

**uponor**



# **Uponor Smatrix Base/Base PRO**

EN INSTALLATION AND OPERATION  
MANUAL

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- is selected, planned and installed and put into operation by a licensed and competent planner and 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 location 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.

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## 2 Preface

This installation and operation manual describes how to install and operate the components of the system.

### 2.1 Safety instructions

#### Warnings used in this manual

The following symbols are used in the manual to indicate special precautions when installing and operating any Uponor equipment:



#### **WARNING!**

Risk of injury. Ignoring warnings can cause injury or damage components.



#### **CAUTION!**

Ignoring cautions can cause malfunctions.

#### Safety measures

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

- Read and follow the instructions in the installation and operation manual.
- Installation must be performed by a competent person in accordance with local regulations.
- It is prohibited to make changes or modifications not specified in this manual.
- All power supplies must be switched off before starting any wiring work.
- Do not use water to clean Uponor components.
- Do not expose the Uponor components to flammable vapours or gases.

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

#### Power



#### **WARNING!**

The Uponor system uses 50 Hz, 230 V AC 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 V.

### 2.2 Correct disposal of this product (Waste Electrical and Electronic Equipment)



#### **NOTE!**

Applicable in the European Union and other European countries with separate collection systems



This marking shown on the product or its literature indicates that 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 from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.

Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes of disposal.

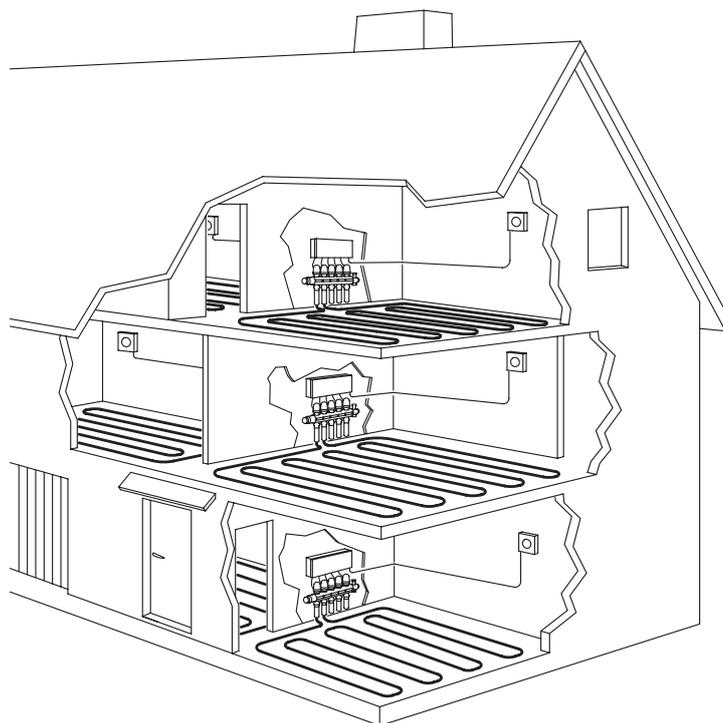
## 3 Uponor Smatrix Base/Base PRO

Uponor Smatrix Base/Base PRO is a management system for underfloor heating and cooling installations. Comfort, user friendliness and temperature control for each individual room of a home can be combined through the various components.

### 3.1 System overview

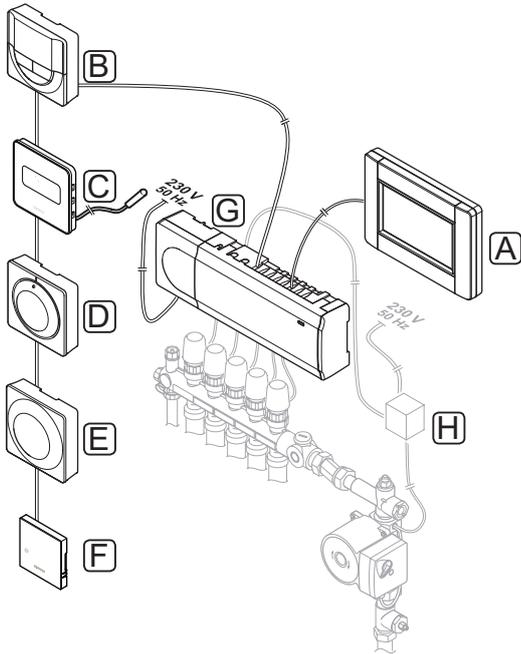
Uponor Smatrix Base/Base PRO consists of a controller, thermostats, actuators and an optional timer. The controller manages the operation of the actuators when the thermostats detect a demand for heating or cooling.

Uponor Smatrix Base/Base PRO is controlled by different types of thermostats. Designed for maximum comfort, the thermostats communicate with the controller by a wired communication protocol. It is possible to mix the different types of Uponor Smatrix Base thermostats in the same installation.



### 3.2 Example of a system

The illustration below shows Uponor Smatrix Base PRO with several installation options and thermostats.



Item	Description
A	Uponor Smatrix Base PRO Interface I-147 (interface I-147)
B	Uponor Smatrix Base Thermostat Prog.+RH T-148 (digital thermostat T-148)
C	Uponor Smatrix Base Thermostat D+RH Style T-149 (digital thermostat T-149) with floor sensor
D	Uponor Smatrix Base Thermostat Standard T-145 (standard thermostat T-145)
E	Uponor Smatrix Base Thermostat Public T-143 (public thermostat T-143)
F	Uponor Smatrix Base PRO Room Sensor+RH Style T-141 (room sensor thermostat)
G	Uponor Smatrix Base Controller X-145 (controller X-145)
H	External connection box for pumps (third-party product, just schematic example in illustration)

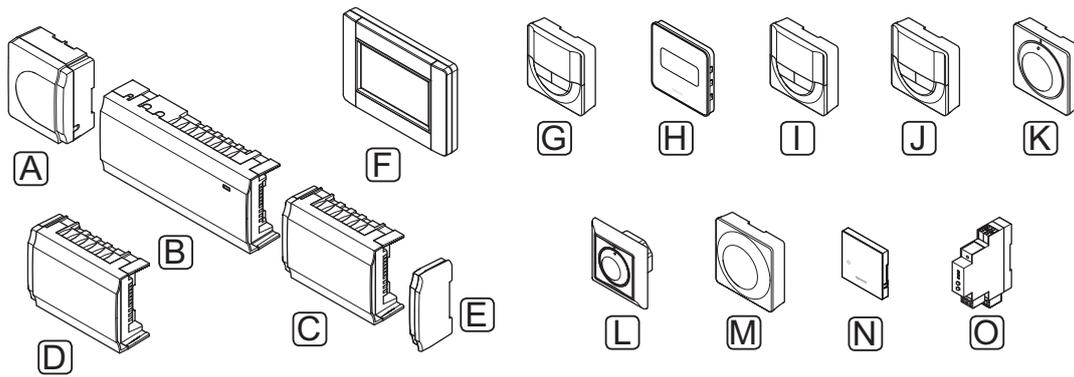


#### NOTE!

The floor sensor can be connected to thermostats T-143, T-146, T-148, and T-149. Floor temperature limitation together with thermostats T-141 or T-143 can only be done in a Base PRO system using an interface.

For example, the maximum limitation can protect a sensitive floor covering from exposure of too high temperature when there is a high heating demand. The minimum limitation can keep a tiled floor warm even when there is a no general demand for heat supply to the room.

### 3.3 Uponor Smatrix Base/Base PRO components



Pos.	Uponor designation	Description
A	Uponor Smatrix Transformer A-1XX (transformer A-1XX)	Transformer module
B	Uponor Smatrix Base PRO Controller X-147 Uponor Smatrix Base Controller X-145	Controller
C	Uponor Smatrix Base Slave Module M-140 (slave module M-140)	Slave module
D	Uponor Smatrix Base Star Module M-141 (star module M-141)	Star module
E	Uponor Smatrix Base End cover	End cover
F	Uponor Smatrix Base PRO Interface I-147 (interface I-147)	Interface
G	Uponor Smatrix Base Timer I-143 (timer I-143)	Timer
H	Uponor Smatrix Base Thermostat D+RH Style T-149 (digital thermostat T-149)	Digital thermostat with relative humidity sensor and operative sensor

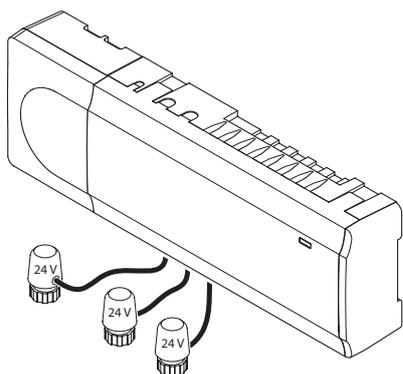
Pos.	Uponor designation	Description
I	Uponor Smatrix Base Thermostat Prog.+RH T-148	Programmable digital thermostat with relative humidity sensor
J	Uponor Smatrix Base Thermostat Dig T-146	Digital thermostat
K	Uponor Smatrix Base Thermostat Standard T-145	Standard thermostat with print on dial
L	Uponor Smatrix Base Thermostat Flush T-144 (flush thermostat T-144)	Flush thermostat
M	Uponor Smatrix Base Thermostat Public T-143	Public thermostat
N	Uponor Smatrix Base PRO Room Sensor+RH Style T-141 (room sensor thermostat)	Room sensor thermostat with relative humidity sensor and operative sensor
O	Uponor Smatrix Base PRO Gateway Module R-147 KNX (KNX module)	KNX module

## CONTROLLER

The controller 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 controller which is typically located near the hydraulic system manifolds.

The illustration below shows the controller with the transformer module and actuators.



### CAUTION!

Only 24 V Uponor actuators are compatible with the controller.

## Uponor Smatrix Base PRO Controller X-147

Main characteristics:

- Integrated Dynamic Energy Management functions such as autobalancing (on by default). Other functions such as comfort setting, room bypass, and supply temperature monitoring requires an interface.
- Electronic control of actuators.
- Connection of maximum eight actuators (24 V).
- 2-way communication with up to six room thermostats.
- Heating/cooling function (advanced) switched by dry contact, public thermostat (heating/cooling sensor only) or touch panel interface.
- Comfort/ECO mode switched by dry contact, public thermostat or touch panel interface.
- Separate relays for control of pump and boiler.
- Integrated heat pump module (only available in systems with four controllers or less, and in selected countries, contact a local Uponor office for more information).

- KNX connectivity via KNX module.  
*See separate documentation.*
- Valve and pump exercise.
- Logging, back up and updates via microSD card.
- Relative humidity control (requires an interface).
- Control of combined underfloor heating/cooling and ceiling cooling (requires an interface).
- Lower indoor temperature with ECO mode. Use a timer I-143, interface I-147, or public thermostat T-143 (with Comfort/ECO switch) to activate ECO mode in all rooms at once. Use a digital thermostat T-148 to activate ECO mode in a single room.

Options:

- The controller can be expanded with a slave module which adds an extra six channels and six actuator outputs.
- The controller can be expanded with a star module which adds eight extra bus connectors to the system. It can be connected to the controller or slave module and is mostly used for a star topology.
- Connect up to 16 controllers into one system (requires an interface).
- Modular placement (detachable transformer).
- Cabinet or wall mounted (DIN rail or supplied screws).
- Free placement and orientation when installing the controller.

## Uponor Smatrix Base Controller X-145

### Main characteristics:

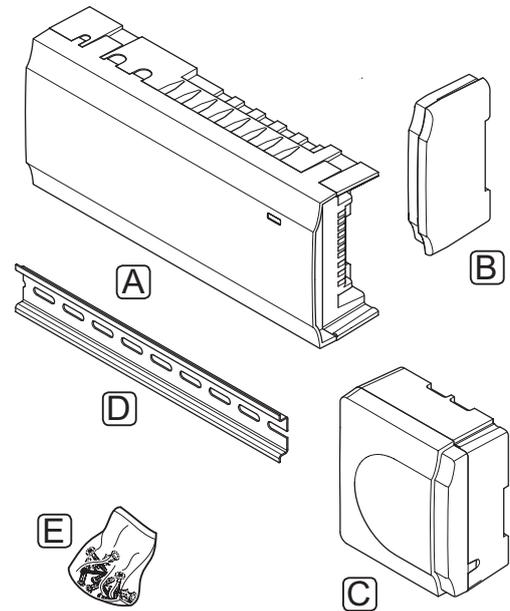
- Integrated Dynamic Energy Management functions such as autobalancing (on by default).
- Electronic control of actuators.
- Connection of maximum eight actuators (24 V).
- 2-way communication with up to six room thermostats.
- Heating/cooling function (basic) switched by dry contact.
- Separate relays for control of pump and boiler.
- Valve and pump exercise.
- Basic relative humidity control.
- Lower indoor temperature with ECO mode. Use a timer I-143, interface I-147, or public thermostat T-143 (with Comfort/ECO switch) to activate ECO mode in all rooms at once. Use a digital thermostat T-148 to activate ECO mode in a single room.

### Options:

- The controller can be expanded with a slave module which adds an extra six channels and six actuator outputs.
- The controller can be expanded with a star module which adds eight extra bus connectors to the system. It can be connected to the controller or slave module and is mostly used for a star topology.
- Modular placement (detachable transformer).
- Cabinet or wall mounted (DIN rail or supplied screws).
- Free placement and orientation when installing the controller.

## Components of the controller

The illustration below shows the controller and its components.



Item	Description
A	Uponor Smatrix Base Controller X-145
B	End cap
C	Transformer
D	DIN rail
E	Mounting material

## INTERFACE (BASE PRO ONLY)

Uponor Smatrix Base PRO Interface I-147 is a touch screen interface which communicate with the X-147 controller by a wired communication protocol.

The interface acts as a link between the user and the controller(s) running in the system, displaying information and enabling simplified programming of all relevant system settings.

The Uponor Smatrix Base PRO system can be operated without the interface, but with reduced functionality (in example: many of the main characteristics listed below cannot be used).



### NOTE!

Uponor Smatrix Base PRO systems without an interface can only operate with reduced functionality.

## Uponor Smatrix Base PRO Interface I-147

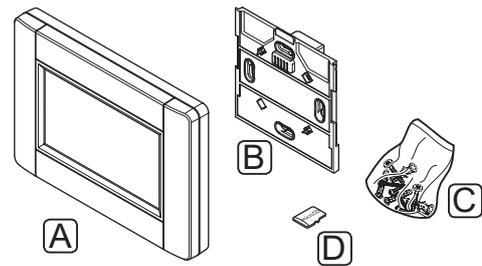
Main characteristics:

- Touch screen interface.
- Display information and change settings of up to 16 controllers running within one system.
- Adjust temperature setpoints of registered thermostats within the system.
- Installation setup wizard when installed for the first time or after a factory reset.
- User friendly menu system available in several different languages.
- Backlit display.
- Temperature setback programs for each connected thermostat.
- Limitations of maximum/minimum temperature.
- Schedule temporary lowering of setpoint during holiday.
- Automatic change between summer- and winter time.

- Diagnostic function detecting if a room thermostat is installed in the right room (room check). The function is only available in systems with four controllers or less.
- Possibility to automatically open up to two rooms per controller when other rooms are closed to maintain a minimum flow (room bypass).
- System diagnostic (alarms etc).
- Visualize trends by e.g. comparing setpoint with room temperature etc.
- Advanced cooling settings.
- Change language and/or update the software with microSD card.
- KNX connectivity (requires an external module).
- Control of accessories (outputs etc).

## Components of the interface

The illustration below shows the interface and its components.



Item	Description
A	Uponor Smatrix Base PRO Interface I-147
B	Wall bracket with power supply
C	Mounting material
D	MicroSD card

## THERMOSTATS

The thermostats communicate with the controller by a wired communication protocol and are used either individually or in combination with each other.

The following Uponor Smatrix thermostats can be used in the system:

Thermostat	Base PRO	Base
D+RH T-149	X*	X*
Prog.+RH T-148	X*	X*
Digital T-146	X*	X*
Standard T-145	X	X
Flush T-144	X	X
Public T-143	X	X
Sensor T-141	X	-

\* With reduced functionality



### NOTE!

The thermostat is affected by the temperature of the surrounding surfaces as well as the ambient air temperature.

## Uponor Smatrix Base Thermostat D+RH Style T-149

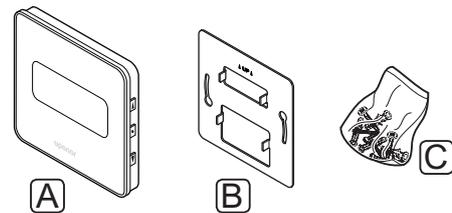
The thermostat shows the ambient, set temperature or relative humidity on the display. Temperature settings are adjusted using the +/- buttons on the front.

Main characteristics:

- Power saving e-paper display (updates every 10 minutes).
- Displays Celsius or Fahrenheit.
- Operative sensor for increased comfort.
- Calibration of displayed room temperature.
- Heating/cooling demand indication on display.
- Displays Uponor logo and software version during power up sequence.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- 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.
- Switch between Comfort and ECO mode with optional timer.
- Adjust ECO setback value.
- Relative humidity limit indicated in display.
- Invert display color.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base Thermostat D+RH Style T-149
B	Metal wall bracket
C	Mounting material

### Uponor Smatrix Base Thermostat Prog.+RH T-148

The thermostat shows the ambient, set temperature or relative humidity, and time on the display. Settings are adjusted using the +/- buttons on the front. Other programmable settings are scheduling and individual ECO mode (on a room by room basis) etc.

Uponor recommends only using this thermostat in systems without a timer. Because scheduling and priority issues might occur.

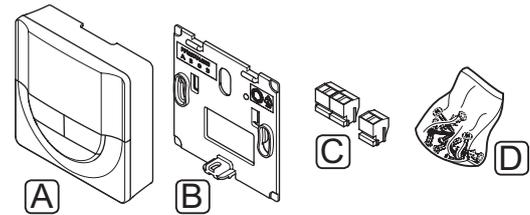
Main characteristics:

- Backlit display, dims after 10 seconds of inactivity.
- Displays Celsius or Fahrenheit.
- Calibration of displayed room temperature.
- Heating/cooling demand indication on display.
- Displays software version during power up sequence.
- Setup wizard to set time and date when installed for the first time or after a factory reset.
- 12/24h clock for scheduling.
- Internal memory to save time and date settings during short power outages.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- 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.
- Programmable to switch between Comfort and ECO modes with adjustable ECO setback value in the room.

- Cannot be overridden by other thermostats or timers, when it is set to a program.
- Relative humidity limit indicated in display.
- Scheduling, pre-programmed and customizable schedules.
- Lower indoor temperature on a room by room basis with ECO mode.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base Thermostat Prog.+RH T-148
B	Wall bracket
C	Connection terminals
D	Mounting material

### Uponor Smatrix Base Thermostat Dig T-146

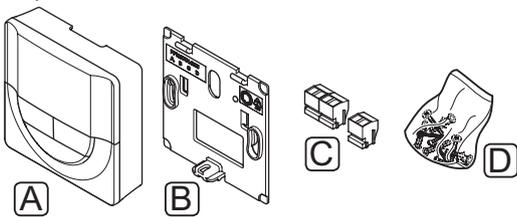
The thermostat shows the ambient or set temperature on the display. Temperature settings are adjusted using the +/- buttons on the front.

Main characteristics:

- Backlit display, dims after 10 seconds of inactivity.
- Displays Celsius or Fahrenheit.
- Calibration of displayed room temperature.
- Heating/cooling demand indication on display.
- Displays software version during power up sequence.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- 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.
- Switch between Comfort and ECO mode with optional timer.
- Adjust ECO setback value.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base Thermostat Dig T-146
B	Wall bracket
C	Connection terminals
D	Mounting material

### Uponor Smatrix Base Thermostat Standard T-145

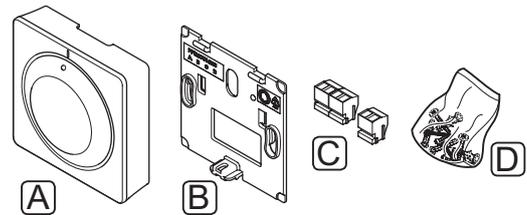
The thermostat temperature settings are adjusted using the dial. The 21 °C position is marked on the dial.

Main characteristics:

- Adjust temperature setpoint with large dial.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- Printed scale on the dial.
- LED in lower right corner indicating, for about 60 seconds, whether a heating or cooling demand exists.
- Enable or disable Comfort/ECO scheduling for the room with a dip switch on the back.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base Thermostat Standard T-145
B	Wall bracket
C	Connection terminals
D	Mounting material

**Uponor Smatrix Base Thermostat Flush T-144**

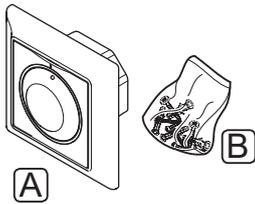
The thermostat temperature settings are adjusted using the dial. The 21 °C position is marked on the dial.

Main characteristics:

- Flush installation, specially designed for in-wall box installation.
- Adjust temperature setpoint with large dial.
- Printed scale on the dial.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- LED indicating, for about 60 seconds, whether a heating or cooling demand exists.
- Enable or disable Comfort/ECO scheduling for the room with a dip switch beneath the dial, which have to be removed for access.
- Different frames can be used for installation in a switch rail frame.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base Thermostat Flush T-144
B	Mounting material

**Uponor Smatrix Base Thermostat Public T-143**

The thermostat is designed for public locations which means that the dial is hidden. It must be removed from the wall to set the temperature. When it is removed, an alarm is triggered (if activated).

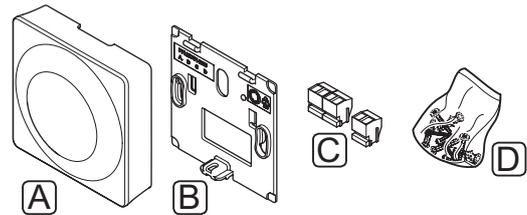
The thermostat can be registered as a system device, enabling extra functions. When functioning as a system device, the internal room sensor is disabled.

Main characteristics:

- Adjust setpoint temperature with a potentiometer on the back of the thermostat.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- Alarm is indicated on the controller if removed from wall for tamper detection (activated at registration).
- Dry contact input for forced ECO mode of operation, if registered as a system device.
- Optional external temperature sensor can be connected to the thermostat.
- Optional outdoor temperature sensor can be registered as either standard thermostat or system device.
- Dip switch for selecting between function or sensor mode of operation.
- Enable or disable Comfort/ECO scheduling for the room with a dip switch on the back.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base Thermostat Public T-143
B	Wall bracket
C	Connection terminals
D	Mounting material

### Uponor Smatrix Base PRO Room Sensor+RH Style T-141

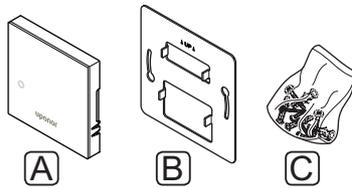
The thermostat is designed to be as small as possible, and still able to control the room temperature.

Main characteristics:

- Operative sensor for increased comfort.
- Adjust setpoint temperature via the Base PRO interface I-147.
- Setpoint range is 5 – 35 °C (maximum and minimum setting may be limited by other system settings).
- Relative humidity limit indicated in display via the Base PRO interface I-147.

Components of the thermostat:

The illustration below shows the thermostat and its components.



Item	Description
A	Uponor Smatrix Base PRO Room Sensor+RH Style T-141
B	Metal wall bracket
C	Mounting material

### TIMER

#### Uponor Smatrix Base Timer I-143 (Base only)

The timer enables control of the system with scheduling, Comfort/ECO settings, and Holiday mode etc. Settings are adjusted using the +/- buttons on the front.

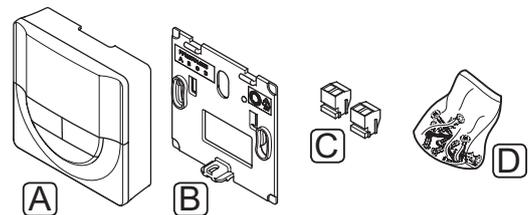
The timer only shows time, date and current scheduling program.

Main characteristics:

- Backlit display, dims after 10 seconds of inactivity.
- Timer symbol on the front to differentiate it from thermostats.
- Displays Celsius or Fahrenheit in the settings.
- Comfort/ECO and heating/cooling mode indication on display.
- Displays software version during power up sequence.
- Setup wizard to set time and date when installed for the first time or after a factory reset.
- 12/24h clock for scheduling.
- Internal supercapacitor to save time and date settings during short power outages.
- ECO mode setback for analogue thermostats. Digital thermostats use their own setback temperatures. Thermostat T-148 required to set its program to Off.
- Scheduling, pre-programmed and customizable schedules.
- Disable/enable holiday mode.
- Enable autobalancing in the system.

Components of the timer:

The illustration below shows the timer and its components.



Item	Description
A	Uponor Smatrix Base Timer I-143
B	Wall bracket
C	Connection terminals
D	Mounting material

## SLAVE MODULE

### Uponor Smatrix Base Slave Module M-140

The slave module adds six channels and actuator outputs to an existing Uponor Smatrix Base controller.

Main characteristics:

- Easy plug in installation on existing controller, no additional wiring needed.
- Register up to six extra thermostats to the system.
- Connect up to six extra actuators (24 V).
- Electronic control of actuators.
- Valve exercise.

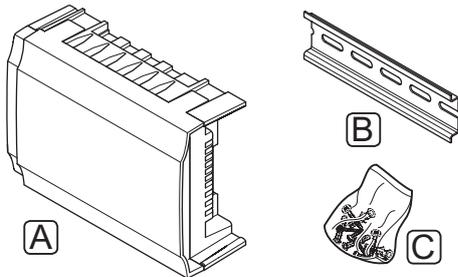


#### NOTE!

Only one slave module extension is supported per controller.

Components of the slave module:

The illustration below shows the slave module and its components.



Item	Description
A	Uponor Smatrix Base Slave Module M-140
B	DIN rail
C	Mounting material

## STAR MODULE

### Uponor Smatrix Base Star Module M-141

The star module enables thermostats to be installed in a centralized star topology instead of the standard bus topology.

Main characteristics:

- Install the wiring from the thermostats in a centralized star topology (instead of a bus topology) which opens up for flexible wiring approaches.
- Requires an Uponor Smatrix Base controller.
- Adds 8 extra bus connectors to the system.
- Only thermostat input signals is allowed.
- Can be attached directly to the controller or slave module or by using a communication cable utilising one connector in each unit.

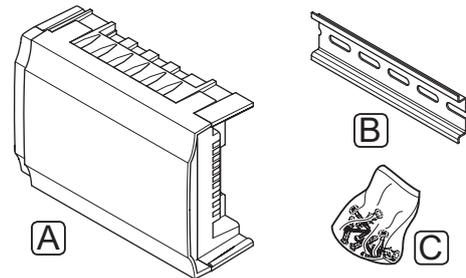


#### NOTE!

Only one star module extension is supported per controller.

Components of the star module:

The illustration below shows the star module and its components.



Item	Description
A	Uponor Smatrix Base Star Module M-141
B	DIN rail
C	Mounting material

## KNX MODULE

### Uponor Smatrix Base PRO Gateway Module R-147 KNX

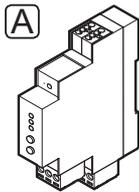
The KNX module enables communication between an Uponor Smatrix Base PRO system and a standard KNX bus.

Main characteristics:

- Enables useage of either Uponor or KNX thermostats in the system.
- Access to setpoints for every room.
- Access to readout of room and floor temperatures.
- Access to alarm monitoring.
- Access to heat curve in Uponor Smatrix Move PRO controller (if connected to a Base PRO system bus).
- Enables usage of standard KNX system for Comfort/ECO and heating/cooling switch.

Components of the KNX module:

The illustration below shows the KNX module and its components.



Item	Description
A	Uponor Smatrix Base PRO Gateway Module R-147 KNX

## UPONOR ACTUATORS

Uponor actuators are mounted on top of the manifold valves and is 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) or higher (cooling 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. 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 that the actuator is closed.

Time to open and close an actuator is 1 minute.

### PWM control

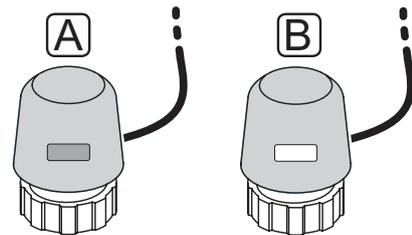
PWM control is used when the Autobalancing function is active.

When installing a system with PWM control, all balancing valves can be fully opened, the system is balanced automatically.

### ! NOTE!

Autobalancing can be used in combination with hydronic balancing.

See section 3.5 Functions > Autobalancing for more information.

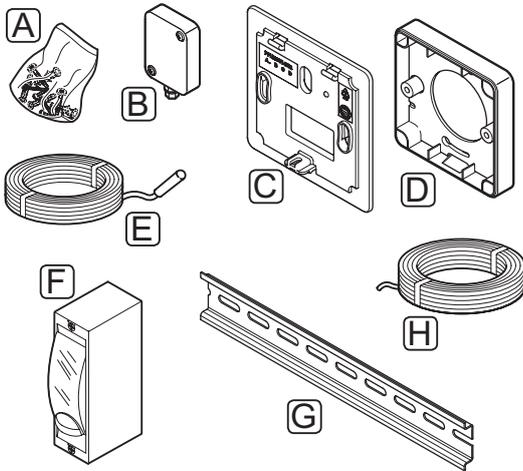


A Actuator has closed the valve – empty indicator

B Actuator has opened the valve – white indicator

### 3.4 Accessories

Uponor offers a wide variety of accessories for use with the standard portfolio.



#### NOTE!

Some of these accessories may be included in the system.

Item	Component	Description
A	Screws	Mounting material for thermostats T-141, T-143, T-145, T-146, T-148, T-149 and timer I-143
B	Uponor Smatrix Sensor Outdoor S-113  (outdoor sensor S-113)	Outdoor sensor for use with thermostats T-143, T-146, T-148, and T-149
C	Uponor Smatrix Wallframe T-X A-1XX  (wallframe T-X A-1XX)	Wall frame for covering larger area of the wall than original back plate. Used at installation of thermostats T-143, T-145, T-146, T-148 and timer I-143
D	Uponor Smatrix Base Surface Adaptor Style T-149 A-14X	Surface distance adaptor, if needed for mounting thermostat T-149 on the wall.
E	Uponor Smatrix Sensor Floor/Remote S-114  (floor/remote sensor S-114)	Floor/remote sensor for use with thermostats T-143, T-146, T-148 and T-149
F	Uponor Heating/Cooling relay	Relay for connecting external voltage signal from a heating/cooling source, such as a heat pump, to a controller input.
G	DIN rail	DIN rail for use with Uponor Smatrix Base/Base PRO controller
H	Uponor Smatrix Bus cable A-145	Bus cable for use with thermostats

### 3.5 Functions

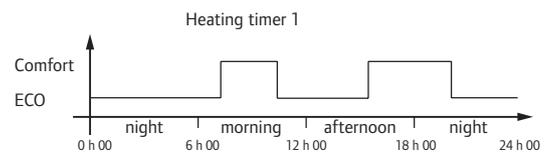
Uponor Smatrix Base/Base PRO is used to control an underfloor heating and/or cooling system in a house or building.

The thermostats registered to the controller is used to control the actuators mounted on top of the manifold valves.

As soon as the temperature measured at a thermostat is lower (heating mode) or higher (cooling mode) than the setpoint temperature, a demand to change the room temperature is created and sent to the controller. The controller will operate the actuators according to current control mode and settings. This will manage the flow to the floor loops in the room and adjust the room temperature. Once the set temperature is reached, this information is sent to the controller and the demand is met.

#### COMFORT AND ECO MODES

If a timer is connected to the controller, it is possible to regulate the temperature setpoint modes between three different temperatures. Available modes is **Comfort**, **ECO** (economy), and **Holiday**. See example of *Comfort and ECO mode below*.



The diagram shows that the system delivers heating in comfort mode in the morning and afternoon, but the system enters ECO mode during night and in the middle of the day, when the house normally is empty.

## AUTOBALANCING



### NOTE!

Autobalancing can be used in combination with hydronic balancing.

The Uponor Smatrix Base/Base PRO controller can operate the actuator outputs by either on/off signals or by Autobalancing (on by default), using pulse width modulation (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% on time.

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.

## HEATING/COOLING OFFSET

Uponor uses an offset temperature to adjust the setpoints when switching between heating and cooling. This improves the performance of the system and reduces the need of manual setpoint adjustments when switching between heating and cooling.

The offset is 2 °C and is used to increase the setpoints when switching to cooling. When switching back to heating, the value is used to reduce the setpoint. The offset can be changed using an interface I-147 (Base PRO only).

## RELATIVE HUMIDITY FUNCTION

To avoid condensation when having a cooling system, it is recommended measuring the relative humidity (RH) in the rooms. The relative humidity is measured with one or more thermostats (with RH sensor).

### Uponor Smatrix Base

Cooling is shut off for the whole system if the RH reaches a "worst case level" of 80% in one of the thermostats (if more than one).

Cooling will start again when the relative humidity falls below 76%.

### Uponor Smatrix Base PRO

Cooling is shut off on a per room basis when the relative humidity limit is reached (set in the interface, default 75%). If a dehumidifier is installed (requires an Uponor Smatrix Move PRO controller) it will be activated when the dehumidifier start limit is reached.

Cooling will start again and the dehumidifier is deactivated when the relative humidity falls below a hysteresis set in the interface ("Deadzone", default 5%).

## PUMP MANAGEMENT

The controller in a system has a pump relay, to which one pump can be connected. If there is some sort of demand in a room, the pump is started. In a Base PRO system, with an interface connected, the pump management parameter is automatically set to common mode. Use the interface to change the setting if needed. Available settings are **Common**, **Individual** and **H/C switch**.

### Common mode (Base PRO with interface only):

Relay status is set on a system wide basis. One pump per system is connected (to the master controller only). If there is a demand in one room of the controllers, the main pump is started.

### Individual mode (Base PRO with interface only):

Relay status is set on a controller basis. One pump per controller is connected. If there a demand in a room, only the pump connected to that controller is started.

**H/C-switch (Base PRO with interface only):**

Use the relay as a heating/cooling output. A circulation pump cannot be connected to the controller using the **PUMP** connector.

If more than one controller (Base PRO only) is available in the system, and the circulation pump settings in the interface is set to **Common**. The **PUMP** connector on the other controllers can be used for heating/cooling output signal.

**ACTUATOR MANAGEMENT**

Actuator management prevents too many actuators to be open at the same time in order to reduce the peak power need. Peak current can be reduced by delaying the opening of some actuators, as they use most current while being opened.

Up to eight actuators in up to six rooms can be opened at the same time. Additional actuators are queued and opened in order.

**HEATING FALL BACK**

If the connection to a thermostat is lost, the corresponding loop cannot be regulated using the room temperature. The controller then activates a fall back function for the affected loop and the actuators are operated with a set interval.

The function is activated until the thermostat is reconnected.

**SYSTEM CLOCK**

To facilitate scheduling and different timer settings, the controller receives the correct time and date from one of the input devices (interface, timer, programmable thermostat etc). The clock can be set to automatically switch between summer and winter time (Base PRO with an interface only).

**MICROSD CARD (BASE PRO ONLY)**

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

**HEAT PUMP INTEGRATION (BASE PRO ONLY)**

The controller can connect to selected heat pumps and adjust the supply temperature to the system.

