Technical manual GS 4x.00 knx – application description – air quality sensor

GS 40.00 knx

GS 41.00 knx

General Information

The device fits for the particular use of the following tasks: monitoring of the air quality in building systems technology (schools, offices, hotels, conference venue etc.), data transfer and regulation via bus system. The device is intended for use in accordance with the defined technical data. Operate the device exclusively in a dry room! The device is not qualified for security relevant tasks such as emergency doors, fire protection equipment, fermenting cellars etc.

The air quality sensor GS 4x.00 knx can provide the following data and control for the KNX bus:

CO_2:	Value output
	Control (step and PI control)
Relative humidity:	Value output
	Control (step and PI control)
Temperature:	Value output
	Control heating / cooling (2-point and PI control)
	Alarms
Dew point:	Value output
	Alarm
Air pressure:	Value output

Please consider that handling and installation of the device is explained in the instruction manual enclosed to the product!
Please take into account the resolution of the 2 Bytes data type (see KNX Specification)!

Table of contents

Application program

Manufacturer: Hugo Müller GmbH & Co KG, Sturmbühlstraße 145-149, D-78054 VS-Schwenningen
Program name: GS 4x.00 knx
Installation: Add the device to your device list and open a new project. You can download the ETS database on our webpage:
http://www.hugo-mueller.de/connect/knx-devices,d,en,4,16,154.html

Number of communication objects:	69	Number of group adresses:	254	Number of allocations:	255

Technical data

Power supply:	via KNX bus voltage
Bus current:	< 10 mA
Bus system:	KNX
Sensors:	CO_2, relative humidity, temperature, dew point, VAV control
Measuring range CO_2 concentration:	390–10,000 ppm
Measuring range rel. humidity:	0–100%
Measuring range temperature:	0–50°C
Measuring range atmospheric pressure:	300-1,100 hPa
Class of protection:	IP 20 to DIN EN 60529
Permitted ambient temperature:	0°C …+50°C
Test mark:	CE
Housing:	Self-extinguishing thermoplastic
Housing colour:	114 x 83 x 24 mm
Mounting:	Wall
Type of connection:	KNX bus terminal

Overview parameters

Parameters	Subcategory parameters	Description
CO_2	CO_2 sensor	Settings for the CO_2 sensor: activation – deactivation, definition of the sending procedure of the measured values.
	CO_2 control	Setting of the controller type (inactive, single-stage, two-stage, three-stage, PI) and corresponding control values (output format, switch and cyclical sending).
Relative humidity	Relative humidity sensor	Settings for the relative humidity sensor: activation – deactivation, definition of the sending procedure of the measured values.
	Relative humidity control	Setting of the controller type (inactive, single-stage, two-stage, three-stage, PI) and corresponding control values (output format, switch and cyclical sending).
Temperature	Temperature sensor	Settings for the temperature sensor: activation – deactivation, definition of the sending procedure of the measured values.
	Temperature alarm	Setting the parameters for the frost alarm and heat alarm: activation – deactivation, definition of the sending procedure of the measured values.
	Temperature control	Setting of the controller type (inactive, heating, cooling, heating & cooling) and for other control values (additional level and control).
Dew point	Dew point temperature	Settings for the dew point: activation – deactivation, definition of the sending procedure of the measured values.
	Dew point alarm	Settings for the dew point: activation – deactivation, definition of the sending procedure of the measured values.
Air pressure	Air pressure sensor	Settings for the air pressure sensor: activation – deactivation, definition of the sending procedure of the measured values.
VAV control	Settings	Settings for the VAV control: activation – deactivation of PI controllers as well as the definition of the sending procedure of the controller values.

