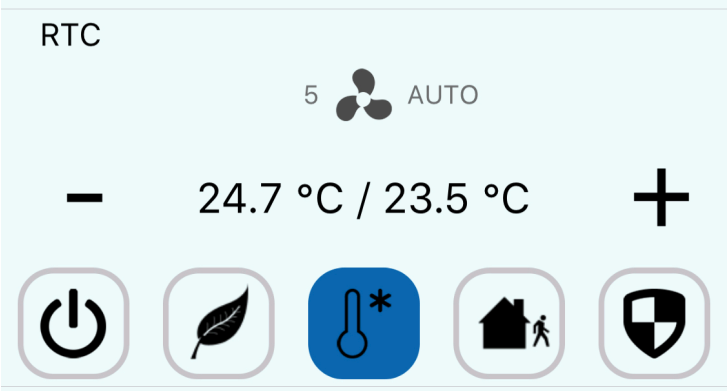
xxter RTC manual

Version 1.3 – October 2019

Screenshots in this manual and the actual screens on your device can be different, as updates are made to products on a regular basis.

xxter RTC introduction

The xxter device can be configured to provide Room Thermostat Controller (RTC) functionality. You can add up to 16 single or master RTC's and up to 100 slaves. A master or Single RTC allows you to create an independent thermostat controller using xxter to provide the intelligence using any external temperature sensor to control heating and cooling. The RTC supports many different control mechanisms for central heating, floor heating, radiator valves, air-conditioning, fan coils and many more. In case another RTC exists that can act as an RTC master, xxter can be set up as an RTC slave to integrate the control in xxter. A configured RTC can be included in the visualization and allows complete overview and control of the RTC features.



This document describes the general configuration of an RTC and has two addendums that describe all the configuration options and KNX communication objects that can be used. The configuration menu automatically adapts based on your selection, so only the applicable options will be shown.

The RTC functionality is available on xxter devices of type HK(E)02E and requires firmware version 2.9 or newer. To use the RTC controller in the visualization, the iOS, Android or Windows app version 2.9 or newer is required.

This manual is intended for the installation professional and expects the reader to have knowledge and training for KNX-systems and knowledge of heating and cooling control systems (HVAC).

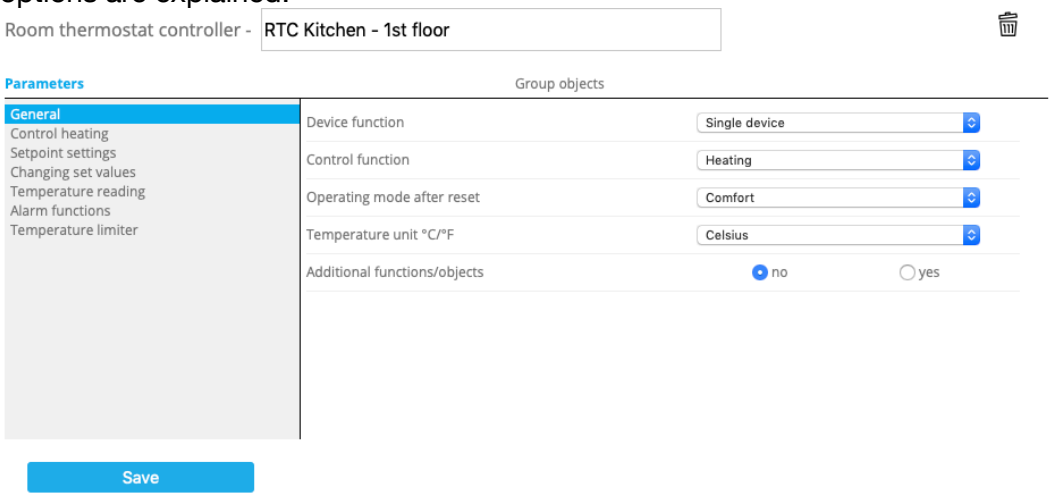
More information about xxter can be found at our website www.xxter.com or on our forum forum.xxter.com. On our website you can also find the regular installation and user manuals.

Setting up an RTC

The xxter RTC configuration is done online through the *My xxter* environment (https://my.xxter.com/). Login with your professional account and select the appropriate xxter project for which you want to configure the RTC. Select the “Room thermostat controllers” tab on the left to manage your RTC’s.

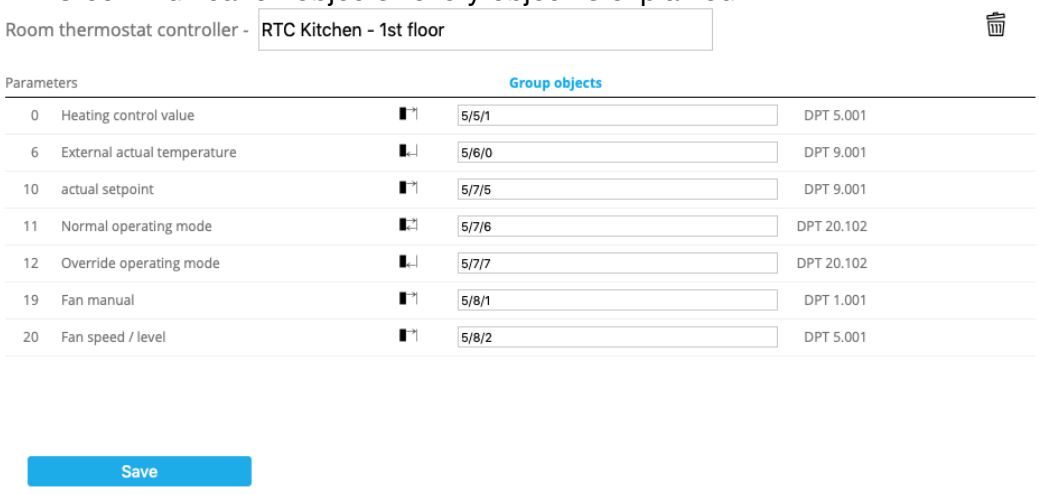
1. RTC Parameters

Every RTC should receive a recognizable name, so the end-user can select this to include the RTC in the visualization. The RTC behavior is set up on the *Parameters* tab, according to the preferences and the end user’s situation. Please take in mind that changing a parameter can also update the menu structure and availability of other options. In “Addendum A – RTC configuration options” all possible options are explained.



2. RTC Communication objects

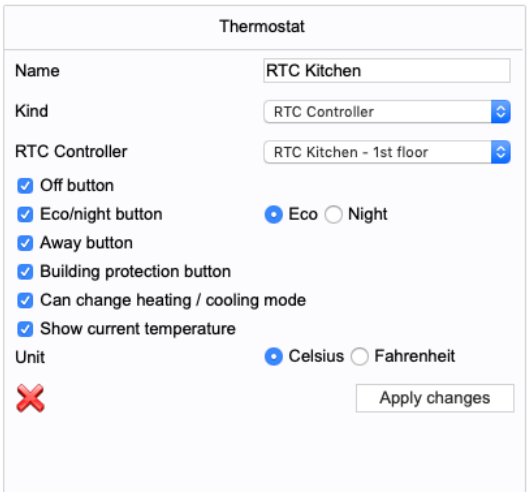
After the parameters are set-up, you can provide the communication objects in the *Group objects* tab. This binds the KNX group addresses to the RTC configuration. The records that are available, their function and their datapoint types depend on the parameters you have set up. In “Addendum B – RTC communication objects” every object is explained.



When you are content with the RTC configuration, press the *Save* button.

3. RTC visualization

After the RTC has been set-up, you can include it in the visualization. Select the profile and page you want to add the RTC to (either a list page or an image page) and add the element “Thermostat”.



For every RTC element, you can select which options you want to allow in the visualization. These options, together with the parameters of the RTC you have set up, will define the possibilities you have in the xxter app.

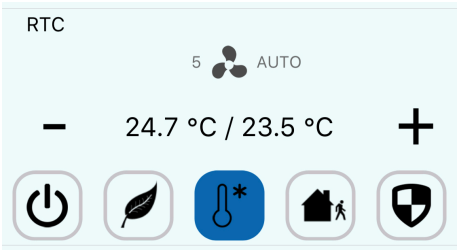
4. Load the RTC on the device and in the app

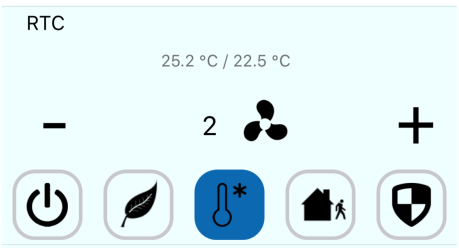
Now the RTC configuration is complete, it can be loaded on the device. Either use the option *Push configuration to xxter device* on the project’s settings page, or log onto the device and select *Load configuration*. Subsequently, select *Load profile configuration* in the app on the iOS or Android device or Windows computer to update the profile.