*This function is only available in selected countries, contact a local Uponor office for more information.*

**NOTE!**

This function is only available to Base PRO systems with four controller or less.

*See heat pump documentation for more information.*

**ROOM CHECK (BASE PRO WITH INTERFACE ONLY)**

Room check is a diagnostic function detecting whether a room thermostat is installed in the right room.

**NOTE!**

This function is only available to Base PRO systems with four controller or less.

*See section 14.7 Settings > Room check for more information.*

**ROOM BYPASS (BASE PRO WITH INTERFACE ONLY)**

Up to a maximum of two rooms, for each controller, can be selected to act as a bypass in the system.

*See section 14.7 Settings > Room bypass for more information.*

## 4 Install Uponor Smatrix Base/Base PRO

### 4.1 Installation procedure

#### UPONOR SMATRIX BASE/BASE PRO

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

Stage	Procedure	Page
1	Prepare for installation	22
2	Install Uponor Smatrix Base/Base PRO controller	26
3	Connect a slave module (optional)	27
4	Connect a star module (optional)	28
5	Install Uponor Smatrix Base/Base PRO thermostats and sensors	40
6	Install optional Uponor Smatrix Base timer (Base only)	56
7	Install Uponor Smatrix Base PRO interface (Base PRO only)	60
8	Finish installation	66

#### UPONOR SMATRIX BASE PRO INTERFACE I-147

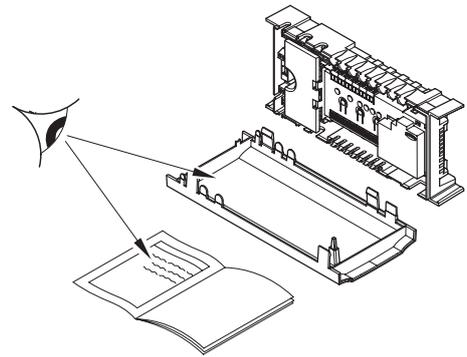
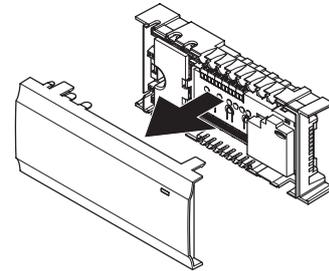
Follow the process described below to install the Uponor Smatrix Base PRO Interface I-147.

Stage	Procedure	Page
1	Placement of interface	60
2	Startup guide	62

### 4.2 Prepare for installation

Before starting the installation:

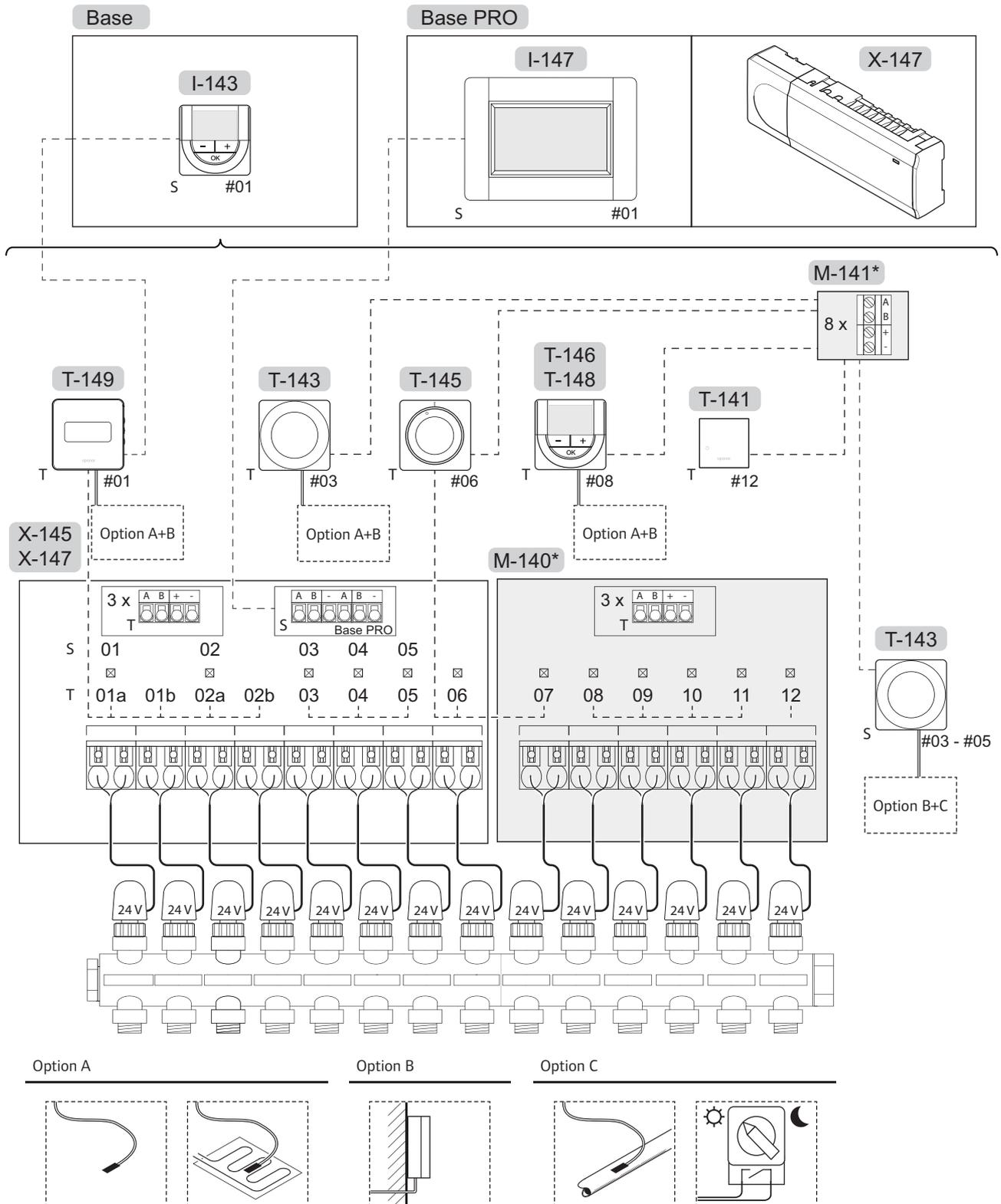
- Verify the contents of the package with the packing list.  
*See also section 3.3 Uponor Smatrix Base/Base PRO components for identification of components.*
- Check whether an external temperature sensor is to be installed with a compatible thermostat.
- Study the wiring diagram in the end of this manual or inside the controller cover.



To determine where to best place the Uponor Smatrix Base components, follow these guidelines:

- Ensure that the controller can be installed close to the manifold pair. Note that each manifold pair must have its own controller.
- Ensure that the controller can be mounted close to a 230 V AC wall socket, or if required by local regulations, to a junction box, connected to the mains power.
- Ensure that installed Uponor Smatrix Base/Base PRO components are protected from running or dripping water.

### 4.3 Installation example



\*) This example contains optional accessories which adds six actuator outputs (slave module M-140) and extra bus connectors (slave module M-140 and star module M-141) to the Uponor Smatrix Base controller

See also the wiring diagram in the end of the manual.



**CAUTION!**

Only 24 V Uponor actuators are compatible with the controller.

### UPONOR SMATRIX BASE/BASE PRO SYSTEM

A connection example of Uponor Smatrix Base/Base PRO Controller (six channels) with an optional Uponor Smatrix Base Slave Module (six extra channels) using system devices (S) and thermostats (T) as shown in figure.

The installation will work in a standard way with the thermostats regulating each room according to their set temperatures.

#### Connections

The system is based on a bus communications protocol (requires the thermostats unique ID to be registered to the controller), utilising daisy chain, direct or star topology connections. This allows serial and parallel connections, making wiring and connection of thermostats and system devices much easier than connecting one thermostat per connection terminal.

The wide array of connection possibilities presented with this communications protocol can be combined in any way best suited for the current system.

#### Thermostats and actuators

- Thermostat #01 controls the actuators on channels 01a, 01b, 02a and 02b with the help of an option.
- Thermostat #03 controls the actuators on channels 03 to 05 with the help of an option.
- Thermostat #06 controls the actuators on channels 06 and 07.
- Thermostat #08 controls the actuators on channels 08 to 11 with the help of an option.
- Thermostat #12 controls the actuator on channel 12.

#### System devices

- Interface I-147 (Base PRO only) controls the whole system and individual settings for each thermostat can be set. Schedules can be programmed for one or several thermostats instructing them when to switch between Comfort and ECO modes.
- The timer (Base only) controls the switching between Comfort and ECO modes for all available thermostats activated for scheduling (except the digital thermostat T-148).
- Public thermostat T-143 with various functions (options B and C).



#### NOTE!

If registering a public thermostat T-143 with various functions as a system device, the thermostat only acts as a remote unit. It does not control the room temperature in the room where it is placed.

#### Option A

- External temperature sensor.
- Floor temperature sensor.

#### Option B

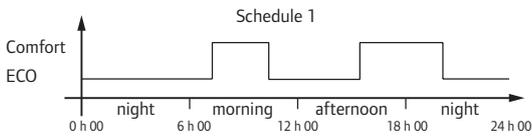
- Outdoor temperature sensor.

#### Option C

- External temperature sensor for heating/cooling switch (Base PRO with interface only).
- Comfort/ECO mode switch.

## Schedules

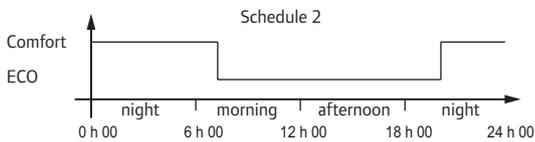
Programmable schedules can, during heating and/or cooling, switch between Comfort and ECO mode. See example below.



Other rooms can, depending on system setup, simultaneously switch between Comfort and ECO mode according to their own programmed schedules.

This requires one or more of the following:

- Uponor Smatrix Base PRO Interface I-147 (Base PRO only)  
The interface allows individual programmed schedules for the rooms in the system. Any other devices with its own programmed schedules are overridden and its menus hidden.
- Uponor Smatrix Base Timer I-143 (Base only)  
The timer applies the schedule program to the whole system. For the timer to control the digital thermostat T-148, it is required that the thermostat program is set to **Off**.
- Uponor Smatrix Base Thermostat Prog.+RH T-148  
The thermostat is in control of its own room, with restrictions stated above, regarding the interface and timer.



Even if programmed schedules exist in the system, some rooms may still operate without any scheduling. These rooms will operate in constant Comfort mode and is not affected by the programming of other rooms.

Room sensor T-141:

- Set the value in the Base PRO interface I-147.

Public thermostat T-143:

- Set the switch on its back to comfort mode only.

Standard thermostat T-145:

- Set the switch on its back to comfort mode only.

Digital thermostats T-146, and T-149:

- Set the **ECO setback** value in menu **03** to **0**.

Digital thermostat T-148:

- Set the **ECO setback** value in menu **03** to **0** and menu **00** to **Off**.

### Heating/cooling switch

The heating/cooling switch is manually controlled through an external signal to the controller. It is used to switch the operation of the controller between heating and cooling modes.

## 5 Install Uponor Smatrix Base/Base PRO controller

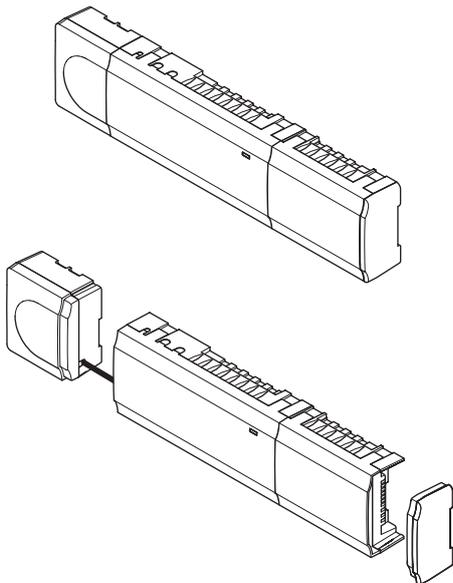
### 5.1 Placement of controller

Refer to the installation preparation guidelines (see section 4.2 *Prepare for installation*), and use the following guidelines when positioning the controller:

- Position the controller just above the manifold. Check the position of the 230 V AC power outlet.
- Check that the cover of the controller can be easily removed.
- Check that connectors and switches are easily accessible.

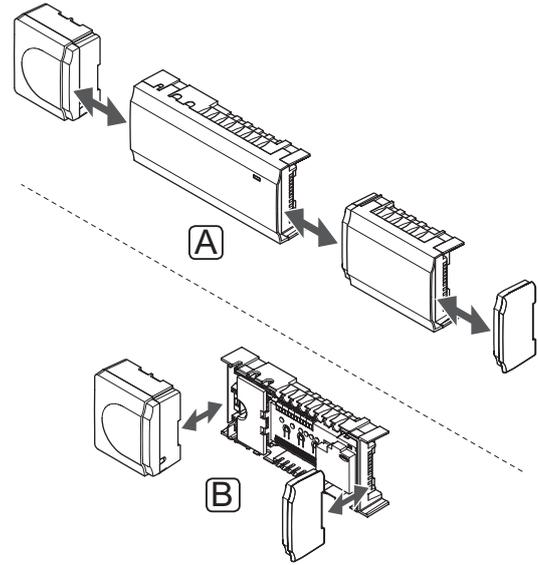
#### MODULAR PLACEMENT

The controller 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).



#### Attaching/detaching components

The components can either snap on or off without the need of removing the covers (A, recommended to do on a flat surface or on a DIN-rail), or by sliding them into place when the covers are removed (B).



#### WARNING!

The transformer module is heavy and might detach if the controller is held upside down without the cover on.



#### CAUTION!

The slave module must be attached by snapping it into place due to connection pins sticking out of the module.



#### NOTE!

Wires between transformer and controller card needs to be disconnected prior to detaching.

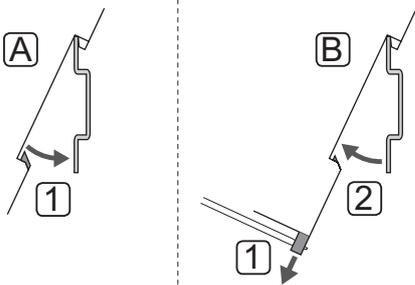
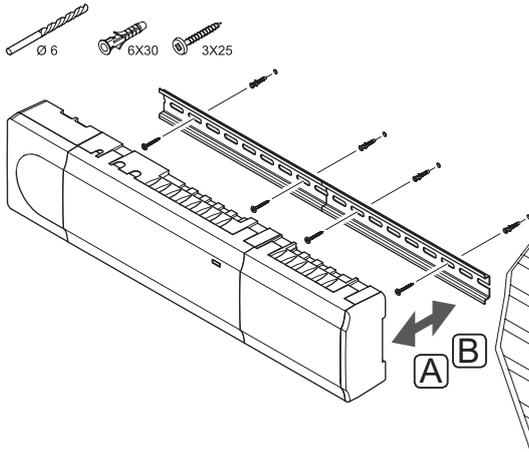
## 5.2 Attach controller to the wall

The controller is delivered in kits including screws, wall plugs and a DIN rail.

### DIN RAIL (RECOMMENDED)

Attach the DIN rail to the wall using the screws and wall plugs. The controller is then attached to the DIN rail.

The figure below shows how to attach the controller using a DIN rail.

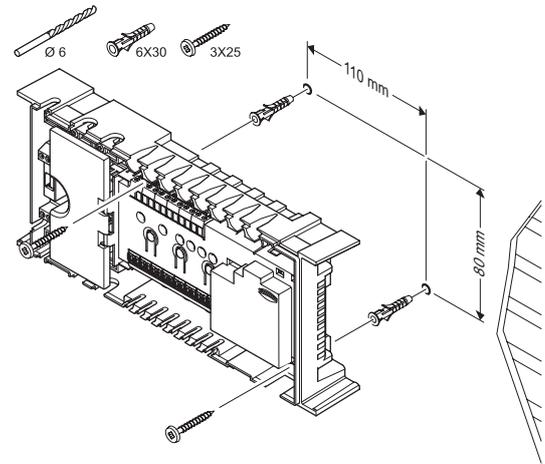


**CAUTION!**

Make sure the controller cannot slide off the DIN rail if mounting it in any other position than horizontal.

### SCREWS AND WALL PLUGS

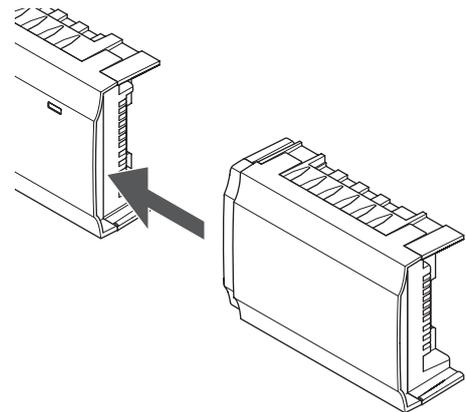
The figure below shows controller mounting hole positions and how to attach it to the wall using screws and wall plugs.



## 5.3 Connect the slave module (optional)

### ATTACH THE SLAVE MODULE

The illustration below shows how to connect the slave module to the controller.

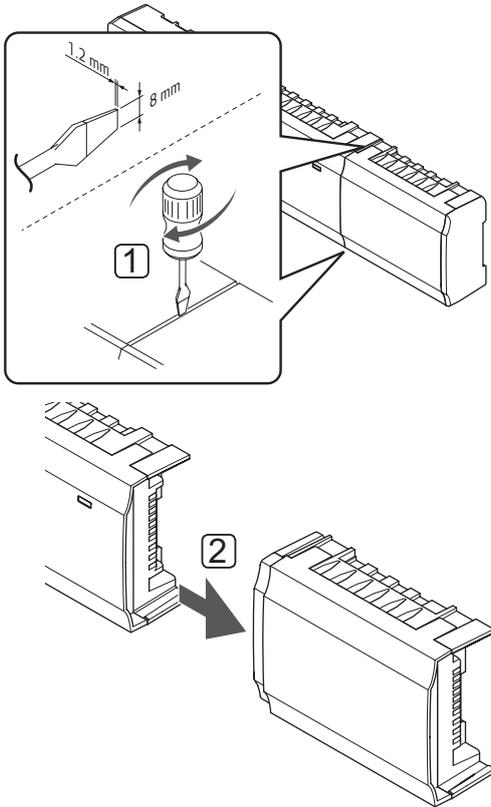


**NOTE!**

Only one slave module extension is supported per controller.

### REMOVE THE SLAVE MODULE

The illustration below shows how to remove the slave module from the controller.



1. Place a wide flat head screwdriver in the slot between the slave module and the other unit and twist until one side has popped of. Repeat for the other side.
2. Remove the slave module. Use caution not to bend the connection pins.

### 5.4 Connect the star module (optional)

The star module can be connected to the controller by either snapping it into place or connecting it using a cable.

#### ! NOTE!

Only one star module extension is supported per Uponor Smatrix Base controller.

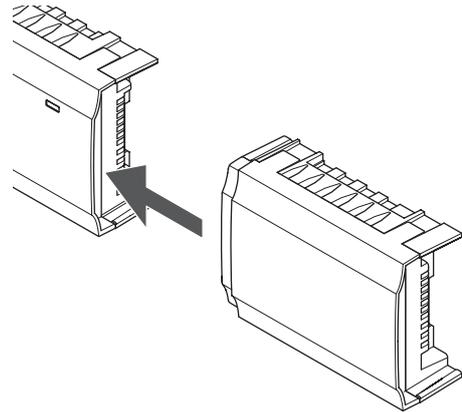
#### ! NOTE!

Only one star module extension per bus type (thermostat and/or system bus) is supported per Uponor Smatrix Base PRO controller.

A star module can only be used for one bus type at a time. That is, a thermostat cannot be connected to a star module connected to the system bus and vice versa.

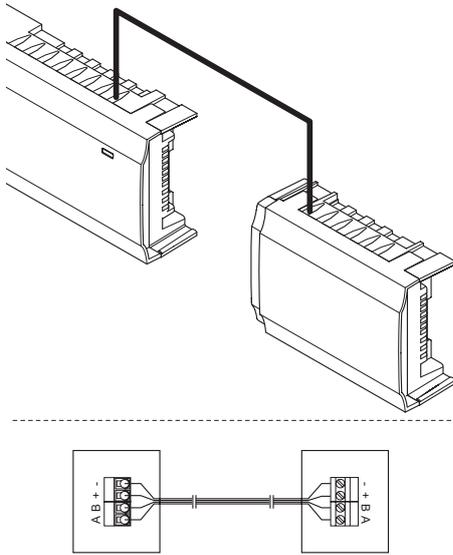
#### ATTACH THE STAR MODULE

The illustration below shows how to snap the star module into place direct to the controller or an optional slave module.



### CABLE CONNECTION

The illustration below shows how to connect the star module to the controller using cable connection.

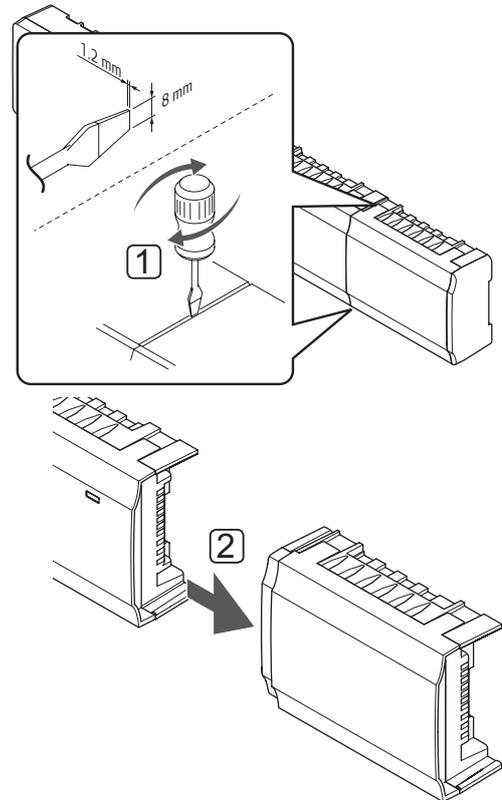


#### NOTE!

This connection method uses two extra connection points in the system.

### REMOVE THE STAR MODULE

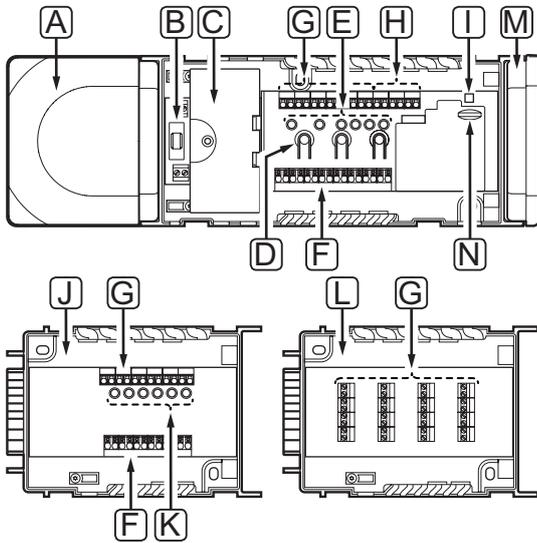
The illustration below shows how to remove the star module from the controller.



1. Place a wide flat head screwdriver in the slot between the star module and the other unit and twist until one side has popped off. Repeat for the other side.
2. Remove the star module. Use caution not to bend the connection pins.

## 5.5 Connect components to controller

Refer to the wiring diagram found in the end of this document. The illustration below shows the inside of the controller.



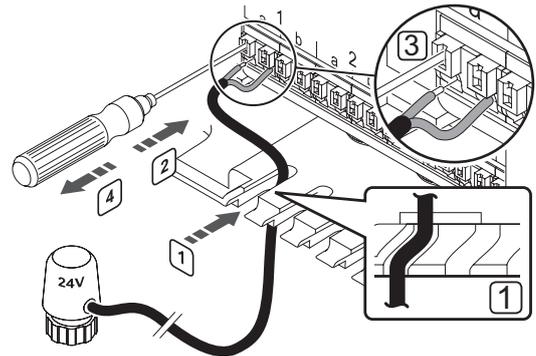
Item	Description
A	Transformer, 230 V AC 50 Hz power module
B	Fuse (T5 F3.15AL 250V)
C	Optional inputs and outputs for pump, boiler management, and heat pump connection (Base PRO only)
D	Channel registration buttons
E	LEDs for channels 01 – 06
F	Quick connectors for actuators
G	Bus connection terminals
H	System bus connection terminals (Base PRO only)
I	Power LED
J	Uponor Smatrix Base Slave Module M-140 (optional)
K	LEDs for channels 07 – 12
L	Uponor Smatrix Base Star Module M-141 (optional)
M	End cap
N	MicroSD card (Base PRO only)

### CONNECT ACTUATORS TO CONTROLLER

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

Connect the actuators to the controller as follows. Use the figure below for guidance to the instructions.

1. Lead the cables from the actuators through cable entries in the bottom of the controller frame. See *figure below*.



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.



#### NOTE!

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

### CONNECT ANOTHER CONTROLLER (BASE PRO WITH INTERFACE ONLY)

Up to another 16 Base PRO controllers can be connected in the same system.

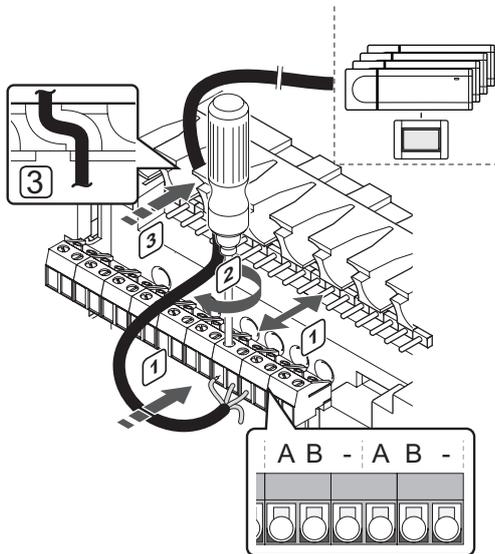
The controllers are connected to each other using daisy chain, direct connection, or using star topology (the star module can be used). A star module can only be used for one bus type at a time. That is, a thermostat cannot be connected to a star module connected to the system bus and vice versa.

See section 6.3 for more information about daisy chain.



#### CAUTION!

Make sure the controller is connected to a system bus connector (one of the rightmost connectors) on the controller. Otherwise the controllers will be unable to communicate with each other.



To connect a communication cable to the controller:

1. Lead the cables through cable entries on the top of the controller frame.
2. Insert two wires (A,B), the - wire is optional and only used in some cases, into a free system connector (one of the rightmost connectors) on the controller.
3. Tighten the screws fixing the wires in the connector.
4. Cut and stow away unused wires.

### CONNECT THERMOSTATS TO CONTROLLER

Thermostats are connected to the controller through a wired bus communication protocol.

See section 6 Uponor Smatrix Base/Base PRO thermostats and sensors for installation of thermostats.

### CONNECT HEATING/COOLING INPUT TO CONTROLLER (OPTIONAL)

If the system is contain a product producing cooling, the controller can switch between heating and cooling by using the heating/cooling input.

The heating/cooling input is connected to a dry contact that functions as either an auxiliary control system or two-position relay.

- When the relay is open, the system is in heating mode.
- When the relay is closed, the system is in cooling mode.

The heating/cooling switch can be connected and controlled in several different ways, depending on the system. Use only one of the following:

#### Uponor Smatrix Base system:

- Use an input:  
Connect the input to the controller. Switch mode using a switch on the wall or a heat pump.

#### Uponor Smatrix Base PRO system:

- Use an input:  
Connect the input to either the controller. Switch mode using a switch on the wall or a heat pump.
- Use an output on a sub controller and the interface to switch mode:  
Connect the heating/cooling relay to an output on a sub controller. Use the interface to set heating or cooling mode.
- Use a supply temperature sensor  
Connect a supply temperature sensor to a public thermostat. Use the interface to switch between heating and cooling using the supply temperature.



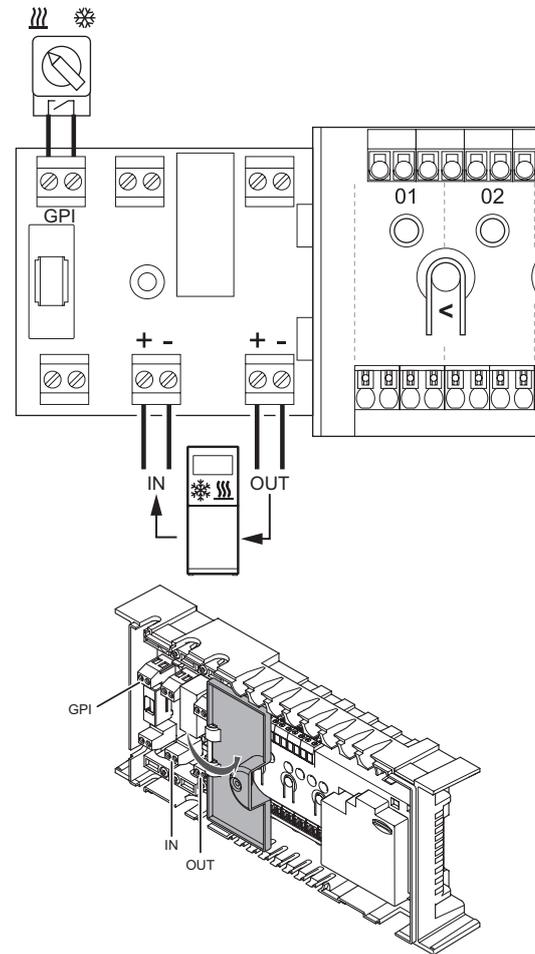
#### CAUTION!

To avoid damaging the equipment, do not apply a voltage across the controller heating/cooling input.

For further information, see the heating/cooling relay documentation.

### To connect a heating/cooling input to the controller:

The illustration below shows components of the heating/cooling system connected to a controller.



**WARNING!**

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.

1. Study the wiring diagram, in the end of the manual or inside the cover of the controller, to locate the connector positions.
2. Ensure that the power is disconnected from both the controller and the heating/cooling relay.
3. Remove the screw and open the cover for the optional connections compartment.
4. Route the cable to/from the heating/cooling input via a cable entry.
5. Connect the cable to/from the heating/cooling input to the connection labelled **GPI** or **IN** (if a heat pump is connected, Base PRO only) on the controller.

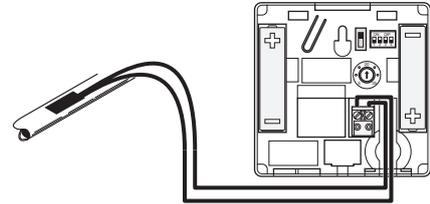
Base PRO with interface only:

6. Go to menu **Heating/cooling** in the interface and select **Cooling available**.
7. Enter the submenu **Operating mode** to the settings menu to **Heating/cooling** and select **H/C Slave**.

Heating/cooling switch is now installed and activated.

**To connect a supply temperature sensor for heating/cooling switch to a public thermostat (Base PRO with interface only):**

The illustration below shows components of the heating/cooling system connected to a public thermostat T-143.

**CAUTION!**

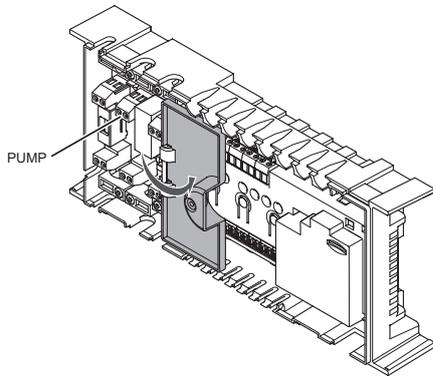
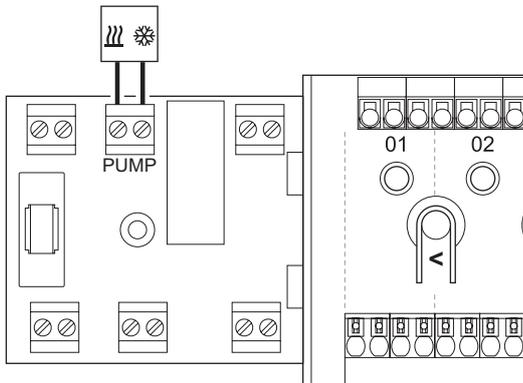
If more than one controller is available in the system, register the thermostat as a system device to the master controller.

1. Ensure that the power is disconnected from the thermostat.
2. Connect the sensor attached to the supply pipe to the input terminal on the thermostat.
3. Set the DIP switch to 1 = **Off**, 2 = **Off**, 3 = **On**, 4 = **Off**. See section 6.4 *Connect external sensor to thermostat > Uponor Smatrix Base Thermostat Public T-143* for more information.
4. Register the thermostat to the controller as a **Heating cooling switch from sensor input**, system device channel **4**. See section 6.12 *Register system devices* for more information.
5. Go to menu **Heating/cooling** in the interface and select **Cooling available**.
6. Enter the submenu **Operating mode** to the settings menu to **Heating/cooling** and select **H/C Master**.
7. Enter the settings menu to **H/C Master** in **Heating/cooling > Operating mode** and select **H/C sensor**.
8. Set a temperature and hysteresis to switch between heating and cooling.

Heating/cooling switch is now installed and activated.

### To connect a heating/cooling output to a sub controller (Base PRO with interface only):

The illustration below shows components of the heating/cooling system connected to a sub controller.



#### WARNING!

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.



#### NOTE!

This connection requires a dry contact sensing input in the component producing heating/cooling.

1. Ensure that the power is disconnected from both the sub controller and the heating/cooling relay.
2. Connect the cable to/from the component producing heating/cooling to the connector labelled **PUMP** on the sub controller.
4. Go to menu **Integration** in the interface and select **Controller relay**.
5. Select **Common** and enter the Settings menu that appears.
6. Select the sub controller to which the cable is connected to and set the output to **H/C switch**.
7. Go to menu **Heating/cooling** in the interface and select **Cooling available**.
8. Enter the submenu **Operating mode** to the settings menu to **Heating/cooling** and select **H/C Master**.
9. Enter the settings menu to **H/C Master** in **Heating/cooling > Operating mode** and select **Force cooling** or **Force heating** to select either cooling or heating.
10. Verify that the relay closes, when in cooling mode, and opens, when in heating mode.

Heating/cooling output is now installed and activated.

**CONNECT PUMP MANAGEMENT (OPTIONAL)**

The controller can operate a circulation pump, which stops when there is no demand for heating or cooling.