Communication objects

Communication objects 1 - 69								
Number	**Name**	**Object function**	**C**	**R**	**W**	**T**	**U**	**Data Type**
1	CO_2: CO_2 value [ppm]	output	C	-	-	T	-	2-byte float value, parts/million (ppm)
2	CO_2: CO_2 value external [ppm]	input	C	-	W	-	-	2-byte float value, parts/million (ppm)
3	CO_2: request CO_2 value	input	C	-	W	-	-	1-bit, trigger
4	CO_2: sensor error	output	C	-	-	T	-	1-bit, boolean
5	CO_2C: control value (0...255)	output	C	-	-	T	-	8-bit unsigned value, counter pulses (0..255)
6	CO_2C: control value level 1 (priority)	output	C	-	-	T	-	1-bit controlled, switch control
7	CO_2C: control value level 2 (priority)	output	C	-	-	T	-	1-bit controlled, switch control
8	CO_2C: control value level 3 (priority)	output	C	-	-	T	-	1-bit controlled, switch control
9	CO_2C: base setpoint [ppm]	input	C	-	W	-	-	2-byte float value, parts/million (ppm)
10	CO_2C: blocking object level 1	input	C	-	W	-	-	1-bit, enable
11	CO_2C: blocking object level 2	input	C	-	W	-	-	1-bit, enable
12	CO_2C: blocking object level 3	input	C	-	W	-	-	1-bit, enable
13	CO_2C: blocking object	input	C	-	W	-	-	1-bit, enable
14	rH: humidity value [%]	output	C	-	-	T	-	2-byte float value, humidity (%)
15	rH: humidity value (1 byte) [%]	output	C	-	-	T	-	8-bit unsigned value, percentage (0..100%)
16	rH: humidity value external [%]	input	C	-	W	-	-	2-byte float value, humidity (%)
17	rH: request humidity value	input	C	-	W	-	-	1-bit, trigger
18	rH: sensor error	output	C	-	-	T	-	1-bit, boolean
19	RHC: control value (0...100%)	output	C	-	-	T	-	8-bit unsigned value, percentage (0..100%)
20	RHC: control value level 1 (priority)	output	C	-	-	T	-	1-bit controlled, switch control
21	RHC: control value level 2 (priority)	output	C	-	-	T	-	1-bit controlled, switch control
22	RHC: control value level 3 (priority)	output	C	-	-	T	-	1-bit controlled, switch control
23	RHC: base setpoint [%]	input	C	-	W	-	-	2-byte float value, humidity (%)
24	RHC: base setpoint (1 byte) [%]	input	C	-	W	-	-	8-bit unsigned value, percentage (0..100%)
25	RHC: blocking object level 1	input	C	-	W	-	-	1-bit, enable
26	RHC: blocking object level 2	input	C	-	W	-	-	1-bit, enable
27	RHC: blocking object level 3	input	C	-	W	-	-	1-bit, enable
28	RHC: blocking object	input	C	-	W	-	-	1-bit, enable
29	T: temperature value [°C]	output	C	-	-	T	-	2-byte float value, temperature (°C)
30	T: temperature value external [°C]	input	C	-	W	-	-	2-byte float value, temperature (°C)

31	T: request temperature value	input	C	-	W	-	-	1-bit, trigger
32	T: sensor error	output	C	-	-	T	-	1-bit, boolean
33	T: heat alarm	output	C	-	-	T	-	1-bit, boolean
34	T: frost alarm	output	C	-	-	T	-	1-bit, boolean
35	RTC: comfort temperature	input	C	-	W	-	-	2-byte float value, temperature (°C)
36	RTC: standby setback when heating	input	C	-	W	-	-	2-byte float value, temperature (°C)
37	RTC: eco setback when heating	input	C	-	W	-	-	2-byte float value, temperature (°C)
38	RTC: standby increment when cooling	input	C	-	W	-	-	2-byte float value, temperature (°C)
39	RTC: eco increment when cooling	input	C	-	W	-	-	2-byte float value, temperature (°C)
40	RTC: current setpoint temperature	output	C	-	-	T	-	2-byte float value, temperature (°C)
41	RTC: comfort temperature +/- 0,1K	input	C	-	W	-	-	1-bit, up/down
42	RTC: standby setback when heating +/- 0,1K	input	C	-	W	-	-	1-bit, up/down
43	RTC: eco setback when heating +/- 0,1K	input	C	-	W	-	-	1-bit, up/down
44	RTC: standby increment when cooling +/- 0,1K	input	C	-	W	-	-	1-bit, up/down
45	RTC: eco increment when cooling +/- 0,1K	input	C	-	W	-	-	1-bit, up/down
46	RTC: HVAC Modus: 1=comf, 2=stdb, 3=eco	send/reception	C	-	W	T	-	1-byte, HVAC mode
47	RTC: comfort mode enable	input	C	-	W	-	-	1-bit, enable
48	RTC: standby mode enable	input	C	-	W	-	-	1-bit, enable
49	RTC: eco mode enable	input	C	-	W	-	-	1-bit, enable
50	RTC: status heating	output	C	-	-	T	-	1-bit, switch
51	RTC: status cooling	output	C	-	-	T	-	1-bit, switch
52	RTC: control value main level heating	output	C	-	-	T	-	8-bit unsigned value, percentage (0..100%)
53	RTC: control value extra level heating	output	C	-	-	T	-	8-bit unsigned value, percentage (0..100%)
54	RTC: control value main level cooling	output	C	-	-	T	-	8-bit unsigned value, percentage (0..100%)
55	RTC: control value extra level cooling	output	C	-	-	T	-	8-bit unsigned value, percentage (0..100%)
56	RTC: guide value [°C]	input	C	-	W	-	-	2-byte float value, temperature (°C)
57	RTC: blocking object heating	input	C	-	W	-	-	1-bit, enable
58	RTC: blocking object cooling	input	C	-	W	-	-	1-bit, enable
59	RTC: blocking object extra level heating	input	C	-	W	-	-	1-bit, enable
60	RTC: blocking object extra level cooling	input	C	-	W	-	-	1-bit, enable
61	DEWP: dewpoint temperature [°C]	output	C	-	-	T	-	2-byte float value, temperature (°C)
62	DEWP: dewpoint alarm enabled (switching object)	output	C	-	-	T	-	1-bit, switch
63	DEWP: request dewpoint temperature	input	C	-	W	-	-	1-bit, trigger
64	P: Absolute air pressure [Pa]	output	C	-	-	T	-	2-byte float value, pressure (Pa)

