solutions
The power LED and channel LED on the controller flashes.	The antenna is out of position or a wire is disconnected	Install the antenna in a correct position with the cable correctly connected.
Alarm in the interface The battery icon ▯ is displayed in room information on the interface or thermostat.	The batteries in the thermostat are discharged.	Replace the batteries. When the error is resolved, the thermostat screen displays the room temperature and the battery icon ▯ disappears.
Radio alarm in interface The radio icon ⑴ is displayed in room information on the thermostat. The power LED and thermostat LEDs in the controller for the connected channels flash.	The thermostat is out of radio range.	Reduce the distance between the thermostat and controller or change location of the thermostat in the room.

Table 9-5: Base unit alarms

Contact the installer

For installer contact information, refer to the installation report at the end of this document. Prepare the following information before contacting an installer:

• Installation report

• Drawings of the underfloor heating system (if available)

• List of all alarms, including time and date

Installer instructions

To determine if a problem is caused by the supply system or the control system, loosen the actuators from the manifold for the room concerned, wait a few minutes and check if the flow pipe of the underfloor heating loop becomes warm.

If the pipe does not become warm, the problem is in the heating system. If the loop becomes warm, the cause could be the room control system.

A supply system defect can be indicated by no warm water in the manifold. Check the boiler and circulation pump.

Appendix A
Technical data

General

IP	IP20 (IP: degree of inaccessibility to active parts of the product and degree of water)
Maximum ambient RH (relative humidity)	85% at 68ºF (20ºC)

Thermostats

ERP	IV
Low-voltage tests	EN 60730-1* and EN 60730-2-9***
EMC (electromagnetic compatibility requirements) tests	EN 60730-1 and EN 301-489-3
ERM (electromagnetic compatibility and radio spectrum matters) tests	EN 300 220-3
Power supply	Two 1.5 V AAA alkaline batteries
Voltage	2.2 V to 3.6 V
Operating temperature	32ºF to 113ºF (0°C to 45°C)
Storage temperature	14ºF to 149ºF (-10°C to 65°C)
Radio frequency	912 MHz
Transmitter duty cycle	<1%

Antenna

Power supply	From controller
Radio frequency	912 MHz
Transmitter duty cycle	<1%
Receiver class	2

Base unit

Low-voltage tests	EN 60730-1* and EN 60730-2-1**
EMC (electromagnetic compatibility requirements) tests	EN 60730-1 and EN 301-489-3
ERM (electromagnetic compatibility and radio spectrum matters) tests	EN 300 220-3
Power supply	24 VAC +10/-15%, 50 Hz or 60 Hz
Internal fuse	T5 F3.15AL 250 V, 5x20 3.15A quick acting
Internal fuse, heat output	TR5-T 8.5 mm Wickmann 100 mA time lag
Operating temperature	32ºF to 113ºF (0°C to 45°C)
Storage temperature	-68ºF to 158ºF (-20°C to 70°C)
Maximum consumption	45 W
Pump and boiler relay outputs	24 VAC +10/-15%, 8 A maximum
General purpose input (GPI)	Only dry contact
Valve outputs	24 VAC, 0.2 A average, 0.4 A peak

* EN 60730-1 Automatic electrical controls for household and similar use Part 1: General requirements

** EN 60730-2-1 Automatic electrical controls for household and similar use Part 2-1: Particular requirements for electrical controls for electrical household appliances

*** EN 60730-2-9 Automatic electrical controls for household and similar use Part 2-9: Particular requirements for temperature sensing controls

Technical specifications

Cables	Standard cable length	Maximum cable length	Wire gauge
Cable from base unit to antenna	1.6' (0.50 m)	16' (5 m)	CAT.5e or CAT.6, RJ 45 connector
Cable from base unit to actuator	2.5' (0.75 m)	65' (20 m)	Base unit: 0.2 mm² to 1.5 mm²
External sensor cable to thermostat	16' (5 m)	16' (5 m)	0.6 mm²
Floor sensor cable to thermostat	16' (5 m)	16' (5 m)	0.75 mm²
Outdoor sensor cable to thermostat	-	16' (5 m)	Twisted pair