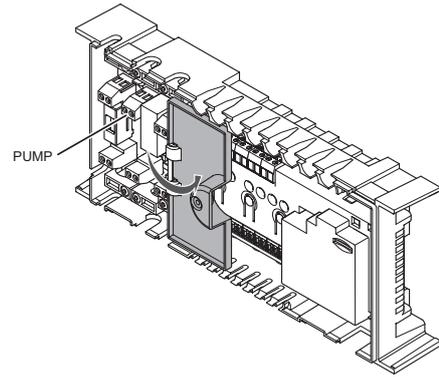
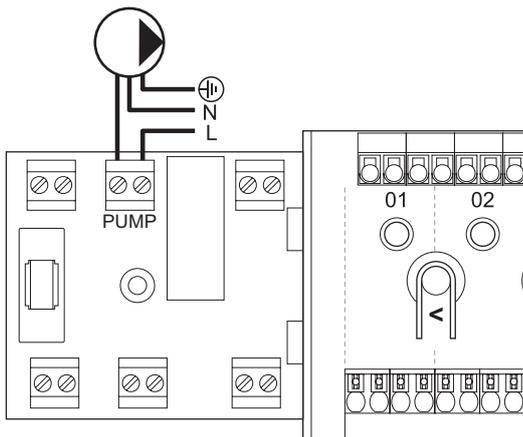
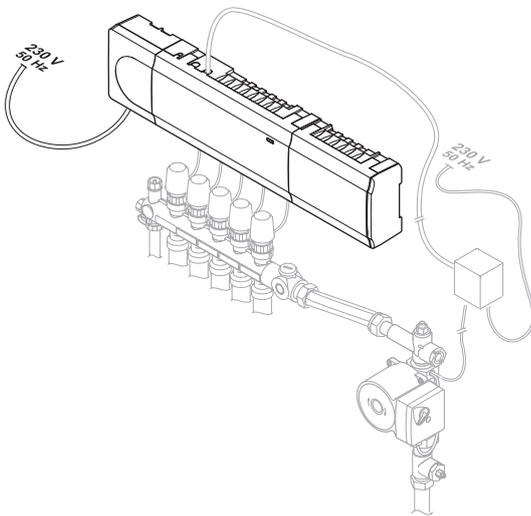
**NOTE!**

See the documentation from the circulation pump supplier as well as relevant Uponor wiring diagrams before connecting the pump.

- The controller cannot supply power for the pump.
- The controller uses a dry contact connection on the terminal block to control the circulation pump.
- The electrical circuits of the pump must be protected by a circuit breaker with a maximum rating of 8 A.

The circulation pump is connected to the controller.

The illustration below shows how to connect a circulation pump to the controller.



To connect a circulation pump to the controller:



**WARNING!**

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.

1. Study the wiring diagram, in the end of the manual or inside the cover of the controller, to locate the connector positions.
2. Ensure that the power is disconnected from both the controller and the circulation pump.
3. Remove the screw and open the cover for the optional connections compartment.
4. Route the cable to/from the pump via a cable entry.
5. Connect the L wire to/from the pump via the connection labelled **PUMP**.



**NOTE!**

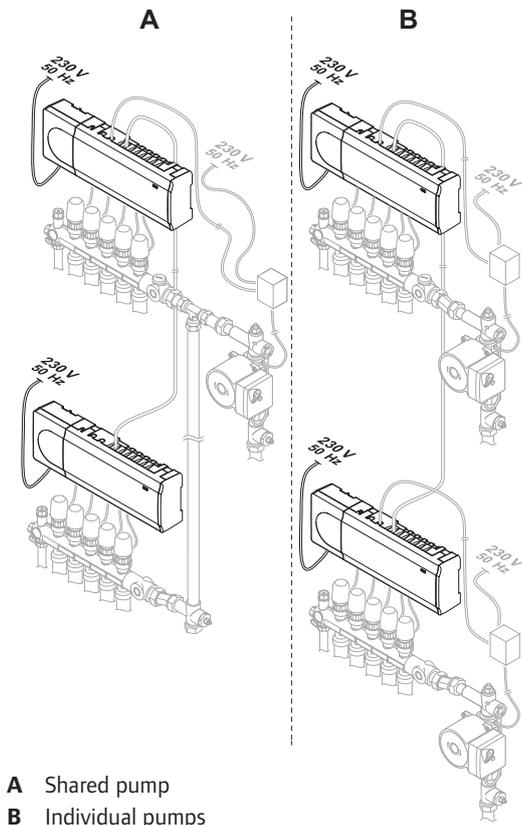
There is no power in the controller to supply the pump. The pump connector in the controller provides only a dry contact to switch off and on the power connection to the pump.

6. Secure the pump cable with a cable clamp in the enclosure.
7. Close and secure the lid to the optional connections compartment.

### Shared or individual pumps (Base PRO with interface only)

A pump for all manifolds and controllers can be connected to the closest controller.

If separate pumps are used for each manifold, each pump can be connected to be run by its own controller, as shown in the illustration below.



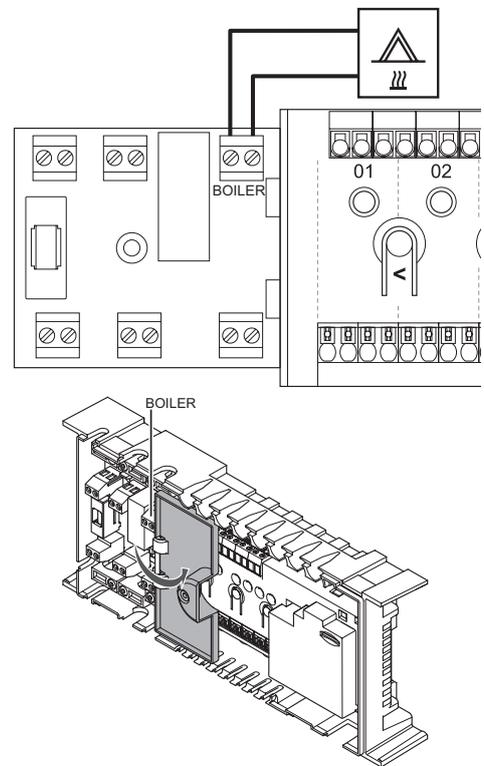
### CONNECT BOILER (OPTIONAL)

The controller includes a boiler relay, it can be used to send a signal to either fire the heat source or to power open a 2-port motorised zone valve positioned on the flow to the underfloor heating manifold. If the relay is used to power open a zone valve then, the volt free auxiliary contacts 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 an electrically operated 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 to the controller.

The illustration below shows how to connect a boiler to the controller.



**WARNING!**

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.

**NOTE!**

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

To connect a boiler to the controller:

1. Study the wiring diagram, in the end of the manual or inside the cover of the controller, to locate the connector positions.
2. Ensure that the power is disconnected from both the controller and the boiler.
3. Remove the screw and open the cover for the optional connections compartment.
4. Route the cable from/to the boiler via a cable entry.
5. Connect the boiler to the connection labelled **BOILER**.

**NOTE!**

There is no power in the controller 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.

6. Secure the cable to/from the boiler with a cable clamp in the enclosure.
7. Close and secure the lid to the optional connections compartment.

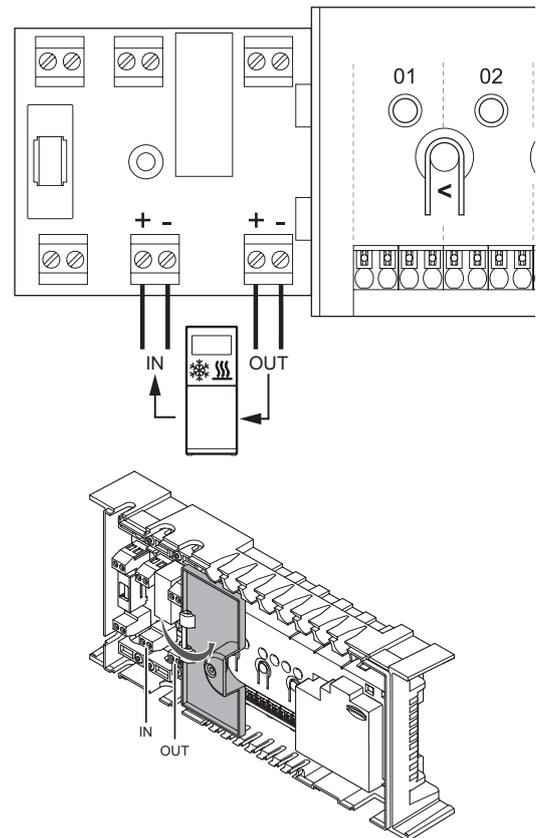
**CONNECT HEAT PUMP INTEGRATION (OPTIONAL, BASE PRO ONLY)**

The controller can connect to selected heat pumps and adjust the supply temperature to the system.

**NOTE!**

This function is only available to Base PRO systems with four controller or less.

The illustration below shows how to connect a compatible heat pump to the controller.



**WARNING!**

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.

**CAUTION!**

If **Heat pump integration** is deactivated in the interface (if installed, Base PRO only) make sure that it also is deactivated in the heat pump. Otherwise it may affect the operation of the heat pump.

**NOTE!**

See the heat pump supplier documentation and the relevant Uponor wiring diagram before performing the connection.

*Contact a local Uponor office for complete list of compatible heat pumps.*

To connect a compatible heat pump to the controller:

1. Study the wiring diagram in the end of the manual, or inside the cover of the controller, to locate the connector positions.
2. Ensure that the power is disconnected from both the controller and the heat pump.
3. Remove the screw and open the cover for the optional connections compartment.
4. Route the cables from/to the heat pump via a cable entry.
5. Connect the signal cable receiving from the heat pump to the connection labelled **IN**.
6. Connect the signal cable sending to the heat pump to the connection labelled **OUT**.
7. Secure the cables to/from the heat pump with cable clamps in the enclosure.
8. Close and secure the lid to the optional connections compartment.

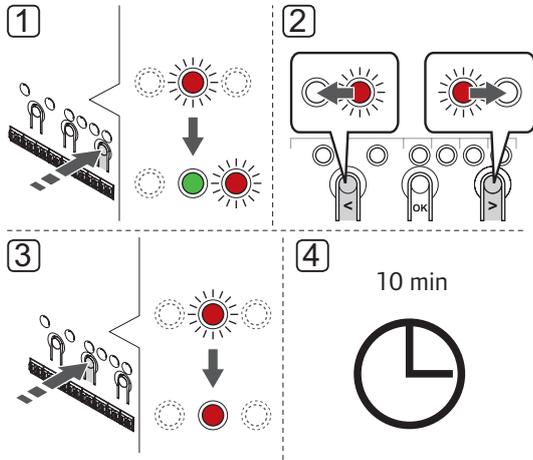
**5.6 Connect the controller to AC power**

To conclude the installation of the controller:

1. Check that all wiring is complete and correct:
  - Actuators
  - Heating/cooling switch
  - Circulation pump
2. Ensure that the 230 V AC compartment of the controller is closed and the fixing screw is tightened.
3. Connect the power cable to a 230 V AC wall socket, or if required by local regulations, to a junction box.

## 5.7 Test 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 controller automatically returns to run mode when finished.



### NOTE!

Activated forced mode for a channel is indicated with a lit LED, when in forced mode.

To test the actuators:

1. Enter forced mode by pressing the > button while in run mode.  
For information about how to exit to run mode, see section 10.4 Run mode > Exit to 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 forced mode for the selected channel. The LED of the channel turns fixed red, which means that the controller 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 fixed 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 forced operation can always be cancelled by entering forced mode, selecting the active channel, and pressing the **OK** button.

## 6 Install Uponor Smatrix Base/Base PRO thermostats and sensors

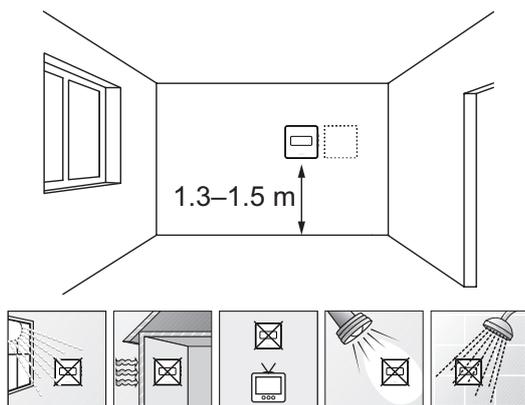
The following thermostats can be connected to the system:

- Uponor Smatrix Base Thermostat D+RH Style T-149
- Uponor Smatrix Base Thermostat Prog.+RH T-148
- Uponor Smatrix Base Thermostat Dig T-146
- Uponor Smatrix Base Thermostat Standard T-145
- Uponor Smatrix Base Thermostat Flush T-144
- Uponor Smatrix Base Thermostat Public T-143
- Uponor Smatrix Base PRO Room Sensor+RH Style T-141

### 6.1 Placement of thermostats

Refer to the installation preparation guidelines (see section 4.2 *Prepare for installation*), and use the following guidelines when positioning the thermostats:

1. Select an indoor wall and a position 1.3 m to 1.5 m above the floor.
2. Ensure that the thermostat is away from direct solar radiation.
3. Ensure that the thermostat will not be heated through the wall by sunshine.
4. Ensure that the thermostat is away from any source of heat, for example television set, electronic equipment, fireplace, spotlights, and so on.
5. Ensure that the thermostat is away from any source of humidity and water splashes (IP20).



### 6.2 Label thermostats

Label the thermostats, where suitable, with the channel numbers they are to control, for example, #02, #03.

For a system with interface and several controllers, add the ID of each controller, for example, 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

### 6.3 Connect thermostats to controller

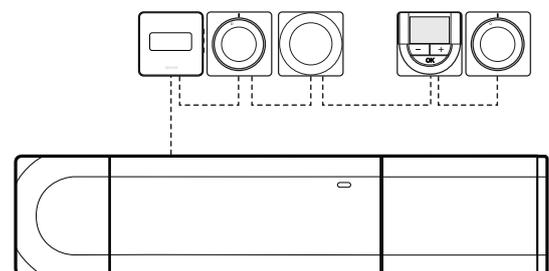
The system is based on a bus communications protocol, utilising daisy chain, direct or star topology connections. This makes wiring and connection of thermostats and system devices much easier than connecting one thermostat per connection terminal.

The wide array of connection possibilities presented with this communications protocol can be combined in any way best suited for the current system.

#### DAISY CHAIN CONNECTION

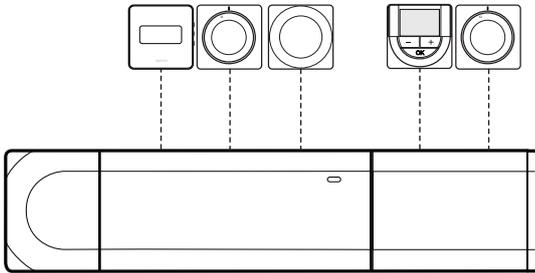
The thermostats in the example are connected in series and only one cable needs to be routed from the controller and slave module (if available).

This method reduces the total length of cable needed in the system.



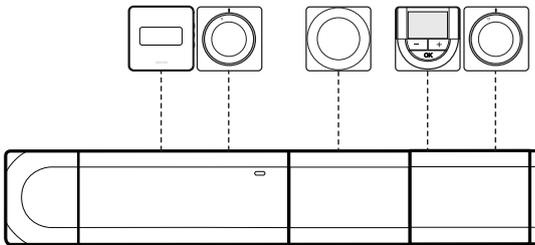
**DIRECT CONNECTION TO CONTROLLER AND SLAVE MODULE**

Every thermostat in the example is connected to the controller and slave module (if available) with its own cable.



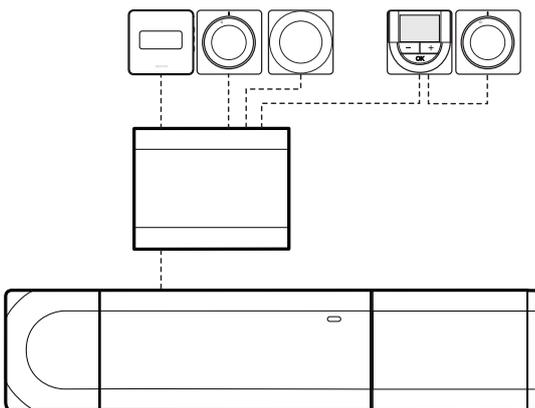
**CONNECTION TO ATTACHED STAR MODULE**

The star module is attached to the controller and slave module (if available) adding extra connection terminals to the system. Each thermostat in the example is connected direct to the controller, slave module (if available) and star module.

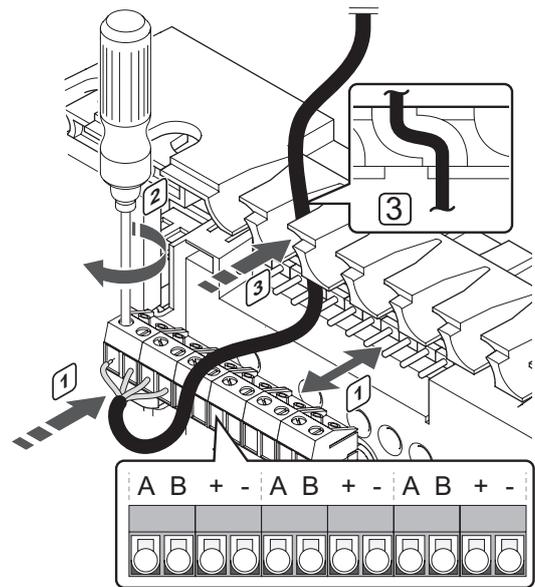


**CONNECTION TO CABLE CONNECTED STAR MODULE**

The star module is connected to the controller and/or slave module (if available) with a cable, using two of the extra connection points. Each thermostat in the example is connected direct to the star module, except one that is connected with daisy chain.



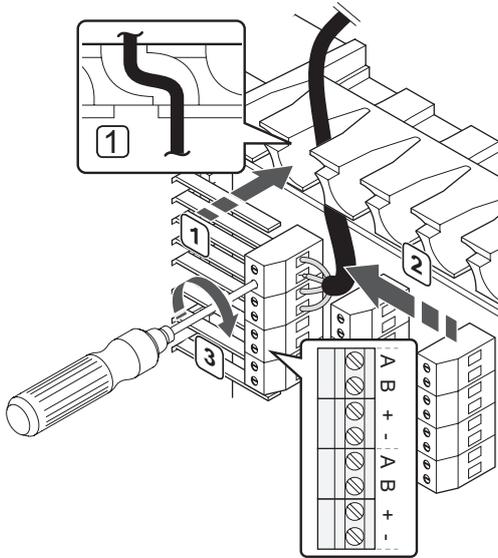
**CONNECT COMMUNICATION CABLE TO CONTROLLER AND/OR SLAVE MODULE**



To connect a communication cable to the controller:

1. Lead the cables through cable entries on the top of the controller frame.
2. Insert the four wires (A,B, + and -) into the connector on the controller.
3. Tighten the screws fixing the wires in the connector.

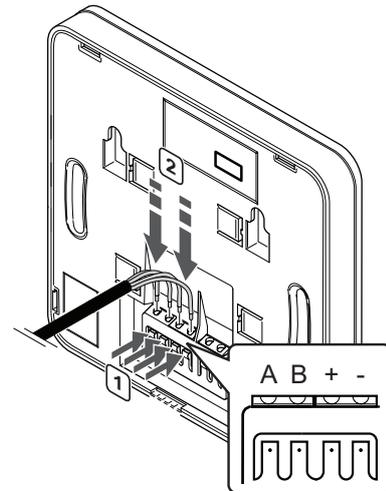
## CONNECT CABLE TO STAR MODULE



To connect a communication cable to a star module:

1. Lead the cables through cable entries in the star module frame.
2. Insert the four wires (A,B, + and -) into the connector on the electrical card.
3. Tighten the screws fixing the wires in the connector.

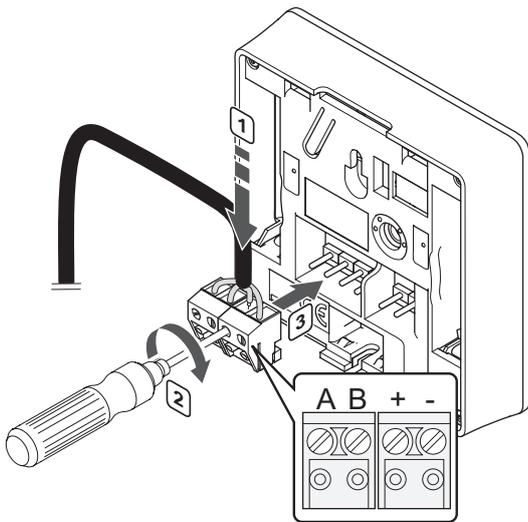
## CONNECT COMMUNICATION CABLE TO THERMOSTAT T-149



To connect a communication cable to thermostat T-149:

1. Press the push button on the connection terminal on the back of the thermostat.
2. While pressing the push button, insert each of the four wires into the connection terminal on the thermostat (marked A,B, + or -).
3. Repeat steps 1 and 2 until all wires are connected.

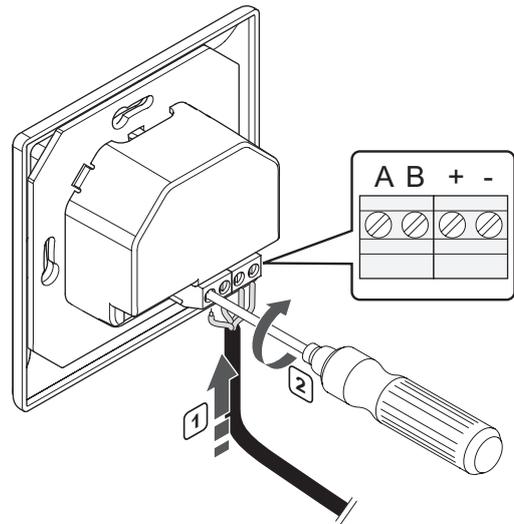
### CONNECT COMMUNICATION CABLE TO THERMOSTAT T-143, T-145, T-146, AND T-148



To connect a communication cable to thermostat T-148, T-146, T-145 and T-143:

1. Insert the four wires into the removable connectors marked (A,B, + and -) on the thermostat.
2. Tighten the screws fixing the wires in the connector.
3. Insert the connectors on the input pegs on the thermostat.

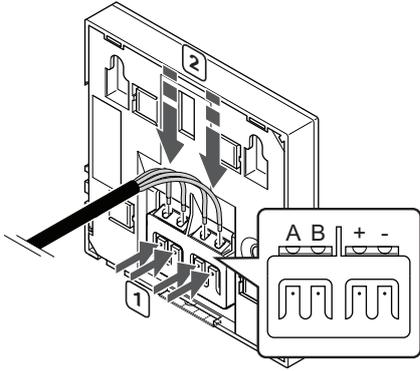
### CONNECT COMMUNICATION CABLE TO THERMOSTAT T-144



To connect a communication cable to thermostat T-144:

1. Insert the four wires into the connectors marked (A,B, + and -) on the thermostat.
2. Tighten the screws fixing the wires in the connector.

## CONNECT COMMUNICATION CABLE TO THERMOSTAT T-141



To connect a communication cable to thermostat T-149:

1. Press the push button on the connection terminal on the back of the thermostat.
2. While pressing the push button, insert each of the four wires into the connection terminal on the thermostat (marked A,B, + or -).
3. Repeat steps 1 and 2 until all wires are connected.

## 6.4 Connect external sensor to thermostat (optional)

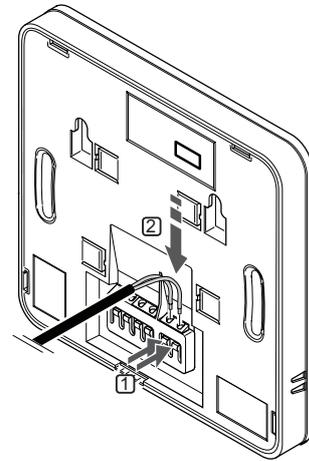
An optional external sensor can be connected to the thermostats (except the standard thermostat T-145, flush thermostat T-144, and room sensor T-141) for extra functionality.

### ! NOTE!

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.

### THERMOSTAT T-149

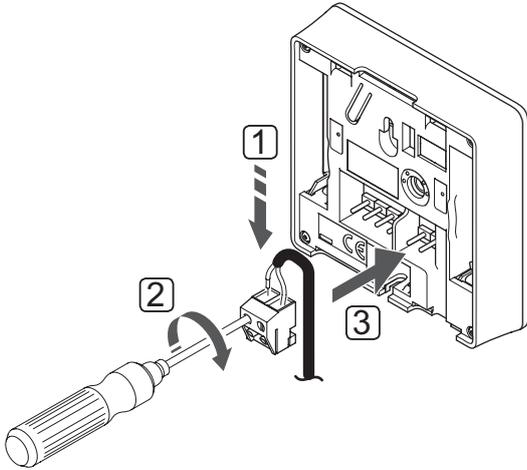
Connect the sensor to the terminal located at the back of the thermostat, as shown in the illustration below.



1. Press the push buttons on the connection terminals on the back of the thermostat.
2. While pressing the push buttons, insert the two wires from the sensor cable (non polarized) into the connection terminal.

### THERMOSTATS T-143, T-146, AND T-148

Connect the sensor to the single terminal located at the back of the thermostat, as shown in the illustration below.



1. Insert the two wires from the sensor cable (non polarized) into the terminal.
2. Tighten the screws fixing the wires in the connector.
3. Insert the terminal on the input pegs on the thermostat.

### UPONOR SMATRIX BASE THERMOSTAT D+RH STYLE T-149

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.

See section 12 Operate Uponor Smatrix Base/Base PRO digital thermostats for more information.

### UPONOR SMATRIX BASE THERMOSTAT PROG.+RH T-148

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.

See section 12 Operate Uponor Smatrix Base/Base PRO digital thermostats for more information.

### UPONOR SMATRIX BASE THERMOSTAT DIG T-146

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.

See section 12 Operate Uponor Smatrix Base/Base PRO digital thermostats for more information.

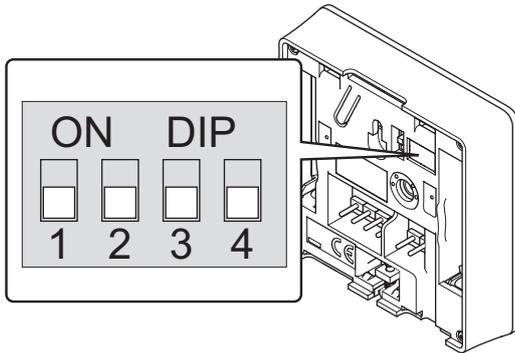
## UPONOR SMATRIX BASE THERMOSTAT PUBLIC T-143

The external temperature sensor input can be used for either a floor temperature sensor, an outdoor temperature sensor, or a Comfort/ECO switch. Use the DIP switches on the thermostat to select a control mode which corresponds to the use of the sensor and thermostat.



### CAUTION!

If more than one controller is available in the system, register the thermostat as a system device to the master controller.



Function*	Switch
Standard room thermostat	
Standard room thermostat together with a floor temperature sensor	
Standard room thermostat, or system device, together with an outdoor temperature sensor	
System device together with a supply temperature sensor for heating/cooling switch over function	
System device where the sensor input is used for Comfort/ECO switch over function **	
Remote sensor	

\* If registering the thermostat as a system device, it will no longer work as a standard room thermostat any more.

\*\* Closed = ECO



### CAUTION!

The switches must be set before the thermostat is registered.

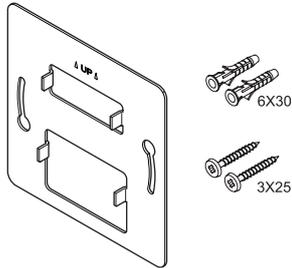


### CAUTION!

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

## 6.5 Attach thermostat T-149 to the wall

The thermostats are delivered in kits including screws, wall plugs, and a wall bracket, presenting several options of attaching the thermostat to the wall.



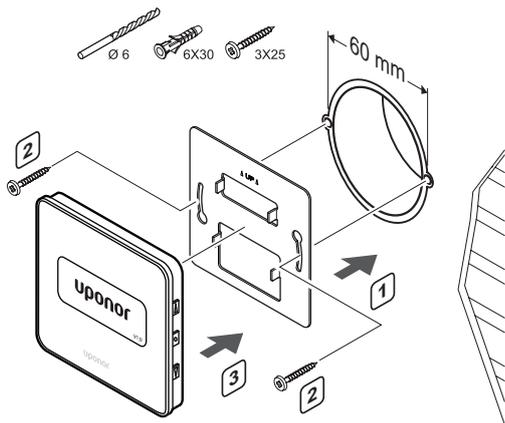
### USING WALL BRACKET (RECOMMENDED)

The illustration below shows thermostat mounting hole positions and how to attach it to the wall using a wall bracket.



#### CAUTION!

Do not overtighten the screws for the wall bracket. It may cause the metal to distort.



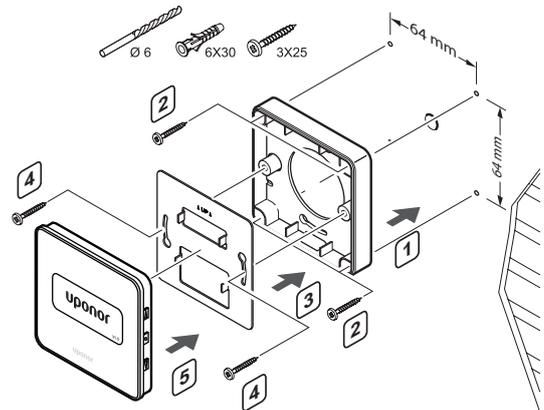
### USING WALL BRACKET AND SURFACE ADAPTOR (OPTION)

The illustration below shows thermostat mounting hole positions and how to attach it to the wall using a wall bracket and surface adaptor (option).



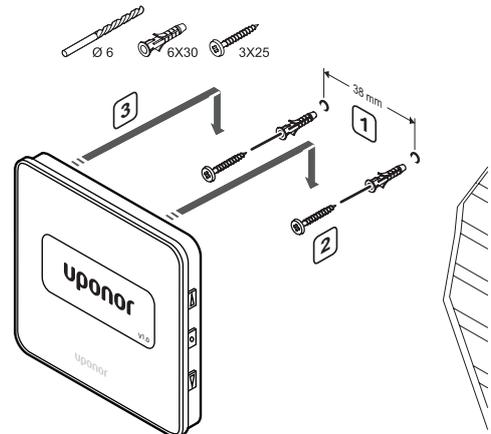
#### CAUTION!

Do not overtighten the screws for the wall bracket. It may cause the metal to distort.



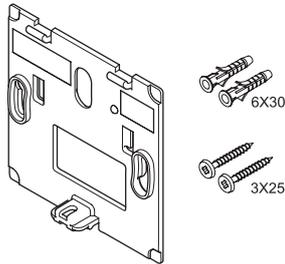
### SCREW AND WALL PLUG

The illustration below shows how to attach the thermostat to the wall using one screw and wall plug.



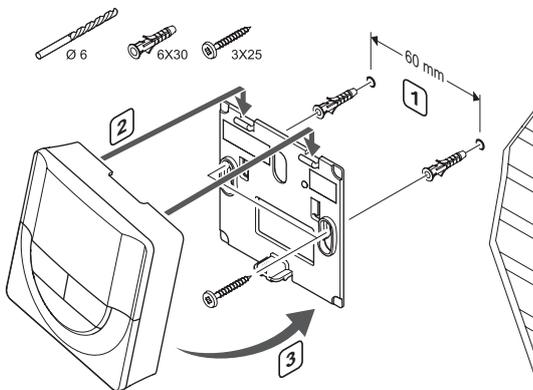
### 6.6 Attach thermostat T-148, T-146, T-145, and T-143 to the wall

The thermostats are delivered in kits including screws, wall plugs, and a wall bracket, presenting several options of attaching the thermostat to the wall.



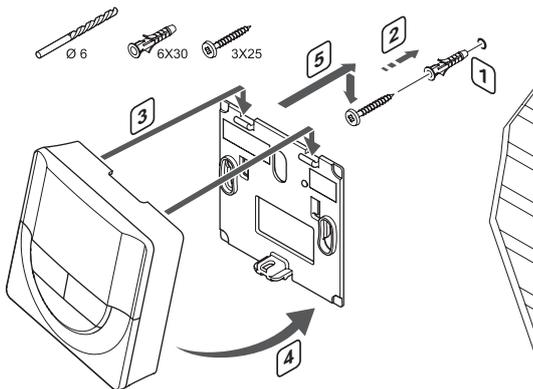
#### USING WALL BRACKET (RECOMMENDED)

The illustration below shows thermostat mounting hole positions and how to attach it to the wall using a wall bracket.



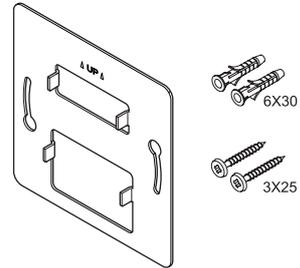
#### SCREW AND WALL PLUG

The illustration below shows how to attach the thermostat to the wall using one screw and wall plug.



### 6.7 Attach thermostat T-141 to the wall

The thermostats are delivered in kits including screws, wall plugs, and a wall bracket, presenting several options of attaching the thermostat to the wall.



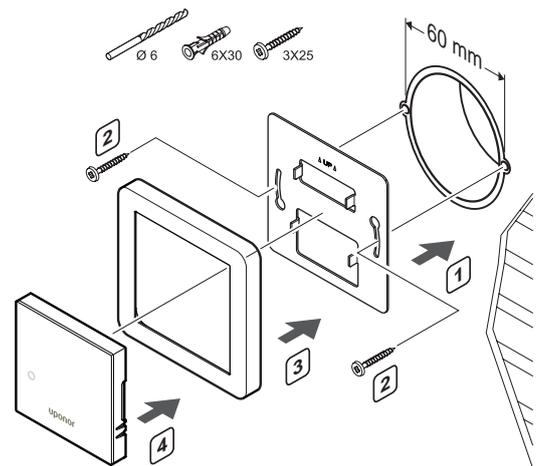
#### USING WALL BRACKET (RECOMMENDED)

The illustration below shows thermostat mounting hole positions and how to attach it to the wall using a wall bracket.



#### CAUTION!

Do not overtighten the screws for the wall bracket. It may cause the metal to distort.



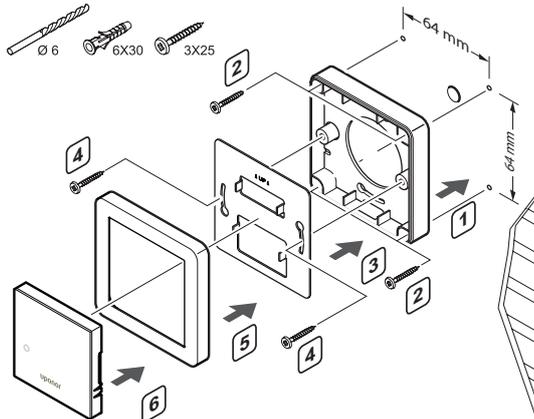
### USING WALL BRACKET AND SURFACE ADAPTOR (OPTION)

The illustration below shows thermostat mounting hole positions and how to attach it to the wall using a wall bracket and surface adaptor (option).



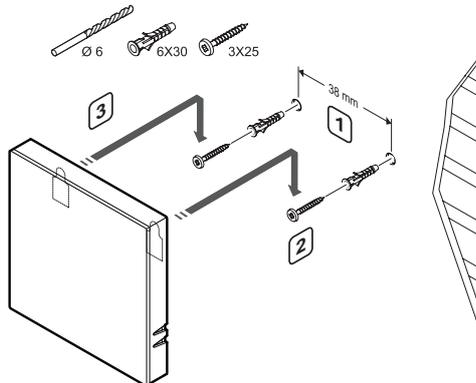
#### CAUTION!

Do not overtighten the screws for the wall bracket. It may cause the metal to distort.