65	P: Relative air pressure [Pa]	output	C	-	-	T	-	2-byte float value, pressure (Pa)
66	P: air pressure sensor error	output	C	-	-	T	-	1-bit, boolean
67	P: request absolute air pressure	input	C	-	W	-	-	1-bit, trigger
68	P: request relative air pressure	input	C	-	W	-	-	1-bit, trigger
69	VAVC: control value (0...255)	output	C	-	-	T	-	8-bit unsigned value, counter pulses (0..255)

Communication flags

Flag	Name	Meaning
C	Communication	Object can communicate
R	Read	Object status can be requested (ETS, display etc.)
W	Write	Object can receive information
T	Transmit	Object can send information
U	Update	Object can request a value from another bus participant. The answer is interpreted as write command and updates the value of the communication object. This is typically used to request external sensor data after a bus voltage recovery.

Adjustment options for:

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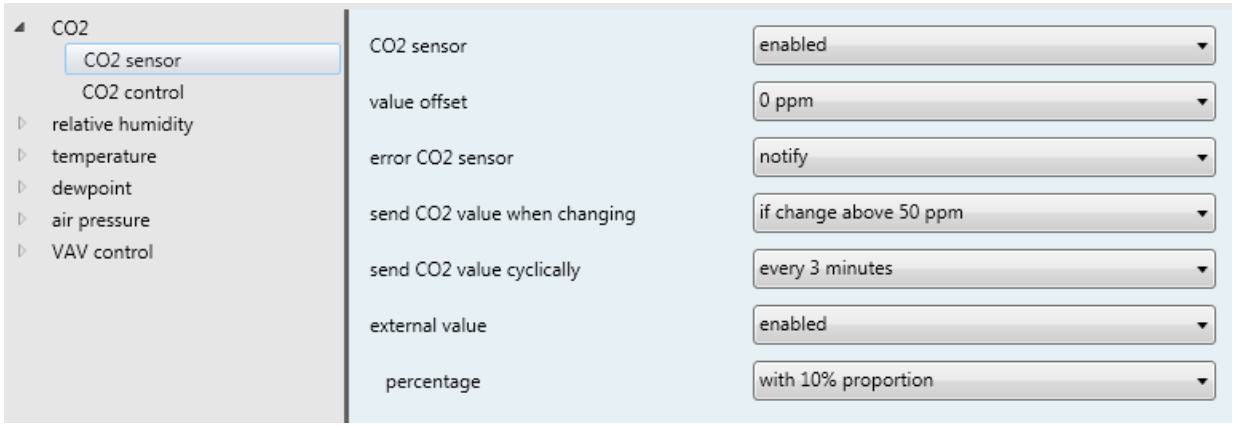
1. CO_2, rel. humidity, temperature and air pressure sensor

