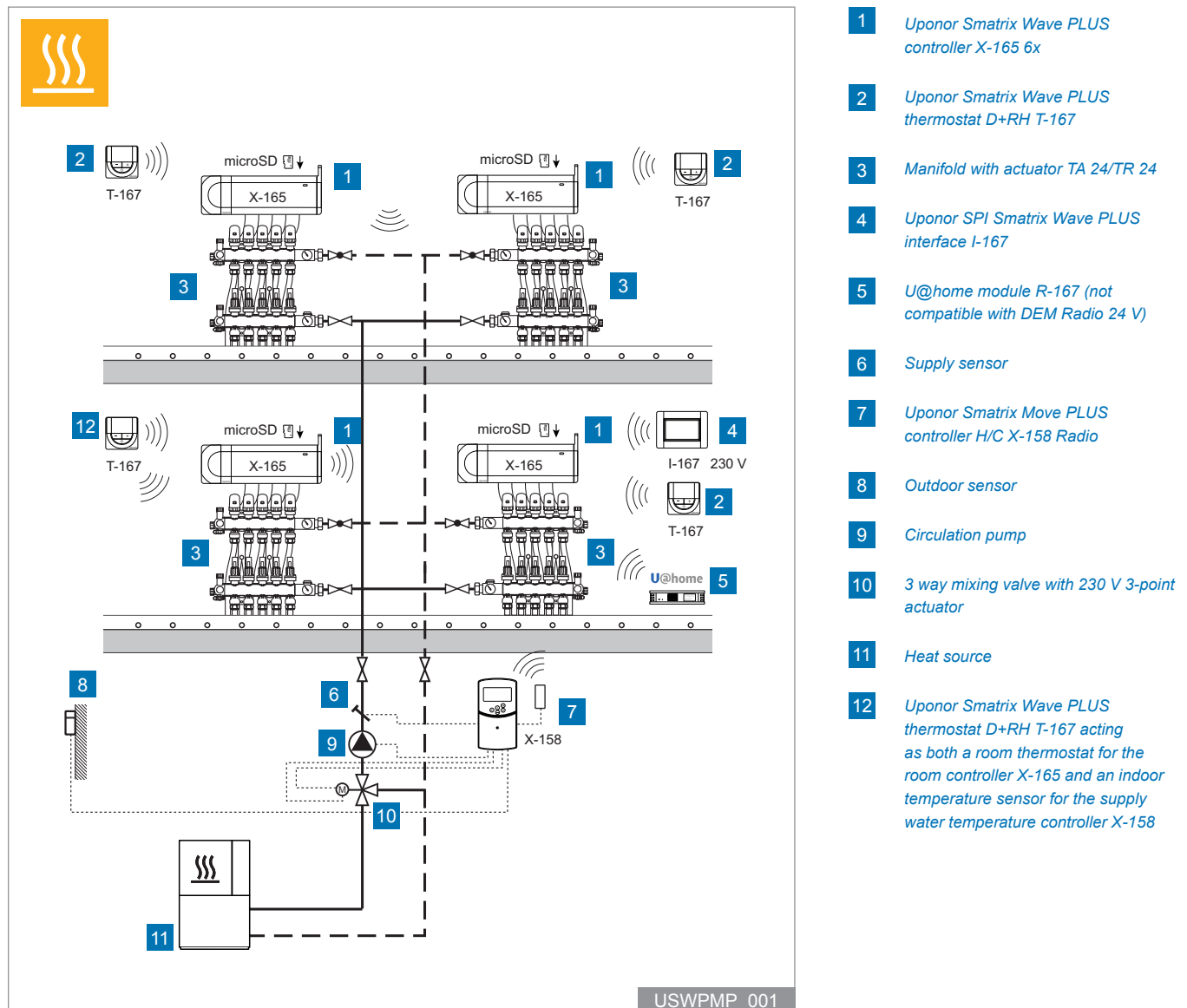


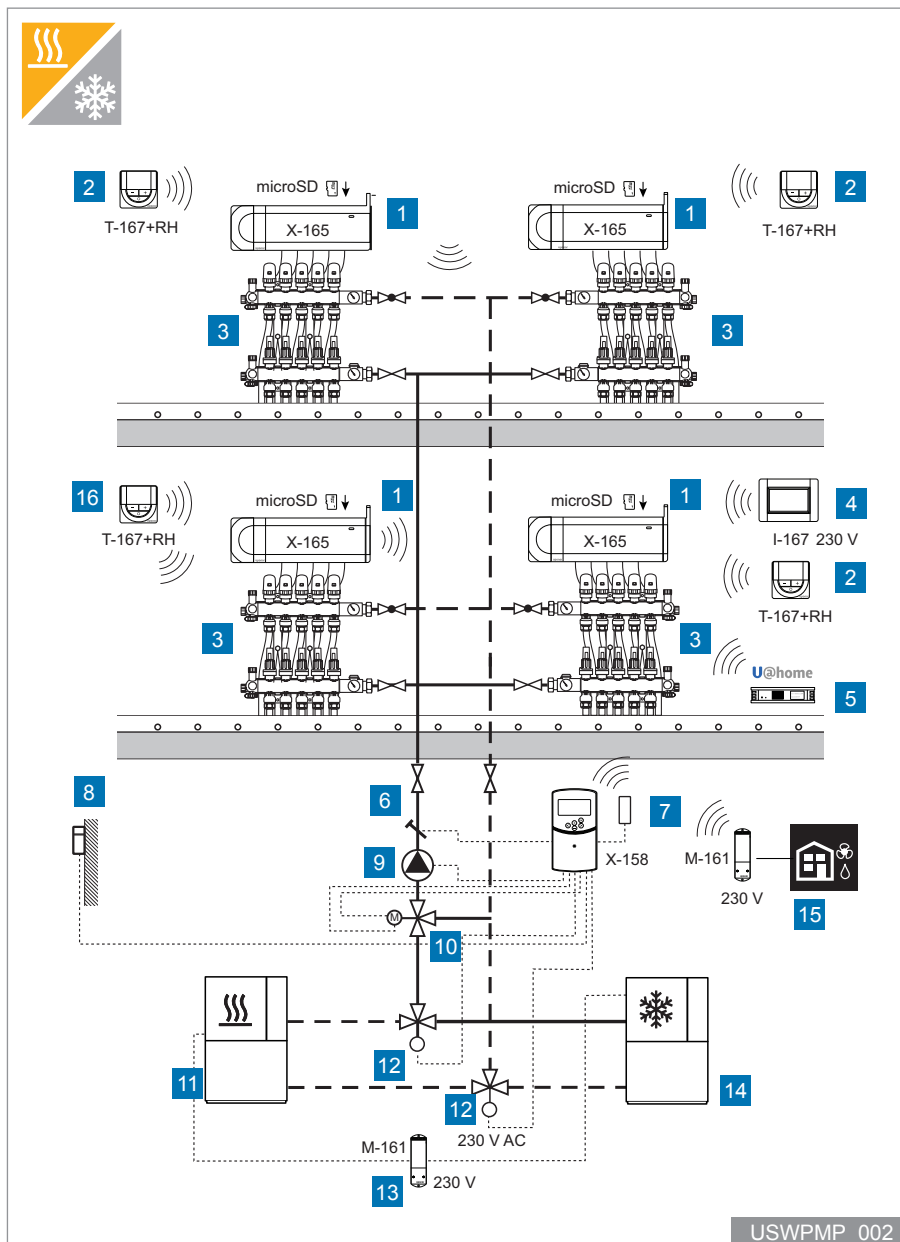
Uponor Smatrix Wave PLUS and Move PLUS; Room and supply water temperature control



The diagram shows a simplified illustration of the key control components used for a heating only application with both room and supply water temperature controls. A maximum of four room controllers X-165 can be used with one interface I-167 (touchscreen) and one U@home remote access module R-167.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Wave PLUS and Move PLUS; Room and supply water temperature control