Base unit layout
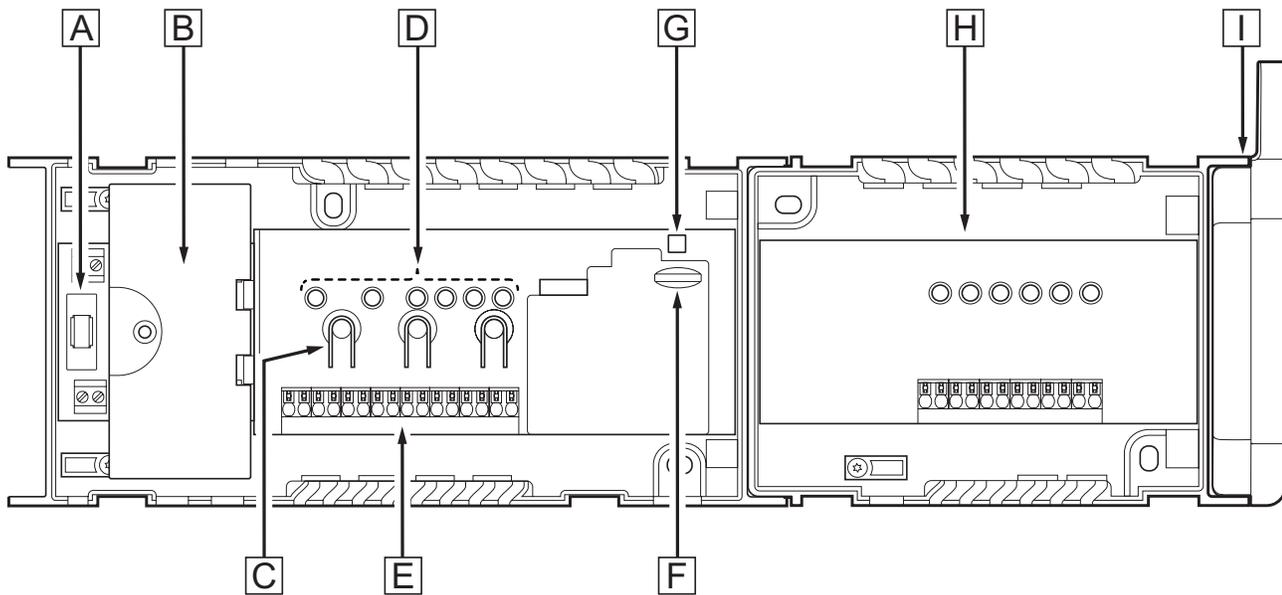
Figure A-1: Base unit layout

Item	Description
A	Fuse (T5 F3.15AL 250 V)
B	Optional inputs and outputs (pump and boiler management, and heat pump connection)
C	Channel registration buttons
D	LEDs for channels 01 – 06
E	Quick connectors for actuators
F	MicroSD card
G	Power LED
H	Wireless Base Unit Expansion Module, 6 zones (A3801160) (optional)
I	Wireless antenna, RJ-45 connector