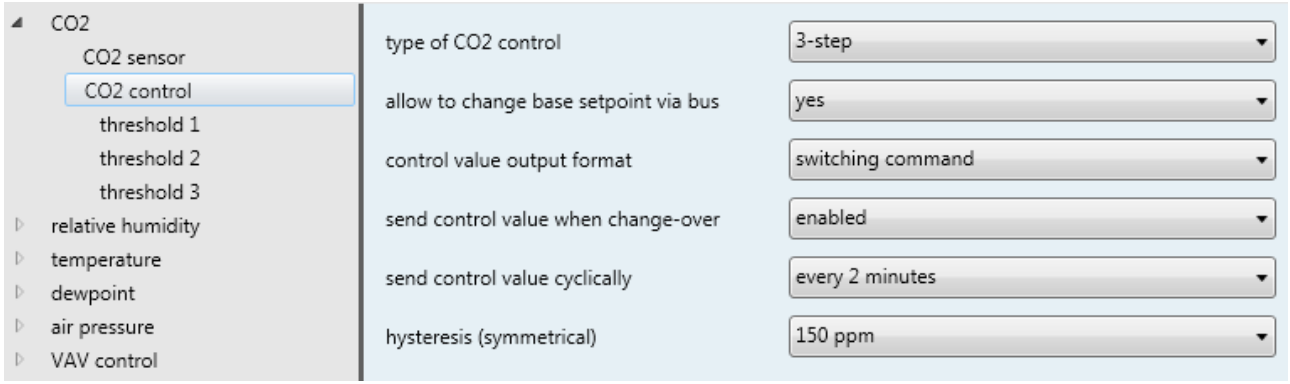
(Picture shows CO_2 sensor)



Designation	Options			Description
CO_2 sensor	Disabled Enabled	Error CO_2 sensor	Notify Don´t notify	If there are no new values provided from the sensor for more than 10 minutes, the sensor failure will be reported.
		Send CO_2 value when changing	*Disabled* Change from 10 to 500 ppm	No reaction. The new value is sent if the difference between old and new value is above the defined sending threshold.
		Send CO_2 value cyclically	*Disabled* Every minute – once a day	No reaction. Cyclic sending of the recent value.
Value offset	Selection: -500 to +500 ppm			The value is adjusted by this offset. A correction might be necessary in different causes. (e.g. sensor is placed at an unfavorable position, next to a window.
External value	Disabled Enabled	Selection: Include a share of 10% to 90% or use external value only		No reaction. The internal and an external value are taken pro rata to calculate an overall value. This value is relevant for the control and the sending procedure is as defined above.
Height [m. a. s. l.] (0…5000m) **(only for air pressure)**	Selection: 0 to 5000m			Settings for the calculation of the relative air pressure.

2. CO_2 and relative humidity control

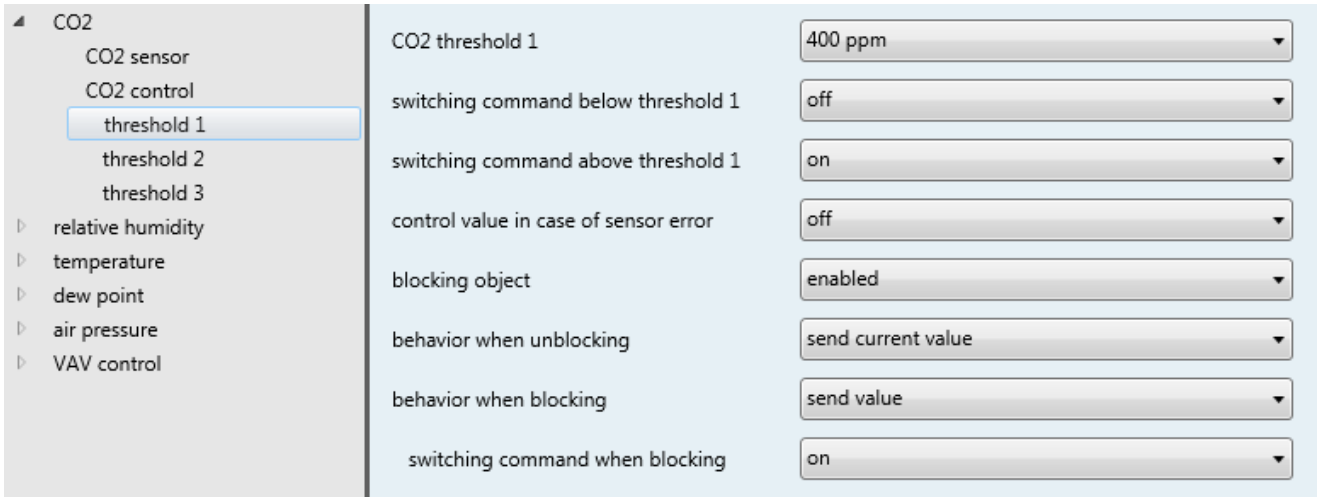
(Picture shows CO_2 control)