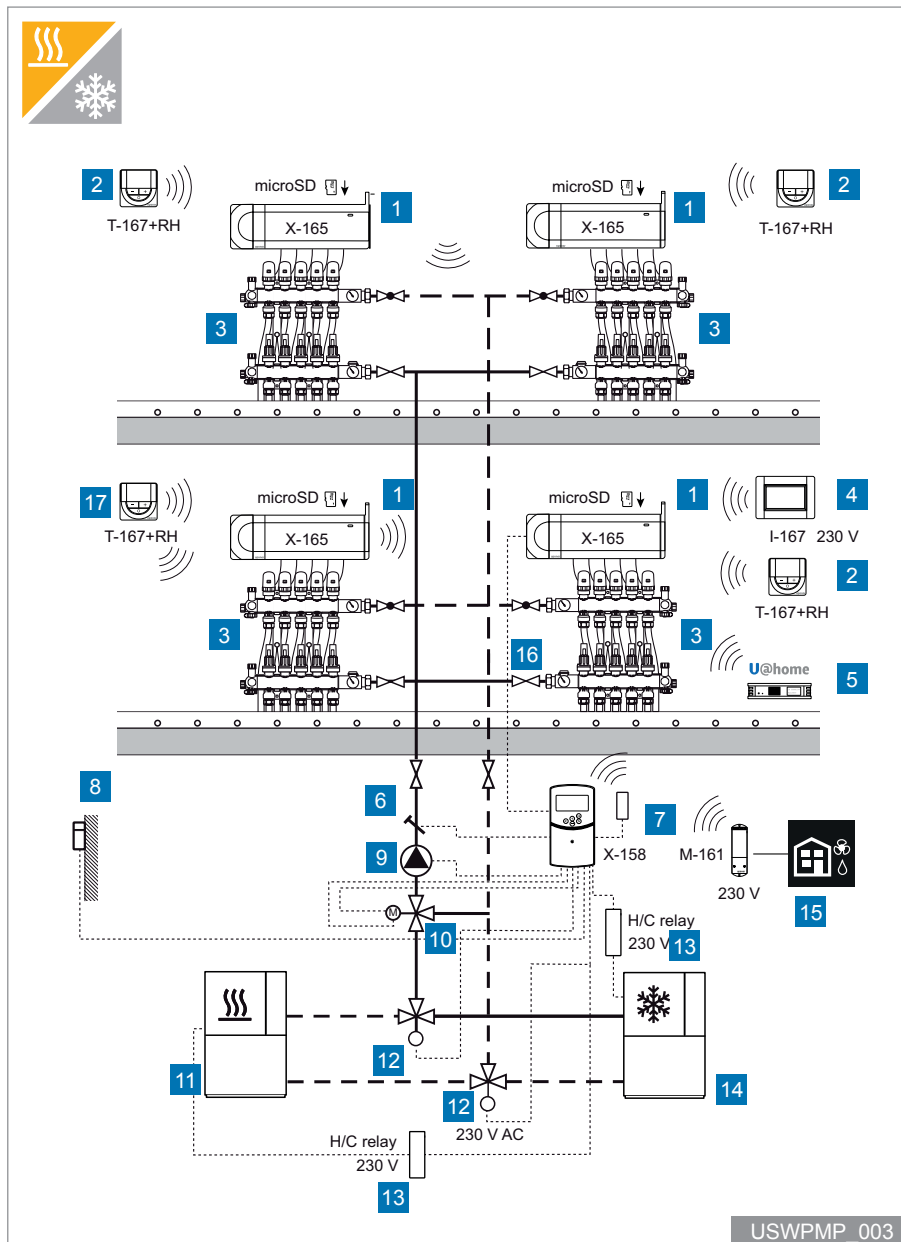


- 1 Uponor Smatrix Wave PLUS controller X-165 6x
- 2 Uponor Smatrix Wave PLUS thermostat D+RH T-167
- 3 Manifold with actuator TA 24/TR 24
- 4 Uponor SPI Smatrix Wave PLUS interface I-167
- 5 U@home module R-167 (not compatible with DEM Radio 24 V)
- 6 Supply sensor
- 7 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 8 Outdoor sensor
- 9 Circulation pump
- 10 3 way mixing valve with 230 V 3-point actuator
- 11 Heat source
- 12 H/C switchover valve with 230 V motor
- 13 Optional: boiler/chiller activation per controller; Uponor Smatrix Wave relay module M-161 2x
- 14 Chiller
- 15 Optional: dehumidifier activation per controller; Uponor Smatrix Wave relay module M-161 2x
- 16 Uponor Smatrix Wave PLUS thermostat D+RH T-167 acting as both a room thermostat for the room controller X-165 and an indoor temperature sensor for the supply water temperature controller X-158

The diagram shows a simplified illustration of the key control components for a heating and cooling application with both room and supply water temperature control. Heating and cooling changeover plus dehumidification control are provided by the relay modules M-161. A maximum of four controllers X-165 can be used with one interface I-167 and one U@home remote access module R-167.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Wave PLUS and Move PLUS; Room and supply water temperature control

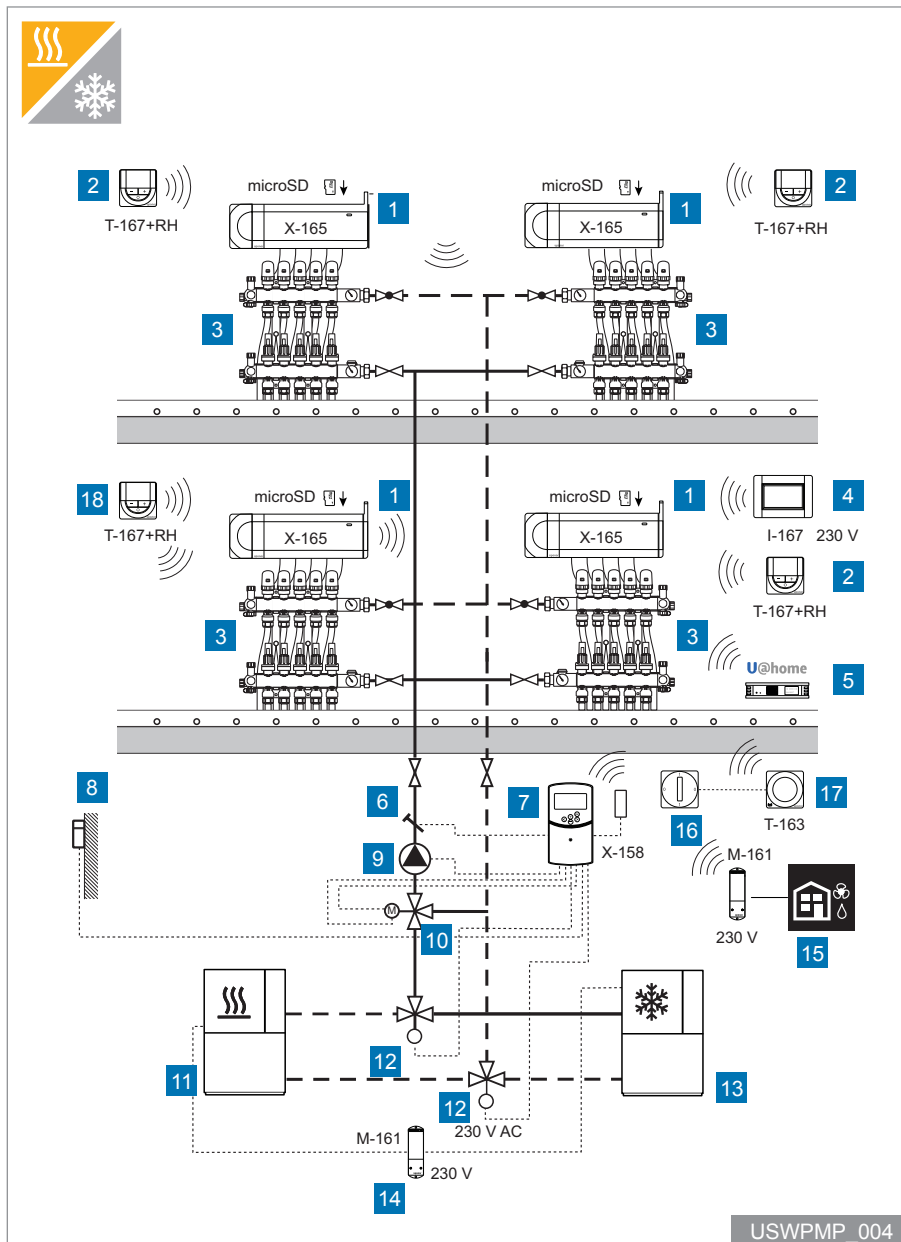


- 1 Uponor Smatrix Wave PLUS controller X-165 6x
- 2 Uponor Smatrix Wave PLUS thermostat D+RH T-167
- 3 Manifold with actuator TA 24/TR 24
- 4 Uponor SPI Smatrix Wave PLUS interface I-167
- 5 U@home module R-167 (not compatible with DEM Radio 24 V)
- 6 Supply sensor
- 7 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 8 Outdoor sensor
- 9 Circulation pump
- 10 3 way mixing valve with 230 V 3-point actuator
- 11 Heat source
- 12 H/C switchover valve with 230 V motor
- 13 H/C relay 230 V
- 14 Chiller
- 15 Optional: dehumidifier activation per controller; Uponor Smatrix Wave relay module M-161 2x
- 16 Pump relay output to Move PLUS meaning pump on demand
- 17 Uponor Smatrix Wave PLUS thermostat D+RH T-167 acting as both a room thermostat for the room controller X-165 and an indoor temperature sensor for the supply water temperature controller X-158

The diagram shows a simplified illustration of the key control components for a heating and cooling application with both room and supply water temperature control. Dehumidification control is provided by the relay module M-161 whilst the heating and cooling changeover signal is sent via the controller X-158 using optional 230 V relays. A maximum of four controllers X-165 can be used with one interface I-167 and one U@home remote access module R-167.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Wave PLUS and Move PLUS; Room and supply water temperature control



The diagram shows a simplified illustration of the key control components for a heating and cooling application with both room and supply water temperature control. Dehumidification control is provided by the relay module M-161 whilst the heating and cooling changeover signal is sent via a public thermostat T-163 registered as a system device. A maximum of four controllers X-165 can be used with one interface I-167 and one U@home remote access module R-167.