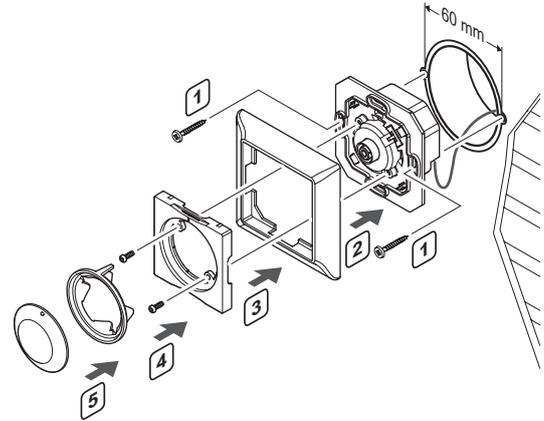
### SCREW AND WALL PLUG

The illustration below shows how to attach the thermostat to the wall using one screw and wall plug.



## 6.8 Attach thermostat T-144 to the wall

The illustration below shows mounting hole positions on the wall bracket, and how to attach the thermostat.



To attach thermostat T-144 to the wall:

1. Insert the wall bracket into a wall box and fasten it with screws. Make sure the communication wires is connected.
2. Attach and hold the wall frame into place.
3. Fasten the wall frame with the two screws and plastic insert.
4. Attach the transparent LED-ring.
5. Attach the dial.

## 6.9 First startup of digital thermostats

At first startup, before registering, the thermostat requires some basic settings.

See section 12 Operate Uponor Smatrix Base/Base PRO digital thermostats for more information.

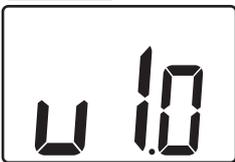
### SOFTWARE VERSION

Current software version is displayed during power up.

T-149



T-146



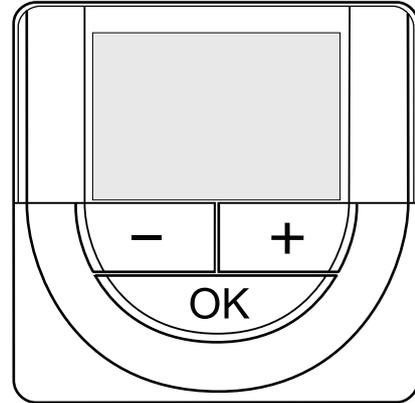
T-148



### SET TIME (T-148 ONLY)

When starting the thermostat for the first time, or after a factory reset, the software requires the time and date to be set. This setting is required to utilise scheduling programs for this thermostat.

Use buttons - or + to change the value, press the **OK** button to set the value and move to the next editable value.



### ! NOTE!

If no button is pressed for about 8 seconds, the current values will be saved and the software exits to control mode.

1. Set hours.



2. Set minutes.



3. Set 12 h or 24 h display of time.



4. Set day of the week (1 = Monday, 7 = Sunday).



5. Set day of the month.



6. Set month.



7. Set year.



8. Press **OK** to return to run mode.

Date and time can also be set in the settings menu.

## 6.10 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.

#### **!** 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 about 60 seconds later, it exits to run mode.

1. Press and hold the **OK** button until the settings icon and menu numbers is displayed in the top right corner of the display (about 3 seconds).
2. Use buttons - or + (T-149 = ▼ 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 + (T-149 = ▼ or ▲) to change control mode (see list below) and press **OK**.

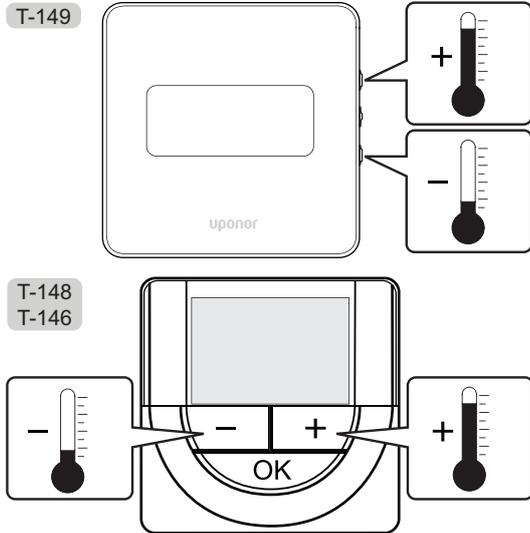
T-149	T-146/ T-148	Description
	RT	Room temperature
	RFT	Room temperature with external floor sensor
	RS	Remote sensor
	RO	Room temperature with remote outdoor sensor

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

**TEMPERATURE SETPOINT**

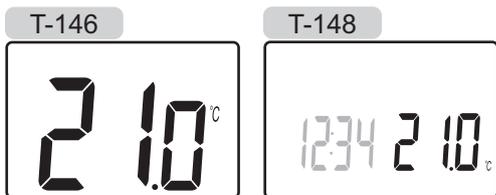
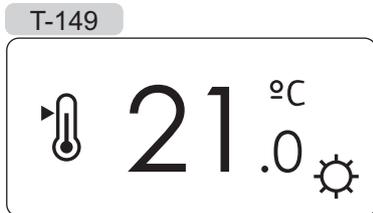
The thermostats are delivered with a default setpoint of 21 °C.

The illustration below shows how to adjust the thermostat temperature setpoint.



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

1. Press the - or + (T-149 = ▼ or ▲) button once.  
The screen shows the current setpoint flashing.



2. Press the - or + (T-149 = ▼ 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.

**6.11 Register thermostats in controller**

**REGISTRATION AT FIRST STARTUP**

When starting the controller for the first time, it automatically enters run mode, which is the standard mode of operation. Go to step 1.

**REGISTRATION IF IN RUN MODE**

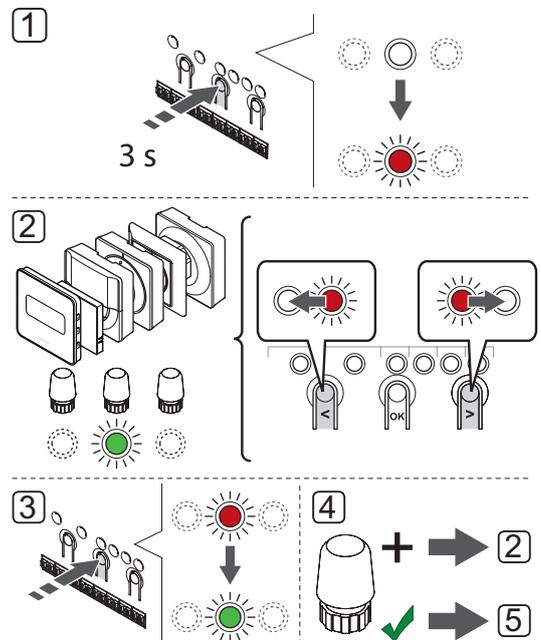
Run mode is the standard mode of the controller when the system is running according to set parameters. Go to step 1.

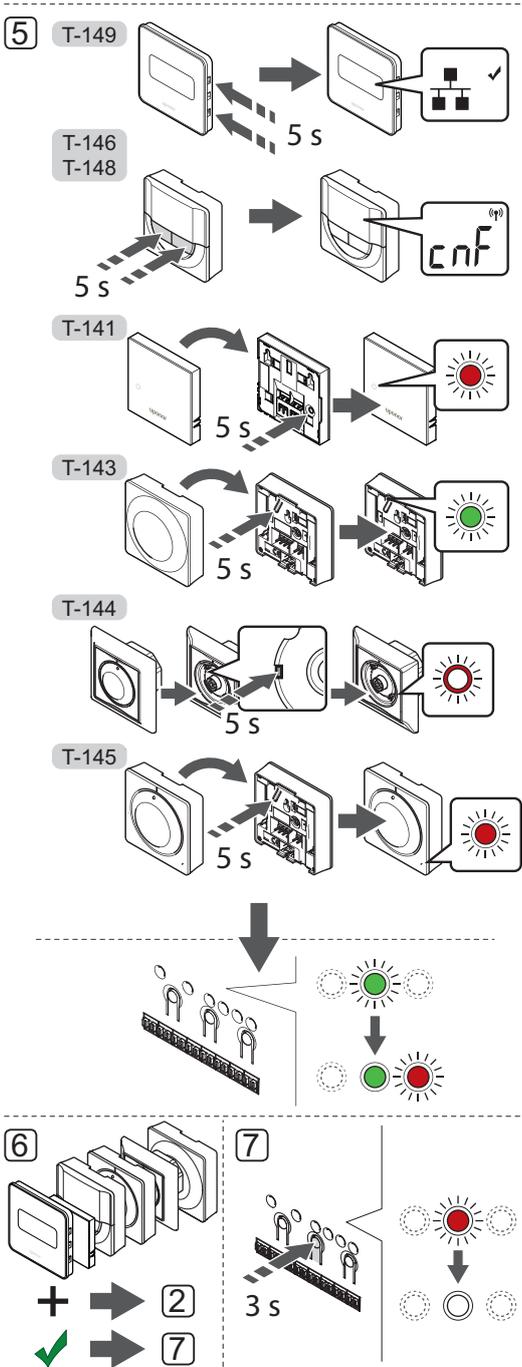
**REGISTRATION IF IN FORCED MODE**

Exit to run mode, see section 10.4 Run mode > Exit to run mode, then go to step 1.

**REGISTRATION**

The illustration below shows how to register the various room thermostats associated with the controller.





To register room thermostats in the controller:

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!** It is recommended to register all channels to the thermostat at the same time.

5. Select a thermostat

**THERMOSTAT T-143**

- 5.1 Optional: To activate tamper alarm during registration, set the Disable timer switch to Comfort mode (☀️).
- 5.2 Gently press and hold the registration button on the thermostat, release when the LED starts flashing green (located in the hole above the registration button).  
The selected channel LED in the controller turns fixed green and the registration is complete.

- 5.3 Optional: If tamper alarm was activated during registration, set the Disable timer switch to preferred mode.

**THERMOSTAT T-144**

- 5.1 Using a pointed instrument, gently press and hold the registration button on the thermostat, release when the LED above the dial starts flashing.  
The selected channel LED in the controller turns fixed green and the registration is complete.

**THERMOSTATS T-141 AND T-145**

- 5.1 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.

## THERMOSTATS T-146 AND T-148

- 5.1 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.

## THERMOSTAT T-149

- 5.1 Press and hold both **▼** and **▲** buttons on the thermostat until the 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.

To unregister already registered thermostats, see section 10.6 Unregister channels in controller.

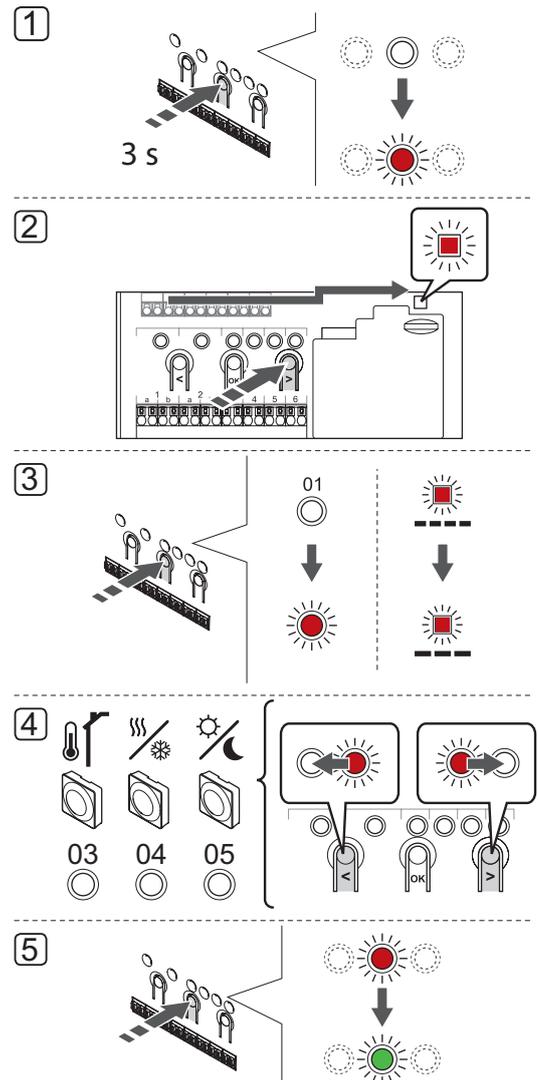
## 6.12 Register system devices

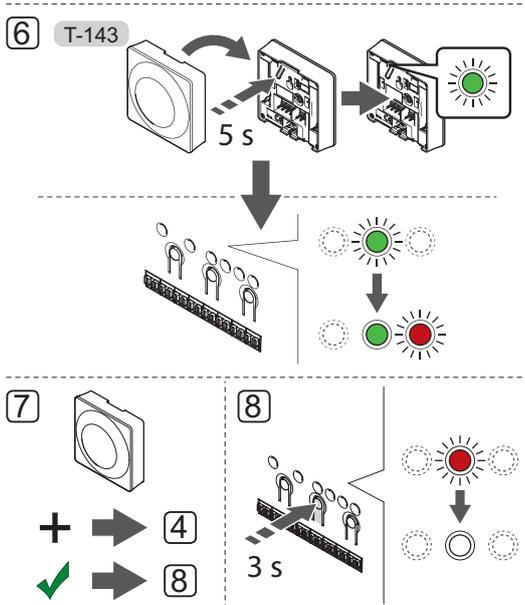
In addition to room thermostats, the controller can also be connected to system devices.

Available system devices:

- Touch screen interface (Base PRO only), see section 8 Install Uponor Smatrix Base PRO interface for installation procedure
- Timer, see section 7 Install Uponor Smatrix Base timer for installation procedure
- Public thermostat with various functions

The illustration below shows how to register system devices to the controller.



**NOTE!**

Registration of at least one thermostat must be done before registering a system device.

**NOTE!**

If registering a public thermostat T-143 as a system device with various functions, the thermostat only acts as a remote unit. It does not control the room temperature in the room where it is placed.

**CAUTION!**

The DIP switches in public thermostat T-143 must be set before the thermostat is registered.

**CAUTION!**

Make sure the controller is in run mode. For information about how to exit to run mode, see section 10.4 Run mode > Exit to run mode.

To register system devices in the controller:

1. Press and hold the **OK** button on the controller until one of the channel LEDs starts flashing.
2. Use buttons < or > to move the pointer to the power LED (LED flashes red).
3. Press the **OK** button to select system device registration (power LED). The power LED starts flashing according to the pattern long blink, short pause, long blink. Channel 1 starts flashing red.

4. Use buttons < or > to move the pointer to the preferred system channel, see list below.

1 = Touch screen interface (Base PRO only)

See section 8 Install Uponor Smatrix Base PRO interface for more information.

1 = Timer

See section 7 Install Uponor Smatrix Base timer for more information.

2 = Not used

3 = Public thermostat with outdoor sensor

4 = Public thermostat with heating/cooling switch from sensor input (Base PRO with interface only).

5 = Public thermostat with Comfort/ECO switch from contact

5. Press the **OK** button to select system device channel. The channel LED starts flashing green.

#### 6. Public thermostat T-143 as a system device

6.1 Gently press and hold the registration button on the thermostat, release when the LED starts flashing green (located in the hole above the registration button).

The selected channel LED in the controller turns fixed green and the registration is complete.

7. Repeat steps 4 through 6 until all system devices are registered.

8. Press and hold the **OK** button on the controller until the green LEDs turn off to end registration and return to run mode.

To unregister already registered sensors and switches, see section 10.6 Unregister channels in controller.

## 7 Install Uponor Smatrix Base timer

The following timer can be connected to the system:

- Uponor Smatrix Base Timer I-143



### NOTE!

Only one timer per controller can be registered.



### NOTE!

A timer can only be registered to a Uponor Smatrix Base controller.

### 7.1 Placement of timer

Refer to the installation preparation guidelines, see section 4.2 *Prepare for installation*.

### 7.2 Label timer

Label the timer, where suitable, with the system channel number they are registered to, #01. For installations with several systems, add the ID of the controller, for example, 1.01 or 2.01.

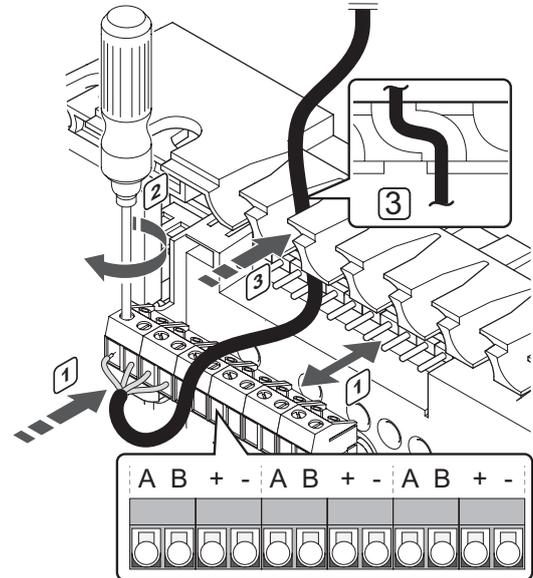
### 7.3 Connect timer to controller

The system is based on a bus communications protocol, utilising daisy chain, direct or star topology connections. This makes wiring and connection of thermostats and system devices (eg. a timer) much easier than connecting one device per connection terminal.

The wide array of connection possibilities presented with this communications protocol can be combined in any way best suited for the current system.

See section 6.3 *Connect thermostat to controller for more information about different connection methods*.

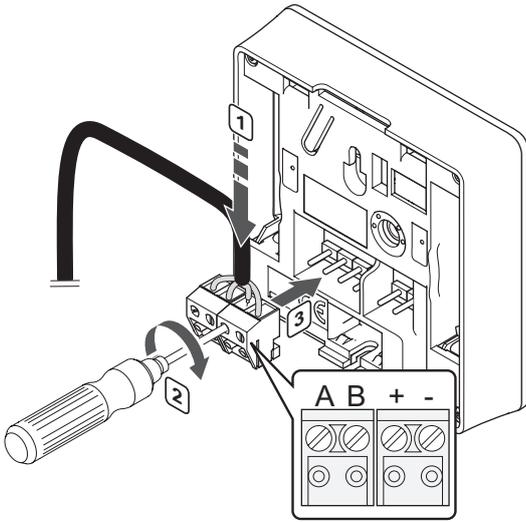
### CONNECT COMMUNICATION CABLE TO CONTROLLER AND/OR SLAVE MODULE



To connect a communication cable to the controller:

1. Lead the cables through cable entries on the top of the controller frame.
2. Insert the four wires (A,B, + and -) into the connector on the controller.
3. Tighten the screws fixing the wires in the connector.

### CONNECT COMMUNICATION CABLE TO THERMOSTAT



To connect a communication cable to a timer:

1. Insert the four wires into the removable connectors marked (A,B, + and -) on the timer.
2. Tighten the screws fixing the wires in the connector.
3. Insert the connectors on the input pegs on the timer.

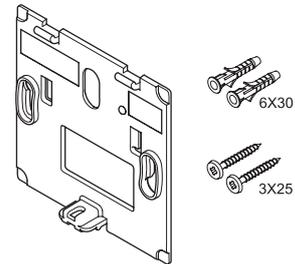
### CONNECT CABLE TO STAR MODULE

To connect a communication cable to a star module:

1. Lead the cables through cable entries in the star module frame.
2. Insert the four wires (A,B, + and -) into the connector on the electrical card.
3. Tighten the screws fixing the wires in the connector.

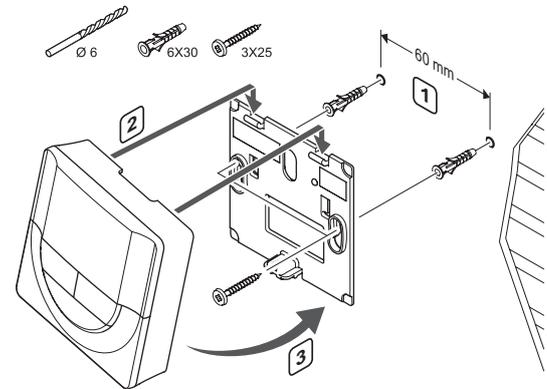
## 7.4 Attach a timer to the wall

The timer is delivered in kits including screws, wall plugs, and a wall bracket, presenting several options of attaching the timer to the wall.



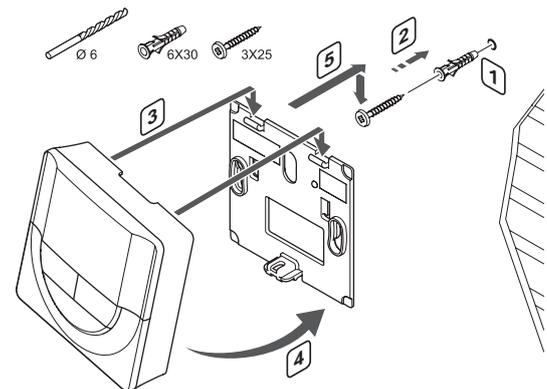
### USING WALL BRACKET (RECOMMENDED)

The illustration below shows timer mounting hole positions and how to attach it to the wall using a wall bracket.



### SCREW AND WALL PLUG

The illustration below shows how to attach it to the wall using one screw and wall plug.



## 7.5 First startup of the timer

When starting the timer for the first time, before registering, the timer requires some basic settings.

See section 13 Operate Uponor Smatrix Base timer for more information.

### SOFTWARE VERSION

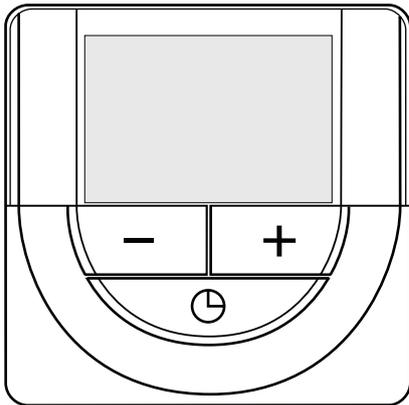
Current software version is displayed during power up.



### SET TIME

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

Use buttons - or + to change the value, press the **OK** button to set the value and move to the next editable value.



### NOTE!

If no button is pressed for about 8 seconds, the current values will be saved and the software exits to control mode.

1. Set hours.



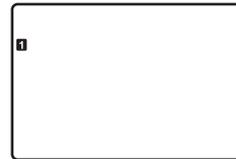
2. Set minutes.



3. Set 12 h or 24 h display of time.



4. Set day of the week (1 = Monday, 7 = Sunday).



5. Set day of the month.



6. Set month.



7. Set year.

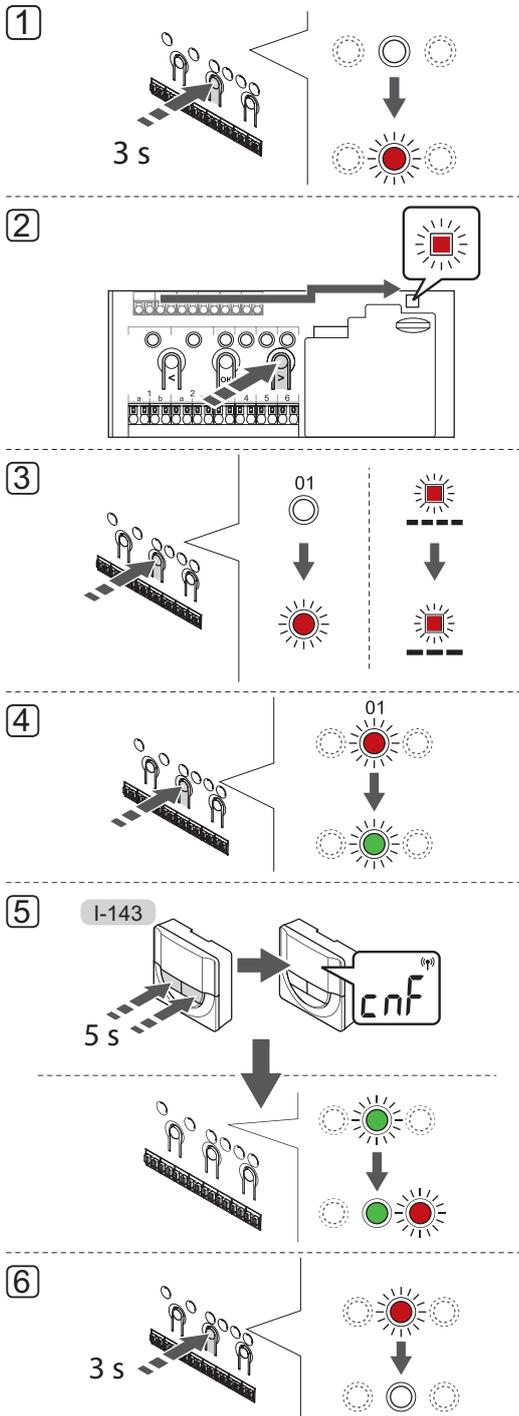


8. Press **OK** to return to run mode.

Date and time can also be set in the settings menu.

## 7.6 Register timer in controller

The illustration below shows how to register a timer associated with the controller.



**NOTE!** Registration of at least one thermostat must be done before registering a timer.

**CAUTION!**

Make sure the controller is in run mode. For information about how to exit to run mode, see section 10.4 Run mode > Exit to run mode.

To register a timer in the controller:

1. Press and hold the **OK** button on the controller until one of the channel LEDs starts flashing.
2. Use buttons **<** or **>** to move the pointer to the power LED (LED flashes red).
3. Press the **OK** button to enter system device registration mode (power LED). The power LED starts flashing according to the pattern long blink, short pause, long blink. Channel 1 starts flashing red.
4. Press the **OK** button to select system device channel 1 (timer interface). Channel 1 LED starts flashing green.
5. Press and hold both **-** and **+** buttons on the timer 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. Press and hold the **OK** button on the controller until the green LEDs turn off to end registration and return to run mode.

To unregister an already registered timer, see section 10.6 Unregister channels in controller.

## 8 Install Uponor Smatrix Base PRO interface

The following interfaces can be connected to the system:

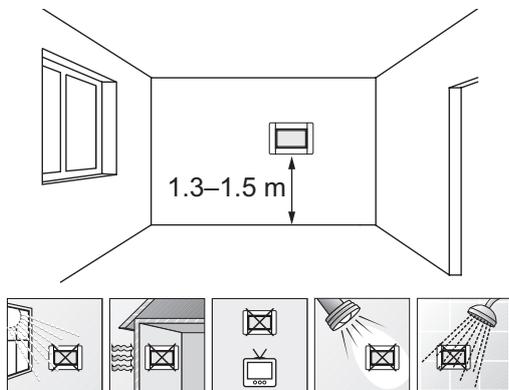
- Uponor Smatrix Base PRO Interface I-147

Up to 16 controllers can be registered and controlled by the interface.

### 8.1 Placement of interface

Refer to the installation preparation guidelines (see section 4.2 *Prepare for installation*), and use the following guidelines when positioning the interface:

1. Select an indoor wall and a position 1.3 m to 1.5 m above the floor.
2. Ensure that the interface is away from direct solar radiation.
3. Ensure that the interface will not be heated through the wall from sunshine.
4. Ensure that the interface is away from any source of heat, for example television set, electronic equipment, fireplace, spotlights, and so on.
5. Ensure that the interface is away from any source of humidity and water splashes (IP20).



### 8.2 Connect interface to the controller

The interface is connected to the (or one of the) controllers using daisy chain, direct connection, or using star topology (the star module can be used). A star module can only be used for one bus type at a time. That is, a thermostat cannot be connected to a star module connected to the system bus and vice versa.



#### NOTE!

The wires must be connected to the supplied wall bracket to ensure operation of the interface.

See section 6.3 for more information about daisy chain.



#### CAUTION!

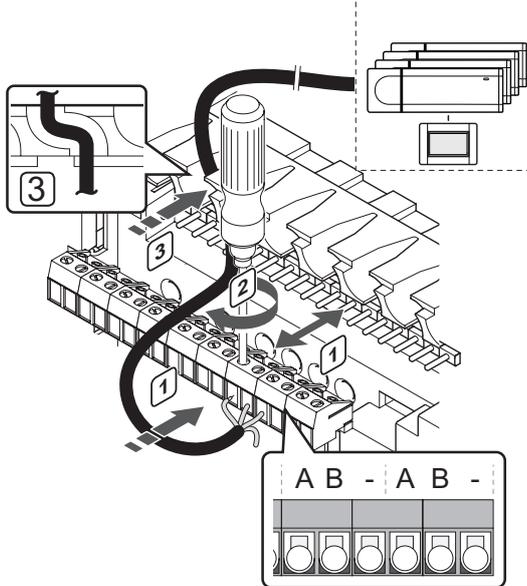
Make sure the interface is connected to a system bus connector (one of the rightmost connectors) on the controller. Otherwise the interface will be unable to communicate with the controller.



#### WARNING!

Electrical installation and service behind secured 230 V AC covers must be carried out under the supervision of a qualified electrician.

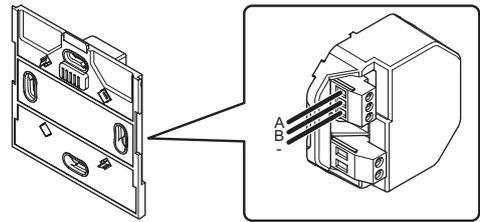
### CONNECT COMMUNICATION CABLE TO CONTROLLER



To connect a communication cable to the controller:

1. Lead the cables through cable entries on the top of the controller frame.
2. Insert two wires (A,B), the - wire is optional and only used in some cases, into a free system connector (one of the rightmost connectors) on the controller.
3. Tighten the screws fixing the wires in the connector.
4. Cut and stow away unused wires.

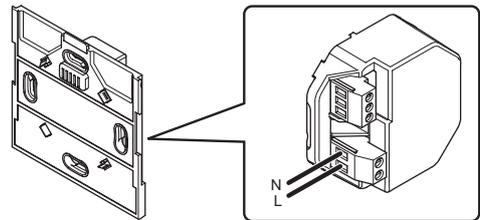
### CONNECT COMMUNICATION CABLE TO INTERFACE WALL BRACKET



To connect a communication cable to the wall bracket:

1. Lead the cables through the wall socket.
2. Insert two wires (A,B), the - wire is optional and only used in some cases, into the connectors on the wall bracket.
3. Tighten the screws fixing the wires in the connector.
4. Cut and stow away unused wires.

### CONNECT POWER TO THE INTERFACE WALL BRACKET



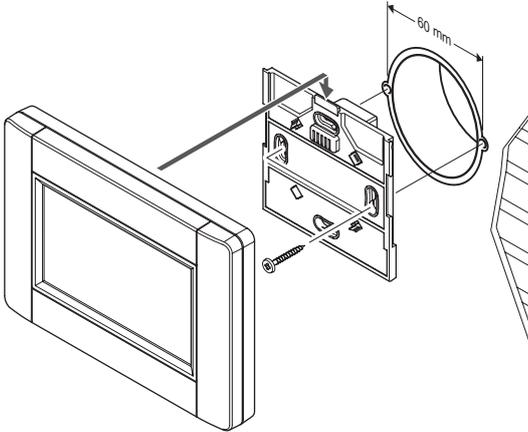
To connect power to the wall bracket:

1. Lead the cables through the wall socket.
2. Insert the two wires (L and N) into the corresponding connectors on the wall bracket.
3. Tighten the screws fixing the wires in the connector.

### 8.3 Attach the interface to the wall

#### USING WALL BRACKET (RECOMMENDED)

The illustration below shows mounting hole positions on the wall bracket, and how to attach the interface.



### 8.4 Charger cable

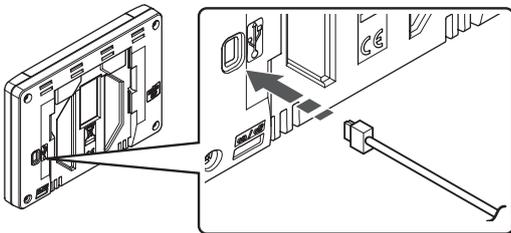
The interface should always be charged attached to the wall bracket, but if needed a standard mini-USB cable can be used.



#### NOTE!

Communication with the controller can only occur when connected to the wall bracket.

The illustration below shows where to attach the cable.



### 8.5 Startup guide

When starting the interface for the first time, or after a factory reset, a startup guide is shown in the touch screen display.

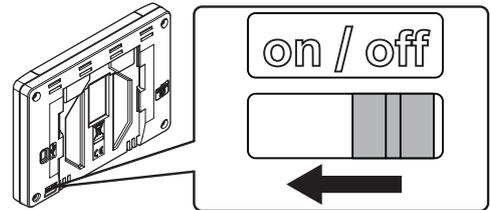


#### NOTE!

Set the controller is in system device registration mode before powering up the interface.

#### POWER UP THE INTERFACE

The power switch is located on the lower left corner on the back of the interface. The interface will power up when connected to a power source.



The startup guide uses the following order:

No	Description
1	Set language
2	Set regional settings
3	Set date and time
4	Set system to heating and/or cooling
5	Register the interface to a controller

All these settings are accessible in the interface menu system.

**Navigating the interface:**

Icon	Description
	Go to home menu
	Go back/cancel changes (if not saved)
	Scroll up and down in lists
	Scroll sideways or change sub menu (if available)
	Cancel settings and return to previous menu
	Move to the previous field
	Decrease value
	Increase value
	Move to the next field
	Confirm settings and return to previous menu or continue to next step in startup guide
	Settings Appears in some menus where more specific settings are available for a parameter

See section 14 Operate Uponor Smatrix Base PRO interface for more information.

**SET LANGUAGE**

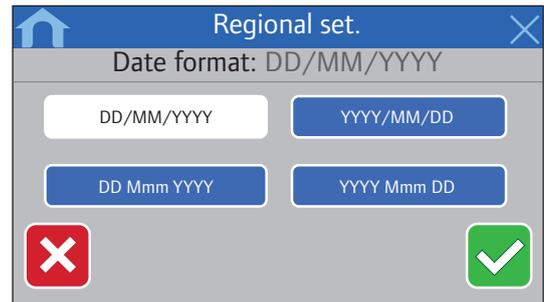
Interaction with the interface can be done in several languages. The most commonly used languages are already loaded in the interface, but more are available with the supplied microSD card inserted.



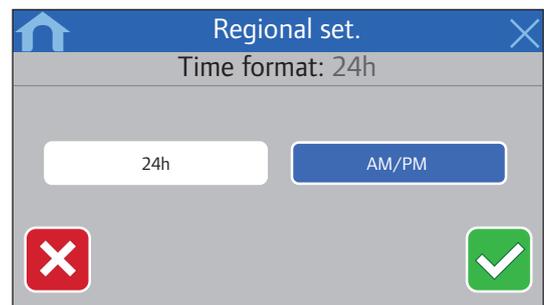
1. Select preferred language from the list by pressing a flag symbol.
2. Confirm and continue to the next step in the startup guide.

**SET REGIONAL SETTINGS**

Set regional settings for date and time.



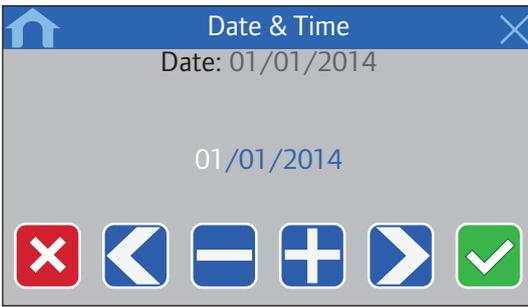
1. Select preferred date format.
2. Confirm and continue to the next step in the startup guide.