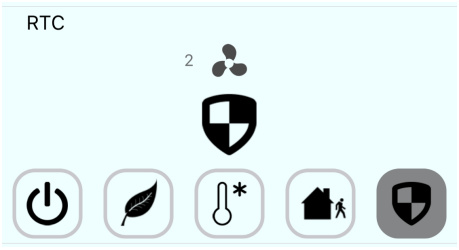
The RTC will now function according to the provided specifications and be controllable through the app.

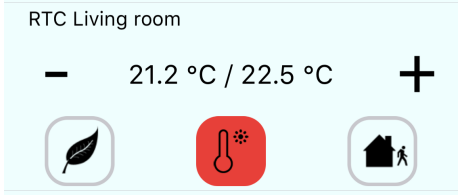
Screen impressions of the visualization

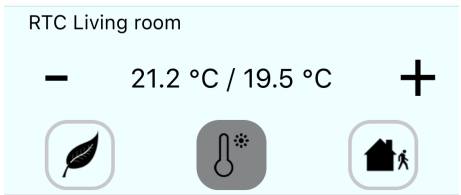
Below are some screen impressions of the RTC element in the app, where the options change depending on the configuration.

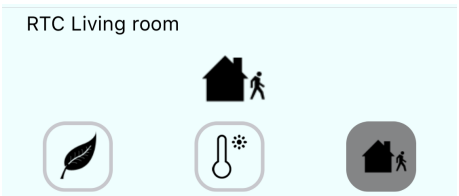












Addendum A - RTC configuration options

1. General - Device function

Options:	Single device
	Master device
	Slave device

- *Single device*: The device is used singly in a room as room temperature controller.
- *Master device*: At least two room temperature controllers are located in one room. One device is to be set up as a master device, while the others are to be programmed as slave devices / temperature sensors. The master device is to be linked to the slave devices using the appropriately labelled communication objects. The master device regulates the temperature.
- *Slave device*: At least two room temperature controllers are located in one room. One device is to be set up as a master device, while the others are to be programmed as slave devices / temperature sensors. The slave devices are to be linked to the master device with the appropriately labelled communication objects. The slave device uses the control functions of the master.

2. General - Control function

Options:	Heating
	Heating with additional stage
	Cooling
	Cooling with additional stage
	Heating and cooling
	Heating and cooling with additional stage

- *Heating*: For operating a heat-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Heating type" can be programmed for optimal control.
- *Heating with additional stage*: In addition to the control function described under heating, the additional stage enables the activation of an additional heating circuit. This type of additional stage is used, for example, to quickly heat up a bathroom with floor heating via a heated towel rack.
- *Cooling*: For operating a cooling-based automatic single-room control. The temperature is regulated to the setpoint value defined in the parameter. The "Controller type" and "Cooling type" can be programmed for optimal control.
- *Cooling with additional stage*: In addition to the control function described under cooling, the additional stage enables the activation of an additional cooling device. This type of additional stage is used, for example, to quickly cool a room via an added cooling device.
- *Heating and cooling*: For operating a two-wire or four-wire system used to heat or cool a room. Switching between heating and cooling takes place using a central switch (two-wire system) or is carried out manually and / or automatically via the single room temperature controller (four-wire system).
- *Heating and cooling* with an additional stage: In addition to the heating and cooling functions, one additional stage each with an autonomous controller type can be programmed.

Note This parameter is only available if the "Device function" parameter is set on "Single device" or "Master device".

3. General - Operating mode after reset

Options:	Comfort
	Standby
	Eco mode
	Frost/heat protection

After a reset the device will run in the operating mode after a restart until a new operating mode is set as the result of device operation or by communication objects, as the case may be. This operating mode should be defined during the planning phase. An improperly defined operating mode can result in a loss of comfort or increased energy consumption.

- *Comfort*: If the room temperature is not automatically lowered and the room is therefore controlled independent of its use.
- *Standby*: If the room is controlled automatically, e.g. by a presence detector, as a function of its use.
- *Eco mode*: If the room is controlled automatically or manually as a function of it use.
- *Frost/heat protection*: If only the building protection function is necessary in the room after a reset.

Note This parameter is only available if the "Device function" parameter is set on "Single device" or "Master device".

4. General - Temperature unit °C/°F

Options:	Celsius
	Fahrenheit

The temperature indication can be changed from Celsius (°C) to Fahrenheit (°F). The conversion from Celsius to Fahrenheit always takes place in the device, since only Celsius values are sent over the KNX bus.

5. General - Additional functions

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. window contact and presence detector.

6. General - Delay time for read telegrams after reset (s)

Options:	Setting option between 1 - 255

After a reset the device will wait for the given time in seconds before sending out the read requests on the required KNX communication objects. If using multiple RTC's in one device, vary this delay to reduce the spike in busload.

7. General - Object 'Current HVAC operating mode' active

Options:	No
	Yes

This parameter enables an additional communication object for the current HVAC operation mode.

8. Operating functions

Note Only available when the "Device function" parameter is set on "Slave device".

9. Operating functions - Switchover heating/cooling

Options:	No
	Yes

This parameter enables the manual switchover between heating and cooling mode for the "Slave device".

10. Operating functions - Fan coil control during heating mode

Options:	No
	Yes

This parameter enables fan coil control in heating mode for the "Slave device".

11. Operating functions - Fan coil control during cooling mode

Options:	No
	Yes

This parameter enables fan coil control in cooling mode for the "Slave device".

12. Heating control

Note Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

13. Heating control - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

- *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.
- *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).
- *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.
- *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.
- *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

14. Heating control - Heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: ▪ Area (e.g. floor heating) 4°C 200 min ▪ Convector (e.g. heater) 1.5°C 100 min ▪ Free configuration
	Fan coil: ▪ Fan coil 4°C 90 min ▪ Free configuration

Multiple heating types (panel heating, convector heating or fan coil) with preset parameters are available to the user. If the required heating type is not available, individual parameters can be specified in free configuration.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

15. Heating control - P-component

Options:	Setting option between 1,0 – 25,0 °C

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Heating type" parameter must be set on "Free configuration".

16. Heating control - I-component (min.)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Heating type" parameter must be set on "Free configuration".

17. Heating control - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Basic stage heating".

18. Basic stage heating

Note Only available when the "Extended settings" parameter under "Heating control" is set on "Yes".

19. Basic stage heating - Status object heating

Options:	No
	Yes

This parameter enables the "Status heating" communication object.

20. Basic stage heating - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energized opened (normal) or de-energized closed (inverse) valves.

- N*ormal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

21. Basic stage heating - Hysteresis

Options:	Setting option between 1,0 – 25,0 °C

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

22. Basic stage heating - Control value difference for sending of heating control value

Options:	0,02
	0,05
	0,1
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

23. Basic stage heating - Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0- 100%" or "Fan coil".

24. Basic stage heating - PWM cycle heating (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an "On-phase" of five minutes and an "Off-phase" of 10 min. The time for a PWM cycle can be specified here.

Note This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off".

25. Basic stage heating - Max control value (0 to 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

26. Basic stage heating - Min control value for basic load (0 to 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load,
e.g. for operating floor heating. Even if the controller calculates the control value zero, a heating medium will flow through the floor heating system to prevent the floor from cooling down. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

27. Control of additional heating stage

Note Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating with additional stage" or "Heating and cooling with additional stages".

28. Control of additional heating stage - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

- *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.
- *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).
- *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.
- *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.
- *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

29. Control of additional heating stage - Additional heating type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: ▪ Area (e.g. floor heating) 4°C 200 min ▪ Convector (e.g. heater) 1.5°C 100 min ▪ Free configuration
	Fan coil: ▪ Fan coil 4°C 90 min ▪ Free configuration

Multiple heating types (panel heating, convector heating or fan coil) with preset parameters are available to the user. If the required heating type is not available, individual parameters can be specified in free configuration.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

30. Control of additional heating stage - P-component

Options:	Setting option between 1,0 – 25,0 °C

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Additional heating type" parameter must be set on "Free configuration".

31. Control of additional heating stage - I-component (min)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Additional heating type" parameter must be set on "Free configuration".

32. Control of additional heating stage - Temperature difference to basic stage

Options:	Setting option between 0,0 – 25,0 °C

The setpoint temperature of the additional stage is defined as a function of the current setpoint temperature of the base stage and is expressed as a difference. The value represents the setpoint value starting at which the additional stage will operate.

33. Control of additional heating stage - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Additional heating stage".

34. Additional heating stage

Note Only available when the "Extended settings" parameter under "Control of additional heating stage" is set on "Yes".