For more detailed information please visit www.uponor.com/smatrix/downloads

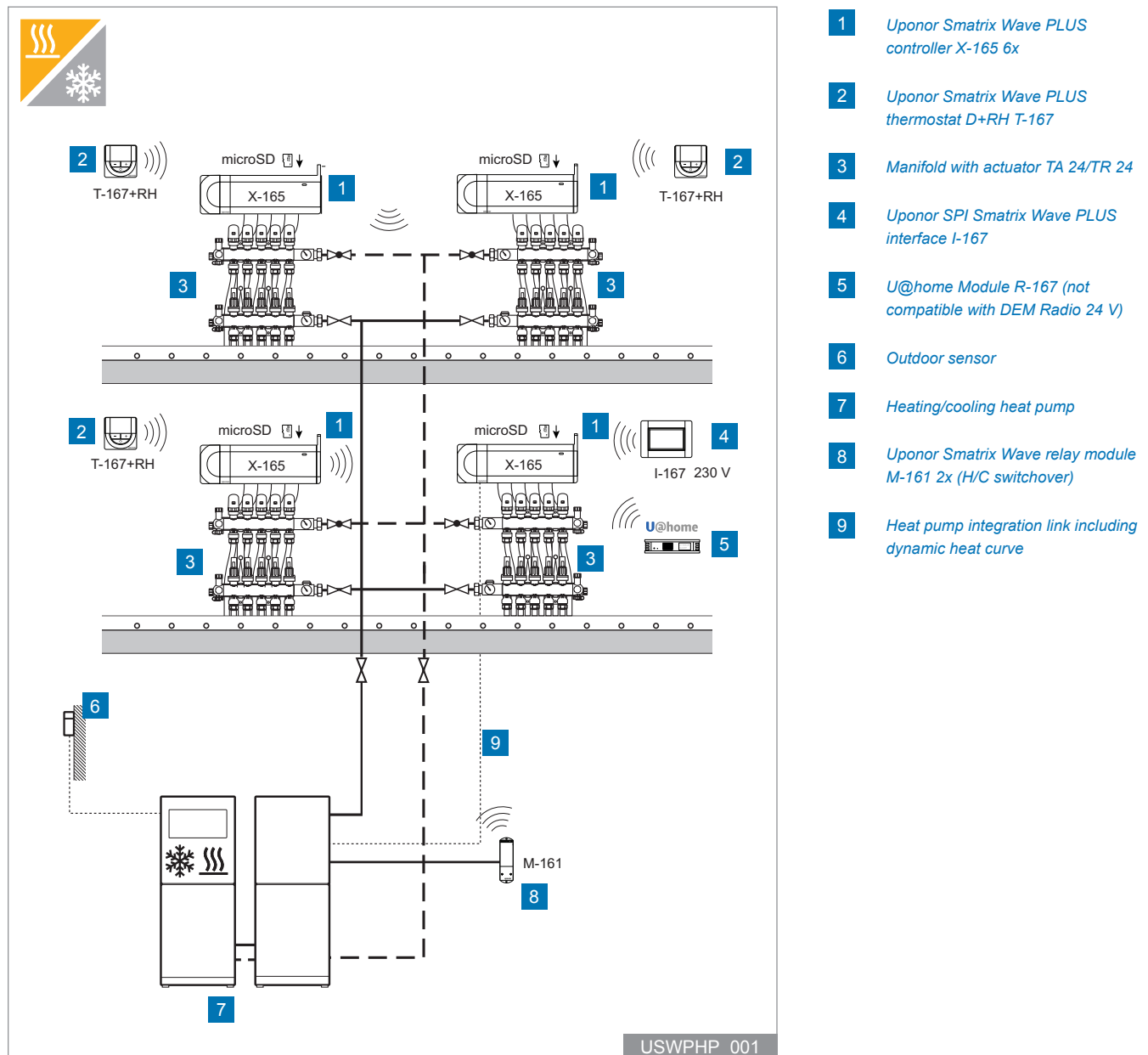
- 1 Uponor Smatrix Wave PLUS controller X-165 6x
- 2 Uponor Smatrix Wave PLUS thermostat D+RH T-167
- 3 Manifold with actuator TA 24/TR 24
- 4 Uponor SPI Smatrix Wave PLUS interface I-167
- 5 U@home Module R-167 (not compatible with DEM Radio 24 V)
- 6 Supply sensor
- 7 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 8 Outdoor sensor
- 9 Circulation pump
- 10 3 way mixing valve with 230 V 3-point actuator
- 11 Heat source
- 12 H/C switchover valve with 230 V motor
- 13 Chiller
- 14 Optional: boiler/chiller activation per controller; Uponor Smatrix Wave relay module M-161 2x
- 15 Optional: dehumidifier activation per controller; Uponor Smatrix Wave relay module M-161 2x
- 16 H/C switchover via external switch
- 17 Uponor Smatrix Wave thermostat public T-163 (registered as a system device for H/C switchover)
- 18 Uponor Smatrix Wave PLUS thermostat D+RH T-167 acting as both a room thermostat for the room controller X-165 and an indoor temperature sensor for the supply water temperature controller X-158

The diagram illustrates a four-pipe heating and cooling system. At the bottom, a central unit (7) with heating and cooling coils is connected to a network of pipes. The system is divided into two main sections by a vertical dashed line. Each section contains two room units (3) mounted on a wall. Each room unit consists of a horizontal manifold with four pipes, each leading to a coil (1) labeled 'X-165'. The room units are connected to the central unit via a network of pipes, including a main supply/return line (8) and a bypass line (9). The room units are also connected to a central control unit (2) labeled 'T-167+RH' via a wireless signal (indicated by three curved lines). The central control unit is connected to a power source (4) labeled 'I-167 230 V' via a power line (5). The system is designed for both heating (indicated by a snowflake icon) and cooling (indicated by a sun icon).

- USWPMP_005

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Wave PLUS with HP integration; Room and heat pump integration

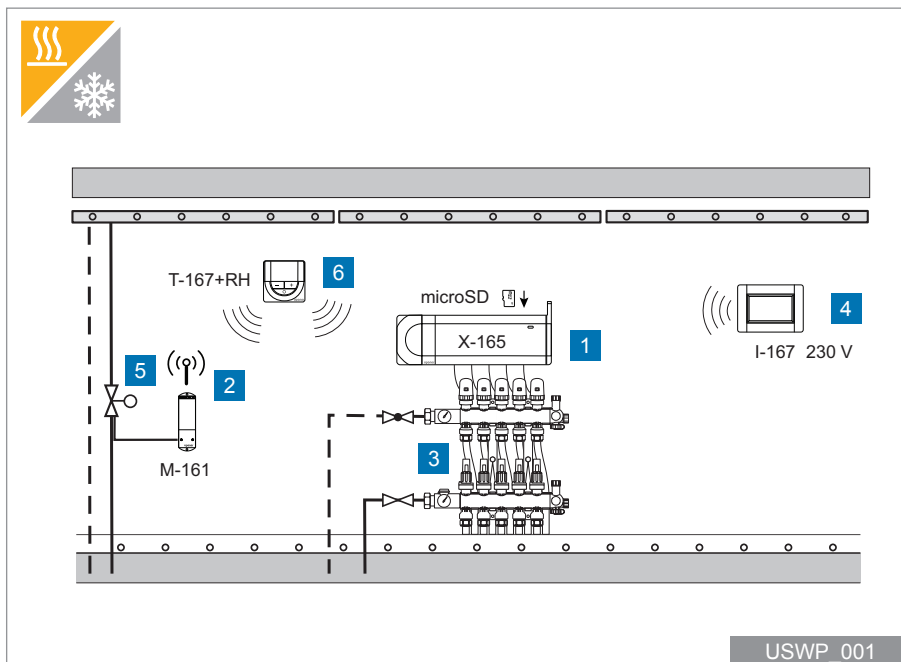


The diagram shows a simplified illustration of the key control components for a heating and cooling application with room control and heat pump integration. A direct hard wired link is used between the controller X-165 and compatible heat pump to enable dynamic heat curve adjustment. Heating and cooling changeover is controlled wirelessly by the relay module M-161. A maximum of four controllers X-165 can be used with one interface I-167 and one U@home remote access module R-167.

For further information on compatible heat pumps for integration please contact your local Uponor representative.

For more detailed information please visit www.uponor.com/smatrix/downloads

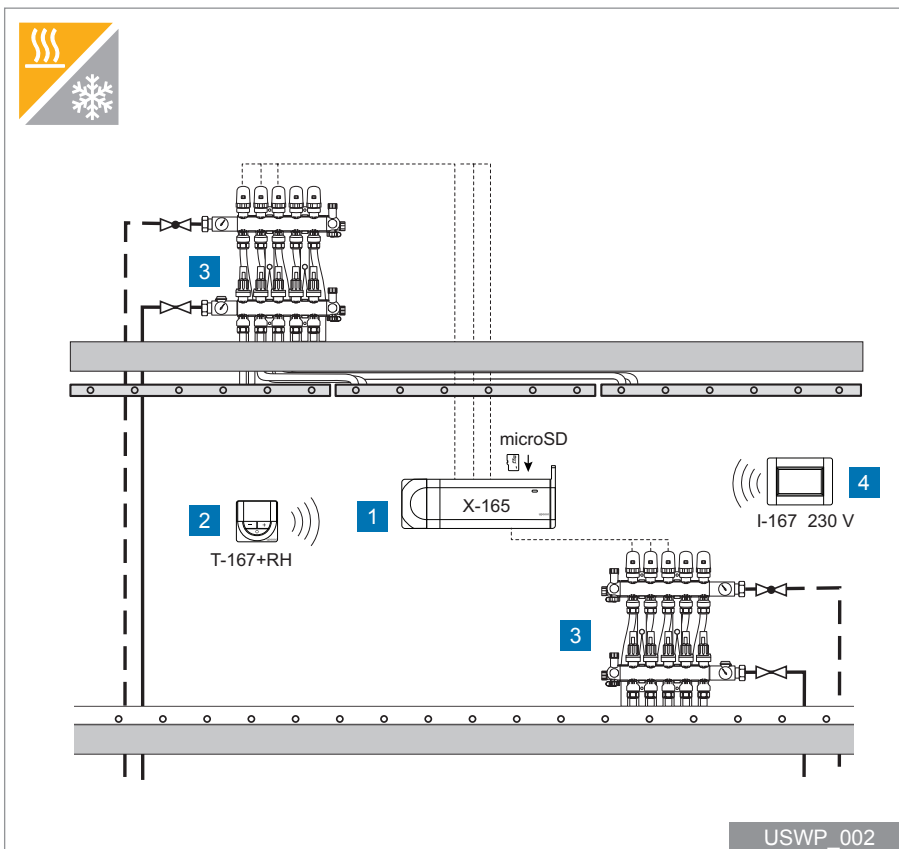
Uponor Smatrix Wave PLUS UFH with ceiling cooling