Base unit wiring
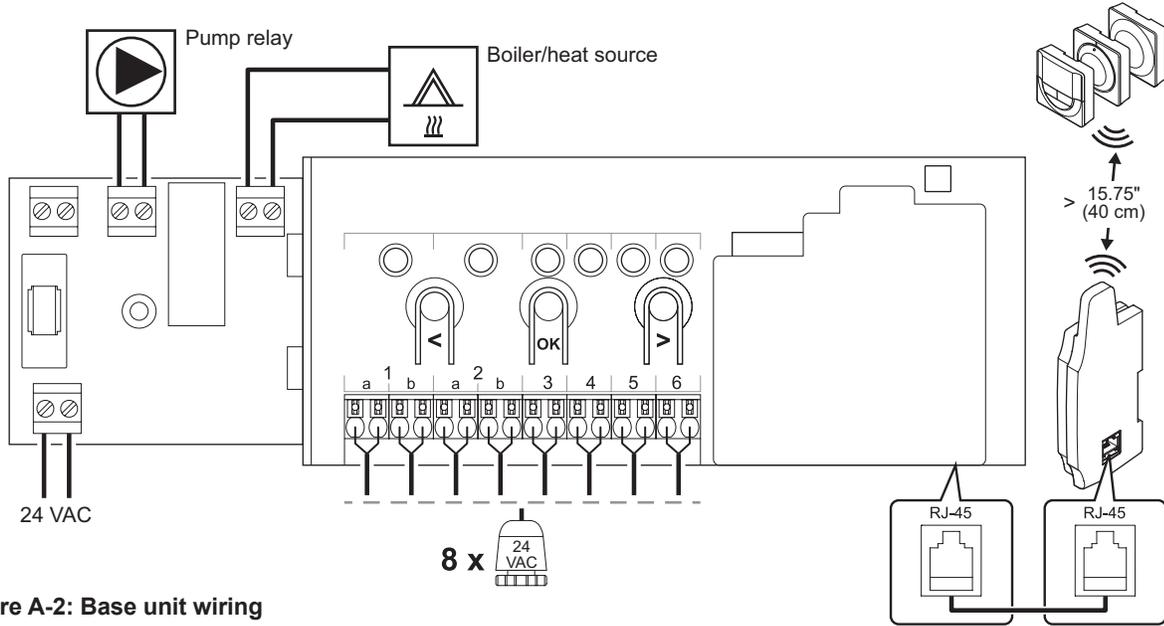
Figure A-2: Base unit wiring

Expansion module wiring
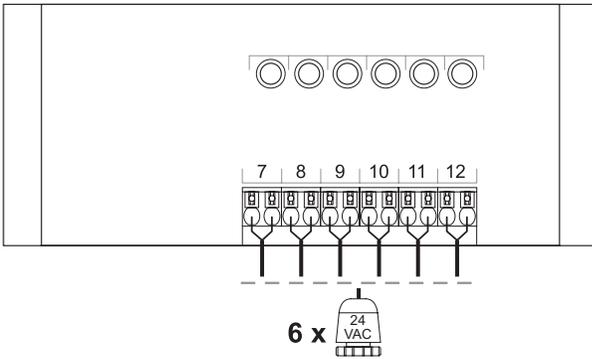
Figure A-3: Expansion module wiring

Dimensions

Base unit and antenna
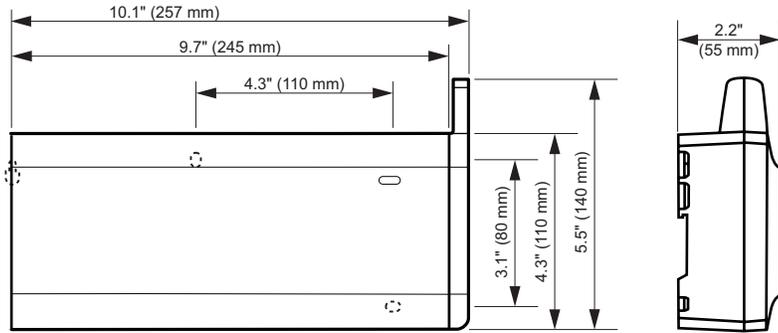
Figure A-4: Base unit and antenna dimensions