35. Additional heating stage - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energized closed (inverse) valves.

- N*ormal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

36. Additional heating stage - Hysteresis

Options:	Setting option between 1,0 – 25,0 °C

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

37. Additional heating stage - Control value difference for sending of heating control value

Options:	0,02
	0,05
	0,1
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

38. Additional heating stage - Cyclic sending of the control value (min)

Options:	Setting option between 1 – 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0- 100%" or "Fan coil".

39. Additional heating stage - Maximum control value (0 - 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

40. Additional heating stage - Minimum control value for basic load (0 - 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load,
e.g. for operating floor heating. Even if the controller calculates the control value zero, a heating medium will flow through the floor heating system to prevent the floor from cooling down. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

41. Cooling control

Note Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

42. Cooling control - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

- *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.
- *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).
- *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the

control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.

- *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.
- *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

43. Cooling control - Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: ▪ Area (e.g. cooling ceiling) 5°C 240 min ▪ Free configuration
	Fan coil: ▪ Fan coil 4°C 90 min ▪ Free configuration

Two cooling types (area or fan coil) with preset parameters are available to the user.
If the required cooling type is not available, individual parameters can be specified in free configuration.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

44. Cooling control - P-component

Options:	Setting option between 1,0 – 25,0 °C

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

45. Cooling control - I-component (min.)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and ultimately reaching, the setpoint value. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

46. Cooling control - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Basic stage cooling".

47. Basic stage cooling

Note Only available when the "Extended settings" parameter under "Cooling control" is set on "Yes".

48. Basic stage cooling - Status object cooling

Options:	No
	Yes

This parameter enables the "Status cooling" communication object.

49. Basic stage cooling - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energized opened (normal) or de-energized closed (inverse) valves.

- N*ormal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

50. Basic stage cooling - Hysteresis

Options:	Setting option between 1,0 – 25,0 °C

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

51. Basic stage cooling - Control value difference for sending of cooling control value

Options:	0.02
	0.05
	0.1
	Send cyclic only

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

52. Basic stage cooling - Cyclic sending of the control value (min)

Options:	Setting option between 1 – 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Byte, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0- 100%" or "Fan coil".

53. Basic stage cooling - PWM cycle cooling (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an "On-phase" of five minutes and an "Off-phase" of 10 min. The time for a PWM cycle can be specified here.

Note This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off”.

54. Basic stage cooling - Maximum control value

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off“ or "Fan coil".

55. Basic stage cooling - Minimum control value for basic load

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load,
e.g. for operating surface cooling. Even if the controller calculates the control value zero, a cooling medium will flow through the cooling area to prevent the floor from heating up. Under "Settings of

basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note This parameter is only available when "Control value type" parameter is set either on “PI continuous, 0 – 100%”, “PI PWM, On/Off” or “Fan coil”.

56. Control of additional cooling stage

Note Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Cooling with additional stage" or "Heating and cooling with additional stages".

57. Control of additional cooling stage - Control value type

Options:	2-point 1 bit, Off/On
	2-point 1 byte, (0/100%)
	PI continuous, 0-100%
	PI PWM, On/Off
	Fan coil

The actuation of the control valve is determined by the selection of the controller type.

- *2-Point 1 Bit, Off/On*: The 2-point control is the simplest type of control. The controller switches on when the room temperature drops below a certain level (setpoint temperature value minus hysteresis) and switches off when a particular value (setpoint temperature value plus hysteresis) is exceeded. The switch-on and switch-off commands are transmitted as 1-bit commands.
- *2-Point 1 Byte, 0/100%*: This is another two-point control as described above. In this case, however, the switch-on and switch-off commands are transmitted as 1-byte values (0% / 100%).
- *PI continuous, 0-100%*: The PI controller adjusts its output value between 0% and 100% to match the difference between the actual value and the setpoint value and enables a precise regulation of the room temperature to the setpoint value. It sends the control value to the bus as a 1-byte value (0% - 100%). To reduce the bus load, the control value is only transmitted if it has changed by a predefined percentage in relation to the previous sent value. The control value can also be transmitted cyclically.
- *PI PWM, On/Off*: This also is a PI controller. Here, the output is a 1-bit command. For this to occur, the calculated control value is converted into a pulse-interval signal.
- *Fan coil*: The fan coil controller operates like the PI continuous controller. In addition, it allows the separate activation of the fan in the fan coil unit (e.g. fan speed levels 1 - 3).

58. Control of additional cooling stage - Cooling type

Options:	PI continuous, 0 – 100% and PI PWM, On/Off: ▪ Area (e.g. cooling ceiling) 5°C 240 min ▪ Free configuration

	Fan coil: ▪ Fan coil 4°C 90 min ▪ Free configuration

Two cooling types (area or fan coil) with preset parameters are available to the user.
If the required cooling type is not available, individual parameters can be specified in free configuration.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

59. Control of additional cooling stage - P-component

Options:	Setting option between 1,0 – 25,0 °C

The P-component refers to the proportional band of a control. It fluctuates around the setpoint value and can be used to influence control speed with a PI controller. The smaller the setpoint, the faster it reacts to the control. However, to avoid the risk of an overshoot, this value should not be set too low.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

60. Control of additional cooling stage - I-component (min)

Options:	Setting option between 0 - 255

The I-component refers to the reset time of a control. The integral component has the effect of moving the room temperature slowly toward, and to ultimately reaching, the setpoint. Depending on the type of system used, the reset time has to have different values. In general, the more inactive the overall system, the greater the reset time.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil". In addition, the "Cooling type" parameter must be set on "Free configuration".

61. Control of additional cooling stage - Extended settings

Options:	No
	Yes

This parameter enables additional functions and communication objects, e.g. "Additional cooling stage".

62. Additional cooling stage

Note Only available when the "Extended settings" parameter under "Control of additional cooling stage" is set on "Yes".

63. Additional cooling stage - Mode of the control value

Options:	Normal
	Inverse

The mode of the control value can be used to adapt the control value to de-energised opened (normal) or de-energized closed (inverse) valves.

- N*ormal*: Value 0 means "Valve closed".
- *Inverse*: Value 0 means "Valve open".

64. Additional cooling stage - Hysteresis

Options:	Setting option between 1,0 – 25,0 °C

The hysteresis of the two-point controller specifies the fluctuation range of the controller around the setpoint value. The lower switching point is located at "Setpoint value minus hysteresis" and the upper point is at "Setpoint value plus hysteresis".

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On" or "2-point 1 Byte, 0/100%".

65. Additional cooling stage - Control value difference for sending of cooling control value

Options:	2%
	5%
	10%

The control values of the 0 - 100% PI continuous controller are not transmitted after every calculation. Instead, they are transmitted when the calculation results in a value that is different enough to the previous sent value to make a transmission meaningful. This value difference can be entered here.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

66. Additional cooling stage - Cyclic sending of the control value (min)

Options:	Setting option between 1 - 60 minutes

The current control value used by the device can be cyclically transmitted to the bus.

Note This parameter is only available when the "Control value type" parameter is set either on "2-point 1 Bit, Off/On", "2-point 1 Byte, 0/100%", "PI continuous, 0- 100%" or "Fan coil".

67. Additional stage cooling - PWM cycle cooling (min)

Options:	Setting option between 1 - 60 minutes

In PI PWM, On/off the control value percentage values are converted into a pulse-interval signal. This means that a selected PWM cycle will be divided into an on-phase and an off-phase based on the control value. Accordingly, a control value output of 33% in a PWM cycle of 15 min. results in an "On-phase" of five minutes and an "Off-phase" of 10 min. The time for a PWM cycle can be specified here.

Note This parameter is only available when the "Control value type" parameter is set on "PI PWM, On/Off".

68. Additional cooling stage - Max control value (0 to 255)

Options:	Setting option between 0 - 255

The maximum control value of the PI controller defines the maximum value outputted by the controller. If a maximum value under 255 is chosen, the value will not be exceeded, even if the controller calculates a higher control value.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

69. Additional cooling stage - Min control value for basic load (0 to 255)

Options:	Setting option between 0 - 255

The minimum control value of the PI controller defines the minimum value output by the controller. If a minimum value greater than zero is chosen, the controller will not output a lower value, even if it calculates a value that is lower. This parameter can be used to set a basic load,
e.g. for operating surface cooling. Even if the controller calculates the control value zero, a cooling medium will flow through the cooling area to prevent the floor from heating up. Under "Settings of basic load", it is also possible to define whether this basic load will be permanently active or whether it will be switched by the "Basic load" object.

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

70. Settings of basic load

Note This parameter is only available when "Control value type" parameter is set either on "PI continuous, 0 – 100%", "PI PWM, On/Off" or "Fan coil".

71. Settings of basic load - Minimum control value for basic load > 0

Options:	Always active
	Activate via object

The function finds application when in the desired area, e.g. with floor heating, the floor is to have a basic warmth. The size of the minimum control value specifies the volume of heating medium that flows through the controlled area, even when the calculation of the control value of the controller would indicate a lower value.