The diagram shows a simplified illustration of the key control components used for a combined floor heating and ceiling cooling application with room and supply distribution control. A thermostat T-167 is used for both heating and cooling operation and communicates with the relay module M-161 to enable cooling supply for ceiling panels. Heating and cooling changeover can be activated by either the interface I-167 or thermostat T-167.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Wave PLUS UFH with ceiling cooling

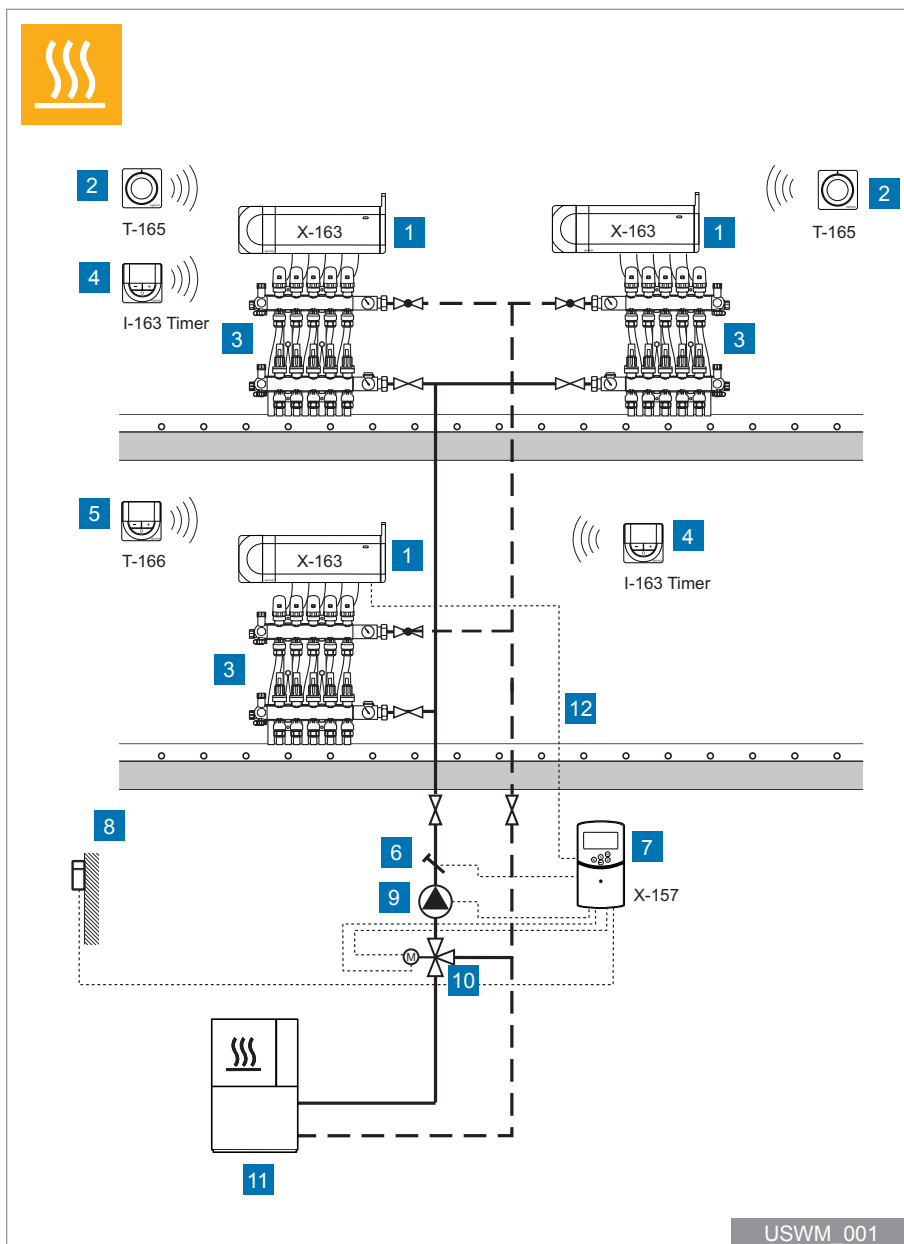


- 1 Uponor Smatrix Wave PLUS controller X-165 6x
- 2 Uponor Smatrix Wave PLUS thermostat D+RH T-167
- 3 Manifold with actuator TA 24/TR 24
- 4 Uponor SPI Smatrix Wave PLUS interface I-167

The diagram shows a simplified illustration of the key control components used for a combined floor heating and ceiling cooling application with room control. A controller X-165 and thermostat T-167 is used to control both floor heating and ceiling cooling. Heating and cooling changeover can be activated by either the interface I-167 or thermostat T-167.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Wave + Move; Room and supply water temperature control

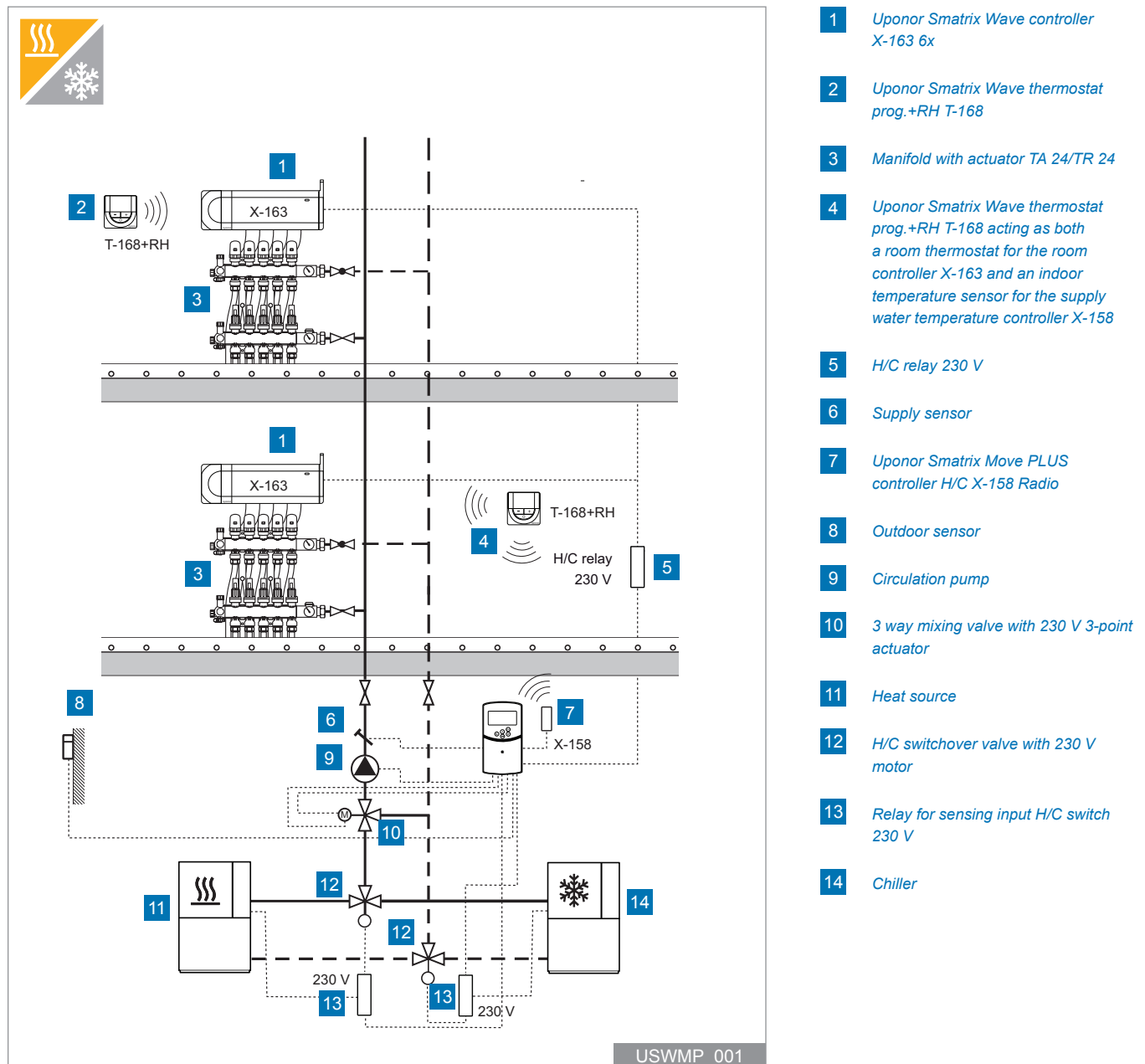


- 1 Uponor Smatrix Wave controller X-163 6x
- 2 Uponor Smatrix Wave thermostat standard T-165
- 3 Manifold with actuator TA 24/TR 24
- 4 Uponor Smatrix Wave timer I-163
- 5 Uponor Smatrix Wave thermostat Dig T-166
- 6 Supply sensor
- 7 Uponor Smatrix Move controller H X-157
- 8 Outdoor sensor
- 9 Circulation pump
- 10 3 way mixing valve with 230 V 3-point actuator
- 11 Heat source
- 12 Pump relay output to Smatrix Move meaning pump on demand

The diagram shows a simplified illustration of the key components used for a heating application with room and supply temperature control. The controller X-163 can provide a pump enable signal to the Smatrix Move controller through a hard wired link.