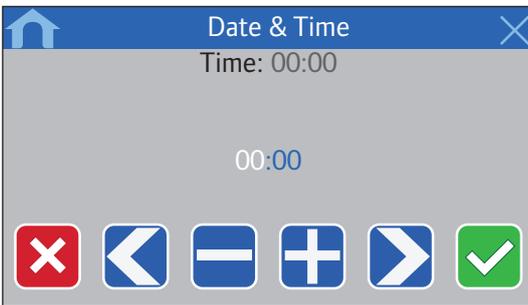
3. Select preferred time format.
4. Confirm and continue to the next step in the startup guide.

**SET DATE AND TIME**

Set the date and time of the system.



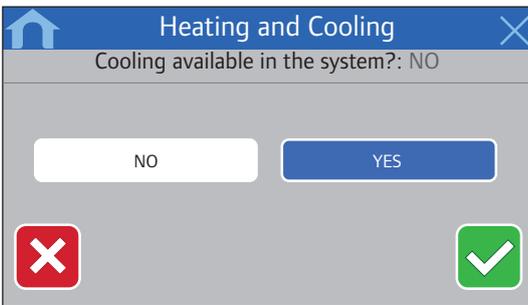
1. Set the current date.
2. Confirm and continue to the next step in the startup guide.



3. Set the current time.
4. Confirm and continue to the next step in the startup guide.

**SELECT IF COOLING IS AVAILABLE IN THE SYSTEM**

Set whether cooling is available in the system or not.

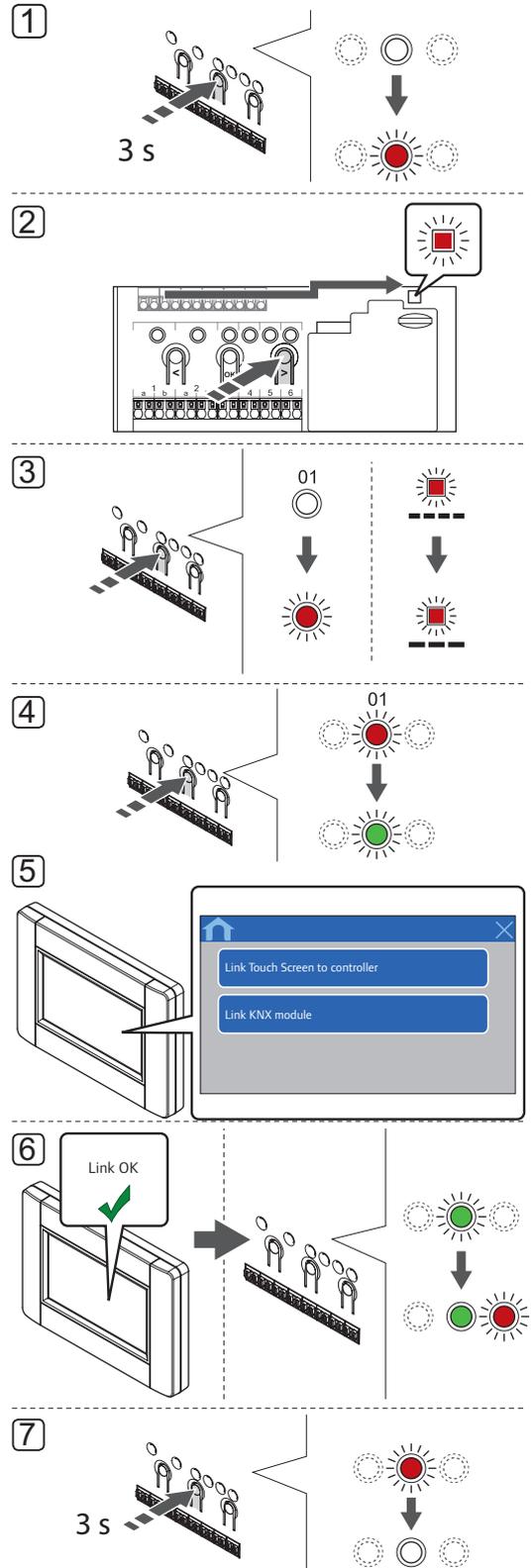


1. Select if cooling is available in the system.
2. Confirm and continue to the next step in the startup guide.

**REGISTER THE INTERFACE TO A CONTROLLER**

The interface must be registered to a controller to be able to control the connected system.

Up to 16 controllers can be registered and controlled by the interface.



**NOTE!**

Registration of at least one thermostat must be done before registering an interface.

**NOTE!**

Registration of at least one thermostat must be done before registering an interface.

**CAUTION!**

Make sure the controller is in run mode. For information about how to exit to run mode, see section 10.4 Run mode > Exit to run mode.

To register the interface to a controller:

1. Press and hold the **OK** button on the controller until one of the channel LEDs starts flashing.
2. Use buttons **<** or **>** to move the pointer to the power LED (LED flashes red).
3. Press the **OK** button to enter system device registration mode (power LED). The power LED starts flashing according to the pattern long blink, short pause, long blink. Channel 1 starts flashing red.
4. Press the **OK** button to select Channel 1. The channel LED starts flashing green.
5. **USING THE INTERFACE START GUIDE:**
  - 5.1 Follow the instructions in section 8.5 Startup guide until the button **Link Touch Screen to controller** appears.
  - 5.2 Press **Link Touch Screen to controller** to initialize registration.

**USING THE INTERFACE MENU SYSTEM:**

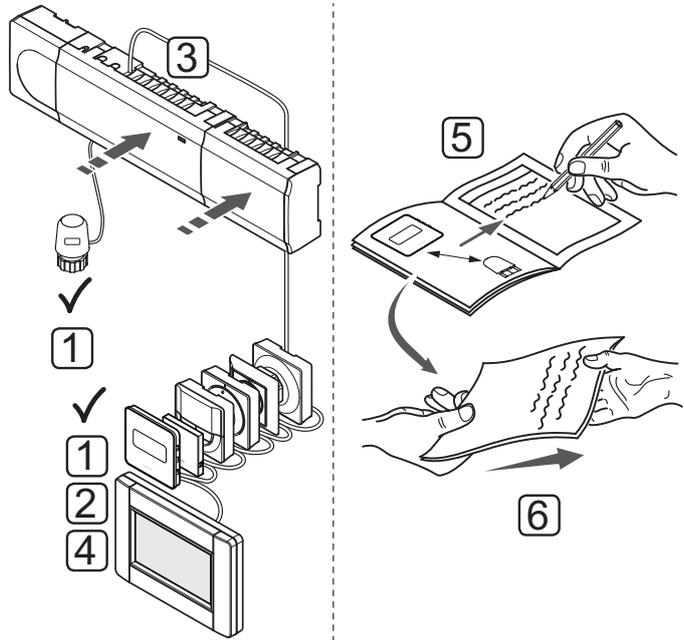
- 5.1 Go to the **Link** menu (**Main menu > Preferences**).
- 5.2 Press **Link Touch Screen to controller** to initialize registration.
6. The interface gets registered to the controller. The selected channel LED in the controller turns fixed green and the registration is complete.
7. Press and hold the **OK** button on the controller until the green LEDs turn off to end registration and return to run mode.

To unregister an already registered interface, see section 10.6 Unregister channels in controller.

## 9 Finishing installation

Make a complete check up of the installation:

1. Check that the thermostats are working correctly.  
Turn thermostat setpoints to maximum to obtain a heating demand and make sure that the actuators are running.
2. Set thermostats and interface (if installed, Base PRO only) to the defined operating settings.
3. Close the covers of the controller.
4. Attach thermostats, timer (if installed, Base only) and interface (if installed, Base PRO only) to the wall.
5. Print and fill in the "Installation report" located at the end of the manual.
6. Give the manual and all information about the system to the user.



# 10 Operate Uponor Smatrix Base/Base PRO controller

Uponor Smatrix Base/Base PRO controls the underfloor heating/cooling installation according to customer needs. Temperatures are adjusted with thermostats located in each room.

## 10.1 Principle of operation

As soon as the temperature measured at a thermostat is lower (heating mode) or higher (cooling 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.

## 10.2 Normal operation without optional scheduling programs

When the system is running in normal mode:

- In **Heating mode**, the actuators are open when room temperatures are lower than the temperatures set on the thermostats.
- In **Cooling mode**, the actuators are open when room temperatures are higher than the temperatures set on the thermostats.

*For information about operating the interface, see section 14 Operating Uponor Smatrix Base PRO interface.*

*For information about operating the analogue thermostats, see section 11 Operating Uponor Smatrix Base/Base PRO analogue thermostat.*

*For information about operating the digital thermostats, see section 12 Operating Uponor Smatrix Base/Base PRO digital thermostat.*

## 10.3 Operation with scheduling programs

Scheduling programs provide an option to switch selected rooms between Comfort and ECO mode using a 7-day program. This optimises the installation and conserves energy.

The use of scheduling programs requires at least one of:

- Uponor Smatrix Base Thermostat Prog.+RH T-148
- Uponor Smatrix Base Timer I-143
- Uponor Smatrix Base PRO Interface I-147 (Base PRO only)

*For information about operating the thermostat, see section 12 Operating Uponor Smatrix Base/Base PRO digital thermostats.*

*For information about operating the timer, see section 13 Operating Uponor Smatrix Base timer.*

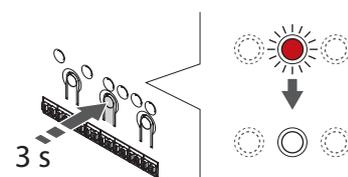
*For information about operating the interface, see section 14 Operating Uponor Smatrix Base PRO interface.*

## 10.4 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).

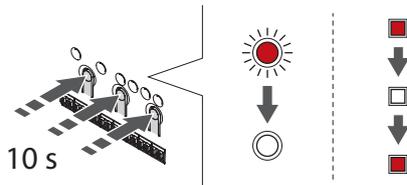


## 10.5 Reset the controller

If problems, such as inaccurate channel registration exist, reset the controller. The following illustration shows the location of the reset button in the controller.

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.

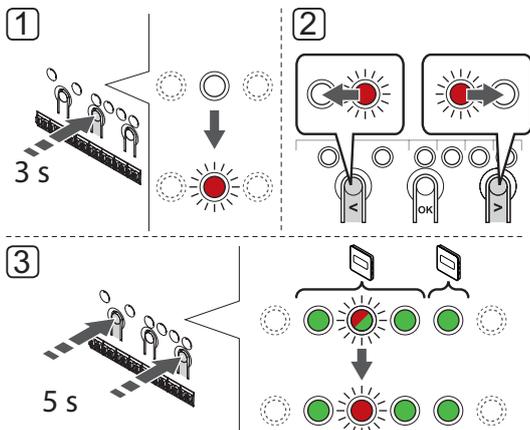


3. Installation and registration are required after resetting the controller.

## 10.6 Unregister channels in the controller

### UNREGISTER ONE CHANNEL

When a channel is inaccurately registered or if a thermostat registration needs to be redone, it is possible to remove the current registration from the controller.



### CAUTION!

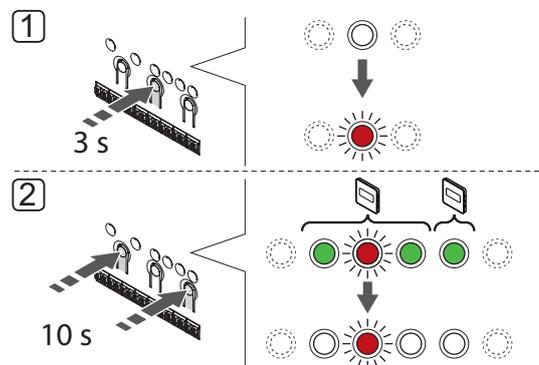
Make sure the controller is in run mode. For information about how to exit to run mode, see section 10.4 Run mode > Exit to run mode.

To unregister a channel:

1. Press and hold the **OK** button on the controller 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).

### UNREGISTER ALL CHANNEL

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



### CAUTION!

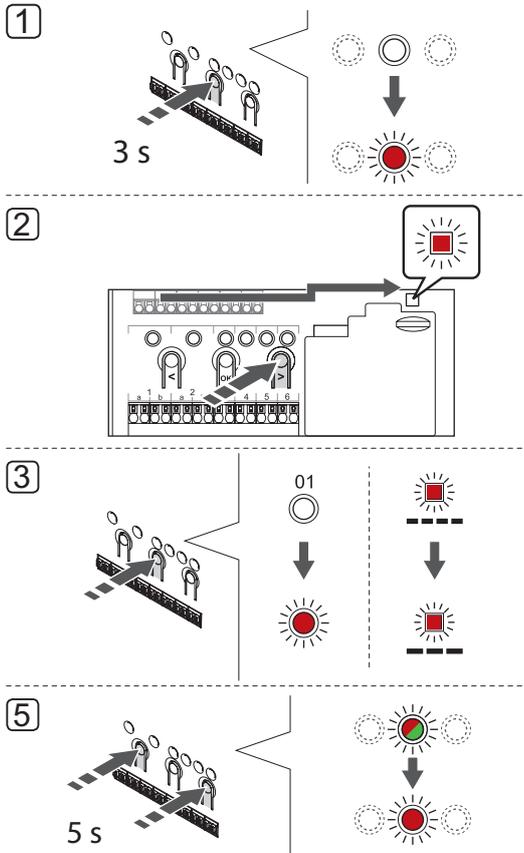
Make sure the controller is in run mode. For information about how to exit to run mode, see section 10.4 Run mode > Exit to run mode.

To cancel all channel registrations:

1. Press and hold the **OK** button on the controller 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.

**UNREGISTER A SYSTEM DEVICE**

When a channel is inaccurately registered to a system device, it is possible to remove the registration, as shown in the illustration below.



**CAUTION!**

Make sure the controller is in run mode. For information about how to exit to run mode, see section 10.4 Run mode > Exit to run mode.

To unregister a system device:

1. Press and hold the **OK** button on the controller until one of the channel LEDs starts flashing.
2. Use buttons **<** or **>** to move the pointer (LED flashes red) to the power LED.
3. Press the **OK** button to select system device registration. The power LED starts flashing according to the pattern long blink, short pause, long blink. Channel 1 starts flashing red, or red/green if a device is registered to that channel.
4. Use buttons **<** or **>** to move the pointer (LED flashes red) to the selected channel (flashes green if registered), see the following list.

1 = Touch screen interface (Base PRO only)

1 = Timer (Base only)

2 = Not used

3 = Public thermostat with outdoor sensor

4 = Public thermostat with heating/cooling switch from sensor input (Base PRO with interface only).

5 = Public thermostat with Comfort/ECO switch

5. Press the **<** and **>** buttons simultaneously for about 5 seconds until the LED for the selected channel start flashing red.

**10.7 Update controller software (Base PRO only)**

Software and update instructions can be found on the Uponor website.

# 11 Operate Uponor Smatrix Base/Base PRO analogue thermostats

Two types of thermostats, both analogue and digital, can be used in an Uponor Smatrix Base/Base PRO system.

## Analogue thermostats:

- Uponor Smatrix Base PRO Room Sensor+RH Style T-141
- Uponor Smatrix Base Thermostat Public T-143
- Uponor Smatrix Base Thermostat Flush T-144
- Uponor Smatrix Base Thermostat Standard T-145

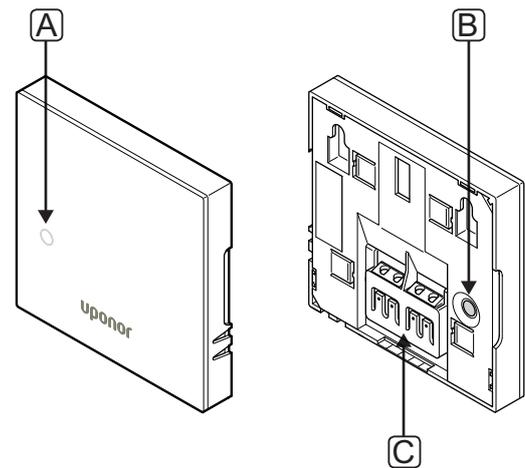
The analogue thermostats are controlled by either turning a dial (T-144, and T-145), adjusting a potentiometer on its back (T-143), or via the Base PRO interface I-147 (T-141, T-143, T-144, and T-145).

## 11.1 Thermostat layout

### ROOM SENSOR THERMOSTAT T-141

During normal operation the thermostat is monitored and controlled via the Base PRO interface I-147.

The illustration below shows the parts of the thermostat.



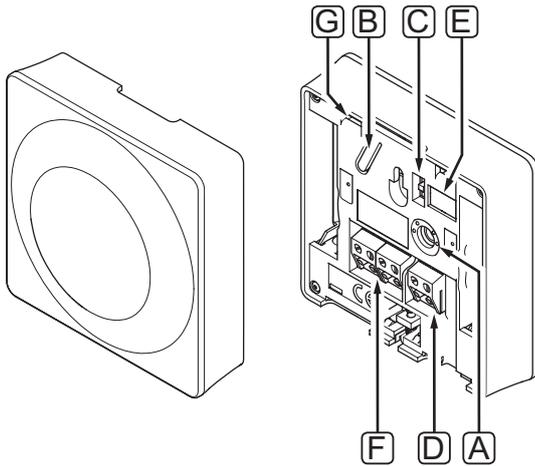
Item	Description
A	Heating/cooling demand LED
B	Registration button
C	Terminal for communication cable

**PUBLIC THERMOSTAT T-143**

During normal operation a discreet LED on back of the thermostat is lit for about 60 seconds if there is a demand for heating or cooling.

The thermostat contains a switch that, if activated during registration, sends an alarm when the thermostat is removed from the wall. The alarm is transmitted through the connected cables, causing the related channel LED on the controller to flash.

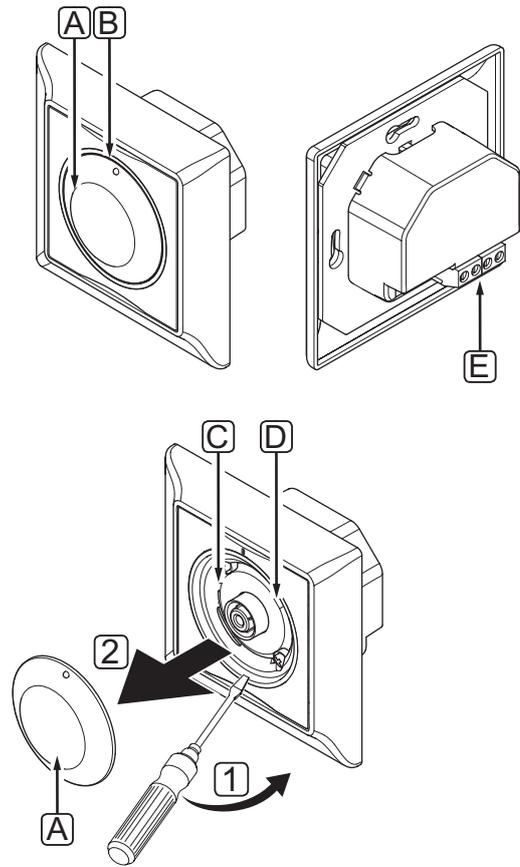
The illustration below shows the parts of the thermostat.



Item	Description
A	Setpoint temperature potentiometer
B	Registration button
C	Disable timer switch
D	Terminal for external sensor (non-polarised)
E	Configuration DIP switches
F	Terminal for communication cable
G	Heating/cooling demand LED

**FLUSH THERMOSTAT T-144**

The illustration below shows the parts of the thermostat.

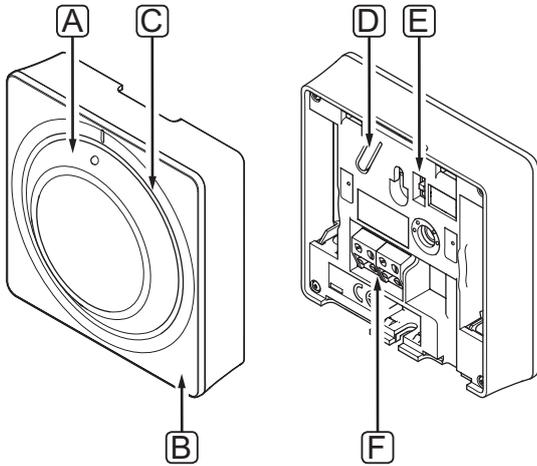


Item	Description
A	Room temperature setpoint dial control
B	Heating/cooling demand LED
C	Registration button
D	Disable timer switch
E	Terminal for communication cable

### STANDARD THERMOSTAT T-145

During normal operation a discreet LED on the thermostat is lit for about 60 seconds if there is a demand for heating or cooling.

The illustration below shows the parts of the thermostat.



Item	Description
A	Room temperature setpoint dial control
B	Heating/cooling demand LED
C	Clear dial guide
D	Registration button
E	Disable timer switch
F	Terminal for communication cable

## 11.2 Adjust temperature

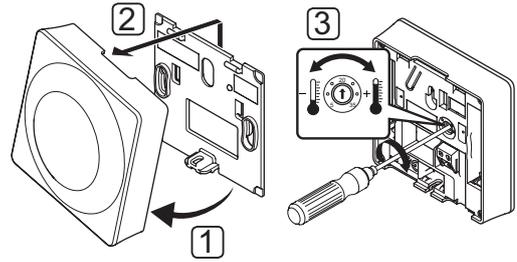
The temperature is changed by adjusting the setpoint on the thermostat to a value between 5 and 35 °C.

### ROOM SENSOR THERMOSTAT T-141

The setpoint for thermostat T-141 can only be changed via the Base PRO interface I-147. If an interface I-147 is not connected, the setpoint will be fixed to 21 °C.

### PUBLIC THERMOSTAT T-143

The illustration below shows how to adjust the thermostat temperature setpoint.



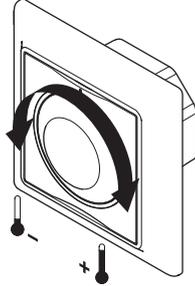
To change the thermostat temperature setpoint:

1. Angle the thermostat from the bracket.
2. Remove it from the wall.
3. Set the desired temperature using the potentiometer.
4. Put the thermostat back on the wall.

### THERMOSTAT FLUSH T-144

Use the dial on the thermostat to adjust the temperature. A LED 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.



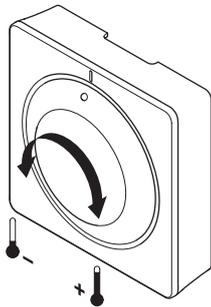
To adjust the thermostat temperature setpoint:

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

### STANDARD THERMOSTAT T-145

Use the dial on the thermostat to adjust the temperature.

The illustration below shows how to adjust the thermostat temperature setpoint.



To adjust the thermostat temperature setpoint:

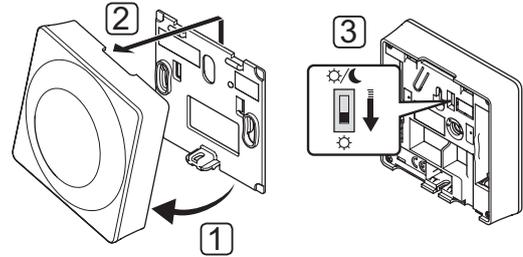
- Twist the dial clockwise for a higher temperature.
- Twist the dial counter-clockwise for a lower temperature.

## 11.3 Disable timer function

Thermostats T-143, T-144, and T-145 have switches allowing the user to disable the timer function (Comfort mode) for the channels controlled by the thermostat. The switch is set to **Comfort/ECO** from the factory.

### THERMOSTATS T-143 AND T-145

The illustration below shows how to disable the timer function on the thermostat.

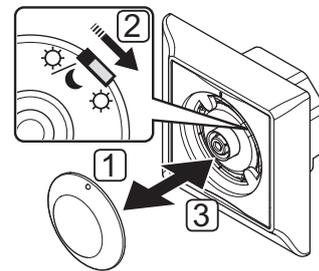


To change the switch to **Disable timer**:

1. Angle the thermostat from the bracket.
2. Remove it from the wall.
3. Switch to Comfort mode, ☀.
4. Put the thermostat back on the wall.

### FLUSH THERMOSTAT T-144

The illustration below shows how to disable the timer function on the thermostat.



To change the switch to **Disable timer**:

1. Remove the dial using a small screwdriver.
2. Switch to Comfort mode, ☀.
3. Put the dial back on the thermostat.

## 11.4 Factory reset

Factory reset sets all parameter values to default settings.



### NOTE!

Do not factory reset the thermostat if not absolutely needed.

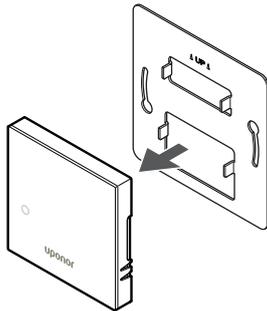


### NOTE!

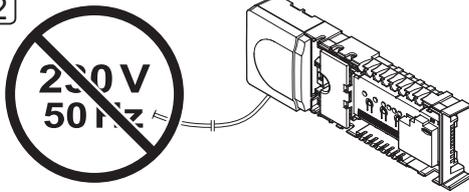
A factory reset removes the registration data from the thermostat.

### THERMOSTAT T-141

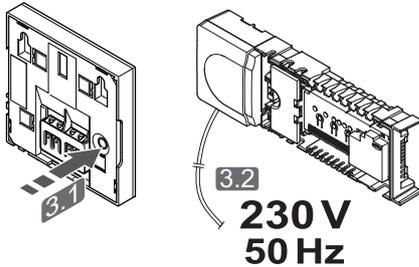
1



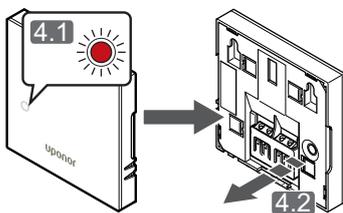
2



3



4



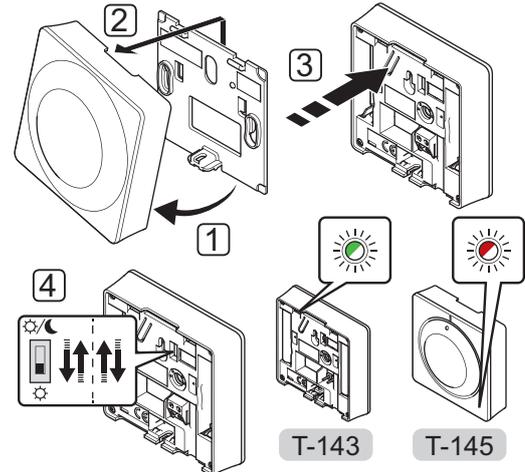
### NOTE!

This operation might need two persons to complete.

To factory reset the thermostat:

1. Remove the thermostat from the wall.
2. Disconnect the controller from the power supply.
3. Press and hold the registration button on the thermostat while reconnecting the controller to power again.
4. Release the button after about 10 seconds when the LED start flashing.
5. The thermostat is now reset to factory default.

### THERMOSTATS T-143 AND T-145



To factory reset the 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.

## 12 Operate Uponor Smatrix Base/Base PRO digital thermostats

Two types of thermostats, both analogue and digital, can be used in an Uponor Smatrix Base/Base PRO system.

The digital thermostats have a display relaying information to the user and buttons for control.

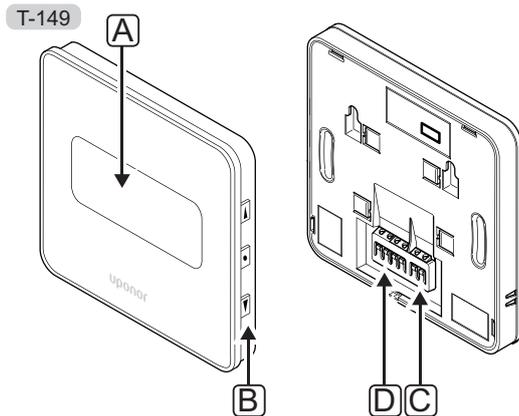
### Digital thermostats:

- Uponor Smatrix Base Thermostat D+RH Style T-149
- Uponor Smatrix Base Thermostat Prog.+RH T-148
- Uponor Smatrix Base Thermostat Dig T-146

### 12.1 Thermostat layout

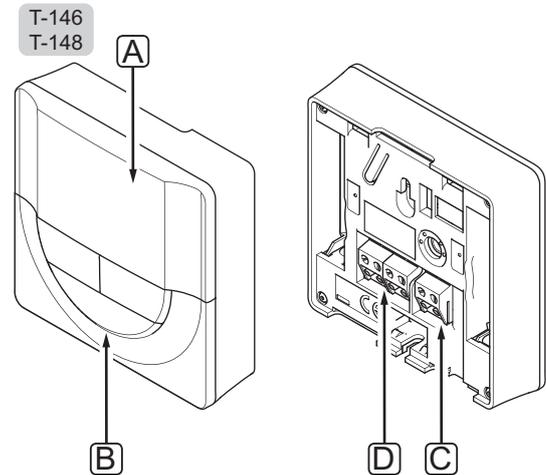
The illustration below shows the parts of the thermostat.

#### THERMOSTAT T-149



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

#### THERMOSTATS T-146 AND T-148



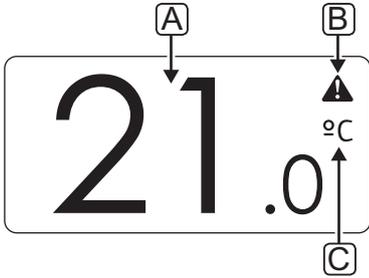
Item	Description
A	Display
B	Buttons
C	Terminal for external sensor (non-polarised)
D	Terminal for communication cable

## 12.2 Display layout

### THERMOSTAT T-149

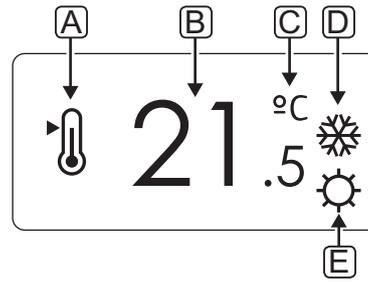
The figures shows different display screens and the different symbols that can be shown.

#### Run mode (default screen)



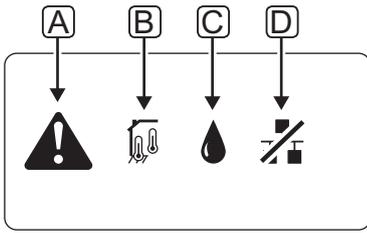
Pos.	Icon	Description
A	21.0	Temperature reading using a - or + sign, two digital characters, a decimal point and a character showing either 0 or 5
B	!	Alarm symbol
C	°C °F	Temperature unit

#### Change setpoint



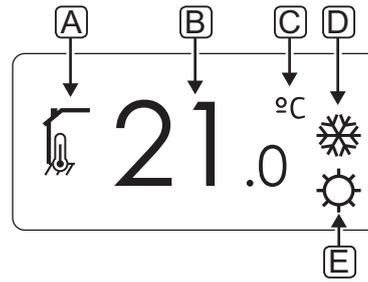
Pos.	Icon	Description
A	🌡️	Change setpoint mode
B	21.5	Temperature setpoint, using a - or + sign, two digital characters, a decimal point and a character showing either 0 or 5
C	°C °F	Temperature unit
D	🔥 ❄️	Heating demand Cooling demand
E	☀️ 🌙	Comfort mode ECO mode

**Alarms**



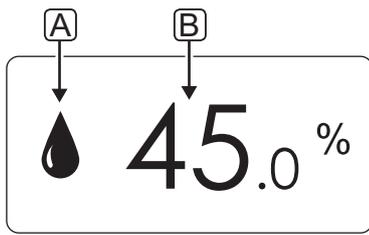
Pos.	Icon	Description
A		Alarm mode
B		Faulty indoor temperature sensor
		Faulty floor temperature sensor
		Faulty remote temperature sensor
		Faulty outdoor temperature sensor
C		Relative humidity limit reached
D		Communication fault indicator

**Control mode**



Pos.	Icon	Description
A		Current control mode
		Indoor temperature indicator
		Current control mode
		Indoor temperature with floor temperature limitation indicator
		Current control mode
		Remote sensor temperature indicator
B		Current control mode
		Outdoor temperature indicator
C	21.0	Temperature unit, shown when the character group A shows a temperature
	°C	Temperature unit
D	°F	Temperature unit
		Heating demand
E		Cooling demand
		Comfort mode
		ECO mode
		Holiday mode

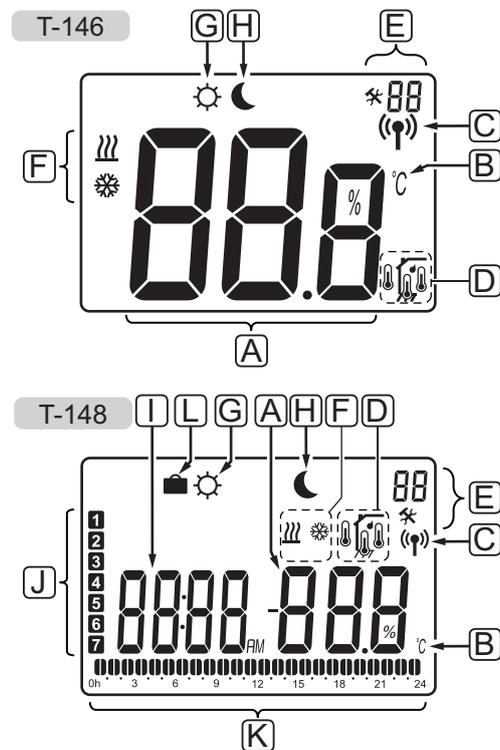
RELATIVE HUMIDITY



Pos.	Icon	Description
A		Relative humidity level
B	45.0	Relative humidity reading using two digital characters. Indicated with a “%” character

THERMOSTATS T-146 AND T-149

The figure below shows all possible symbols and characters that can be shown on the display:



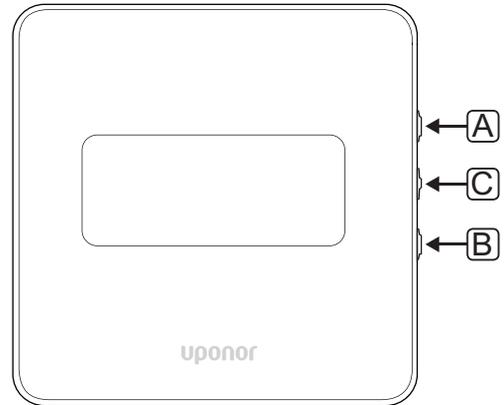
Pos.	Icon	Description
A		T-146 only Message field using three alphanumerical characters
	T-146 	Temperature reading using a - or + sign, two digital characters, a decimal point and a character showing either 0 or 5
	T-148 	Relative humidity reading using two digital characters. Indicated with a “%” character
B		Temperature unit, shown when the character group A shows a temperature
C		Communication indicator
D		Indoor temperature indicator
		Remote sensor temperature indicator (RS mode) The text <b>Err</b> and a flashing sensor icon indicates a faulty sensor
		Indoor temperature with floor temperature limitation indicator The text <b>Err</b> and a flashing floor sensor icon indicates a faulty sensor
		Floor temperature indicator The text <b>Err</b> and a flashing floor sensor icon indicates a faulty sensor
		Outdoor temperature indicator The text <b>Err</b> and a flashing outdoor sensor icon indicates a faulty sensor
		T-148 only Relative humidity limit reached

Pos.	Icon	Description
E		Settings menu
		Settings menu number
F		Heating demand
		Cooling demand
G		Comfort mode
H		ECO mode
		Flashing icon in thermostat T-146 indicates activated holiday mode in the system.
I		<i>T-148 only</i> Digital clock
		<i>T-148 only</i> Parameter name in settings menu
		<i>T-148 only</i> Indicator showing AM or PM when the thermostat is set to 12 h mode
		No indication when the thermostat is set to 24 h mode
J		<i>T-148 only</i> Weekday selected/activated 1 = Monday 7 = Sunday
K		<i>T-148 only</i> Time selected or scheduled hour indicators, for Comfort mode, between 0:00 and 24:00
		Half = 30 minutes
		Full = 1 hour
L		Holiday mode

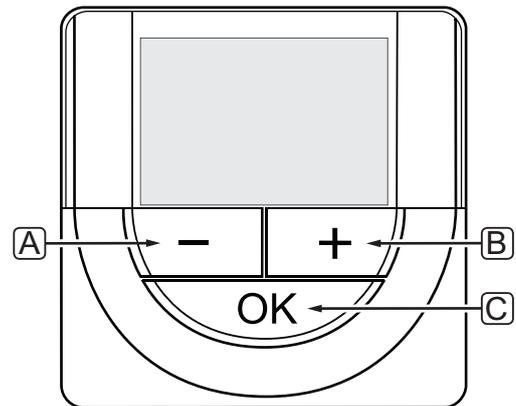
### 12.3 Operating buttons

The figure below shows buttons used to operate the digital thermostats.