- *Always active*: Here it is possible to define whether this basic load will be permanently active or whether it will be switched via the "Basic load" object.
- *Activate via object*: When this parameter is selected, the basic load function, which means the minimum control value with a value higher than zero, can be activated (1) or deactivated (2). If it is activated, then the heating medium will always be fed through the system with at least the minimum control value. If it is deactivated, the control value can be reduced to zero with the controller.

72. Settings of basic load - Basic load active when controller is off

Options:	No
	Yes

Defines whether the basic load should be active yes or no, when the controller is set to “off”.

73. Combined heating and cooling modes

Note Only available when the "Device function" parameter is set on either "Single device" or "Master device" and the control function parameter is set on either "Heating and cooling" or "Heating and cooling with additional stages".

74. Combined heating and cooling modes - Switchover of heating/cooling

Options:	Automatic
	Only via object
	On-site/via extension unit and via object

This function makes it possible to switch between the heating and cooling mode of the device.

- *Automatic*: E.g. for four-conductor systems which allow the switchover between heating and cooling at all times. The device switches automatically between heating and cooling and to the associated setpoint. "Switchover heating/cooling" is a transmitting object.
- *Only via object*: E.g. for two-conductor systems which are operated in heating mode in the winter and cooling mode in the summer. The switchover between heating and cooling and to the associated setpoint is carried out via the corresponding communication object. This function is used when a central switchover of the single room controllers is required. "Switchover heating/cooling" is a receiving object.
- *Local/ via extension unit and via object*: E.g. for four-conductor systems which allow the switchover between heating and cooling at all times. The switchover between heating and cooling and to the associated setpoint is carried out manually on the device by the user of the room or via the "Switchover heating/cooling" object via the bus. "Switchover heating/cooling" is a transmitting and receiving object.

75. Combined heating and cooling modes - Operating mode after reset

Options:	Cooling
	Heating

After a bus voltage failure, a system reset, or the attachment of a device to the bus coupler, the device starts in the parameterized "Operating mode after reset". The operating mode can be changed when the system is running using the options set under "Switchover heating/cooling".

76. Combined heating and cooling modes - Heating/cooling control value output

Options:	Via 1 object
	Via 2 objects

This parameter is used to define whether the control value is transmitted to the climate control actuator using one or two objects. If the climate control actuator has separate control value inputs for heating and cooling, or if separate actuators are used, then the option "Via 2 objects" must be selected. Select the option "Via 1 object" if a single actuator only has one object that receives both the heating and the cooling control values.

77. Combined heating and cooling modes - Additional heating/cooling stage control value output

Options:	Via 1 object
	Via 2 objects

This parameter is used to define whether the control value is transmitted to the climate control actuator using one or two objects. If the climate control actuator has separate control value inputs for heating and cooling, or if separate actuators are used, then the option "Via 2 objects" must be selected. Select the option "Via 1 object" if a single actuator only has one object that receives both the heating and the cooling control values.

Note This parameter is only available when the "Control function" parameter is set on "Heating and cooling with additional stages".

78. Setpoint settings

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

79. Setpoint settings - Setpoint for heating comfort = setpoint for cooling comfort

Options:	No
	Yes

This parameter is used to configure the manner in which the setpoint adjustment functions.

- *Yes*: The device has the same setpoint for heating and cooling in the comfort mode. The system switches to heating when the temperature drops below the setpoint minus hysteresis. It switches to cooling when the temperature exceeds the setpoint plus hysteresis. The hysteresis is parameterizable.
- *No*: The function has two separate setpoints for heating and cooling in the comfort mode. The device will display the currently active setpoint value. Switching between heating and cooling occurs via the "Switchover heating/cooling" parameter setting.

Note This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

80. Setpoint settings - Setpoints for standby and Eco are absolute values

Options:	No
	Yes

This parameter is used to allow the setup of either setpoint temperatures for standby and Eco or reduction/increase temperatures

81. Setpoint settings - Hysteresis for switchover heating/cooling

Options:	Setting option between 0,5 – 10,0 °C

This parameter specifies the one-sided hysteresis for switching between heating and cooling when "Setpoint heating comfort = Setpoint cooling comfort" is active. If the room temperature exceeds the setpoint temperature value plus hysteresis, the system switches to cooling. If the room temperature falls below the setpoint temperature value minus hysteresis, the system switches to heating.

Note This parameter is only available when the "Setpoint heating comfort = Setpoint cooling comfort" parameter is set on "Yes".

82. Setpoint settings - Setpoint temperature for heating and cooling comfort

Options:	Setting option between 10 - 40 °C

Specifies the comfort temperature for heating and cooling when people are present.

Note This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

83. Setpoint settings - Setpoint temperature for heating comfort

Options:	Setting option between 10 - 40 °C

Specifies the comfort temperature for heating when people are present.

Note This parameter is only available when the "Control function" parameter is set on "Heating" or "Heating with additional stage".

84. Setpoint settings - Reduction for standby heating

Options:	Setting option between 0 - 15 °C

Specifies the reduction temperature compared to comfort setpoint in heating mode when nobody is present. On the display, this mode is indicated by the standby icon.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and “Setpoints for standby and Eco are absolute values” is set to “no”.

85. Setpoint settings - Setpoint for heating standby

Options:	Setting option between 10 - 40 °C

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and “Setpoints for standby and Eco are absolute values” is set to “yes”.

86. Setpoint settings - Reduction for heating economy

Options:	Setting option between 0 - 15 °C

Specifies the reduction temperature compared to comfort setpoint in heating mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and “Setpoints for standby and Eco are absolute values” is set to “no”.

87. Setpoint settings - Heating setpoint economy

Options:	Setting option between 10 - 40 °C

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and “Setpoints for standby and Eco are absolute values” is set to “yes”.

88. Setpoint settings – Heating setpoint for building protection

Options:	Setting option between 5 - 15 °C

Function for protecting the building against the cold. On devices with a display, this mode is indicated by the frost protection icon. Manual operation is blocked.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

89. Setpoint settings - Setpoint temperature for cooling comfort

Options:	Setting option between 10 - 40 °C

Specifies the comfort temperature for cooling when people are present.

Note This parameter is only available when the "Control function" parameter is set on "Cooling" or "Cooling with additional stage".

90. Setpoint settings - Increase for standby cooling

Options:	Setting option between 0 - 15 °C

Specifies the temperature in cooling mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and Eco are absolute values" is set to "no".

91. Setpoint settings - Setpoint for cooling standby

Options:	Setting option between 10 - 40 °C

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the standby icon.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and "Setpoints for standby and Eco are absolute values" is set to "yes".

92. Setpoint settings - Increase for economy cooling

Options:	Setting option between 0 - 15 °C

Specifies the temperature in cooling mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and "Setpoints for standby and Eco are absolute values" is set to "no".

93. Setpoint settings - Cooling setpoint economy

Options:	Setting option between 10 - 40 °C

Specifies the temperature in heating mode when nobody is present. On devices with a display, this mode is indicated by the eco icon.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages" and "Setpoints for standby and Eco are absolute values" is set to "yes".

94. Setpoint settings – Cooling setpoint for building protection

Options:	Setting option between 27 - 45 °C

Function for protecting the building against heat. On devices with a display, this mode is indicated by the heat protection icon. Manual operation is blocked.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

95. Setpoint settings - Setpoint adjustment via communication object (DPT 9.001)

Options:	No
	For comfort, standby, eco
	For comfort, standby, eco, building protection

This allows the setpoint to be changed via a communication object, when in the appropriate mode.

96. Setpoint settings - Send current setpoint

Options:	Cyclic and during change
	Only for change

The current setpoint value can be sent to the bus either cyclically and after a change, or only after a change.

97. Setpoint settings - Cyclic sending of the current set-point temperature (min)

Options:	Setting option between 5 – 240 minutes

This parameter is used to specify the amount of time that will elapse before the current setpoint value is automatically transmitted.

Note This parameter is only available when the "Send current setpoint" is set on cyclic.

98. Setpoint adjustment

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

99. Setpoint adjustment — Maximum manual increase during heating mode

Options:	Setting option between 0 - 15 °C

This preset can be used to limit the manual increase during heating.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

100. Setpoint adjustment — Maximum manual reduction during heating mode

Options:	Setting option between 0 - 15 °C

This preset can be used to limit the manual decrease during heating.

Note This parameter is only available when the "Control function" parameter is set on "Heating", "Heating with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

101. Setpoint adjustment — Maximum manual increase during cooling mode

Options:	Setting option between 0 - 15 °C

This preset can be used to limit the manual increase during cooling.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

102. Setpoint adjustment — Maximum manual reduction during cooling mode

Options:	Setting option between 0 – 15 °C

This preset can be used to limit the manual decrease during cooling.