Base unit with expansion module and antenna
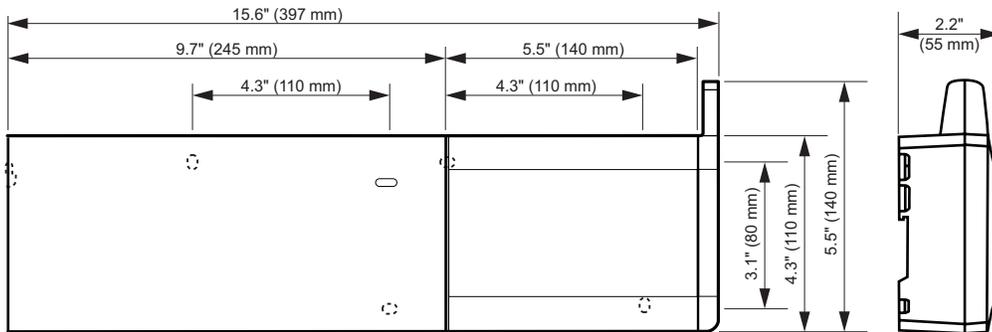
Figure A-5: Base unit with expansion module and antenna dimensions

Thermostats

A8500167

A8500165
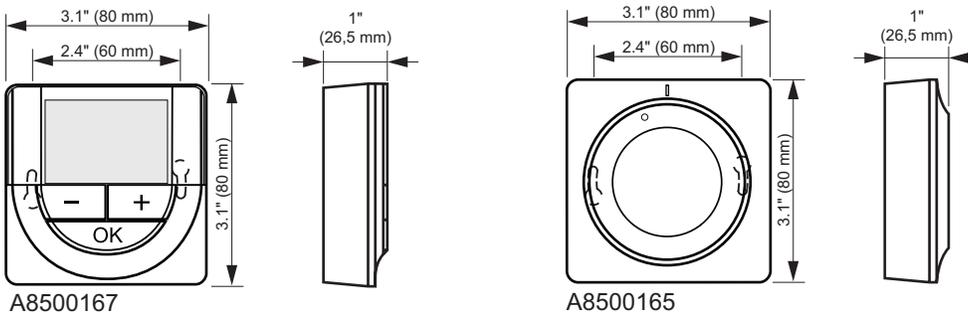
Figure A-6: Thermostat dimensions

Appendix B
Installation report
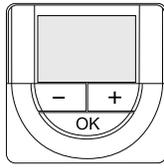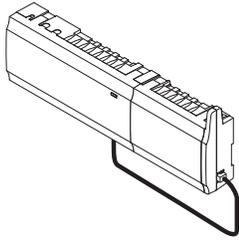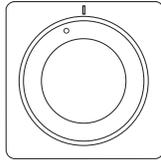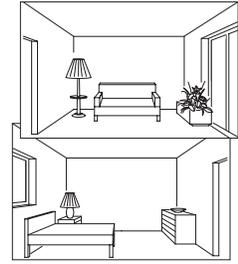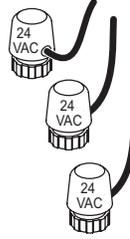
Controller number	Channels			Rooms
1				
Expansion module 1				
Floor sensor				
Outdoor sensor				
Remote sensor				

....

....

....

....

....

....
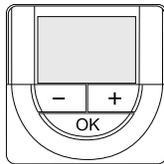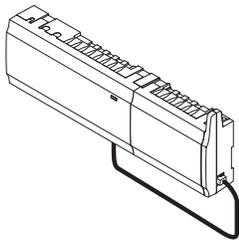
Controller number	Channels			Rooms
2				
Expansion module 2				
Floor sensor				
Outdoor sensor				
Remote sensor				

....

....

....

....

....

....

....

....

....

....

	A3800167	A3800165	24 VAC / 24 VAC / 24 VAC	
Controller number	**Channels**			**Rooms**
3				
Expansion module 3				
Floor sensor				
Outdoor sensor				
Remote sensor				

....
....
....
....
....
....
....
....
....
....

Controller number	Channels			Rooms
	A3800167	A3800165		
4				
Expansion module 4				
Floor sensor				
Outdoor sensor				
Remote sensor				

Uponor Inc.
5925 148th Street West
Apple Valley, MN 55124
USA

T 800.321.4739
F 952.891.2008

Uponor Ltd.
2000 Argentia Rd., Plaza 1, Ste. 200
Mississauga, ON L5N 1W1
CANADA

T 888.994.7726
F 800.638.9517

uponor

uponorpro.com