T-149



T-146  
T-148



Pos.	Description
A	The - and + buttons are used to:
B	<ul style="list-style-type: none"> <li>Adjust setpoint temperature</li> <li>Modify parameters in the settings menus</li> </ul>
C	The OK button is used to: <ul style="list-style-type: none"> <li>Toggle between current status data, and values of available sensors connected to the thermostat</li> <li>Enter and exit the settings menu</li> <li>Confirm a setting</li> </ul>

## 12.4 Start up

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

The first time the thermostat is started, or after a factory reset, the software requires the time and date to be set (T-148 only).

### SOFTWARE VERSION

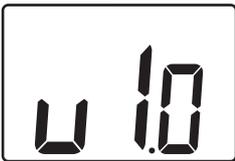
Current software version is displayed when the thermostat is powered on.

Examples:

T-149



T-146



T-148



### SET TIME AND DATE (T-148 ONLY)

When starting the thermostat for the first time, or after a factory reset, the software requires the time and date to be set.

Use buttons - or + to change the value, press the **OK** button to set the value and move to the next editable value.

#### **!** NOTE!

If no button is pressed for about 8 seconds, the current values will be saved and the software exits to run mode.

1. Set hours.



2. Set minutes.



3. Set 12 h or 24 h display of time.



4. Set day of the week (1 = Monday, 7 = Sunday).



5. Set day of the month.



6. Set month.



7. Set year.



8. Press **OK** to return to run mode.

Date and time can also be set in the settings menu.

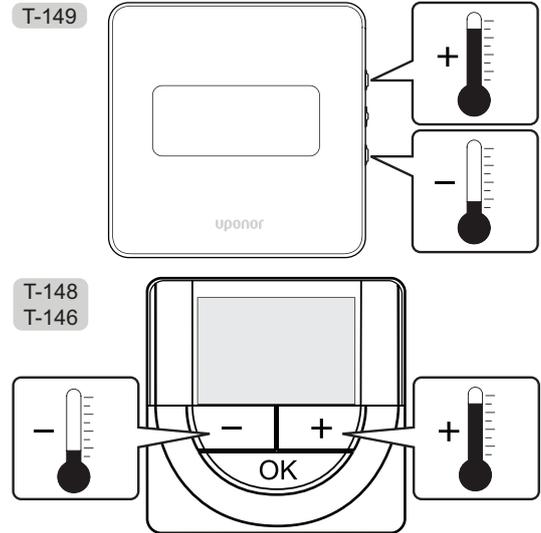
See section 12.9 Settings for more information.

## 12.5 Adjust temperature

The temperature is changed 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.

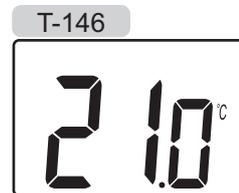
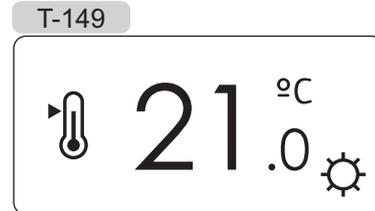
The illustration below shows how to adjust the thermostat temperature setpoint.



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

1. Press the - or + (T-149 = ▼ or ▲) button once.

The screen shows the current setpoint flashing.



2. Press the - or + (T-149 = ▼ 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.

## 12.6 Run mode

During normal operation the thermostat is in run mode.

While in run mode the display shows specific control mode information.

## 12.7 Control mode

The thermostat has four different control modes, set in the settings menu.

Control modes:

T-149	T-146/ T-148	Description
	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 when in a control mode. The digital thermostat T-148 also shows the clock and scheduled program information.

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

### RT, ROOM TEMPERATURE MODE

1. Room temperature (default)
2. Alarm list (only shown if an alarm is present in a T-149 thermostat)
3. Room temperature, current ECO/Comfort mode, and current heating/cooling demand (T-169 only)
4. Relative humidity (T-148 only)

### RFT, ROOM FLOOR TEMPERATURE MODE

1. Room temperature (default)
2. Alarm list (only shown if an alarm is present in a T-149 thermostat)
3. Floor temperature, current ECO/Comfort mode, and current heating/cooling demand (T-149 only)
4. Relative humidity (T-148 and T-149 only)
5. Floor temperature (T-146 and T-148 only)

### RS, REMOTE SENSOR MODE

1. Room temperature (default)
2. Alarm list (only shown if an alarm is present in a T-149 thermostat)
3. Remote sensor, current ECO/Comfort mode, and current heating/cooling demand (T-149 only)
4. Relative humidity (T-148 and T-149 only)

### RO, REMOTE OUTDOOR SENSOR MODE

1. Room temperature (default)
2. Alarm list (only shown if an alarm is present in a T-149 thermostat)
3. Outdoor temperature, current ECO/Comfort mode, and current heating/cooling demand (T-149 only)
4. Relative humidity (T-148 and T-149 only)
5. Outdoor temperature (T-146 and T-148 only)

## 12.8 Change control mode

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



### 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 about 60 seconds later, it exits to run mode.

1. Press and hold the **OK** button until the settings icon and menu numbers is displayed in the top right corner of the display (about 3 seconds).
2. Use buttons - or + (T-149 = ▼ 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 + (T-149 = ▼ or ▲) to change control mode (see list below) and press **OK**.

T-149	T-146/ T-148	Description
	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.

## 12.9 Settings

In this menu all settings regarding the operation of the thermostat is set.



### NOTE!

As long as scheduling (program **00**) is activated (not set to **Off**) in a digital thermostat T-148, no other unit (timer) is allowed to change (override) the Comfort/ECO mode in that room.



### 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 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 + (T-149 = ▼ or ▲) to change the numbers to locate a submenu (see list below).

**00** = Program (T-148 only)

**02** = Heating/cooling changeover\*

**03** = ECO mode setback temperature

**04** = Control mode

**05** = High floor temperature limitation

**06** = Low floor temperature limitation

**07** = Cooling allowed

**08** = Display unit

**10** = Time and date (T-148 only)

**11** = Room temperature calibration

**12** = Invert screen (T-149 only)

\* *This menu is not visible if the thermostat is registered to a controller.*

4. Press **OK** to enter parameter edit mode.  
T-146 and T-148: the parameter starts flashing.  
T-149: the menu number is underlined.
5. Change parameters in the submenus.
6. Press and hold the **OK** button for about 3 seconds to exit the settings menu.

**00 PROGRAM (T-148 ONLY)**

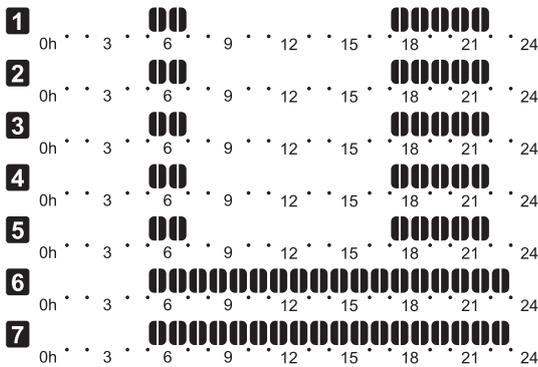
In this menu, one of seven different scheduling programs for Comfort/ECO mode can be set. Program 1 to 6 is pre-programmed and the 7th is user defined. The scheduled programs show the day split into 30 minute intervals which is set to either Comfort (black marker) or ECO mode (blank marker).

*This menu is not visible if an interface is connected to the system. Settings are referred to an interface (Base PRO only).*

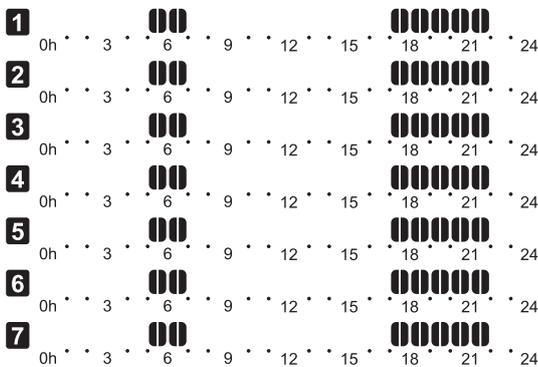
Program Off (default):

Room is set in Comfort mode. If a timer is available in the system, the room will use those set schedules but the thermostats own **ECO mode setback temperature.**

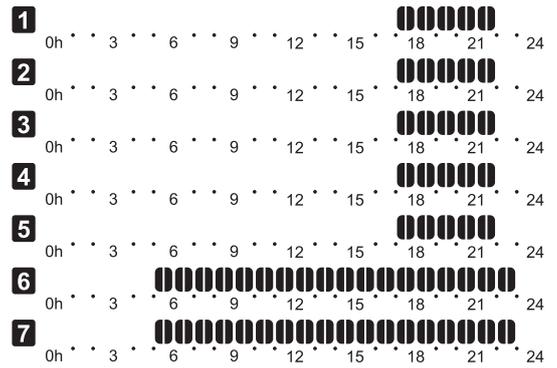
Program P1:



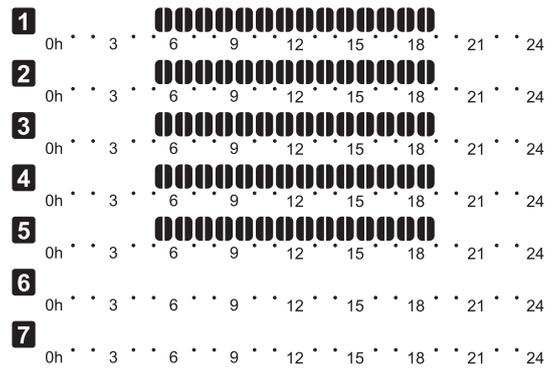
Program P2:



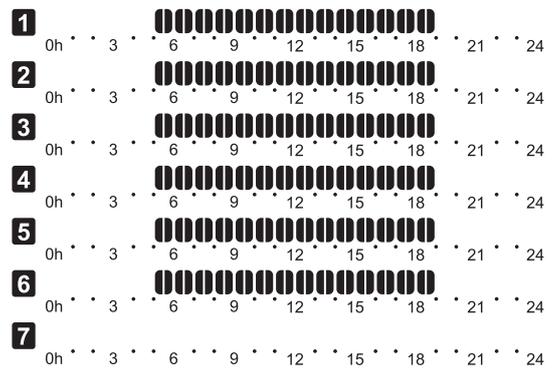
Program P3:



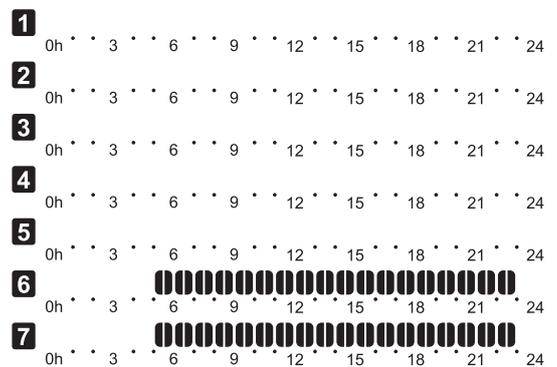
Program P4:



Program P5:



Program P6:



### Select scheduling program

To select a scheduling program:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to select program.  
Select between: **P1–P6**, **U** (user defined program) and **Off**.
3. Press **OK** to confirm program selection and return to the settings menu.

### Customise user defined program for a single day

To customise the user defined program:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to select program **U**.
3. Press **OK** to confirm program selection.  
The current day starts flashing.
4. Use buttons - or + to select a day.
5. Press and hold **OK** until **00:00** appears on the display (takes about 2 seconds).
6. Press **OK** to switch the marked interval between Comfort (☀) and ECO mode (☾).
7. Use buttons - or + to move the marker (at the bottom of the display). When moving the marker from one interval to another save the selected mode to that interval.
8. Repeat steps 6 and 7 until the display shows **23:30**.
9. Press + to finalize the current day and the software exits to the settings menu.
10. Repeat from step 1 to customise another day.

### Customise user defined program for a full week

NOTE! This method resets the current user defined program to factory defaults.

To customise the user defined program:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to select program **U**.
3. Press and hold **OK** until day **1** and **00:00** appears on the display.
6. Press **OK** to switch the marked interval between Comfort (☀) and ECO mode (☾).
7. Use buttons - or + to move the marker (at the bottom of the display). When moving the marker from one interval to another save the selected mode to that interval.
8. Repeat steps 6 and 7 until the display shows **23:30**.
9. Press + to finalize programming the current day.  
The text **Copy Yes** appears (Yes is flashing).
10. Use buttons - or + to select **Yes** or **No** and press **OK** to confirm.  
Select **Yes** to copy the setting of the current day to the next. Repeat for every day that should be identical.  
Select **No** and press **OK** to create a new scheduling interval for the following day. Then repeat steps 6 through 10 until the whole week is programmed.
11. The display returns to the settings menu when the final day is done.

## 02 HEATING/COOLING CHANGEOVER

This menu is not visible if the thermostat is registered to a controller. Heating/cooling changeover will be controlled by a physical heating/cooling switch (Base or Base PRO) or the interface (Base PRO only), if connected.

## 03 ECO MODE SETBACK TEMPERATURE

In this menu the setback temperature for whenever the channel is in ECO mode is set.

The setting adjusts the current setpoint with the set value. In heating mode the setpoint is reduced, and in cooling mode it is increased.

If the setback temperature is set to 0, the thermostat will remain unaffected if a program sets the system in ECO mode.

This menu is not visible if an interface is connected to the system. The setting is then available in an interface (Base PRO only).

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to change the parameter.

Default: 4 °C

Setting range: 0 – 11 °C, 0.5 °C increments

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

## 04 CONTROL MODE

In this menu control mode for the thermostat is set.

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

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

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to change control mode (see list below).

T-149	T-146/ T-148	Description
	RT	Room temperature
	RFT	Room temperature with external floor sensor
	RS	Remote sensor
	RO	Room temperature with remote outdoor sensor

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

## 05 HIGH FLOOR TEMPERATURE LIMITATION

In this menu a limit on the maximum allowable floor temperature is set.

This menu is only visible if control mode RFT is activated in settings menu 04. For systems with an interface this menu only shows the set value, changes are done in the interface (Base PRO only).

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to change the parameter.

Default: 26 °C

Setting range: 20 – 35 °C, 0.5 °C increments

### NOTE!

This parameter cannot be set lower than the set value in settings menu **06 Low floor** temperature limitation.

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

**06 LOW FLOOR TEMPERATURE LIMITATION**

In this menu a limit on the minimum allowable floor temperature is set.

*This menu is only visible if control mode RFT is activated in settings menu 04. For systems with an interface this menu only shows the set value, changes are done in the interface (Base PRO only).*

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to change the parameter.

*Default: 20 °C*

*Setting range: 10 – 30 °C, 0.5 °C increments*



**NOTE!**

If this parameter is set lower than 16 °C the cooling icon will start flashing, warning for risk of condensation in the system.



**NOTE!**

This parameter cannot be set higher than the set value in settings menu **05 High floor** temperature limitation.

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

**07 COOLING ALLOWED**

In this menu it is set whether cooling is allowed in the room or not.

*This menu is not visible if an interface is connected to the system. The settings are then available in the interface (Base PRO only).*

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to toggle between **Yes** and **No**.

T-149	T-146/ T-148	Description
	Yes	Shows the cooling demand icon
	No	Hides the cooling demand icon

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

**08 DISPLAY UNIT**

In this menu temperature display unit is set.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to toggle between Celsius and Fahrenheit.

T-149	T-146/ T-148	Description
	DEg °C	Degrees Celsius
	DEg °F	Degrees Fahrenheit

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

**10 TIME AND DATE (T-148 ONLY)**

In this menu time and date is set. This setting is required to utilise scheduling programs for this thermostat.

*If an interface, a timer, or another digital thermostat T-148 (with a lower channel number) is registered to the controller, they will push the set time and date to the thermostat. Then only the 12/24 h setting is available.*

Use buttons - or + to change the value. Press the **OK** button to set the value and move to the next editable value.



**NOTE!**

In case of short power outages, an internal memory is used to save the time and date settings.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Set hours.
3. Set minutes.
4. Set 12 h or 24 h display of time.
5. Set day of the week (1 = Monday, 7 = Sunday).
6. Set day of the month.
7. Set month.
8. Set year.
9. Press **OK** to confirm change and return to the settings menu.

## 11 ROOM TEMPERATURE CALIBRATION

In this menu the room temperature shown in the thermostat display can be calibrated.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + (T-149 = ▼ or ▲) to change the parameter.

*Default: 0.0 °C*

*Setting range: -6.0 – 6.0 °C, 0.1 °C increments*

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

## 12 INVERT SCREEN (T-149 ONLY)

In this menu the colour in the display can be inverted.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons ▼ or ▲ to change the screen setting.
3. Press **OK** to confirm the change and return to the settings menu.

### 12.10 Factory reset

Factory reset sets all parameter values to default settings.



#### NOTE!

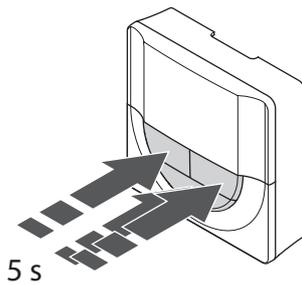
Do not factory reset the thermostat if not absolutely needed.



#### NOTE!

A factory reset removes the registration data from the thermostat.

### THERMOSTATS T-146 AND T-148

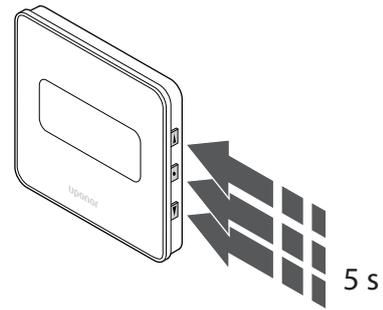


5 s

To factory reset 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.

### THERMOSTAT T-149



5 s

To factory reset 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.

# 13 Operate Uponor Smatrix Base timer

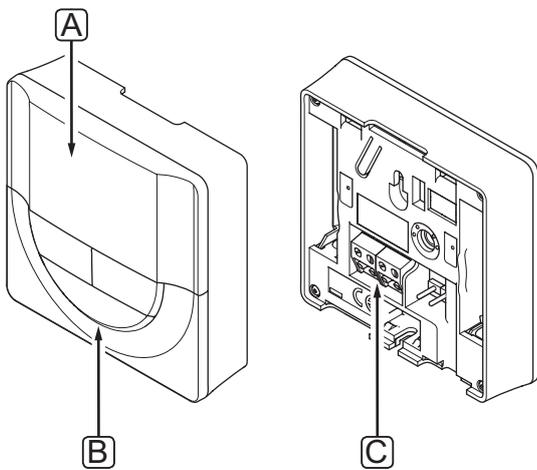
The timer (Base only) provide an option to switch selected rooms between Comfort and ECO mode using a 7-day program. It has a display relaying information to the user and buttons for control.

**Timers:**

- Uponor Smatrix Base Timer I-143

## 13.1 Timer layout

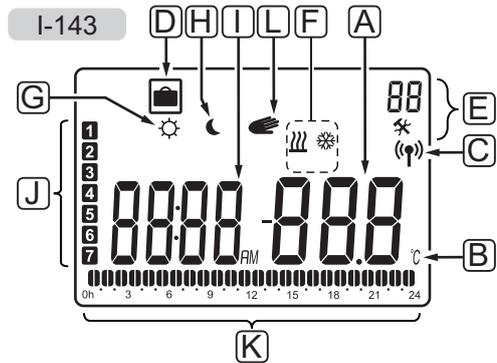
The illustration below shows the parts of the timer.



Item	Description
A	Display
B	Buttons
C	Terminal for communication cable

## 13.2 Screen layout

The figure below shows all possible symbols and characters that can be shown on the display:

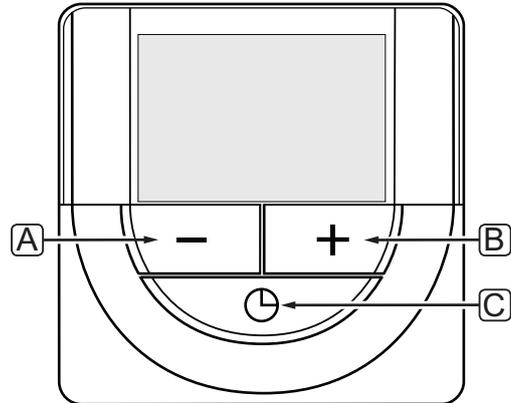


Pos.	Icon	Description
A	000	Message field using three alphanumerical characters Parameter in settings menu
B	°C °F	Temperature unit, shown when the character group A shows a temperature
C	(Ⓜ)	Communication indicator
D	👜	Holiday mode
E	🔧	Settings menu
	00	Settings menu number
F	🔥	Heating mode
	❄️	Cooling mode
G	☀️	Comfort mode
H	🌙	ECO mode

Pos.	Icon	Description
I		Digital clock
		Parameter name in settings menu
	 	Indicator showing AM or PM when the thermostat is set to 12 h mode
		No indication when the thermostat is set to 24 h mode
J		Weekday selected/activated 1 = Monday 7 = Sunday
K		Time selected or sheduled hour indicators, for Comfort mode, between 0:00 and 24:00  Half = 30 minutes Full = 1 hour
L		Manual override. For example forced Comfort or ECO mode.

### 13.3 Operating buttons

The figure below shows buttons used to operate the timer.



Pos.	Description
A	The - and + buttons are used to:
B	<ul style="list-style-type: none"> <li>• Comfort and ECO mode override*</li> <li>• Modify parameters in the settings menus</li> </ul>
C	The <b>OK</b> button is used to: <ul style="list-style-type: none"> <li>• Toggle clock and program status*</li> <li>• Enter and exit the settings menu**</li> <li>• Confirm a setting</li> <li>• Cancel holiday mode**</li> </ul>

\* Not in holiday mode

\*\* Press and hold while in run mode

## 13.4 Start up

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

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

### SOFTWARE VERSION

Current software version is displayed when the timer is powered on.

Example:



### SET TIME AND DATE

When starting the timer for the first time, or after a factory reset, the software requires the time and date to be set.

Use buttons - or + to change the value, press the OK button to set the value and move to the next editable value.



#### NOTE!

If no button is pressed for about 8 seconds, the current values will be saved and the software exits to run mode.

1. Set hours.



2. Set minutes.



3. Set 12 h or 24 h display of time.



4. Set day of the week (1 = Monday, 7 = Sunday).



5. Set day of the month.



6. Set month.



7. Set year.



8. Press **OK** to return to run mode.

Date and time can also be set in the settings menu.

See section 13.7 Settings for more information.

### 13.5 Run mode

The timer can show the following information in the display.

- Clock
- Comfort/ECO mode activated
- Holiday mode
- Manual override

Use the **OK** button to toggle between the information available and showing current program setting.

### 13.6 Forced Comfort/ECO mode

Comfort or ECO mode can temporarily force the system to switch mode, depending on current mode. Forced mode will be activated until either switched back manually or if a scheduled program switches mode.

To activate forced mode:

1. Press any button to activate the display on the timer.
2. Use the **-** or **+** buttons until the icon for Comfort or ECO mode appears together with the icon for manual override.

 = Manual override

 = Comfort mode

 = ECO mode

3. Press **OK** to confirm the change. The overridden program and remaining time is shown.
4. Press **OK** again, or wait a couple of seconds to return to run mode.

### 13.7 Settings

In this menu all settings regarding the operation of the timer is set.

#### **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 the numbers **00** 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
  - 01** = Holiday mode
  - 02** = Autobalancing activation
  - 03** = ECO mode setback temperature
  - 08** = Display unit
  - 10** = Time and date
4. Press **OK** to enter parameter edit mode, the parameter starts flashing.
5. Change parameters in the submenus.
6. Press and hold the **OK** button for about 3 seconds to exit the settings menu.

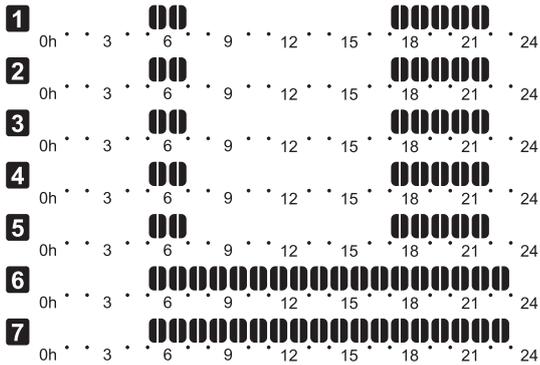
**00 PROGRAM**

In this menu, one of seven different scheduling programs for Comfort/ECO mode can be set. Program 1 to 6 is pre-programmed and the 7th is user defined. The scheduled programs show the day split into 30 minute intervals which is set to either Comfort (black marker) or ECO mode (blank marker).

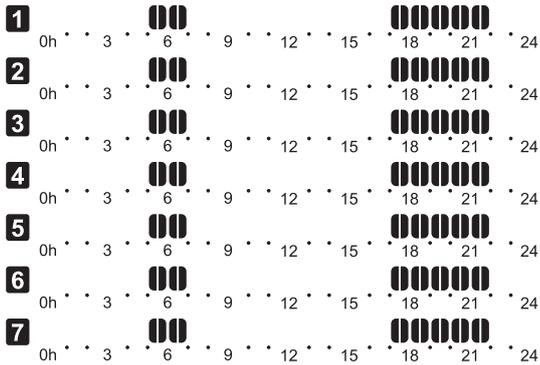
Program Off (default):

Controlled rooms are always set to Comfort mode.

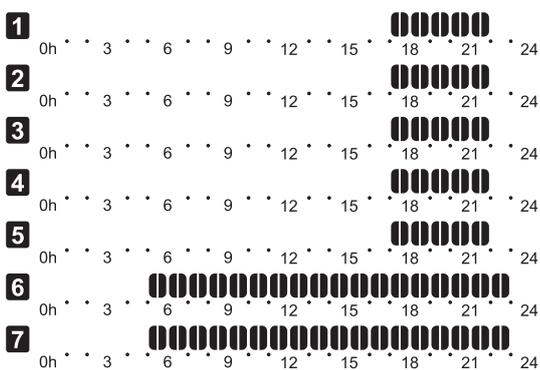
Program P1:



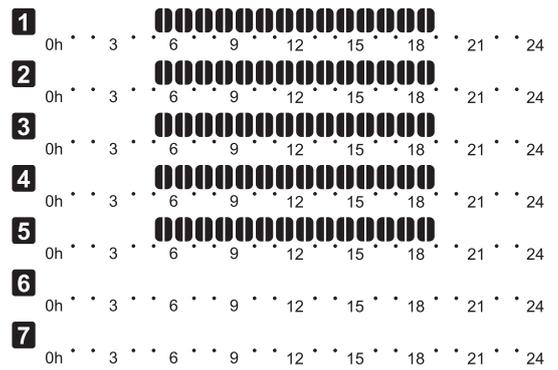
Program P2:



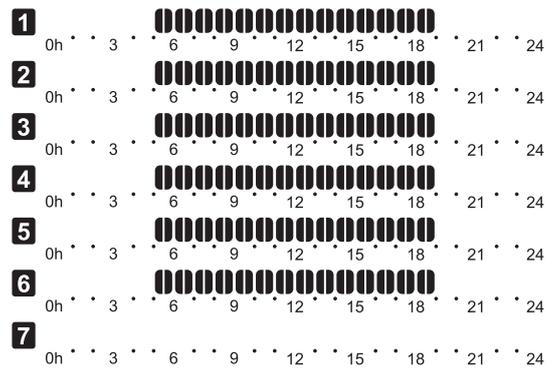
Program P3:



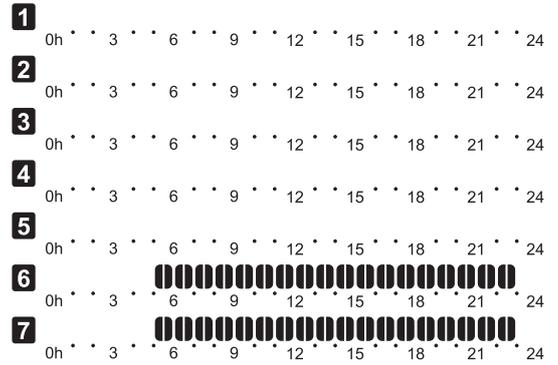
Program P4:



Program P5:



Program P6:



### Select scheduling program

To select a scheduling program:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to select program.  
Select between: **P1–P6**, **U** (user defined program) and **Off**.
3. Press **OK** to confirm program selection and return to the settings menu.

### Customise user defined program for a single day

To customise the user defined program:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to select program **U**.
3. Press **OK** to confirm program selection.  
The current day starts flashing.
4. Use buttons - or + to select a day.
5. Press and hold **OK** until **00:00** appears on the display (takes about 2 seconds).
6. Press **OK** to switch the marked interval between Comfort (☀) and ECO mode (☾).
7. Use buttons - or + to move the marker (at the bottom of the display). When moving the marker from one interval to another save the selected mode to that interval.
8. Repeat steps 6 and 7 until the display shows **23:30**.
9. Press + to finalize the current day and the software exits to the settings menu.
10. Repeat from step 1 to customise another day.

### Customise user defined program for a full week

NOTE! This method resets the current user defined program to factory defaults.

To customise the user defined program:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to select program **U**.
3. Press and hold **OK** until day **1** and **00:00** appears on the display.
6. Press **OK** to switch the marked interval between Comfort (☀) and ECO mode (☾).
7. Use buttons - or + to move the marker (at the bottom of the display). When moving the marker from one interval to another save the selected mode to that interval.
8. Repeat steps 6 and 7 until the display shows **23:30**.
9. Press + to finalize programming the current day.  
The text **Copy Yes** appears (Yes is flashing).
10. Use buttons - or + to select **Yes** or **No** and press **OK** to confirm.  
Select **Yes** to copy the setting of the current day to the next. Repeat for every day that should be identical.  
Select **No** and press **OK** to create a new scheduling interval for the following day. Then repeat steps 6 through 10 until the whole week is programmed.
11. The display returns to the settings menu when the final day is done.

### 01 HOLIDAY MODE

In this menu a time period can be set well in advance for when away on holiday. When activated, the timer attempts to reduce the system energy need by setting a different setpoint temperature for the system.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to set the number of days away.

*Default: 0d (day)*  
*Setting range: 1 – 44d (days)*

3. Press **OK** to confirm number of days. The temperature setting starts flashing.
4. Use buttons - or + to adjust the setpoint temperature during the previously set time period (holiday).

*Default: 17 °C*  
*Setting range: 5 – 35 °C, 0.5 °C increments*

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

### 02 AUTOBALANCING ACTIVATION

In this menu autobalancing can be activated for the system.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to activate/deactivate.

**on** = Activated (default)  
**OFF** = Deactivated

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

### 03 ECO MODE SETBACK TEMPERATURE

In this menu the ECO mode setback temperature for the analogue thermostats is set.

The setting changes the current setpoints (lowers in heating, and raises in cooling, with the set value) on the thermostats, when the system is set to ECO mode.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to change the parameter.

*Default: 4 °C*  
*Setting range: 0 – 11 °C, 0.5 °C increments*

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

### 08 DISPLAY UNIT

In this menu temperature display unit is set.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Use buttons - or + to toggle between Celsius and Fahrenheit.

**DEg °C** – degrees Celsius  
**DEg °F** – degrees Fahrenheit

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

## 10 TIME AND DATE

In this menu time and date is set. This setting is required to utilise scheduling programs in this timer.

Use buttons - or + to change the value. Press the **OK** button to set the value and move to the next editable value.



### NOTE!

In case of short power outages, an internal supercapacitor is used to save the time and date settings.

To change this setting:

1. Press **OK** to enter parameter edit mode.
2. Set hours.
3. Set minutes.
4. Set 12 h or 24 h display of time.
5. Set day of the week (1 = Monday, 7 = Sunday).
6. Set day of the month.
7. Set month.
8. Set year.
9. Press **OK** to confirm change and return to the settings menu.

## 13.8 Factory reset

Factory reset sets all parameter values to default settings.



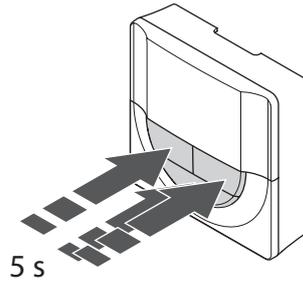
### NOTE!

Do not factory reset the timer if not absolutely needed.



### NOTE!

A factory reset removes the registration data from the timer.



To factory reset the timer:

1. Press and hold the -, + and **OK** buttons for about 5 seconds until the screen goes blank.
2. The timer is now reset to factory default.

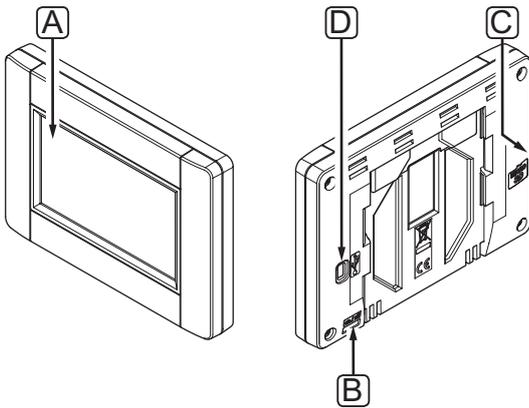
# 14 Operate Uponor Smatrix Base PRO interface

The interface provides a centralised management of the Uponor Smatrix Base PRO system with continuous information updates and access to system settings.

## Interface:

- Uponor Smatrix Base PRO Interface I-147

The illustration below shows the exterior of the interface.