Note This parameter is only available when the "Control function" parameter is set on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

103. Setpoint adjustment - Step size of setpoint adjustment

Options:	0.1
	0.2
	0.5
	1.0

This controls the step size by which the user can decrease or increase the setpoint in comfort mode.

104. Setpoint adjustment - Resetting of the manual adjustment for receipt of a basic setpoint

Options:	No
	Yes

Activating this parameter will cause the manual adjustment to be deleted and the new setpoint value to be provided when a new value is received via the "Basic setpoint" object.
If the parameter is deactivated, the manual adjustment is added to the new base setpoint value. Example: Previous base setpoint value of 21°C + manual adjustment of 1.5°C = 22.5°C. The object receives a new basic setpoint of 18°C plus the previous manual adjustment of 1.5°C for a total of 19.5°C.

105. Setpoint adjustment - Resetting the manual adjustment for change of operating mode

Options:	No
	Yes

If the device switches to a new operating mode, the manual adjustment is deleted and the parameterized setpoint temperature for the operating mode plus any change by the base setpoint value object will be applied if this parameter is activated. Example: Comfort temperature of 21°C plus manual adjustment of 1.5°C = 22.5°C. Change to Eco with programmed temperature 17°C. The device regulates the temperature to 17°C, since the manual adjustment is deleted.
If the parameter is deactivated, the manual setpoint adjustment will be added to the temperature in the new operating mode. Example: Comfort temperature of 21°C plus manual adjustment of 1.5°C = 22.5°C. If the system switches to Eco with a parameterized temperature of 17°C, the device regulates the temperature to 18.5°C, since the manual adjustment is added.

106. Setpoint adjustment - Resetting the manual adjustment via object

Options:	No
	Yes

If this parameter is activated, a separate object can be used to delete the manual adjustment at any time. Example of application: Resetting the manual adjustment on all devices located in a building using a system clock.

107. Setpoint adjustment - Permanent storage of on-site operation

Options:	No
	Yes

If this parameter is activated, the manual settings for setpoint and, where applicable, fan speed level, as well as the value of the "Basic load" object, will be stored in the device and re-activated after a reset. The same applies to the operating mode.
If the device is re-programmed, the stored setpoint values will also be deleted.

108. Temperature reading - Inputs of temperature reading

Options:	External measurement
	Weighted measurement

The room temperature can be measured externally and fed to the device by an object via the bus. In addition, weighted measuring is also available, in which the weighted average of up to two external temperature values is calculated and used as an input value for control.

109. Temperature reading - Weighting of external measurement (%)

Options:	Setting option between 0 – 100

Specifies the weighting of the external measurement at a level between 0% and 100%.

Note This parameter is only available when the "Inputs of temperature reading" parameter is set on "Weighted measurement".

110. Temperature reading - Weighting of external measurement 2 (%)

Options:	Setting option between 0 - 100

Specifies the weighting of the external measurement 2 at a level between 0% and 100%. When added together with the (0%...100%) weighting of the external measurement, the result must be 100%.

Note This parameter is only available when the "Inputs of temperature reading" parameter is set on "Weighted measurement".

111. Temperature reading - Cyclic sending of the actual temperature (min)

Options:	Setting option between 5 – 240 minutes

The current actual temperature used by the device can be cyclically transmitted to the bus.

112. Temperature reading - Difference of value for sending the actual temperature

Options:	Setting option between 0,1 – 10,0 °C

If the change in temperature exceeds the parameterized difference between the measured actual temperature and the previous actual temperature that was sent, the changed value will be transmitted.

113. Temperature reading– Monitoring of temperature reading

Options:	No
	Yes

This parameter allows for the device to switch to error mode in case no temperature has been received over a configurable amount of time.

114. Temperature reading - Monitoring time for temperature reading (hh:mm)

Options:	Setting option between 0 - 120

If no temperature is read within the parameterized time period, the device switches to error mode. It transmits a telegram to the bus via the "Actual temperature error" object and applies the operating mode and control value for error (0 - 255) settings.

Note This parameter is only available when Monitoring of temperature reading is set to “Yes”

115. Temperature reading — Operating mode for fault

Options:	Cooling
	Heating

In the event of a failure of the actual temperature measurement, the device will no longer be able to independently specify the heating/cooling operating type. As a result, the operating type best suited to protecting the building will be selected.

Note This parameter is only available when the "Control function" parameter is set on "Heating and cooling" or "heating and cooling with additional stages".

116. Temperature reading - Control value for fault (0 - 255)

Options:	Setting option between 0 - 255

In the event of a failure of the actual temperature measurement, the device will no longer be able to independently determine the control value. In case of an error, a PWM control (1 Bit) with a fixed cycle time of 15 minutes is used automatically instead of a parameterized 2-point control (1 Bit). In this case the set parameter value is taken into consideration for the control value during an error.

117. Alarm functions

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

118. Alarm functions - Condensate water alarm

Options:	No
	Yes

If a fan coil is used, condensation may form during operation as a result of excessive cooling and/or humidity. The associated condensate is typically collected in a container. To protect the container against overflowing, and thus prevent potential damage to devices and/or the building, the container alerts the "Condensation alarm" object (receiving only) that the maximum fill level has been exceeded. This causes the controller to switch to a protective mode. This status is indicated by the corresponding icon in the visualization. Local operation is blocked. Operation is only possible again after the alarm has been deactivated.

Note This parameter is only available when the "Control function" parameter is set either on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

119. Alarm functions — Dew point alarm

Options:	No
	Yes

When refrigerating machines are used, dew may appear on the refrigerant supply lines during operation as a result of excessive cooling and/or humidity. The dew indicator reports the dew formation via the "Dew point alarm" object (receiving only). This causes the controller to switch to a protective mode. This status is indicated by the corresponding icon in the visualization. Local operation is blocked. Operation is only possible again after the alarm has been deactivated.

Note This parameter is only available when the "Control function" parameter is set either on "Cooling", "Cooling with additional stage", "Heating and cooling" or "Heating and cooling with additional stages".

120. Alarm functions - Frost alarm temperature for HVAC and RHCC status

Options:	Setting option between 0 - 15 °C

The RHCC status and HVAC objects have a frost alarm bit. It the input temperature of the controller drops below the temperature set in this parameter, then the frost alarm bit is set in the status objects. It is reset when the temperature is exceeded.

121. Alarm functions - Heat alarm temperature for RHCC status

Options:	Setting option between 25 – 70 °C

The RHCC status object has a heat alarm bit. If the input temperature of the controller exceeds the temperature set in this parameter, then the heat alarm bit is set in the status object. It is reset when the temperature falls below the set temperature.

122. Temperature limiter

Temperature limiting is used to protect the building from overheating or overcooling, based on an additional temperature sensor. For instance, to protect wooden floors from heating up too much by floor heating. If the measured value exceeds the threshold value, the control value is set to zero. The control value is activated again when the value returns under the threshold value including the hysteresis. For every control function that is enabled (heating, cooling, additional stages) the temperature limiter can be enabled and configured.

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

123. Temperature limiter - Temperature limit (heating, cooling, additional stages)

Options:	No
	Yes

Enables or disables the temperature limit for the control function. Enabling the limit will also make a communication object available for the appropriate temperature sensor.

124. Temperature limiter – Limit temperature

Options:	Setting option between 20 – 100 °C

This parameter is used to set the limit temperature for the corresponding control function.

125. Temperature limiter - Hysteresis

Options:	Setting option between 0,5 – 5 °C

This parameter is used to set the hysteresis for the limit temperature of the corresponding control function. An active limit is deactivated again when the temperature returns under the limit temperature including the hysteresis.

126. Temperature limiter - Integral component of PI controller

Options:	Keep
	Reset

This parameter is used to define the processing of the I-component for PI controllers with a temperature limit.

- If this is set to “Keep”, the previous value of the I-component is the starting point for continuing after the temperature limit is deactivated. This is suitable for slow control systems.
- If this is set to “Reset”, the PI controller will resume with an I-component of zero after the temperature limit is deactivated. This is suitable for fast control systems.

Note: When the control function does not use a PI controller, this parameter has no function.

127. Fan coil unit settings

Options:	Heating/cooling via one system
	Heating/cooling via two system

When both heating and cooling mode use a fan coil, this option allows further fan coil parameters as one system, or one for heating and one for cooling.

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and for both heating and cooling the "Control value type" parameter is set on "Fan coil".

128. Fan coil settings - Fan speed levels

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil". Depending on the amount of fans there will be one menu with settings, or separate menus for heating and cooling.