For more detailed information please visit www.uponor.com/smatrix/downloads

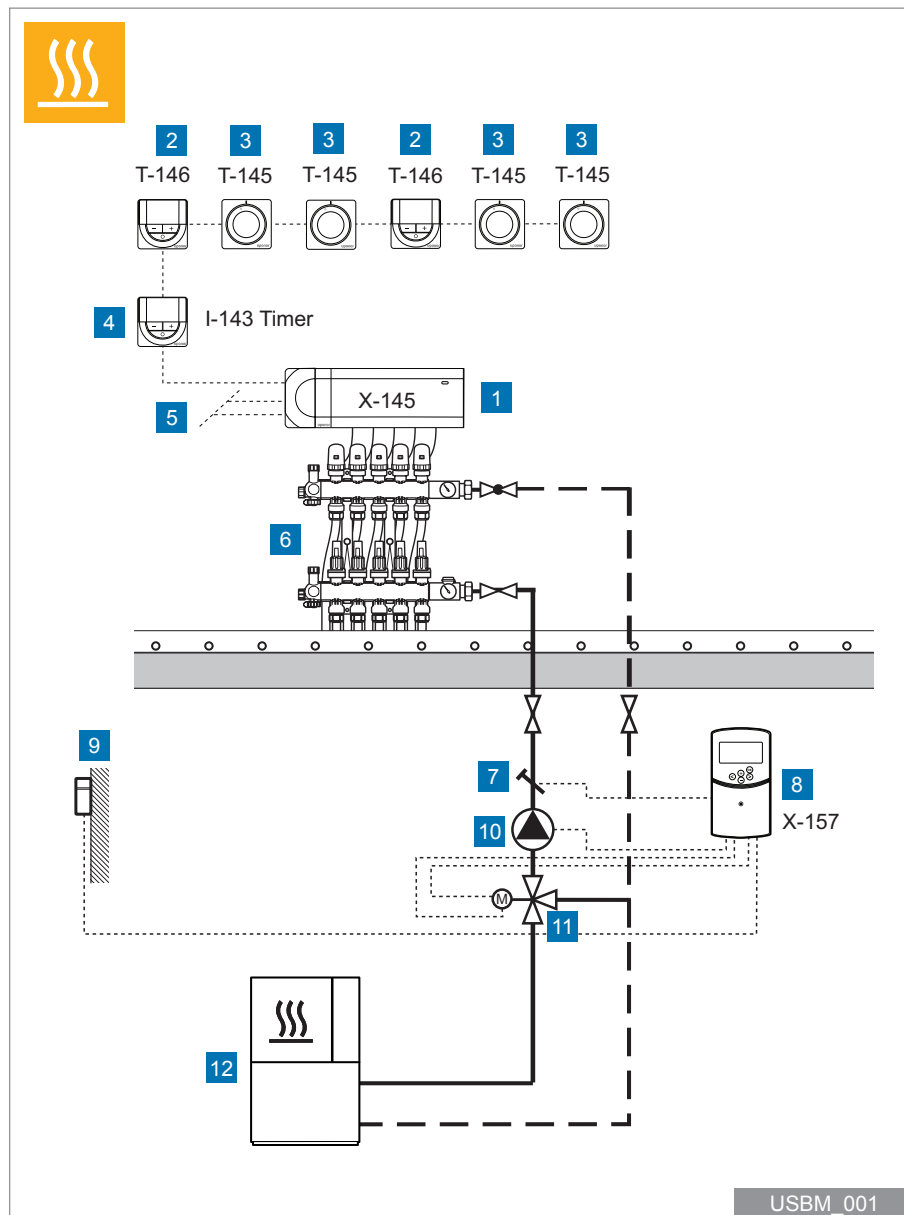
Uponor Smatrix Wave + Move PLUS; Room and supply water temperature control



The diagram shows a simplified illustration of the key components used for a heating and cooling application with room and supply temperature control. The supply controller X-158 can send a H/C signal to both the controllers X-163 and heating/cooling source via a hard wired link.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Base + Move; Room and supply water temperature control

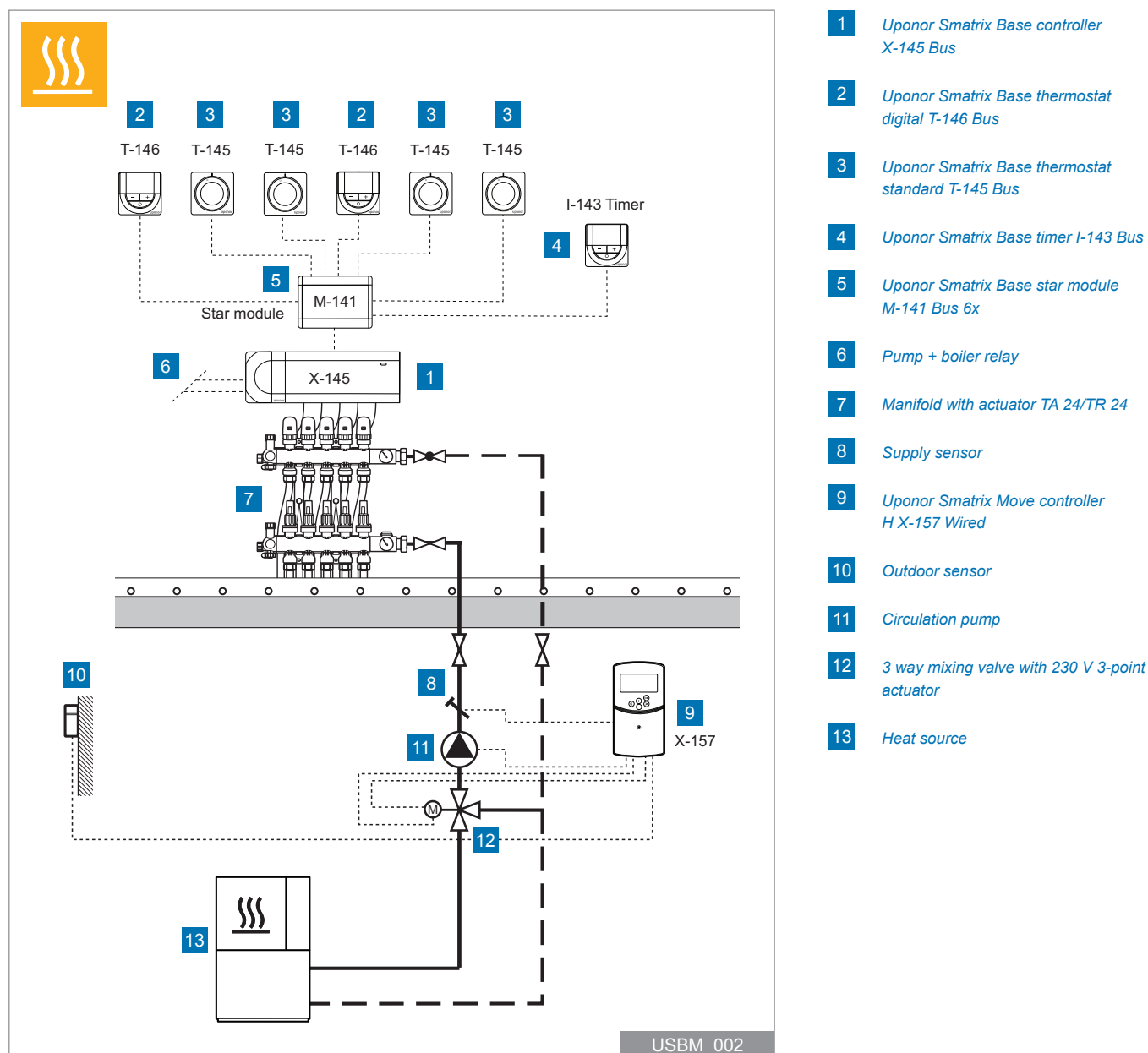


- 1 Uponor Smatrix Base controller X-145 Bus 6x
- 2 Uponor Smatrix Base thermostat digital T-146 Bus
- 3 Uponor Smatrix Base thermostat standard T-145 Bus
- 4 Uponor Smatrix Base timer I-143 Bus
- 5 Pump + boiler relay
- 6 Manifold with actuator TA 24/TR 24
- 7 Supply sensor
- 8 Uponor Smatrix Move controller H X-157 Wired
- 9 Outdoor sensor
- 10 Circulation pump
- 11 3 way mixing valve with 230 V 3-point actuator
- 12 Heat source

The diagram shows a simplified illustration of the key control components used for a heating application with room and supply temperature control. A daisy chain wiring topology is used to connect the thermostats to the room controller X-145. See page 38 for recommended cable specification.