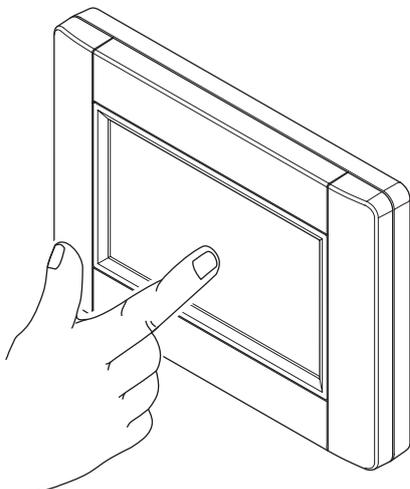


Pos.	Description
A	Screen
B	Power switch
C	MicroSD card slot
D	Mini USB connection

## 14.1 Touch screen

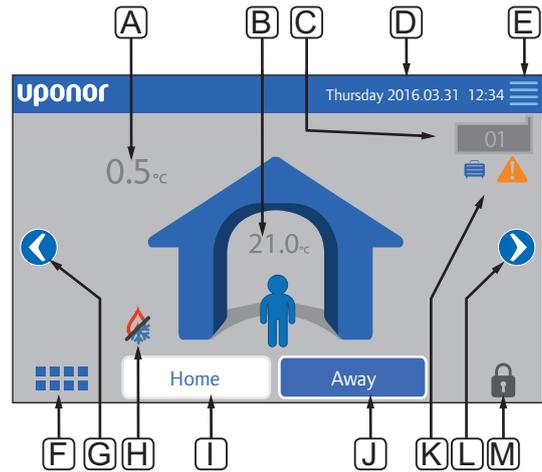
The interface has a touch screen as the main form of communication with the system.

The graphical user interface consists of large icons and buttons which adds to the user friendliness of the system.



## 14.2 Home screen

The home screen is the base of the menu system in the interface. Here basic information of the system is displayed and buttons to venture further into the menu system is available.



Pos.	Description
A	Outdoor temperature (requires outdoor temperature sensor)
B	Indoor temperature
C	Current controller (Base PRO with more than 4 controllers only), select a controller to get access to its room control
D	Date and time
E	Uponor Smatrix Move PRO status (if connected)
F	Main menu
G	Left button, go to the last room menu
H	Heating/cooling mode indication
I	Home button, activates Comfort mode
J	Away button, activates ECO mode
K	Notifications
L	Right button, go to the first room menu
M	Screen lock (requires a PIN-code if activated)

### 14.3 Navigating the menu system

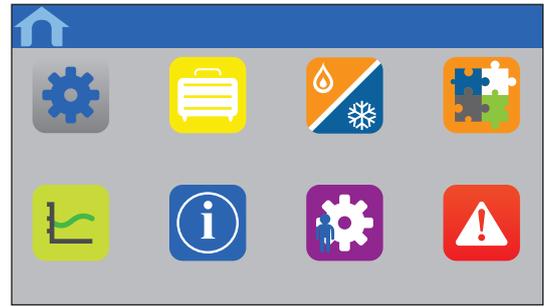
The menu system is navigated by the touch screen and is put together with a basic set of menu types.

#### General navigation buttons

Icon	Description
	Go to home menu
	Go back/cancel changes (if not saved)
	Scroll up and down in lists
	Scroll sideways or change sub menu (if available) The icon is grey if the option is not available
	Cancel settings and return to previous menu
	Move to the previous field
	Decrease value
	Increase value
	Move to the next field
	Confirm settings and return to previous menu or continue to next step in startup guide
	Settings Appears in some menus where more specific settings are available for a parameter

#### ICON GRID

The top most menu use icons for navigation. Press an icon to enter a submenu to change specific settings.



#### SETTINGS LIST

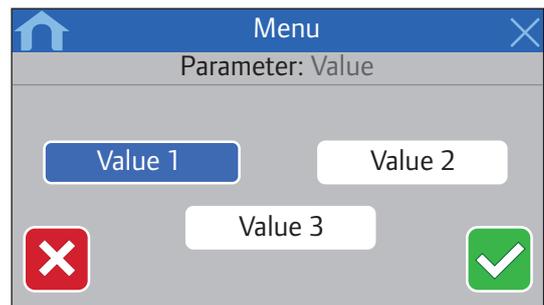
Most submenus have a list of available settings. Press the blue button for a setting to activate, select or set a parameter.



#### SELECT PARAMETER

Change the setting by pressing one of the parameter buttons. Blue button illustrates the chosen and/or previously saved parameter. White buttons illustrate available choices.

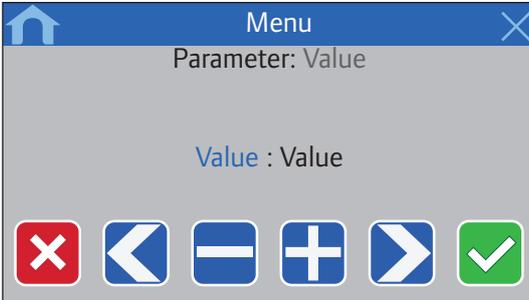
Save the parameter with the green check mark or cancel and revert to previous setting with the red X.



**SET PARAMETER**

Use the arrow buttons, < and >, to move the marker between characters and use buttons - or + to change the previously set value.

Save the parameter with the green check mark or cancel and revert to previous setting with the red X.



**ACTIVATION LIST**

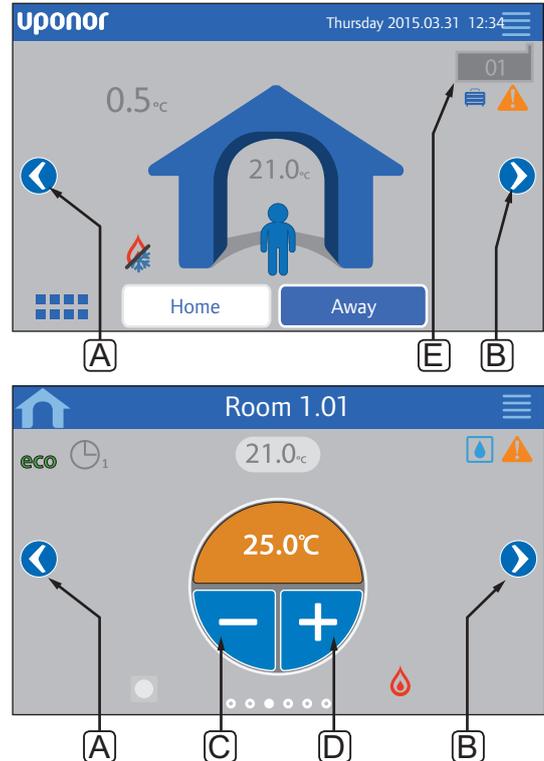
Activate or deactivate settings from a list by pressing on the blue button next to the parameter name.

Activated parameter is illustrated with a green check mark, deactivated with a red X.



**14.4 Adjust temperature**

With the interface the room temperature of every room in the system can be monitored and adjusted.



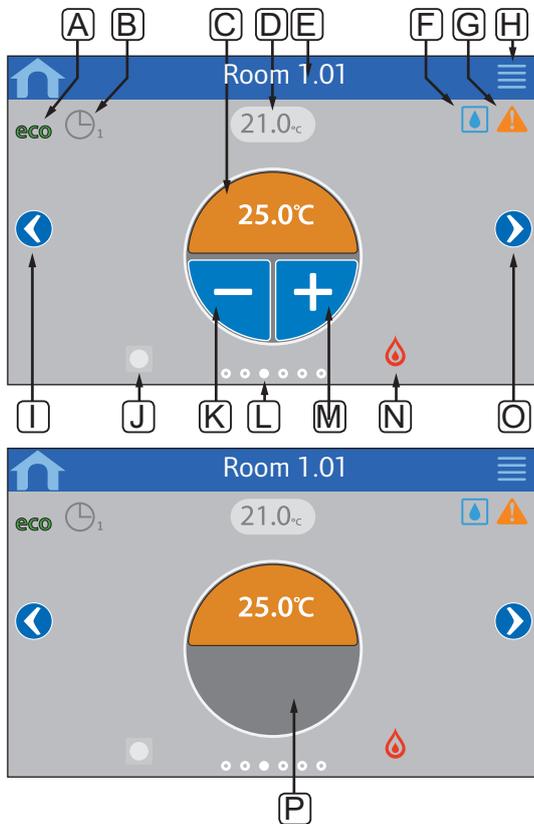
To adjust the temperature in a room:

1. Start from the home screen (if more than 4 controllers are connected to each other).
2. Select the controller (E) in control of the room.
3. Press the left or right arrow (A or B) until the right room menu is displayed.
4. Use buttons - or + (C and D) to adjust the setpoint temperature of the room. If **Thermostat override** (available in **Room settings**) is not allowed, a grey area is showed instead, and setpoint cannot be changed from the interface (for analogue thermostats only).

## 14.5 Room information

In this menu the setpoint for every room can be adjusted without the need to be at the affected thermostat.

Advanced information and settings are available in submenus.



Pos.	Description
A	ECO mode activated
B	Scheduling activated, number indicates which program
C	Setpoint temperature The background colour changes if the system is in heating (orange) or cooling mode (blue)
D	Current room temperature
E	Current room name (editable in room settings)
F	Relative humidity limit reached
G	Active alarms in alarm menu
H	Advanced room information menu button, room status, room settings, and room name
I	Left button, go to the preceding room menu
J	Remote thermostat indication - Blue if receiving setpoint from dial or public thermostat - Grey if dial or public thermostat is overridden by interface - Hidden if there is no dial or public thermostat in use in the current room
K	Decrease setpoint temperature
L	Current room menu indication
M	Increase setpoint temperature
N	Heating/cooling mode indication
O	Right button, go to the next room menu
P	The grey area indicates if the room is using an analog thermostat, with <b>Thermostat override</b> in the <b>Room settings</b> menu not allowed

## ROOM STATUS

This menu shows advanced information not available in the room information menu. It is accessible by pressing button **H** in the room information menu.

Information shown in the menu:

- Current room name
- Controller channels registered to the current room
- ECO mode setback temperature
- Floor sensor, if installed
- Battery status
- Radio status
- Room demand, active or inactive
- Actuator status, opened or not
- Current operating mode, heating or cooling
- Room cooling, enabled or disabled
- Bypass information
- Relative humidity sensor value
- Relative humidity control, activated or not
- Relative humidity setpoint

## ROOM SETTINGS

In this menu advanced settings on a room by room basis can be changed. It is accessible by pressing button **H** in the room information menu.

### Cooling

*Default: Allowed*

*Setting range: Allowed, Not allowed*

Set whether cooling is allowed in the room or not.

### ECO setback

*Default: 4.0 °C*

*Setting range: 0.0 – 11.0 °C, 0.5 °C increments*

Set the setback temperature for when entering ECO mode in a room.

The setting adjusts the current setpoint with the set value. In heating mode the setpoint is reduced and in cooling mode it is increased.

If the setback is set to 0, the thermostat will remain unaffected if a program sets the system in ECO mode.

### ECO profiles

Set, change or view current ECO profile schedules for the current room.

*See section 14.15 ECO profiles for more information.*

### Max setpoint

*Default: 35.0 °C*

*Setting range: min setpoint – 35.0 °C, 0.5 °C increments*

Set the maximum available setpoint temperature for the thermostat in the room.

This setting limits the thermostat placed in the room.

### Min setpoint

*Default: 5.0 °C*

*Setting range: 5.0 °C – max setpoint, 0.5 °C increments*

Set the minimum available setpoint temperature for the thermostat in the room.

This setting limits the thermostat placed in the room.

### Floor temp limit max

*Default: 26.0 °C*

*Setting range: min floor temp limit – 35.0 °C, 0.5 °C increments*

This setting is only available if a floor sensor is installed.

Set the maximum floor temperature limit, if a floor sensor is available in the room and the thermostat is set in RFT control mode.

### Floor temp limit min

*Default: 20.0 °C*

*Setting range: 5.0 °C – max floor temp limit, 0.5 °C increments*

This setting is only available if a floor sensor is installed.

Set the minimum floor temperature limit, if the thermostat is set in RFT control mode.

### Comfort setting

Default: 0% (Off)

Setting range: Inactive, 5 – 12%, 1% increments

Set basic level of comfort for the room when there is no demand for heating. It will shorten the heat up time for the room, which is useful in rooms where other heating sources, e.g. a fireplace, is present. The value is a percentage of time the actuators are opened.

### Thermostat override

Default: No

Setting range: Yes, No

Set whether the interface is allowed to override and manage the setpoint for analogue thermostats.

### Room used for average calculation

Default: Yes

Setting range: Yes, No

Set whether the current room is to be used to calculate average temperatures for the whole system. This value is only used to display a value and does not affect the operation of the system.

### ROOM NAME

Set a name for the room. This name will be used to identify the room in the interface.

## 14.6 Main menu

The main menu is the top most menu and it uses icons for navigation. Press an icon to enter a submenu to change specific settings.

### Menu tree

#### Main menu

System settings	
	General ECO setback
	System ECO profiles
	Valve/pump exercise
	Supply diagnostic
	Autobalance
	Room check
	Room bypass
	RH-Control
	SD card
	Ceiling cooling settings
Holiday	
Heating/Cooling	
	Cooling offset*
	Operating mode*
Integration	
	Controller relay
	General purpose input (GPI)
	Heat pump integration
	Supply water controller
	KNX Gateway
Trends	
Alarms	
Preferences	
	Language
	Display
	Regional settings
	Link
	Date & Time
	Factory reset
System info	

\* Only visible if cooling is available in Heating/Cooling menu

## 14.7 System settings

In this menu, system specific settings can be changed.

### GENERAL ECO SETBACK

Default: 4.0 °C

Setting range: 0.0 – 11.0 °C, 0.5 °C increments

Set a general ECO setback value that will be used to change the room setpoint temperature for all thermostats when in ECO mode. It will lower the setpoint in heating mode and raise the setpoint in cooling mode.



#### NOTE!

Changing this value will reset any individual room setback values already set and the new value will be transmitted to the thermostats.

### System ECO profiles

Set, change or view current ECO profile schedules for the whole system.

See section 14.15 ECO profiles for more information.



#### NOTE!

Setting an ECO profile on a system wide level will overwrite any existing ECO profiles set/created for all rooms in the system.

### VALVE/PUMP EXERCISE

Default: Valve and pump

Setting range: Inactive, Valve only, Valve and pump

Set exercise mode once a week during periods of low activity for the valves and/or pumps to avoid them getting stuck.

If activated, a day and time can be set.

### SUPPLY DIAGNOSTIC

Default: Inactive

Setting range: Active, Inactive

Activate a function checking whether the supply temperatures are too high or too low. The result is displayed after roughly 24 hours. If needed, information on how to optimise the system is also displayed.

### AUTOBALANCE

Default: Active

Setting range: Active, Inactive

Activate the autobalance function.

See section 3.5 Functions > Autobalance for more information.

### ROOM CHECK

This menu is only available to Base PRO systems with less than 5 controllers.

This is a diagnostic function detecting whether a room thermostat is installed in the right room.

The room check can be stopped any time by choosing **Inactive** in **Room check: Active**.

1. Set start time (preferably during the night).  
Default: 22:00
2. Set end time (preferably during the night).  
Default: 07:00
3. Set how much to increase the current setpoint value, for checking purposes.  
Default: 1.0 °C  
Setting range: 0.0 – 5.5 °C, 0.1 °C increments
4. Set how much to decrease the current setpoint value, for checking purposes.  
Default: 0.5 °C  
Setting range: 0.0 – 5.5 °C, 0.1 °C increments
5. Enter the room list and select which rooms to check.  
The function will check one thermostat per 24 hours.
6. Go back to the room check menu and select **Active** in **Room check: Inactive**.

The result is shown in **Room check results** when the room check has run its course.

 = OK

 = Not OK

 = Not checked

### ROOM BYPASS

Select a maximum of up to two rooms, for each controller, to act as a bypass in the system.

The bypass ensures that the actuators for these rooms are opened when there is no heating demand to maintain a minimum flow in the system.

Use rooms with a high heating demand (the coldest rooms) to avoid too high temperatures in rooms with low heating demands.

## RH CONTROL

General RH setpoint:

Default: 75%

Setting range: 0 – 100%, 1% increments

Deadzone (hysteresis):

Default: 5%

Setting range: 0 – 50%, 1% increments

Room RH Setpoint:

Default: 75%

Setting range: 0 – 100%, 1% increments

Set the general relative humidity setpoint and humidity deadzone (hysteresis). The setpoint shuts off cooling for the zone when the limit is reached and the hysteresis decides when the system is allowed to start cooling again.

The controller list displays rooms with a relative humidity (RH) sensor, for each controller if more than one. It is possible to activate RH control (✓ to activate, ✗ to deactivate) and set individual room RH setpoints.

These settings are only available if cooling is allowed and a RH sensor is installed in the system.

## SD CARD

Use a microSD card to clone interface settings or update the software in the interface.

See section 14.16 *MicroSD card for more information.*



### CAUTION!

Do not remove the microSD card while updating.

## CEILING COOLING SETTINGS

Set if a registered channel produces ceiling cooling (if available) or underfloor heating/cooling, for each controller if more than one.

These settings are only applicable if 4-pipe heating/cooling is installed in the system.

## 14.8 Holiday

When away on holiday, the system can be programmed in advance to reduce the system energy need by adjusting the setpoint while away.

Set **Enable Holiday mode** to **Yes** to enable holiday mode during the set period. The holiday mode icon is displayed on the home screen during the set period.

Cancel Holiday mode by entering the Holiday menu again and press **Yes**, when asked **Cancel Holiday mode?**

*This menu is not available when the system is in cooling mode.*

### START DATE

Default: Current time and date

Set a start date and time for the holiday.

### END DATE

Default: 24 hours later than set start date

Set end date and time for the holiday.

### HOLIDAY SETPOINT

Default: 17.0 °C

Setting range: 5.0 – 35.0 °C, 0.5 °C increments

Set an indoor temperature setpoint to be used during the holiday period.

### ENABLE HOLIDAY MODE

Default: No

Setting range: Yes, No

Select **Yes** and confirm to enable holiday mode during the set period.

## 14.9 Heating/Cooling

In this menu, settings regarding switching between heating and cooling are made.

First select if cooling is available in the system. When answering **Yes** a settings menu appears. In the settings menu (⚙️) **Cooling offset** and **Operating mode** can be set.

### COOLING OFFSET

*Default: 2.0 °C*

*Setting range: 0.0 – 5.0 °C, 0.5 °C increments*

Set the offset temperature for when to start cooling.

This value will be added to the current setpoint temperature (setpoint + cooling offset) if cooling is activated.

Cooling will start when the temperature in the room reaches setpoint + cooling offset.

### OPERATING MODE

*Default: H/C Slave*

*Setting range: H/C Master, H/C Slave (H/C input)*

Select how the system decides how to switch between heating and cooling.

**H/C Master** lets the user (forced start) or the system (external sensor input) decide when to switch between heating and cooling. **H/C Slave** switch between heating and cooling with an external input signal (on/off) connected to either the controller or a thermostat. A settings icon (⚙️) appears if choosing **H/C Master**.

#### ⚙️ H/C Master:

*Default: Force Heating*

*Setting range: Force Cooling, Force Heating, H/C Sensor*

Select to either force the system into cooling or heating, or to switch between cooling and heating with the help of an external sensor measuring the supply temperature.

H/C Sensor:

*Switch limit, default: 18.0 °C*

*Switch limit, Setting range: 5.0 – 30.0 °C, 0.5 °C increments*

*Hysteresis, default: 4.0 °C*

*Hysteresis, Setting range: 1.0 – 10.0 °C, 0.5 °C increments*

Set the limit and hysteresis at which supply temperature the system decides when to switch between heating and cooling.

## 14.10 Integration

This menu manages settings when integrating the system with other devices.

### CONTROLLER RELAY

*Default: Common pump (Base PRO), Individual pump (Base)*

*Setting range: Common pump, Individual pump*

Set controller relay mode. This menu is only shown if several controllers are registered to the interface.

#### Individual pump:

Relay status is set on a controller basis. One pump per controller is connected. If there a demand in one room of the controllers, only the pump connected to that controller is started.

#### Common pump:

Relay status is set on a system wide basis. One pump per system is connected (to the master controller only). If there is a demand in one room of the controllers, the main pump is started.

When set to **Common**, controller specific settings are made available.

For each registered controller, except the master controller, the pump output relay can be set to either **H/C switch** or **Inactive** (default). Making the relay able to switch between heating and cooling or deactivating it for the time being.

### GENERAL PURPOSE INPUT (GPI)

*Default: Heating/Cooling switch*

*Setting range: Heating/Cooling switch, ECO/Comfort switch, General System Alarm*

This menu is only available in a Base PRO system.

Set which kind of signal is to be received by the general purpose input.

## HEAT PUMP INTEGRATION

*Default: Inactive*

*Setting range: Active, Inactive*

*This menu is hidden and only available to Base PRO systems with less than 5 controllers. To access the menu, press and hold the menu title "Integration" on top of the screen until this submenu appears.*

*This function is only available in selected countries, contact a local Uponor office for more information.*



### CAUTION!

If **Heat pump integration** is deactivated make sure that it also is deactivated in the heat pump. Otherwise it may affect the operation of the heat pump.

When activated, the system will provide the heat pump with temperature sensor data from Uponor system thermostats to adjust the supply temperature. Device integration specific settings also appears.

### Dynamic heat curve:

*Default: Inactive*

*Setting range: Active, Inactive*

Activates dynamic adjustment of the system heat curve.

### Response:

*Default: Slow*

*Setting range: Slow, Moderate, Fast*

Set the response speed of the system.

A slow system takes longer to reach the setpoint, a fast system is faster but might overshoot the setpoint, and a moderate system is somewhere in between.

### Pulse input:

*Default: Inactive*

*Setting range: Inactive, Active*

Activate pulse input on the controller.

### Sensor values:

Activate the sensor values that should be sent to the heat pump for supply temperature calculations, select from a list.

### SUPPLY WATER CONTROLLER

*Default: Inactive*

*Setting range: Active, Inactive*

Activate if a supply water controller is connected to the Base PRO system.

*See separate documentation for more information.*

### KNX GATEWAY

*Default: Inactive*

*Setting range: Active, Inactive*

Activate if a KNX gateway is connected to the Base PRO system.

*See separate documentation for more information.*

## 14.11 Trends

This menu shows temperature and utilisation trends for the last 7 days, for up to 12 rooms at the time.

Select between showing:

- Curves showing average system temperature, average system setpoint temperature and outdoor temperature (if an outdoor sensor is installed).
- Curves showing indoor temperature and setpoint temperature for a room as well as outdoor temperature (if an outdoor sensor is installed).
- Bars showing a utilisation factor per room. The factor is the percentage of time when the actuator has been opened.

## 14.12 System info

This menu shows information about current software versions, the number of controllers connected and other interface specific information.

## 14.13 Preferences

In this menu, settings specific to the interface are made.

### LANGUAGE

Select language. Current language is shown in the icon before entering the setting.

More languages than shown in the list can be added using the microSD card.

### DISPLAY

#### Backlight:

*Default: 80%*

*Setting range: 10 – 100%, 1% increments*

Set backlight intensity

#### Return screen settings:

*Default: House*

*Setting range: House, Alarms, Trends*

Select which home screen to exit to, after about 3 minutes of inactivity.

#### Screen saver:

*Default: Inactive*

*Setting range: Active, Inactive*

Activate the screen saver. The screen will, after about 3 minutes of inactivity, exit to the home screen and dim the brightness to about 10%. It will brighten again when touched.

#### Switch off backlight during night?:

*Default: No*

*Setting range: No, Yes*

When activated the screen will, between 22:00 and 07:00, exit to the home screen and then shut it off after about 3 minutes of inactivity. It will start again when touched.

#### Screen lock:

*Default: Inactive*

*Setting range: Active, Inactive*

*This function requires a microSD card when being activated. It can be removed afterwards if needed without affecting the function or PIN-code.*

Activate the screen lock and set a PIN-code in the settings menu. The screen will revert to the home screen and lock after 3 minutes of inactivity. To unlock, press the lock-icon on the home screen and enter the set PIN-code. If an incorrect PIN-code is entered 3 times, instructions will appear on the screen on how to retrieve the PIN.

The PIN-code can be changed by accessing the settings menu once again and entering a new code.

The PIN-code is saved in a text-file (TS\_Lock.txt) on the microSD card. It can be easily retrieved and viewed using a computer. Editing or deleting the text-file will not change or deactivate the PIN-code on the interface.

#### Screen cleaner:

The screen cleaner deactivates the touch screen for about 30 seconds, allowing the user to clean the screen without pushing any on-screen buttons.

### REGIONAL SETTINGS

Set a time and date format, and temperature unit to use in the interface.

### LINK

Register and/or unregister one or more controllers to the interface.

#### Link touchscreen to controller:

*See section 8.5 Startup guide > Register the interface to a controller for more information.*

#### Unlink touchscreen from interface:

Select the controller to be unregistered from the list, and confirm the choice by pressing the green checkmark.

### DATE & TIME

Set time and date for the system.

### FACTORY RESET

Reset the interface to default values.

### 14.14 Alarms

This menu shows a list of current alarms in the system.

The list contains information about which kind of alarm it is (**Type**), where it is (**Rooms**) and when it occurred (**Time**).

Only the latest ten alarms are shown in this menu. Alarms older than these ten are deleted automatically, though all alarms is logged with a time stamp on the controller microSD card.

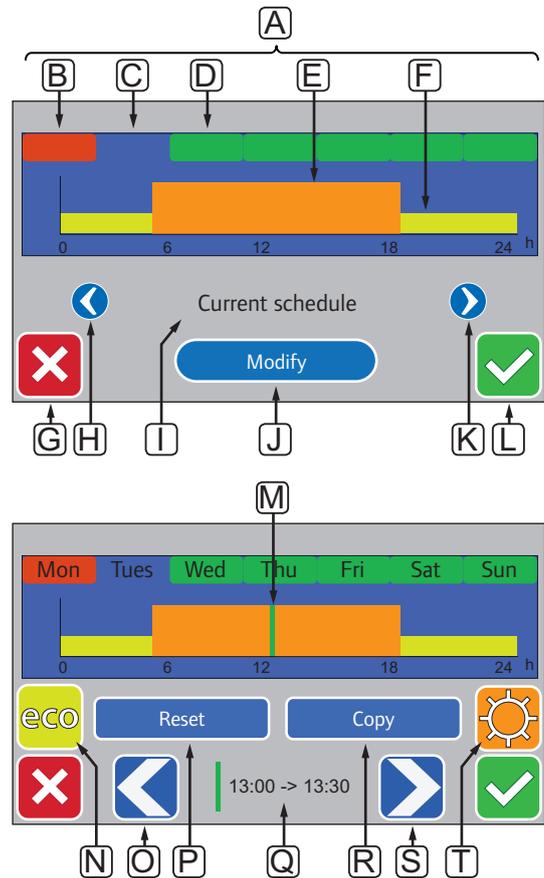
Alarms can be acknowledged and deleted (if remedied) individually or all at once.

 = Acknowledge and delete alarm

### 14.15 ECO profiles (scheduling)

Set, change or view current ECO profile schedules for the current room or system.

**NOTE!** Setting an ECO profile on a system wide level will overwrite any existing ECO profiles set/ created for all rooms in the system.



This illustration is an example showing most of the available graphics in this menu.

Pos.	Description
<b>A</b>	Weekdays, press one of the days to show or modify the schedule for that day
<b>B</b>	Weekday not yet programmed ( <b>Modify</b> only)
<b>C</b>	Weekday selected for viewing or programming
<b>D</b>	Programmed weekday
<b>E</b>	Programmed Comfort mode
<b>F</b>	Programmed ECO mode
<b>G</b>	Cancel settings and go to previous menu
<b>H</b>	Scroll programmed schedules left
<b>I</b>	Programmed schedule name
<b>J</b>	Modify programmed schedule (only shown for <b>Custom</b> schedule)
<b>K</b>	Scroll programmed schedules right
<b>L</b>	Confirm changes and go to previous menu
<b>M</b>	Position of programming marker, 30 minute interval ( <b>Modify</b> only)
<b>N</b>	Program ECO mode for marked 30 minute interval ( <b>Modify</b> only)
<b>O</b>	Move marker left ( <b>Modify</b> only)
<b>P</b>	Reset the custom schedule to default values ( <b>Modify</b> only)
<b>Q</b>	Time of day for programming marker ( <b>Modify</b> only)
<b>R</b>	Copy a schedule from other program ( <b>Modify</b> only)
<b>S</b>	Move marker right ( <b>Modify</b> only)
<b>T</b>	Program Comfort mode for marked 30 min interval ( <b>Modify</b> only)

## ACTIVATE A PROGRAMMED SCHEDULE

To select an ECO profile:

- Go to the **ECO profile** menu.
  - For a single room:
 

**Home screen > Room information > Room settings > ECO profile.**
  - For the whole system:
 

**Home screen > Main menu > System settings > ECO profile.**
- Use buttons < and > [**H** and **K**] to select a profile. The profile name is displayed at position **I**.
- Confirm and save with the green check mark [**L**].

## MODIFY CUSTOM PROFILE

To modify the custom ECO profile for a room:

- Go to the **ECO profile** menu.
  - For a single room:
 

**Home screen > Room information > Room settings > ECO profile.**
  - For the whole system:
 

**Home screen > Main menu > System settings > ECO profile.**
- Use buttons < and > [**H** and **K**] to select the **Custom** profile. The profile name is displayed at position **I**.
- Press **Modify** [**J**].
- Select (press) a weekday [**C**].
- Use buttons < and > [**O** and **S**] to move the marker [**M**] to a the time of the day.
- Press button **N** or **T** to set the selected 30 minute interval to ECO [**N**] or Comfort [**T**] mode. The marker moves automatically to the next 30 minute interval.
 

TIP! Press the button repeatedly to quickly set a large block of time.
- Repeat step 5 and 6 until the selected weekday is set.
- Repeat steps 4 to 7 until the whole week is set.
- Confirm and save with the green check mark [**L**].

## RESET THE CUSTOM PROFILE

To reset and start over with the custom ECO profile:

1. Go to the **ECO profile** menu.
  - 1.1 For a single room:
 

**Home screen > Room information > Room settings > ECO profile.**
  - 1.2 For the whole system:
 

**Home screen > Main menu > System settings > ECO profile.**
2. Use buttons < and > [**H** and **K**] to select the **Custom** profile. The profile name is displayed at position **I**.
3. Press **Modify** [**J**].
4. Press **Reset** [**P**].
5. Start modifying the custom profile.

## CREATE A CUSTOM PROFILE WITH A COPY

To create a custom ECO profile using an existing profile created for another room:

1. Go to the **ECO profile** menu.
  - 1.1 For a single room:
 

**Home screen > Room information > Room settings > ECO profile.**
  - 1.2 For the whole system:
 

**Home screen > Main menu > System settings > ECO profile.**
2. Use buttons **H** and **K** until the **Custom** profile is selected. Profile name is displayed at position **I**.
3. Press **Modify** [**J**].
4. Press **Copy** [**R**].
5. Select the room from where to copy the custom profile.
6. Confirm and save with the green check mark [**L**].

## 14.16 MicroSD card

The microSD card have several purposes for the interface. It can be used to update the software in the interface, clone interface settings, or adding display languages.

### UPDATE THE SOFTWARE



#### CAUTION!

Do not remove the microSD card while updating.

To update the software in the interface:

1. Download the software package from the Uponor website.
2. Eject the microSD card from the interface and insert it into a computer.
3. Copy the downloaded file to the microSD card.
 

NOTE! Use "Safely Remove Hardware and Eject Media", to not cause harm the SD-card when removing it from the computer.
4. Insert the microSD card into the interface.
5. Go to the **SD card** menu, **Main menu > System settings > SD card**.
6. Press **Update with SD-card**.
7. Confirm that system settings can be changed during the process.
8. Wait until the counter in interface has reached 100%, the interface has restarted and the home screen is shown again.
9. The software update is now complete.

## WRITE CLONED SETTINGS



### CAUTION!

Do not remove the microSD card while writing cloned settings.

To write cloned settings to the microSD card:

1. Go to the **SD card** menu, **Main menu > System settings > SD card**.
2. Press **Write cloned settings**.
3. Confirm that any existing cloned settings on the microSD card will be lost and replaced with the ones from the interface.
4. Wait until the interface shows a screen informing that the cloned settings has been saved.
5. A clone of the settings on the interface has now been saved on the microSD card.

## READ CLONED SETTINGS



### CAUTION!

Do not remove the microSD card while reading cloned settings.

To read cloned settings to the interface:

1. Use a microSD card from an identical system.
2. Replace the existing microSD card in the interface with the new one.
3. Go to the **SD card** menu, **Main menu > System settings > SD card**.
4. Press **Read cloned settings**.
5. Confirm that any existing settings will be lost and replaced with the ones on the microSD card.
6. Wait until the interface has restarted and the home screen is shown again.
7. Replace the microSD card with the old one.
8. The cloning of settings is now complete.

## ADD DISPLAY LANGUAGES

To add a new display language:

1. Insert a microSD card, containing the language packages (supplied with the interface), into the interface.
2. Go to the **Language** menu, **Main menu > Preferences > Language**.
3. Use buttons **<** or **>** to scroll between available language packages.
4. Select a new language and press the confirm button.

The current language package will be saved on the interface, overwriting the existing package, and the selected language will be set. The microSD card can be ejected without interfering with the language setting.

## 14.17 Factory reset of the interface



### NOTE!

Do not factory reset the interface if not absolutely needed.



### NOTE!

A factory reset removes the registration data from the interface.

To reset the interface to factory settings:

1. Go to the **Preferences** menu, **Main menu > Preferences**.
2. Press **Factory reset**.
3. Press and hold the confirm button to initiate factory reset. All existing settings will be lost and reset to factory default values.
4. Wait until the interface has restarted and the start up guide is shown.
5. The process of factory reset of the interface is now complete.

# 15 Maintenance

The maintenance of Uponor Smatrix Base/Base PRO includes the following:

- Manual preventive maintenance
- Automatic preventive maintenance
- Corrective maintenance
- Controller LEDs

## 15.1 Manual preventive maintenance

Uponor Smatrix Base requires no preventive maintenance except cleaning:

1. Use a dry soft cloth to clean the components.



### **WARNING!**

Do not use any detergents to clean the Uponor Smatrix Base components.

## 15.2 Automatic preventive maintenance

Uponor Smatrix Base/Base PRO is equipped with an automatic exercise function. This function consists of a test run designed to prevent the pump and actuators from seizing up due to inactivity.

This exercise is run every 6 days  $\pm$ 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.

If the system includes an Uponor Smatrix Base PRO interface, the exercise function can be used at any time.

## 15.3 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 (heating mode only) 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.

### 15.4 Controller LEDs

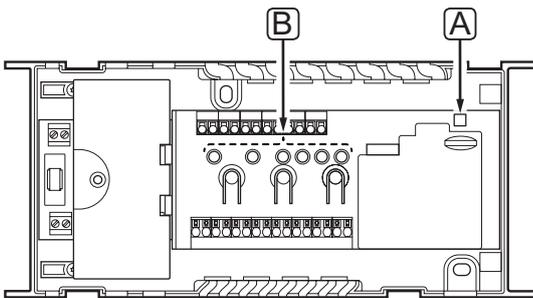
If no Uponor Smatrix Base PRO interface is connected to the system, it is recommended to occasionally check the power LED on the controller for alarms. The power LED flashes continuously for general alarms. Determine which thermostats are issuing alarms by removing the cover. If a channel LED is indicating an error, check the function 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.