129. Fan coil settings - Fan speed levels Number of fan speed levels

Options:	3 levels
	5 levels
	10 levels

This parameter is used to specify the number of fan speed levels the actuator will use to control the fan of the fan coil.

130. Fan coil settings - Fan speed levels - Format of the level output

Options:	0..5
	0..255
	1 bit m off n
	1 bit m 1 off n

- *0 to 5*: The level values (0..3 or 0..5) are output in the 1-byte format as the counter values 0..3 or 0..5.
- *0 to 255*: The level values (0..3 or 0..5) are output as percentage values. Example 5-stage fan: The level value 1 is output as 20%, and 5 is output as 100%.
- *1 Bit m from n*: The level values (0..3 or 0..5) are output using 1-bit objects. The number of objects available is the same as the number of fan speed levels. For level 2, for example, the 1-bit fan speed level objects 1 and 2 are output as the value 1, while the other fan speed level objects use the value 0.
- *1 Bit 1 from n*: The level values (0..3 or 0..5) are output using 1-bit objects. The number of objects available is the same as the number of fan speed levels. For the level 2, for example, only the 1-bit fan speed level object 2 is output as the value 1. The other fan speed level objects use the value 0.

131. Fan coil settings - Fan speed levels - Level output

Options:	For manual operation and automatic
	Only for manual operation

This parameter is used to specify when the output of the fan speed level values will occur, either only when the fan speed levels are manually adjusted or also in automatic mode. This setting depends on the options for the fan coil actuator. If the actuator itself controls the fan speed levels in automatic mode based on a derivative of the control value, then the "Only for manual operation" option must be selected. Otherwise, the other option should be selected.

132. Fan coil settings - Fan speed levels - Lowest manually adjustable level

Options:	Level 0
	Level 1

This parameter is used to preselect the lowest fan speed level that can be set by an operation performed at the device. When level 0 is selected, the heating/cooling system will not be in operation (fan speed level and valve control 0) as long as the current operating mode and operation type are maintained. To avoid damage to the building, level 0 is deactivated after 18 hours and the device is returned to automatic mode.

133. Fan coil settings - Fan speed levels - Level status evaluation

Options:	No
	Yes

The controller obtains the current fan speed level for controlling a fan coil actuator either by calculating it from the table of level values under "Fan coil settings for heating" or "Fan coil settings for cooling", or by receiving feedback from the fan coil actuator. If the "Yes" option is selected, the "Fan coil step status" object is activated for receiving the fan speed level from the fan coil actuator.

134. Fan coil settings

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device" and the "Control value type" parameter is set on "Fan coil". Depending on the amount of fans there will be one menu with settings, or separate menus for heating and cooling.

135. Fan coil settings – Step values

Options:	According to standard values table
	Specify single

With this parameter you can configure if the default values for the stages should be used or that custom should be used.

NB This parameter can only be changed if the number of fan speed stages of 3 or 5.

136. Fan coil settings - Speed level .. to 5 up to control value (0 - 255)

Options:	Setting option between 0 - 255

In this parameter, the control values of the controller are assigned to fan speed levels. This assignment is used if the fan speed levels are transmitted together with the control values.

Note These level settings should be adjusted to match the settings in the fan coil actuator. Setting the "Control value type" to "Fan coil" in the control parameters is only useful for one of either the basic stage or the additional stage. Setting the basic and additional stage parameters to fan coil is not useful, since the control of only one fan coil actuator each for heating and cooling is supported.

The "Fan speed level 4 - 5 up to control value (0 - 255) heating" parameters are available only when the "Number of fan speed levels" is set on "5 levels".

137. Fan coil settings - Fan speed level limit heating for eco mode

Options:	No
	Yes

This parameter limits the fan speed level when the system is switched to eco mode.

138. Fan coil settings - Maximum speed level heating for eco mode

Options:	Setting option between 0 - 10

Specifies the maximum possible fan speed level when the system is switched to eco mode.

139. Summer compensation

Note This parameter is only available if the "Device function" parameter is set on either "Single device" or "Master device".

140. Summer compensation - Summer compensation

Options:	No
	Yes

In order to save energy, and to ensure that the temperature difference occurring during entry and exit of a climate-controlled building stays within comfortable limits, the excessive reduction of room temperature should be prevented during high temperatures in the summer (Summer compensation according to DIN 1946). The room temperature is increased by adjusting the setpoint temperature for cooling. Raising the room temperature does not, however, mean that you heat up the room. Rather, the adjustment is intended to allow the room temperature to increase to a certain setpoint without cooling. This, for example, prevents the air-conditioning system from further reducing the room temperature to 24°C with an external temperature of 35°C. However, activation of the summer compensation requires an outside temperature sensor that transmits its measured value to the bus and can be evaluated by the room temperature controller.

Above the "Upper outside temperature value", the minimum setpoint temperature for cooling is the outside temperature minus the "Upper setpoint offset". The outside temperature has no effect on the minimum setpoint temperature for cooling below the "Lower outside temperature value". Between the "Lower" and "Upper outside temperature value", the minimum setpoint temperature for cooling undergoes floating adjustment by the parameterized setpoint temperature equal to the outside temperature minus the "Lower offset" to a value equal to the outside temperature minus the "Upper setpoint offset" as a function of the outside temperature.

Typical values for summer compensation are:

- 21°C: Lower outside temperature value
- 32°C: Upper outside temperature value
- 0 K: Lower setpoint offset
- 6 K: Upper setpoint offset

This means that a continuous increase of the minimum setpoint value for cooling occurs to a value equal to the outside temperature minus a setpoint offset of 0 to 6 K if the outside temperature increases to 32°C from 21°C.

For example: For an increasing outside temperature, the minimum setpoint value for cooling will be increased starting at an outside temperature of 21°C. The minimum setpoint temperature for cooling is 25.1°C at an outside temperature of 30°C; 25.5°C at an outside temperature of 31°C; 26°C at an outside temperature of 32°C; and 27°C at an outside temperature of 33°C.

141. Summer compensation - (Lower) Starting temperature for summer compensation

Options:	Setting option between 10,0 – 40,0 °C

The parameter defines the lower outside temperature value up to which temperature value the setpoint correction (summer compensation) is performed based on too high an outside temperature.

Note This parameter is only available if the "Summer compensation" parameter is set to "Yes".

142. Summer compensation - Offset of the set-point temperature for the entry into summer compensation

Options:	Setting option between 0,0 – 25,0 °C

The parameter is used to define how many degrees Kelvin the setpoint value will be increased by during summer compensation when the lower temperature value is reached. See “Summer compensation” above for more information.

Note This parameter is only available if the "Summer compensation" parameter is set to "Yes".

143. Summer compensation - (Upper) exit temperature for summer compensation

Options:	Setting option between 10,0 – 40,0 °C

The parameter defines the upper outside temperature value up to which temperature value the setpoint correction (summer compensation) is performed based on too high an outside temperature.

Note This parameter is only available if the "Summer compensation" parameter is set to "Yes".

144. Summer compensation - Offset of the set-point temperature for the exit from summer compensation

Options:	Setting option between 0,0 – 25,0 °C

The parameter is used to define how many degrees Kelvin the setpoint value will be increased by during summer compensation when the upper temperature value is reached. See “Summer compensation” above for more information.

Note This parameter is only available if the "Summer compensation" parameter is set to "Yes".

Addendum B – RTC communication objects

1. Heating control value

Number	Name	Object function	Data type
0	Heating control value (control value heating/cooling)	Output	1. Switching 2. Percent (0 to 100%)

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

2. Additional heating stage

Number	Name	Object function	Data type
1	Additional heating stage (additional heating/cooling stage)	Output	1. Switching 2. Percent (0 to 100%)

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

Note The additional stage can also be used as a parallel second heating stage. To do this, set the parameter for the temperature difference to the basic stage to 0°C.

3. Cooling control value

Number	Name	Object function	Data type
2	Cooling control value	Output	1. Switching 2. Percent (0 to 100%)

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

4. Additional cooling stage

Number	Name	Object function	Data type
3	Additional cooling stage	Output	1. Switching 2. Percent (0 to 100%)

1. This object is used to operate a switching actuating drive, e.g. a thermoelectric

positioner, that is controlled by a switching/heating actuator.
2. This object is used to control an actuating drive with a continuous input value (0%..100%), e.g. an electromotive actuating drive.

Note The additional stage can also be used as a parallel second cooling stage. To do this, set the parameter for the temperature difference to the basic stage to 0°C.

5. Control On/Off or On/Off confirmation

Number	Name	Object function	Data type
4	1. Control On/Off	Output	Switching
	2. On/Off confirmation (master)	Output	Switching
	3. On/Off confirmation (slave)	Input	Switching

If a 0 telegram is received, the controller switches to OFF mode and regulates the temperature to the setpoint value for frost/heat protection. When the controller is switched on again, the remaining operating mode objects are queried in order to determine the new operating mode.