For more detailed information please visit www.uponor.com/smatrix/downloads

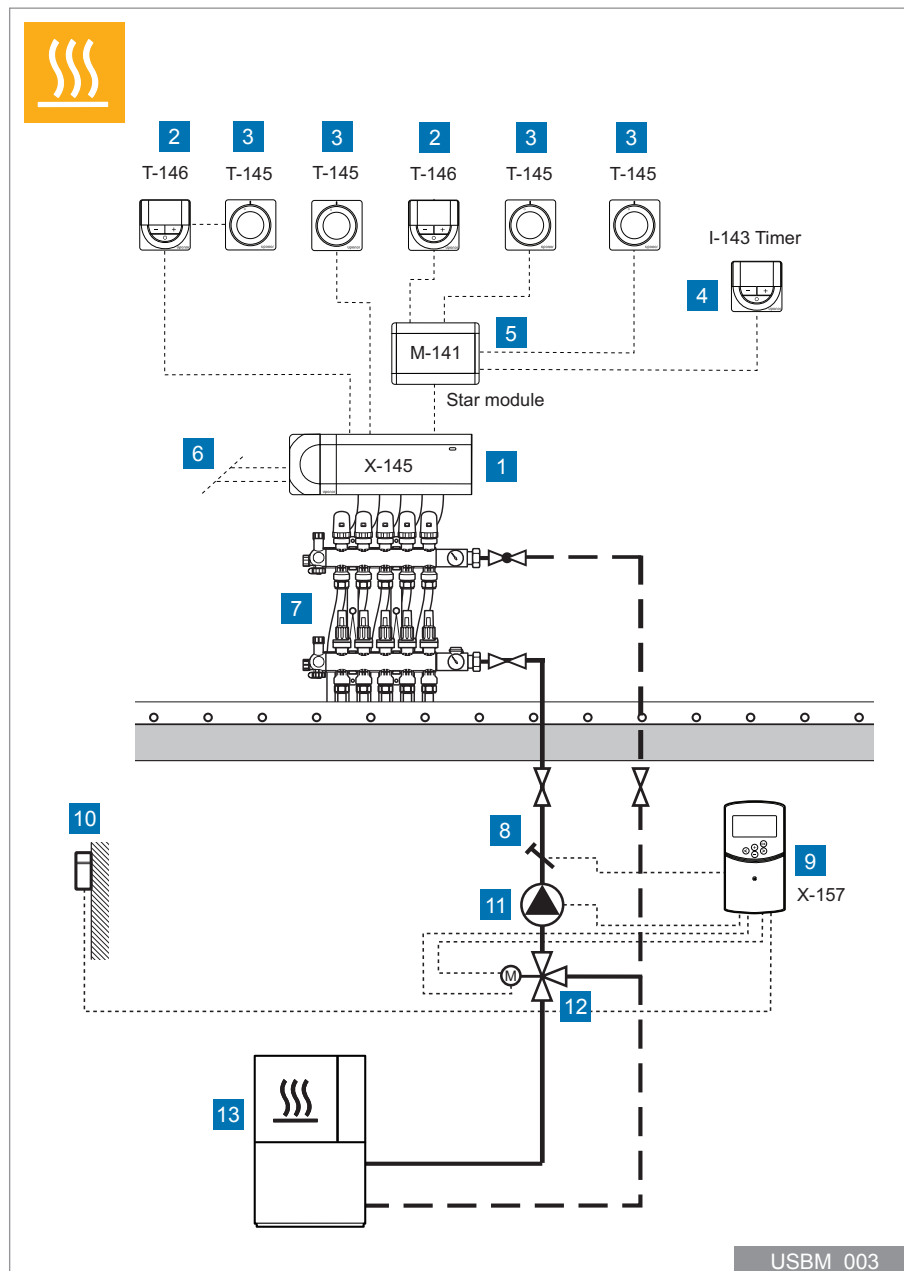
Uponor Smatrix Base + Move; Room and supply water temperature control



The diagram shows a simplified illustration of the key control components used for a heating application with room and supply temperature control. A typical star wiring topology is used to connect the thermostats to a star module M-141. The module reduces the needed amount of cables to be connected back to the room controller X-145 to just one. See page 38 for recommended cable specification.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Base + Move; Room and supply water temperature control

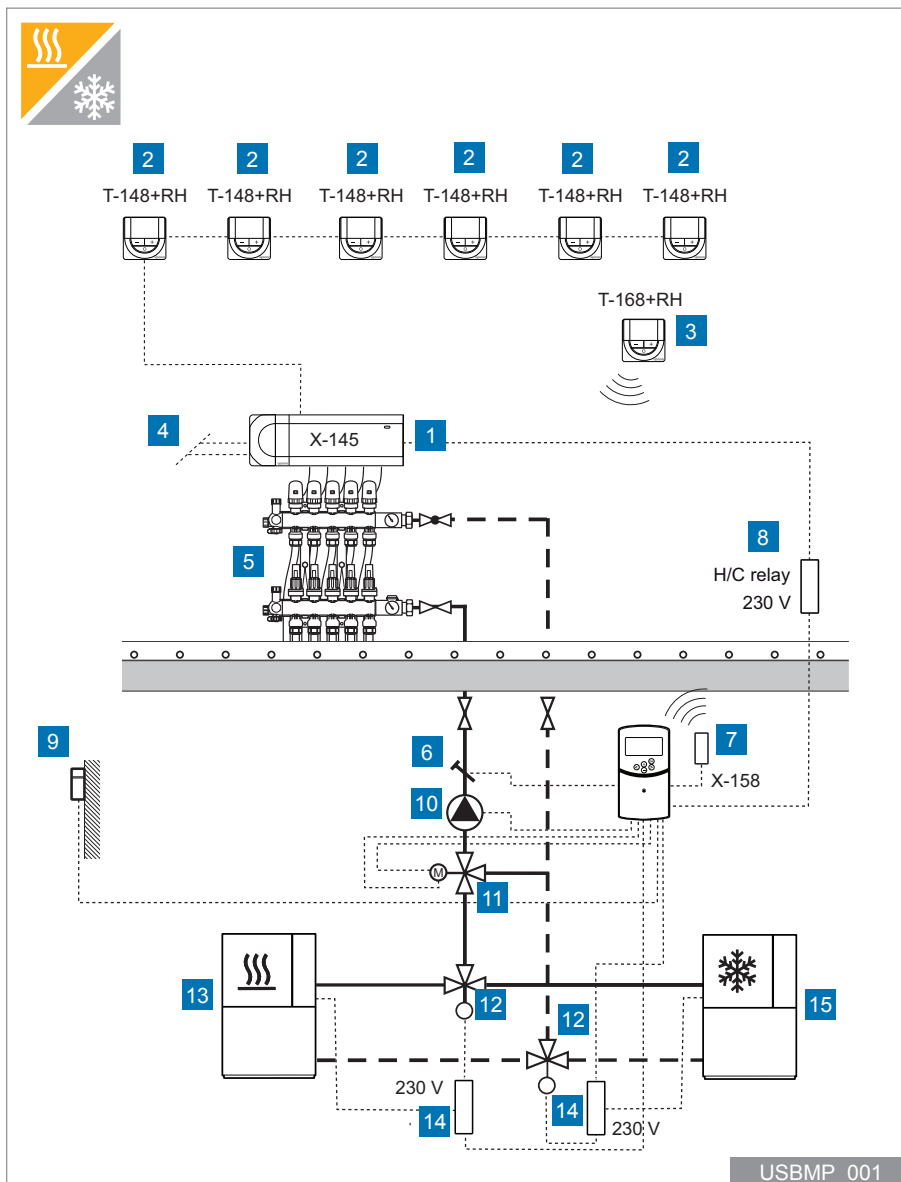


- 1 Uponor Smatrix Base controller X-145 Bus 6x
- 2 Uponor Smatrix Base thermostat digital T-146 Bus
- 3 Uponor Smatrix Base thermostat standard T-145 Bus
- 4 Uponor Smatrix Base timer I-143 Bus
- 5 Uponor Smatrix Base star module M-141 Bus 6x
- 6 Pump + boiler relay
- 7 Manifold with actuator TA 24/TR 24
- 8 Supply sensor
- 9 Uponor Smatrix Move controller H X-157 Wired
- 10 Outdoor sensor
- 11 Circulation pump
- 12 3 way mixing valve with 230 V 3-point actuator
- 13 Heat source

The diagram shows a simplified illustration of the key control components used for a heating application with room and supply temperature control. A mixture of wiring topology is used for the connection of thermostats allowing for greater flexibility when planning and installing the system. See page 38 for recommended cable specification.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Base + Move PLUS; Room and supply water temperature control