Item	Description
A	Power LED
B	Channel LEDs

The table below describes the status of the controller LEDs.

LED	Status
Power	<p>The controller power LED is always on and flashes when a problem occurs, such as:</p> <ul style="list-style-type: none"> <li>• Loss of communication from a thermostat for more than 1 hours</li> <li>• Loss of communication from the timer (Base only) or an interface (Base PRO only) for more than 15 minutes</li> </ul>
Channel during run mode	<ul style="list-style-type: none"> <li>• Red, on – actuators activated</li> <li>• Red flashing – thermostat communication error</li> <li>• Red flashing – tamper alarm (public thermostat T-143)</li> <li>• Off – no demand for heating or cooling</li> </ul>
Channel during registering mode	<ul style="list-style-type: none"> <li>• Red, on – thermostat registered but with communication errors</li> <li>• Green, on – thermostat registered and communication is OK</li> <li>• Red flashing – selector pointing at channel</li> <li>• Green flashing – channel selected to be registered</li> <li>• Off – channel not pointed nor registered</li> </ul>
Channel during forced mode	<ul style="list-style-type: none"> <li>• Red, on – actuators activated</li> <li>• Red flashing – selector pointing at channel</li> <li>• Off – channel not pointed nor activated</li> </ul>

## 15.5 Restore from backup (Base PRO only)

If an existing Uponor Smatrix Base PRO controller has been replaced, installation data (including thermostat registration data) from the replaced controller can be reused to setup the new controller.



### CAUTION!

Make sure the controller is powered off before ejecting the microSD card.



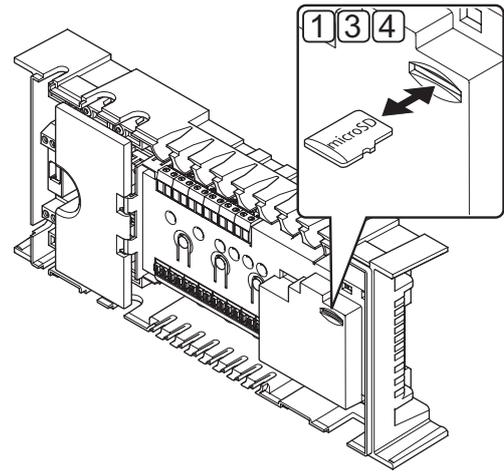
### NOTE!

When replacing a controller, the microSD card from the replaced unit must be used in the new controller. Otherwise all registrations must be redone.



### NOTE!

When a controller 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.



### Preparation

1. Eject the microSD card from the malfunctioning controller.

### Restore from backup to new controller

2. Power off the new controller.
3. Eject the existing microSD card from the new controller.
4. Insert the microSD card containing the installation data from the malfunctioning controller into the new one.
5. Power on the new controller.

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

# 16 Troubleshooting

The table below shows problems and alarms that can occur with Uponor Smatrix Base/Base PRO and describes solutions. A common cause of a problem though may be due to wrongly installed loops or mixed up thermostats.

*In case of mixed up thermostats in a Uponor Smatrix Base PRO system, use the room check function, see section 14.7 System settings for more information.*

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 boiler or shunt If an interface is connected to the system (Base PRO only), run supply diagnostic test
	Room temperature does not match setpoint on 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 and make sure that the wiring is OK Check the interface (if installed) for an error indicating that a thermostat has lost connection (Base PRO only) Reconnect if the connection is lost
	Room temperature does not match setpoint on thermostat	The thermostat is placed in direct sunlight or close to other heat sources The thermostat is placed in the wrong room.	Check placement of the thermostat according to installation instructions and change location if needed Check the placement of the thermostats and change rooms if needed. If an interface is available the room check function can be used. <i>See section 14.7 Settings &gt; Room check for more information.</i>
The room is too cold (or too warm in cooling mode)	Press – or + buttons to display the temperature setpoint on the thermostat	The thermostat setting is too low	Change the temperature setpoint Use maximum and minimum floor temperature limitation settings to protect the system from consequences of unreasonable temperature settings (only if floor temperature sensor is installed)
	The temperature displayed on the thermostat changes after the thermostat is moved	The thermostat may be influenced by an external heat source	Change 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 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 (if installed, Base PRO only)
	ECO in room information menu	ECO mode	Change ECO profile or assign another profile to the room in the interface (if installed, Base PRO only) Reduce the ECO setback value for the thermostat
	Supply temperature from the integrated heat pump (if installed, Base PRO only) is too low after deactivating heat pump integration in the interface	Heat pump integration is still activated in the connected heat pump	Deactivate heat pump integration in the heat pump ( <i>see documentation for the heat pump</i> ) Disconnect the wires between the heat pump integration connectors on the controller and the heat pump

Problem	Indication	Probable cause	Solutions
The room is too warm (or too cold in cooling mode)	Corresponding loop is warm even after a long period without heat call	An actuator does not close	Contact the installer Check that the actuator is correctly installed Replace the actuator
The floor is cold	The room temperature OK but the floor is cold	No heat demand from the underfloor heating system  The room is heated by another heat source	
All rooms are cold (or warm in cooling mode)	Holiday mode	Icon displayed in the interface (if installed, Base PRO only) or timer (Base only)	Cancel Holiday mode
	ECO mode for rooms in timer or digital thermostat T-148	ECO mode	Change ECO profile or assign another profile to the room/system  Reduce the ECO setback value for the thermostats  Reduce the General ECO setback value in the interface (if installed, Base PRO only) or timer (Base only)
	Check the chiller (boiler) information and operation mode of the thermostats	The system is in cooling (heating) mode	Correct signal from external device needed
Disturbing noise from the pump at the same time and day of the week			Change time for pump exercise (requires Base PRO with interface I-147)
No communication	Communication error Software versions incompatible	Registration lost	Contact the installer  Check registration status of the interface and the controller (if installed, Base PRO only)  Register the interface again (if installed, Base PRO only)
Communication failure between the controllers	Communication error	Registration to controller is lost	Contact the installer  Check the registration status of the interface and controller  Check the controller configuration  Check the wiring
Frozen display in the interface	No response when pressing a button	General failure	Restart the interface (power off the interface, wait about 10 seconds and power it on again)

## 16.1 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	<ol style="list-style-type: none"> <li>1. Check that the controller is connected to AC power</li> <li>2. Check the wiring in the 230 V compartment</li> <li>3. Check that there is 230 V AC power in the wall socket</li> </ol>
	There is 230 V AC power in the wall socket	Blown controller fuse or faulty power cable	<ol style="list-style-type: none"> <li>1. Replace the fuse and/or power cable and plug</li> </ol>
The thermostats is faulty	Channel LEDs in the controller continue flashing	The cable is not connected or a wire is damaged	Check the wiring

## 16.2 Digital thermostats T-146, T-148 and T-149 alarms/problems

An alarm is sent when more than 1 hour have elapsed since the controller received the last communication from the thermostat.

The table below shows problems that can occur in the digital thermostats T-146 and T-148.

Indication	Probable cause	Solutions
The display is off	The cable is not connected or a wire is damaged	Check the wiring
No communication icon (📶) is displayed on thermostat screen when -/+ buttons are pressed	The cable is not connected or a wire is damaged.	Check the wiring
	The thermostat is broken	<ol style="list-style-type: none"> <li>Force the thermostat to transmit by changing the temperature setpoint</li> <li>Replace the thermostat</li> </ol>
Relative humidity icon (💧) is displayed (T-148 only)	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	<ol style="list-style-type: none"> <li>Check the connection of the floor sensor</li> <li>Disconnect the floor temperature sensor and check it with an ohmmeter. The value must be around 10 kohms</li> </ol>
The icon for outdoor temperature sensor (🌡️) flashes	Faulty temperature sensor	<ol style="list-style-type: none"> <li>Check the connection of the outdoor sensor</li> <li>Disconnect the floor temperature sensor and check it with an ohmmeter. The value must be around 10 kohms</li> </ol>
The icon for indoor temperature sensor (🏠) flashes	Faulty temperature sensor	<ol style="list-style-type: none"> <li>Contact the installer or replace the thermostat</li> <li>Disconnect the remote temperature sensor (if connected) and check it with an ohmmeter. The value must be around 10 kohms</li> </ol>

The table below shows problems that can occur in the digital thermostat T-149.

Indication	Probable cause	Solutions
Alarm icon  is displayed	An error has occurred	Go to the alarm list for more information
The display is off	The cable is not connected or a wire is damaged.	Check the wiring
Communication icon  is displayed in the alarm list	The thermostat is broken	Force the thermostat to transmit by changing the temperature setpoint Replace the thermostat
Relative humidity icon  is displayed in the alarm list	The relative humidity limit is reached	Lower the humidity level by increasing the ventilation or temperature setpoint
Floor temperature sensor icon  is displayed in the alarm list	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 10 kohms
Outdoor temperature sensor icon  is displayed in the alarm list	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 10 kohms
Indoor temperature sensor icon  is displayed in the alarm list	Faulty temperature sensor	Contact the installer or replace the thermostat
Remote temperature sensor icon  is displayed in the alarm list	Faulty temperature sensor	Contact the installer or replace the remote sensor Disconnect the remote temperature sensor (if connected) and check it with an ohmmeter. The value must be around 10 kohms

### 16.3 Analogue thermostat T-143 alarms/problems

An alarm is sent when more than 1 hour have elapsed since the controller received the last communication from the thermostat.

The table below lists problems that can occur in thermostats T-143.

Indication	Probable cause	Solutions
The channel LED on the controller flashes	Tamper alarm is activated and a public thermostat T-143 is removed from the wall	Check the thermostat settings and put it back on the wall

### 16.4 Contact the installer

For installer contact information, see the installation report in 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

### 16.5 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.

# 17 Technical data

## 17.1 Technical data

<b>General</b>	
IP	IP20 (IP: degree of inaccessibility to active parts of the product and degree of water)
Max. ambient RH (relative humidity)	85% at 20 °C
<b>Thermostat and timer</b>	
CE marking	
ERP (thermostat only)	IV
Low voltage tests	EN 60730-1* and EN 60730-2-9***
EMC (electromagnetic compatibility requirements) tests	EN 60730-1
Power supply	From controller
Voltage	4.5 V to 5.5 V
Operating temperature	0 °C to +45 °C
Storage temperature	-10 °C to +70 °C
Connection terminals (I-143, T-143, T-144, T-145, T-146, and T-148)	0.5 mm <sup>2</sup> to 2.5 mm <sup>2</sup>
Connection terminals (T-141 and T-149)	0.25 mm <sup>2</sup> to 0.75 mm <sup>2</sup> solid, or 0.34 mm <sup>2</sup> to 0.5 mm <sup>2</sup> flexible with ferrules
<b>Interface (Base PRO only)</b>	
CE marking	
Low voltage tests	EN 60730-1 and EN 60730-2-1
EMC (electromagnetic compatibility requirements) tests	EN 60730-1
Power supply	230 V AC +10/-15%, 50 Hz in wall box or mini USB connection
Operating temperature	0 °C to +45 °C
Storage temperature	-20 °C to +70 °C
<b>Controller/interface SD card (Base PRO only)</b>	
Type	micro SDHC, UHS or Standard
Capacity	4 GB to 32 GB, FAT 32 formatting
Speed	Class 4 to 10 (or higher)

Controller	
CE marking	
ERP	Base: IV Base PRO: VIII
Low voltage tests	EN 60730-1* and EN 60730-2-1**
EMC (electromagnetic compatibility requirements) tests	EN 60730-1
Power supply	230 V AC +10/-15%, 50 Hz or 60 Hz
Internal fuse	F3.15AL 250 V, 5x20 3.15A quick acting
Internal fuse, Heat pump output	TR5-T 8.5 mm Wickmann 100 mA Time lag
Operating temperature	0 °C to +45 °C
Storage temperature	-20 °C to +70 °C
Maximum consumption (Base)	40 W
Maximum consumption (Base PRO)	45 W
Pump and boiler relay outputs	230 V AC +10/-15%, 250 V AC 8 A maximum
General purpose input (GPI)	Only dry contact
Heat pump input (Base PRO only)	12 – 24 V DC /5 – 20 mA
Heat pump output (Base PRO only)	5 – 24 V DC /0.5 – 10 mA, current sink ≤ 100 mW
Valve outputs	24 V AC, 0.2 A average, 0.4 A peak
Power connection	1 m cable with europlug (except UK)
Connection terminals for power, pump, GPI and boiler	Up to 4.0 mm <sup>2</sup> solid, or 2.5 mm <sup>2</sup> flexible with ferrules
Connection terminals for bus communication	0.5 mm <sup>2</sup> to 2.5 mm <sup>2</sup>
Connection terminals for valve outputs	0.2 mm <sup>2</sup> to 1.5 mm <sup>2</sup>

\*) 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



Usable in all Europe



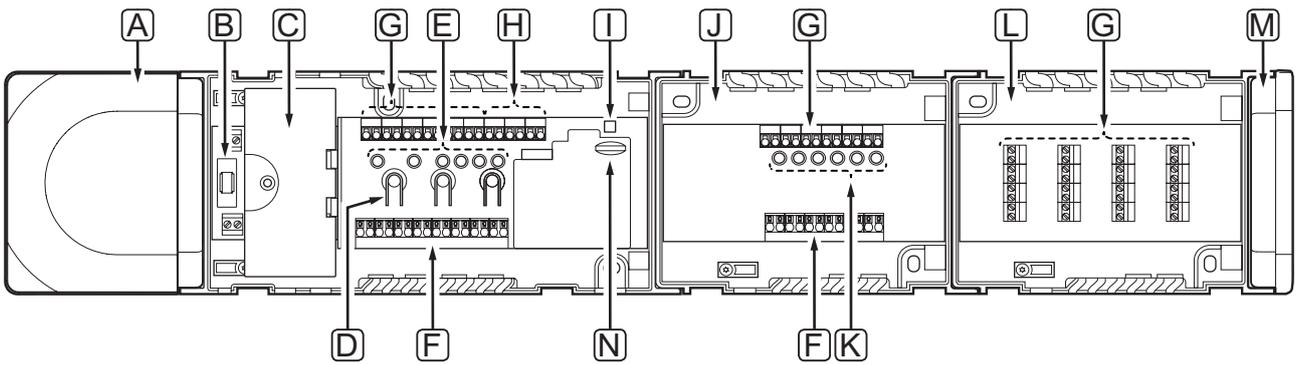
Declaration of conformity:

We hereby declare under our own responsibility that products dealt with by these instructions satisfy all essential demands linked to the information stated in the Safety instruction booklet.

## 17.2 Technical specifications

Cables	Standard cable length	Maximum cable length	Wire gauge
Cable from controller to actuator	0.75 m	20 m	<b>Controller:</b> 0.2 mm <sup>2</sup> to 1.5 mm <sup>2</sup>
External sensor cable to thermostat	5 m	5 m	0.6 mm <sup>2</sup>
Floor sensor cable to thermostat	5 m	5 m	0.75 mm <sup>2</sup>
Outdoor sensor cable to thermostat	-	5 m	Twisted pair
Cable from relay switch to controller GPI input	2 m	20 m	<b>Controller:</b> Up to 4.0 mm <sup>2</sup> solid, or 2.5 mm <sup>2</sup> flexible with ferrules <b>Relay:</b> 1.0 mm <sup>2</sup> to 4.0 mm <sup>2</sup>
Cable to/from heat pump to controller heat pump input/output (Base PRO only)	-	30 m	Twisted pair

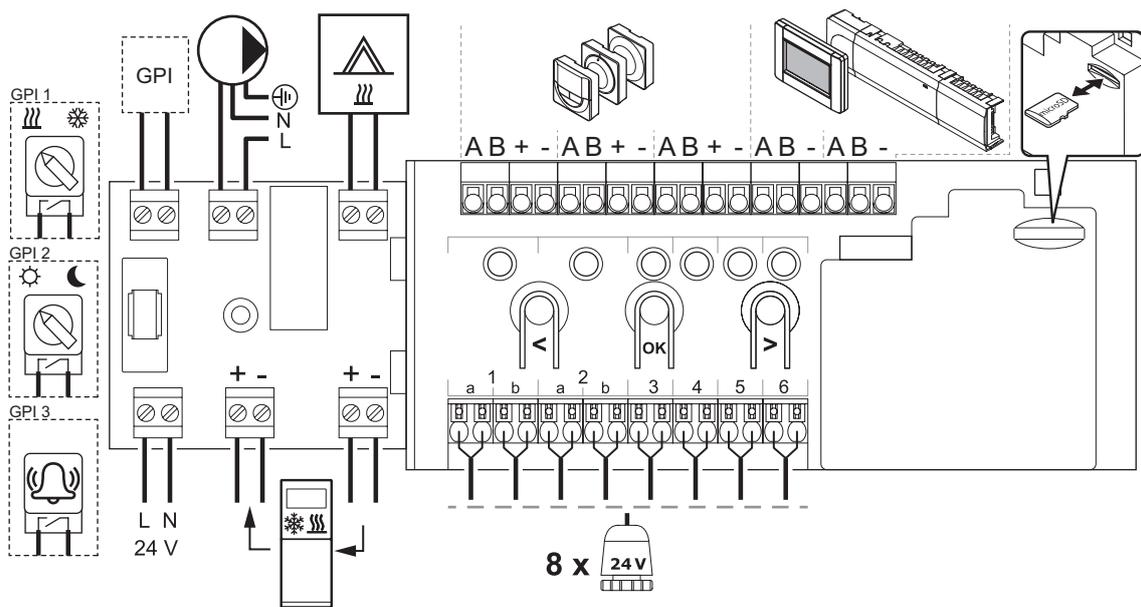
### 17.3 Controller layout



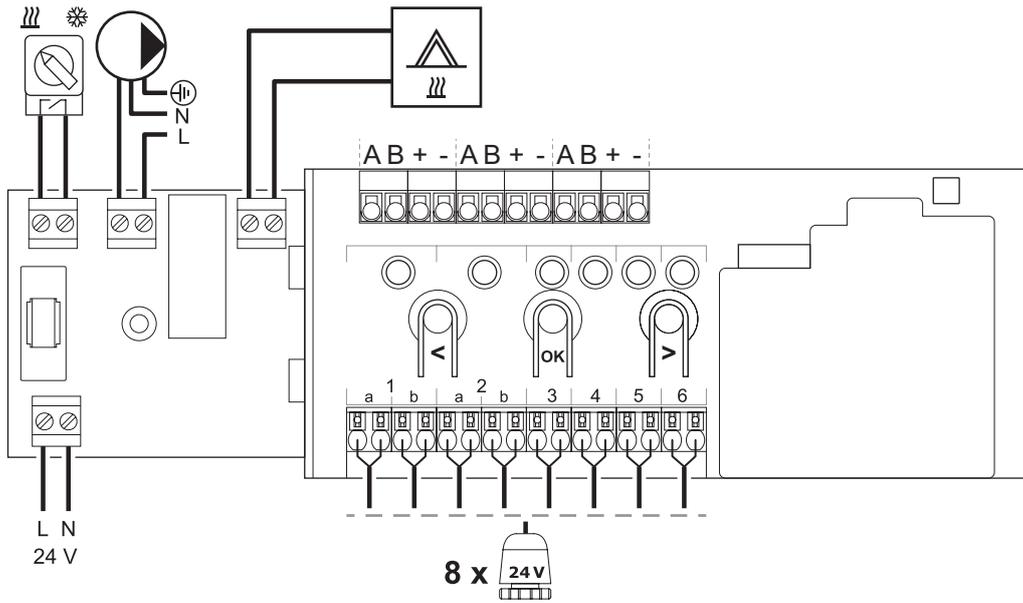
Item	Description
A	Transformer, 230 V AC 50 Hz power module
B	Fuse (T5 F3.15AL 250 V)
C	Optional inputs and outputs (pump and boiler management, and heat pump connection)
D	Channel registration buttons
E	LEDs for channels 01 – 06
F	Quick connectors for actuators
G	Bus connection terminals
H	System bus connection terminals (Base PRO only)
I	Power LED
J	Uponor Smatrix Base Slave Module M-140 (optional slave module)
K	LEDs for channels 07 – 12
L	Uponor Smatrix Base Star Module M-141 (optional star module)
M	End cap
N	MicroSD card (Base PRO only)

### 17.4 Wiring diagrams

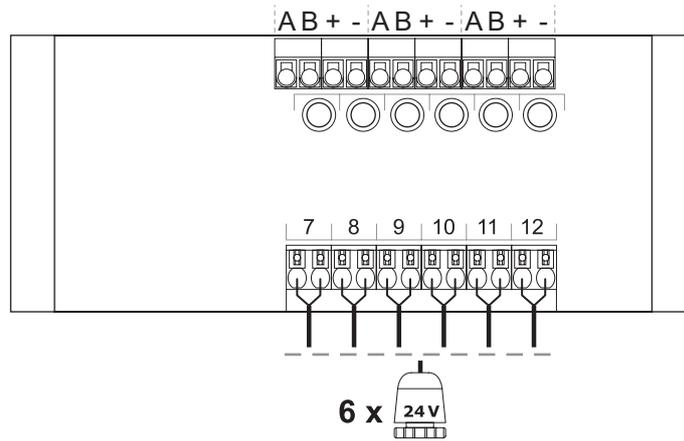
#### UPONOR SMATRIX BASE PRO CONTROLLER



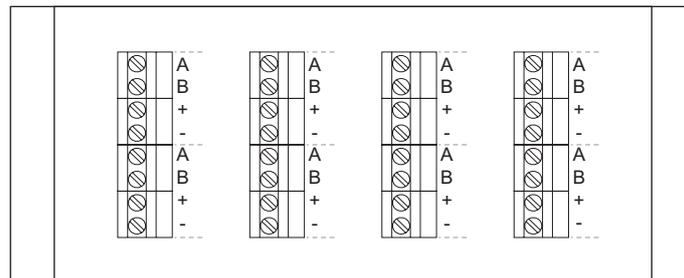
**UPONOR SMATRIX BASE CONTROLLER**



**SLAVE MODULE**

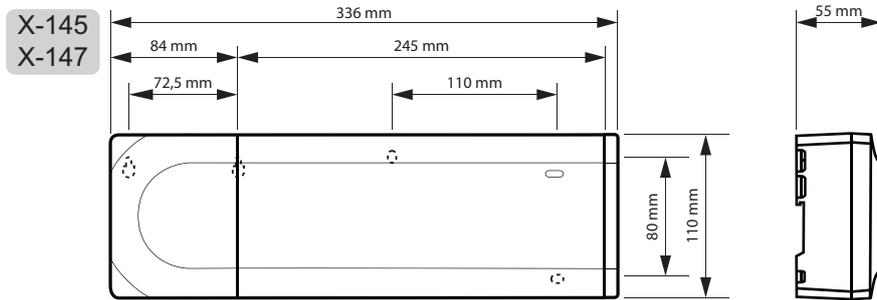


**STAR MODULE**

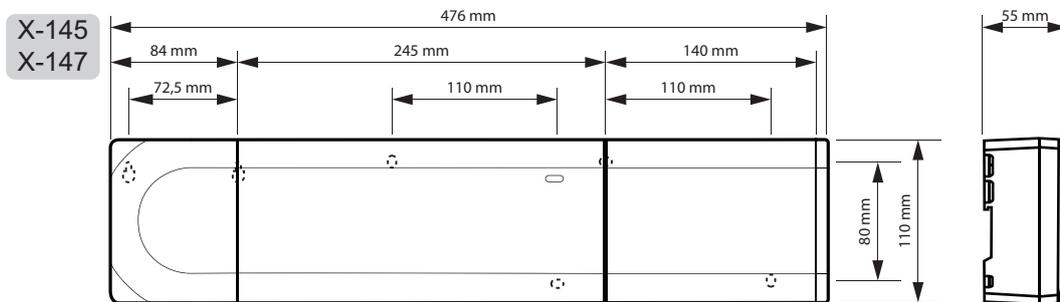


## 17.5 Dimensions

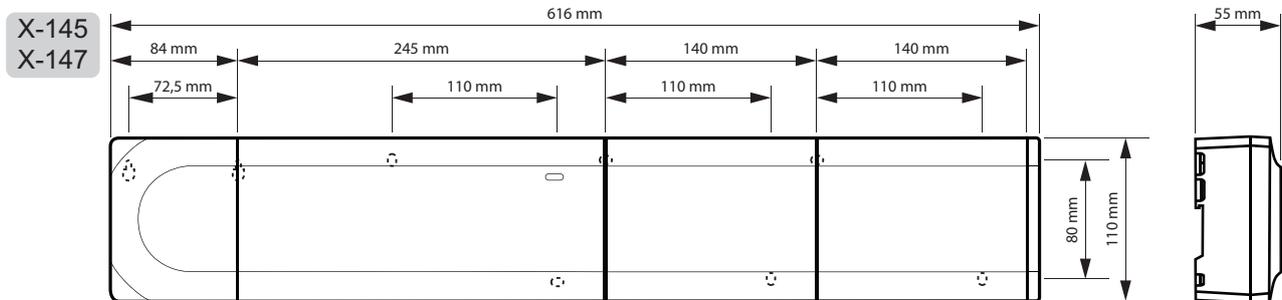
### CONTROLLER (WITH TRANSFORMER AND END CAP)



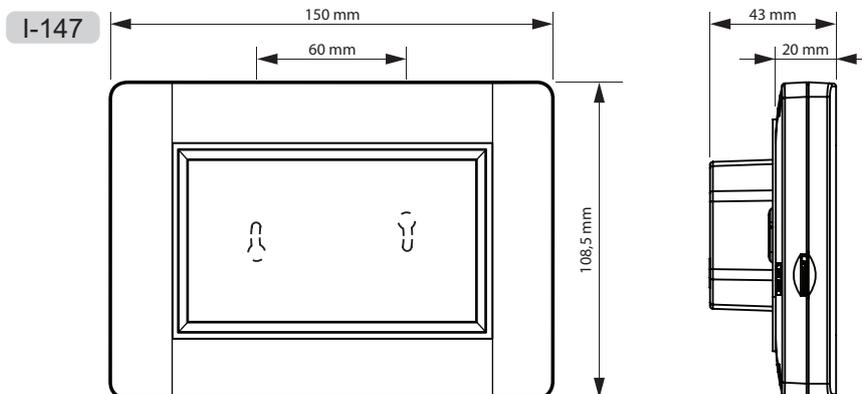
### CONTROLLER (WITH SLAVE MODULE, TRANSFORMER AND END CAP)



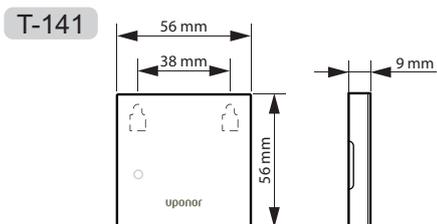
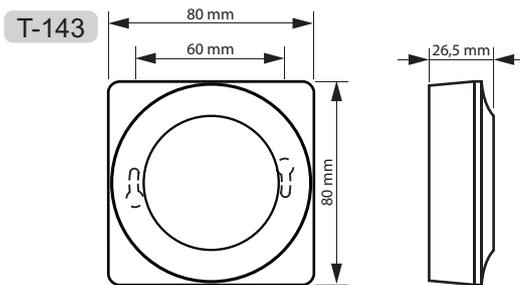
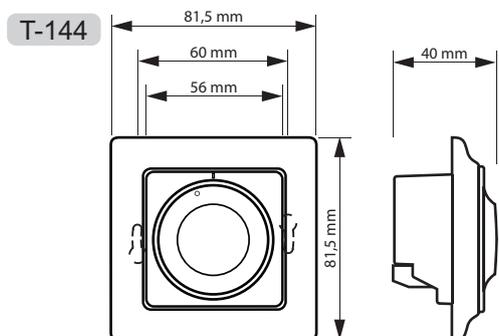
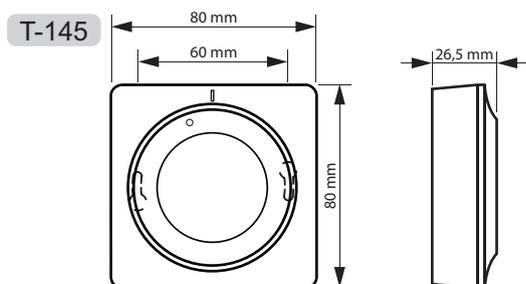
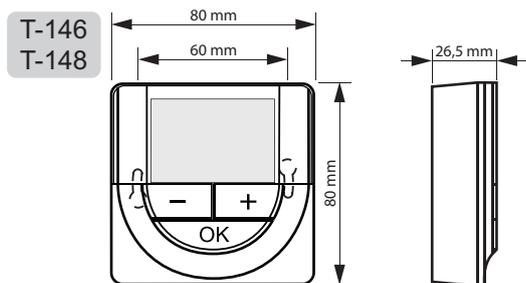
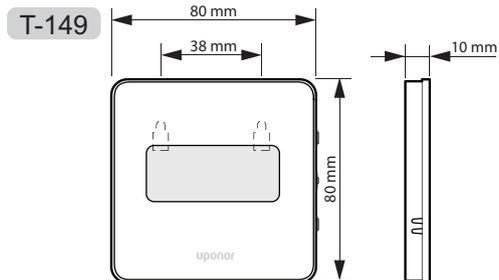
### CONTROLLER (WITH SLAVE MODULE, TRANSFORMER, STAR MODULE AND END CAP)



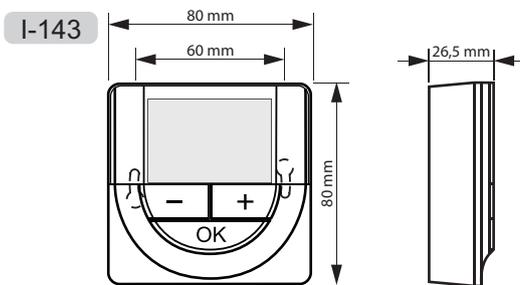
### INTERFACE



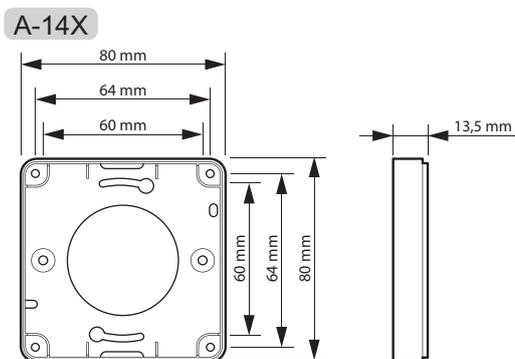
THERMOSTATS



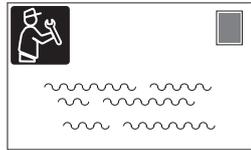
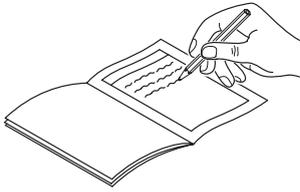
TIMER



STYLE THERMOSTAT (T-141 AND T-149) SURFACE ADAPTOR



# 18 Installation report




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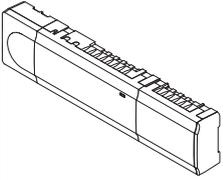
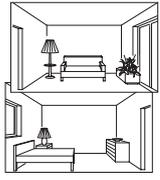
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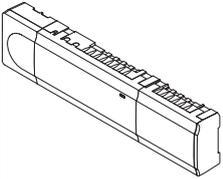
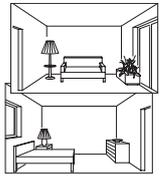


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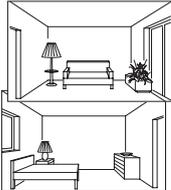


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	Controller # 1	Controller # 2	Controller # 3	Controller # 4	Controller # 5	Controller # 6	Controller # 7	Controller # 8	
<b>Registered system device</b>									<b>Room name</b>
Interface									
Timer									
Outdoor sensor									
Heating/cooling switch sensor									
ECO/Comfort switch									
Pump	Yes <input type="checkbox"/>								
	No <input type="checkbox"/>								
Star module	Yes <input type="checkbox"/>								
	No <input type="checkbox"/>								

	Controller # 9	Controller # 10	Controller # 11	Controller # 12	Controller # 13	Controller # 14	Controller # 15	Controller # 16	
<b>Registered system device</b>									<b>Room name</b>
Interface									
Pump	Yes <input type="checkbox"/>								
	No <input type="checkbox"/>								
Star module	Yes <input type="checkbox"/>								
	No <input type="checkbox"/>								

### 18.1 Controller 1

Thermostat	Controller channel						Slave module channel					
	1	2	3	4	5	6	7	8	9	10	11	12
 T-149												
 T-148												
 T-146												
 T-145												
 T-144												
 T-143												
 T-141												
<b>Connected external sensor</b>												
Floor sensor												
Outdoor sensor												
Remote sensor												
<b>Connected actuator</b>												
												
<b>Room name</b>												
												



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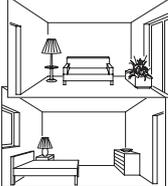
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## 18.2 Controller 2

Thermostat	Controller channel						Slave module channel					
	1	2	3	4	5	6	7	8	9	10	11	12
 T-149												
 T-148												
 T-146												
 T-145												
 T-144												
 T-143												
 T-141												
<b>Connected external sensor</b>												
Floor sensor												
Outdoor sensor												
Remote sensor												
<b>Connected actuator</b>												
												
<b>Room name</b>												
												



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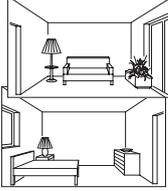
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### 18.3 Controller 3

Thermostat	Controller channel						Slave module channel					
	1	2	3	4	5	6	7	8	9	10	11	12
 T-149												
 T-148												
 T-146												
 T-145												
 T-144												
 T-143												
 T-141												
<b>Connected external sensor</b>												
Floor sensor												
Outdoor sensor												
Remote sensor												
<b>Connected actuator</b>												
												
<b>Room name</b>												
												



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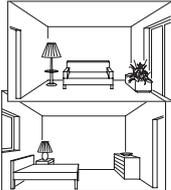
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### 18.4 Controller 4

Thermostat	Controller channel						Slave module channel					
	1	2	3	4	5	6	7	8	9	10	11	12
 T-149												
 T-148												
 T-146												
 T-145												
 T-144												
 T-143												
 T-141												
<b>Connected external sensor</b>												
Floor sensor												
Outdoor sensor												
Remote sensor												
<b>Connected actuator</b>												
												
<b>Room name</b>												
												



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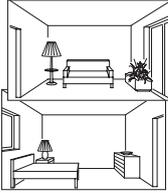
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### 18.5 Controller 5 – 16

Use this page as a template for Base PRO controllers 5 – 16

Thermostat	Controller channel						Slave module channel					
	1	2	3	4	5	6	7	8	9	10	11	12
 T-149												
 T-148												
 T-146												
 T-145												
 T-144												
 T-143												
 T-141												
<b>Connected external sensor</b>												
Floor sensor												
Outdoor sensor												
Remote sensor												
<b>Connected actuator</b>												
												
<b>Room name</b>												
												



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A series of horizontal dotted lines spanning the width of the page, providing a template for handwritten notes.



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Uponor reserves the right to make changes, without prior notification, to the specification of incorporated components in line with its policy of continuous improvement and development.

**Uponor**