Note Item 2 and 3 should be linked to the corresponding master/slave objects.

6. Actual temperature weighted

Number	Name	Object function	Data type
5	Actual temperature weighted	Output	2-byte floating point value

The object outputs the temperature value which is calculated from the recording and weighting of the to two external temperatures.

Note An external temperature measurement for room control may be practical for larger rooms and/or floor heating.

7. External actual temperature

Number	Name	Object function	Data type
6	External actual temperature	Input	2-byte floating point value

2-byte communication object for reading an external temperature value provided via the KNX bus.

8. External actual temperature 2

Number	Name	Object function	Data type
7	External actual temperature 2	Input	2-byte floating point value

2-byte communication object for reading an additional external temperature value provided via the KNX bus.

9. Fault, actual temperature

Number	Name	Object function	Data type
8	1. Fault, actual temperature	Output	Switching
	2. Fault, actual temperature (master)	Output	Switching
	3. Fault, actual temperature (slave)	Input	Switching

If one of the parameterized input temperatures is unavailable to the controller for a period longer than the monitoring time, the controller enters the error mode. The error mode is sent to the bus as the value 1.

Note Item 2 and 3 should be linked to the corresponding master/slave objects.

10. Current setpoint

Number	Name	Object function	Data type
10	Current setpoint	Output	2-byte floating point value

The object outputs the current setpoint temperature resulting from the following: the parameterized setpoint temperature of the current operation type and operating mode, the manual setpoint temperature adjustment, a change in the base setpoint temperature via the base setpoint value object. This is purely a transmitting object.

11. Normal operating mode

Number	Name	Object function	Data type
11	1. Normal operating mode	Input / output	HVAC mode
	2. Normal operating mode (master)	Input / output	HVAC mode
	3. Normal operating mode (slave)	Input / output	HVAC mode

The "Operating mode" object receives, as a 1-byte value, the operating mode that is to be set. Here value 1 means "Comfort", value 2 "Standby", value 3 "Economy" and value 4 "Frost/heat protection".
In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed

operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note Item 2 and 3 should be linked to the corresponding master/slave objects.

12. Override operating mode

Number	Name	Object function	Data type
12	1. Override operating mode	Input	HVAC mode
	2. Override operating mode (master/slave)	Input	HVAC mode

The "Superimposed operating mode" object receives the operating mode that is to be set as 1- byte value. Here value 0 means "Superimposition inactive", value 1 "Comfort", value 2 "Standby", value 3 "Economy" and value 4 "Frost/heat protection". In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate ware alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note Item 2 should be linked to the corresponding master/slave objects.

13. Window contact

Number	Name	Object function	Data type
13	1. Window contact	Input	Switching
	2. Window contact (master/slave)	Input	Switching

The object uses the value 1 to signal an open window to the controller. If no other object with a higher priority is present, then the "Window contact" message causes the controller to be set to the setpoint value for frost/heat protection. In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate water alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note Item 2 should be linked to the corresponding master/slave objects.

14. Presence detector

Number	Name	Object function	Data type
14	1. Presence detector	Input	Switching
	2. Presence detector (master/slave)	Input	Switching

This object transmits the value 1 to the controller to signal that there are people in the room. If not other object with a higher priority is present, then the "Presence detector" causes the controller to be set to the comfort setpoint value. In addition to manual setpoint adjustment and the adjustment of the basic setpoint value, the setpoint temperature of the controller can also be defined by objects "Superimposed operating mode", "Condensate water alarm", "Dew alarm", "Window contact", "Control On/Off", "Presence detector" and "Operating mode (listed in decreasing order of priority).

Note Item 2 should be linked to the corresponding master/slave objects.

15. Status heating

Number	Name	Object function	Data type
15	Status heating	Output	Switching

The room temperature controller sends an ON telegram via the "Heating status" object as soon as it is active in the heating mode. If the controller is in the inactive zone between heating and cooling or is in cooling mode, the room temperature controller transmits an OFF telegram on the "Heating status" object.

16. Status cooling

Number	Name	Object function	Data type
16	Cooling status	Output	Switching

The room temperature controller sends an ON telegram via the "Cooling status" object as soon as it is active in the cooling mode. If the controller is in the inactive zone between heating and cooling or is in heating mode, the room temperature controller transmits an OFF telegram on the "Cooling status" object.

17. Basic load

Number	Name	Object function	Data type
17	Basic load	Input	Switching

This object uses the value 1 to activate a parameterized base load, i.e. a minimum control value greater than zero. The value 0 deactivates the base load. When the base load is deactivated, the control value can be lowered all the way to zero if necessary when the setpoint temperature is reached, despite the minimum value set in the parameter.

Note Deactivating the basic load for a floor heating system is always useful in the summer, since it saves heating energy.

18. Switchover heating/cooling

Number	Name	Object function	Data type
18	Switchover heating/cooling	Input / output	Switching

1. Automatic: If the switchover between heating and cooling is performed automatically by the room temperature controller, then this object is used to provide information on the current heating (0) or cooling (1) status to the KNX bus. It is a transmitting object.
2. Only via object: The switchover between heating and cooling on the room temperature controller occurs solely via this 1-bit communication object. The value (0) activates the heating mode, and the value (1) activates the cooling mode. This is a receiving object.
3. Manual or via object: The switchover between heating and cooling on the room temperature controller occurs by user interaction or via the 1-bit communication object. The information on the respective heating (0) or cooling (1) status is available to the KNX bus. This is a receiving and sending object.

19. Fan manual

Number	Name	Object function	Data type
19	1. Fan manual	Output	Switching
	2. Fan manual confirmation (Master)	Output	Switching
	3. Fan manual confirmation (Slave)	Input	Switching

Using this 1-bit communication object, a fan coil actuator can be placed in manual fan mode or returned to automatic fan mode. In the automatic fan mode of the fan coil actuator, the fan's rotational speed is defined in the fan coil actuator using the control value. In manual fan operation, the user of the room temperature controller can set the fan's rotational speed as needed. This setting will remain active until it is reset. The fan speed level 0 is an exception: to avoid damage to the building, automatic mode is activated again 18 hours after fan speed level 0 is selected.

Note Item 2 and 3 should be linked to the corresponding master/slave objects.

20. Fan speed / level

Number	Name	Object function	Data type
20	1. Fan speed / level 2. Fan speed / level (heating)	Output	Percentage or counter value

The fan speed level in the fan coil actuator is selected via the 1-byte communication object. Whether the fan speed level information is transmitted in manual or also in automatic fan speed level mode can be set. The formats that can be selected for the 1-byte communication object are the fan speed level (0..5) or a percentage value (0..100%) which is calculated back to a fan speed level in the fan coil actuator.

21. Fan speed / level status

Number	Name	Object function	Data type
21	1. Fan speed / level status 2. Fan speed / level status (heating)	Input	Percentage or counter value

With this object, the room temperature controller receives the current fan speed level of the fan coil actuator.

22. Fan speed / level 1

Number	Name	Object function	Data type
22	1. Fan speed level 1 2. Fan speed level 1 (heating)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

23. Fan speed / level 2

Number	Name	Object function	Data type
23	1. Fan speed level 2 2. Fan speed level 2 (heating)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

24. Fan speed / level 3

Number	Name	Object function	Data type
24	1. Fan speed level 3 2. Fan speed level 3 (heating)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

25. Fan speed / level 4

Number	Name	Object function	Data type
25	1. Fan speed level 4 2. Fan speed level 4 (heating)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

26. Fan speed / level 5

Number	Name	Object function	Data type
26	1. Fan speed level 5 2. Fan speed level 5 (heating)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

27. Basic setpoint

Number	Name	Object function	Data type
27	Basic setpoint	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the parameterized basic setpoint value via the KNX bus. Parameters can be used to define whether the value received by this object is interpreted as "Setpoint heating comfort", "Setpoint cooling comfort" or an average between heating and cooling comfort.

28. Resetting manual setpoints

Number	Name	Object function	Data type
28	Resetting manual setpoints	Input	Switching

This 1-bit communication object is used to reset the manual setpoint adjustment that was set on the device.

29. Dew point alarm

Number	Name	Object function	Data type
29	Dew point alarm	Input	Switching

This 1-bit communication object is used to place the controller in the dew point alarm mode. This causes the current setpoint value to be set to the heat protection setpoint value in order to keep the structure from being damaged by dew.

Note This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value (0). When an alarm is active, manual operation of the controller is blocked. This information is indicated by a corresponding icon on the control unit.

30. Condensate water alarm

Number	Name	Object function	Data type
30	1. Condensate water alarm	Input	Switching
	2. Condensate water alarm (master/slave)	Input	Switching

This 1-bit communication object is used to place the controller in the condensation alarm mode. This causes the current setpoint value to be set to the heat protection setpoint value in order to keep the structure from being damaged by an overflowing condensation container.