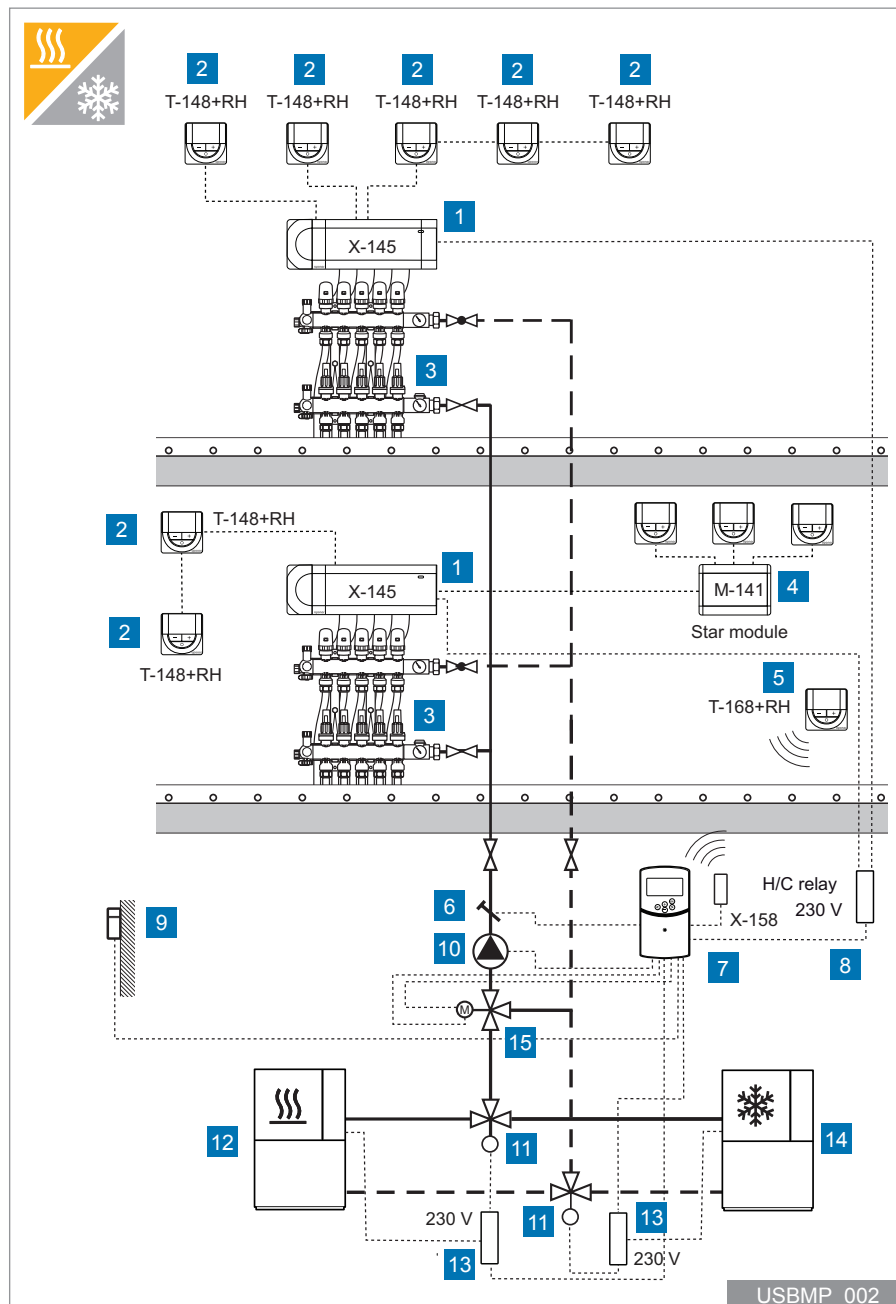


- 1 Uponor Smatrix Base controller X-145 Bus 6x
- 2 Uponor Smatrix Base thermostat prog.+RH T-148 Bus
- 3 Uponor Smatrix Wave thermostat prog.+RH T-168 acting as an indoor temperature sensor for the supply water temperature controller X-158
- 4 Pump + boiler relay
- 5 Manifold with actuator TA 24/TR 24
- 6 Supply sensor
- 7 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 8 H/C relay 230 V
- 9 Outdoor sensor
- 10 Circulation pump
- 11 3 way mixing valve with 230 V 3-point actuator
- 12 H/C switchover valve with 230 V motor
- 13 Heat source
- 14 Relay for sensing input H/C switch
- 15 Chiller

The diagram shows a simplified illustration of the key control components for a heating and cooling application with both room and supply water temperature control. The thermostats T-148 are wired in a daisy chain and provide humidity measurement as well as room temperature control. A wireless thermostat T-168 is used to communicate the indoor temperature value to the room controller X-158 and also act as the master switch for H/C change over. A hard wired link is needed between the room controllers X-158 and X-145 to send a H/C signal.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Base + Move PLUS; Room and supply water temperature control, multi-storey

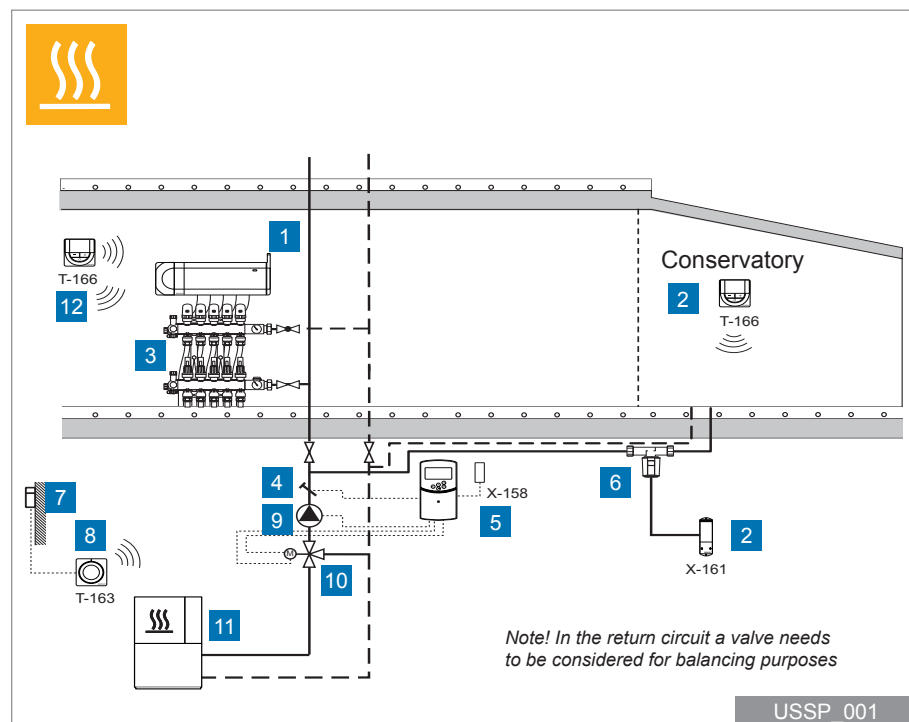


- 1 Uponor Smatrix Base controller X-145 Bus 6x
- 2 Uponor Smatrix Base thermostat prog.+RH T-148 Bus
- 3 Manifold with actuator TA 24/TR 24
- 4 Uponor Smatrix Base star module M-141 Bus 6x
- 5 Uponor Smatrix Wave thermostat prog.+RH T-168 acting as an indoor temperature sensor for the supply water temperature controller X-158
- 6 Supply sensor
- 7 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 8 H/C relay 230 V
- 9 Outdoor sensor
- 10 Circulation pump
- 11 H/C switchover valve with 230 V motor
- 12 Heat source
- 13 Relay for sensing input H/C switch
- 14 Chiller
- 15 3 way mixing valve with 230 V 3-point actuator

The diagram shows a simplified illustration of the key control components for a heating and cooling application with both room and supply water temperature control. The thermostats T-148 are wired using a mixture of daisy chain and star configuration. A wireless thermostat T-168 is used to communicate the indoor temperature value to the room controller X-158 and also act as the master switch for H/C change over. A hard wired link is needed between the room controllers X-158 and X-145 to send a H/C signal.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Space PLUS renovation; Additional room temperature control

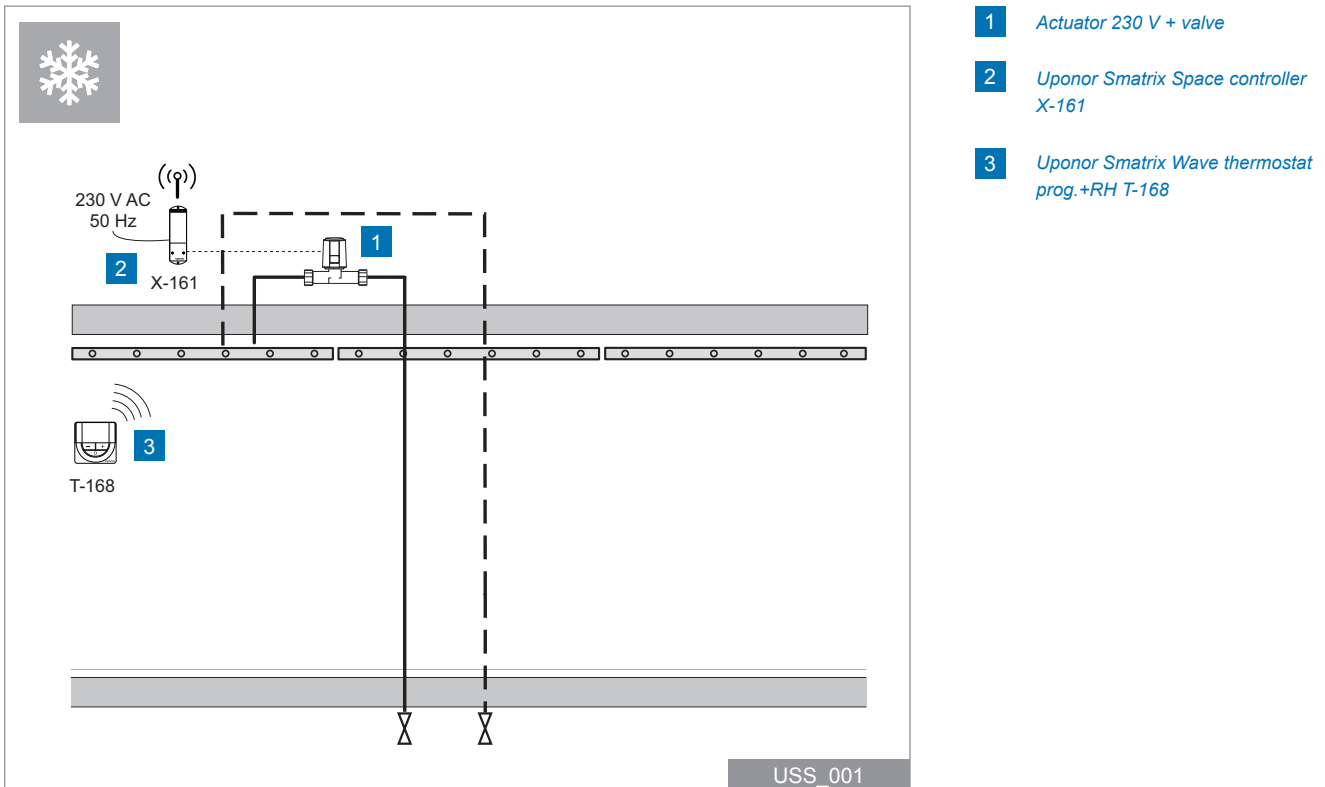


- 1 Uponor Smatrix Wave PLUS controller X-165 6x
- 2 Uponor Smatrix Space PLUS renovation set X-161+T-166
- 3 Manifold with actuator TA 24/TR 24
- 4 Supply sensor
- 5 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 6 Actuator 230 V + valve
- 7 Outdoor sensor
- 8 Uponor Smatrix Wave thermostat public T-163
- 9 Circulation pump
- 10 3 way mixing valve with 230 V 3-point actuator
- 11 Heat source
- 12 Uponor Smatrix Wave thermostat Dig T-166 acting as both a room thermostat for the room controller X-163 and an indoor temperature sensor for the supply water temperature controller X-158

The diagram shows a simplified illustration of the key control components used for the addition of an underfloor heating zone to an existing installation. The Smatrix Space PLUS renovation set can be used to open and close a valve that has been retrofitted to the existing system so as to allow the flow of water into the new zone.