Note This protective mechanism is only active in the cooling mode. It remains in place until it is cancelled by the value (0). When an alarm is active, manual operation of the controller is blocked. This information is indicated by a corresponding icon on the device. Item 2 should be linked to the corresponding master/slave objects.

31. Outside temperature for summer compensation

Number	Name	Object function	Data type
31	Outside temperature for summer compensation	Input	2-byte floating point value

In order to save energy, and to ensure that the temperature difference occurring during entry and exit of a climate-controlled building stays within comfortable limits, the reduction of room temperature by cooling devices should be limited as a function of the outside temperature (summer compensation). This, for example, prevents the air-conditioning system from further reducing the room temperature to 24°C with an outside temperature of 35°C.
This function can only be used with an outside temperature sensor. This 2-byte communication object must then be used to provide the controller with the current outside temperature.

32. Summer compensation active

Number	Name	Object function	Data type
32	Summer compensation active	Output	Switching

This 1-bit communication object is used to indicate via the bus whether the summer compensation is active (1) or inactive (0). If it is active, the setpoint value configured for the cooling mode is increased by the summer compensation function. A decrease of the cooling mode setpoint temperature below the value calculated by the parameterized summer compensation function is not possible. An increase of the setpoint temperature for the cooling mode is always possible.

33. Unit switchover

Number	Name	Object function	Data type
34	Unit switchover	Input / output	Switching

The temperature indication can be changed from Celsius (°C) to Fahrenheit (°F). The conversion from Celsius to Fahrenheit always takes place in the unit, since only Celsius values are sent over the KNX bus. The value (0) results in a temperature indication in Celsius, while the value (1) results in Fahrenheit.

34. On/Off request

Number	Name	Object function	Data type
36	1. On/off request (master)	Input	Switching
	2. On/off request (slave)	Output	Switching

This 1-bit communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

35. Setpoint display

Number	Name	Object function	Data type
37	1. Setpoint display (master)	Output	2-byte floating point value
	2. Setpoint display (slave)	Input	2-byte floating point value

This 2-byte communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

36. Request setpoint

Number	Name	Object function	Data type
38	1. Request set value (master)	Input	2-byte floating point value
	2. Request set value (slave)	Output	2-byte floating point value

This 1-byte communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

37. Confirm setpoint

Number	Name	Object function	Data type
39	1. Confirm set value (master)	Output	2-byte floating point value
	2. Confirm set value (slave)	Input	2-byte floating point value

This 1-byte communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

38. Heating/cooling request

Number	Name	Object function	Data type
40	1. Heating/cooling request (master)	Input	Switching
	2. Heating/cooling request (slave)	Output	Switching

This 1-bit communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

39. Request fan speed / level manual

Number	Name	Object function	Data type
41	1. Request fan speed / level manual (master)	Input	Switching
	2. Request fan speed / level manual (slave)	Output	Switching

This 1-bit communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

40. Request fan speed / level

Number	Name	Object function	Data type
42	1. Request fan speed / level (master)	Input	Percentage or counter value
	2. Request fan speed / level (slave)	Output	Percentage or counter value

This 1-byte communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

41. Confirm fan speed level

Number	Name	Object function	Data type
43	1. Confirm fan speed level (master)	Output	Percentage or counter value
	2. Confirm fan speed level (slave)	Input	Percentage or counter value

This 1-byte communication object must be connected to the respective slave communication object in order to synchronize the devices in the master/slave configuration.

42. Controller status RHCC

Number	Name	Object function	Data type
44	Controller status RHCC	Output	RHCC

This communication object outputs the heating/cooling operation type, active/inactive operation, the frost and heat alarm, and the error (actual temperature reading failure) in accordance with the specification for the RHCC (Room Heating Cooling Controller) status.

43. Controller status HVAC

Number	Name	Object function	Data type
45	1. Controller status HVAC	Output	8-bit
	2. Controller status HVAC (master)	Output	8-bit
	3. Controller status HVAC (slave)	Input	8-bit

This communication object outputs the current operating mode, the heating/cooling mode, active/inactive mode, the frost alarm and the dew point alarm in accordance with the specification for the HVAC (Heating Ventilation Air Conditioning) status.

Note Item 2 and 3 should be linked to the corresponding master/slave objects.

44. Setpoint for heating comfort

Number	Name	Object function	Data type
47	Setpoint for heating comfort	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

45. Setpoint for heating standby

Number	Name	Object function	Data type
48	Setpoint for heating standby	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

46. Heating setpoint economy

Number	Name	Object function	Data type
49	Heating setpoint economy	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

47. Heating setpoint for building protection

Number	Name	Object function	Data type
50	Heating setpoint for building protection	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

48. Setpoint for cooling comfort

Number	Name	Object function	Data type
51	Setpoint for cooling comfort	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

49. Setpoint for cooling standby

Number	Name	Object function	Data type
52	Setpoint for cooling standby	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

50. Cooling setpoint economy

Number	Name	Object function	Data type
53	Cooling setpoint economy	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

51. Cooling setpoint for building protection

Number	Name	Object function	Data type
54	Cooling setpoint for building protection	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the setpoint value via the KNX bus for the appropriate mode.

52. Setpoint error

Number	Name	Object function	Data type
55	Setpoint error	Output	Switching

This communication object is set to active (1) when a requested setpoint is out of range.

53. Heating temperature limit basic stage

Number	Name	Object function	Data type
56	Heating temperature limit basic stage	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the limit value via the KNX bus for heating in the basic stage.

54. Heating temperature limit additional stage

Number	Name	Object function	Data type
57	Heating temperature limit additional stage	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the limit value via the KNX bus for heating in the additional stage.

55. Cooling temperature limit basic stage

Number	Name	Object function	Data type
58	Cooling temperature limit basic stage	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the limit value via the KNX bus for cooling in the basic stage.

56. Cooling temperature limit additional stage

Number	Name	Object function	Data type
59	Cooling temperature limit additional stage	Input	2-byte floating point value

This 2-byte communication object can be used to change/adjust the limit value via the KNX bus for cooling in the additional stage.

57. Fan manual (cooling)

Number	Name	Object function	Data type
60	1. Fan manual (cooling	Output	Switching
	2. Fan manual (cooling) confirmation (master)	Output	Switching
	3. Fan manual (cooling) confirmation (slave)	Input	Switching

Using this 1-bit communication object, a fan coil actuator can be placed in manual fan mode or returned to automatic fan mode. In the automatic fan mode of the fan coil actuator, the fan's rotational speed is defined in the fan coil actuator using the control value. In manual fan operation, the user of the room temperature controller can set the fan's rotational speed as needed. This setting will remain active until it is reset. The fan speed level 0 is an exception: to avoid damage to the building, automatic mode is activated again 18 hours after fan speed level 0 is selected.

Note Item 2 and 3 should be linked to the corresponding master/slave objects.

58. Fan step (cooling)

Number	Name	Object function	Data type
61	Fan step (cooling)	Output	Percentage or counter value

The fan speed level in the fan coil actuator is selected via the 1-byte communication object. Whether the fan speed level information is transmitted in manual or also in automatic fan speed level mode can be set. The formats that can be selected for the 1-byte communication object are the fan speed level (0..5) or a percentage value (0..100%) which is calculated back to a fan speed level in the fan coil actuator.

59. Fan speed / level status (cooling)

Number	Name	Object function	Data type
62	Fan speed / level status	Input	Percentage or counter value

Using this object, the room temperature controller receives the current fan speed level of the fan coil actuator.

60. Fan speed / level 1 (cooling)

Number	Name	Object function	Data type
63	Fan speed / level 1 (cooling)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

61. Fan speed / level 2 (cooling)

Number	Name	Object function	Data type
64	Fan speed / level 2 (cooling)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

62. Fan speed / level 3 (cooling)

Number	Name	Object function	Data type
65	Fan speed / level 3 (cooling)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

63. Fan speed / level 4 (cooling)

Number	Name	Object function	Data type
66	Fan speed / level 4 (cooling)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

64. Fan speed / level 5 (cooling)

Number	Name	Object function	Data type
67	Fan speed / level 5 (cooling)	Output	Switching

This 1-bit communication object is used to output the active status (1) of the fan speed level, while the other fan speed levels are deactivated (0), depending on the parameter setting. If the fan speed level is inactive, the object has a value of (0).

65. Current HVAC operating mode

Number	Name	Object function	Data type
68	Current HVAC operating mode	Output	HVAC mode

This communication object outputs the current operating mode, the heating/cooling mode, active/inactive mode, the frost alarm and the dew point alarm as HVAC mode.