For more detailed information please visit www.uponor.com/smatrix/downloads

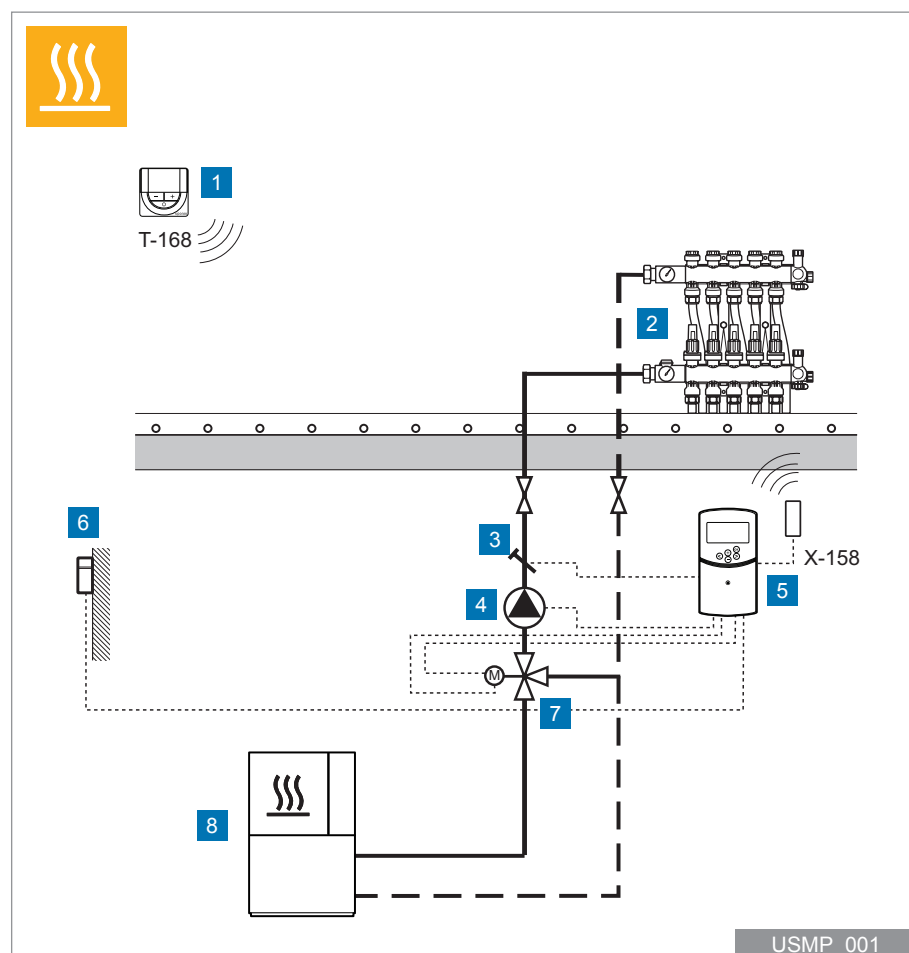
**Uponor Smatrix Space cooling;
Ceiling cooling control with eg. Tichelmann loops**



The diagram shows a simplified illustration of the key control components for ceiling cooling controlled by Smatrix Space PLUS cooling.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Move PLUS; Supply water temperature control

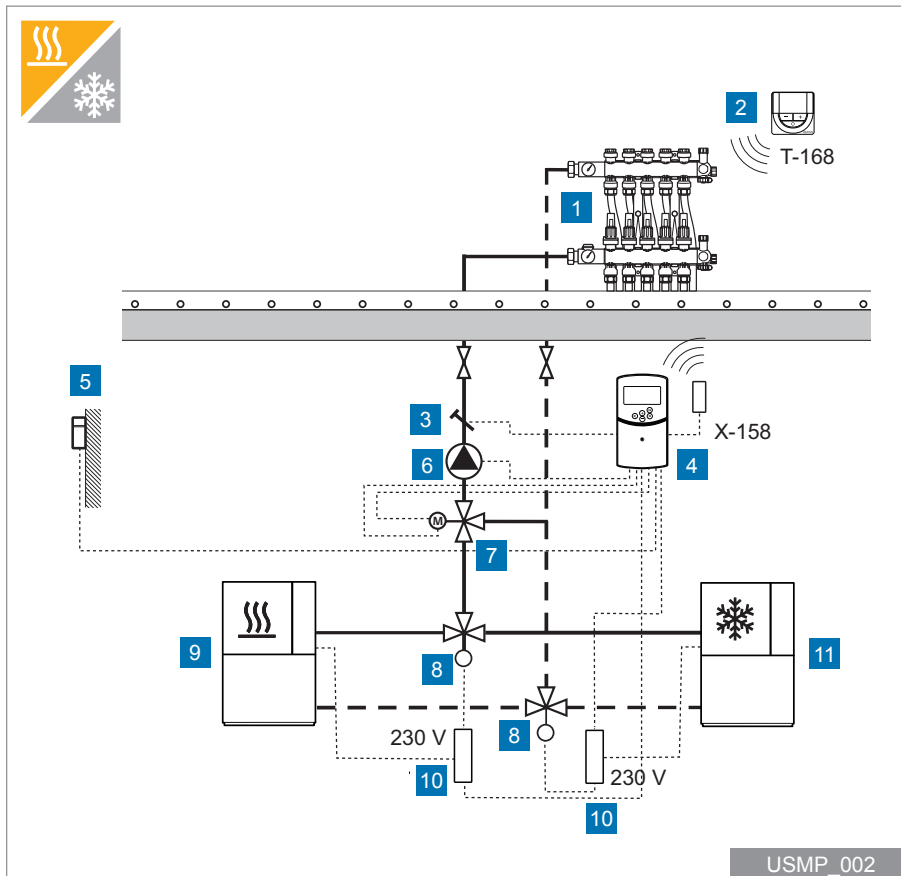


- 1 Uponor Smatrix Wave thermostat prog.+RH T-168
- 2 Manifold
- 3 Supply sensor
- 4 Circulation pump
- 5 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 6 Outdoor sensor
- 7 3 way mixing valve with 230 V 3-point actuator
- 8 Heat source

The diagram shows a simplified illustration of the key components used for both room and supply temperature control for a single zone. The thermostat T-168 is registered to the supply controller X-158 which adjusts the flow temperature to maintain the air temperature setpoint.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Move PLUS; Supply water temperature control

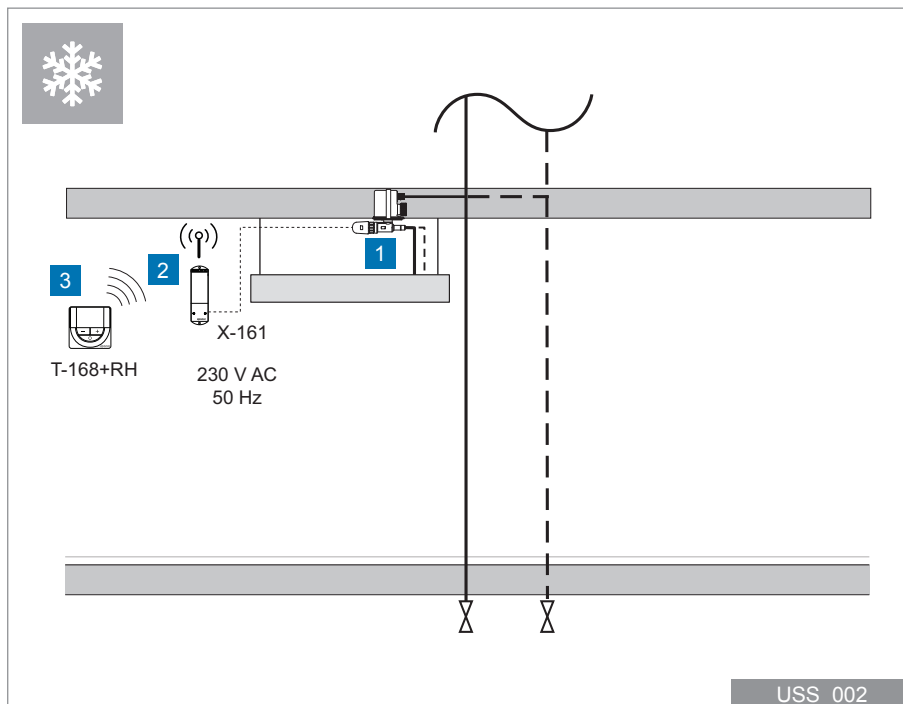


- 1 Manifold
- 2 Uponor Smatrix Wave thermostat prog.+RH T-168
- 3 Supply sensor
- 4 Uponor Smatrix Move PLUS controller H/C X-158 Radio
- 5 Outdoor sensor
- 6 Circulation pump
- 7 3 way mixing valve with 230 V 3-point actuator
- 8 H/C switchover valve with 230 V motor
- 9 Heat source
- 10 Relay for sensing input H/C switch
- 11 Chiller

The diagram shows a simplified illustration of the key components used for a heating and cooling application with both room and supply temperature control for a single zone. The thermostat T-168 is registered to the supply controller X-158 which adjusts the flow temperature to maintain the air temperature setpoint. The thermostat T-168 is also used to measure humidity in cooling operation and switches the system off whenever the maximum limit setpoint is reached.

For more detailed information please visit www.uponor.com/smatrix/downloads

Uponor Smatrix Space cooling; Ceiling cooling control 230 V



- 1 Thermal socket
- 2 Uponor Smatrix Space controller X-161
- 3 Uponor Smatrix Wave thermostat prog.+RH T-168

The diagram shows a simplified illustration of the key control components for Smatrix Space cooling for the activation of ceiling cooling panels.

For more detailed information please visit www.uponor.com/smatrix/downloads