Designation	Options		Description	
Selection of the type of control: ***Disabled*** **1-step** (2.1 / 2.2 a threshold)	Allow to change base setpoint via bus	No Yes	Setting if a change of the base setpoint should be allowed via the bus or not.	
2-step (2.1 / 2.2 two thresholds) **3-step** (2.1 / 2.2 three thresholds) **PI** (2.3 PI control)	Control value output format	Switching command Priority Percent Byte Scene	A switching telegram is sent. A priority telegram is sent. A percentage value is sent. A byte value is sent. A scene value is sent.	There is one object available for every stage. There is one object available for every stage. All steps are sending via one object. All steps are sending via one object. All steps are sending via one object.
	Send control value when change-over	Disabled Enabled	No reaction. When exceeding or falling below a threshold a defined object is sent.	
	Send control value when changing (*PI control*)	Disabled At a change from 1% to 25%	No reaction. If there is a change, the recent control value is sent.	
	Send control value cyclically	Selection: Disabled, Every two minutes to twelve hours or once a day.	No reaction, cyclic sending of the recent control value.	
	Hysteresis (symmetrical) (*single-stage, two-stage, three-stage*)	50 to 300 ppm at CO_2 1% to 10% at rF	The hysteresis can prevent a frequent switching for fast and small changing values.	

2.1 Switching command and priority with threshold 1 to 3 for CO_2 and relative humidity control

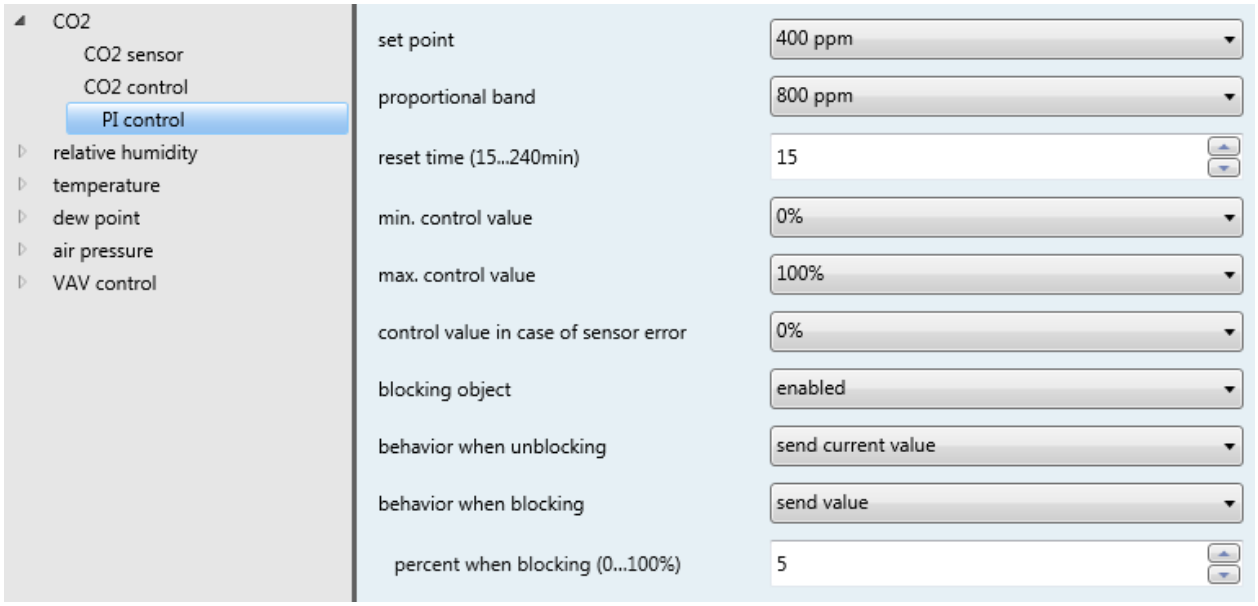
(Picture shows CO_2 thresholds with threshold 1 and switching command)



Designation	Options		Description
Threshold 1	CO_2 threshold 1	Selection: 400 to 1500 ppm	Definition of threshold 1 for the CO_2 value.
Threshold 2	Switching command below threshold 1	off / on	Definition of the switching command below threshold 1.
Threshold 3	Switching command above threshold 1	off / on	Definition of the switching command above threshold 1.
	Control value in case of sensor error	off / on	Definition of the switching command in case of sensor error.
	Blocking object	*Disabled* **Enabled**	No reaction. If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented.
		• Behavior when unblocking	Don´t send Send recent value	There is no control value sent when unblocking. The recent value is sent when unblocking.
		• Behavior when blocking	Don´t send Send value	There is no control value sent when blocking. A switching command is sent when blocking.
		• Switching command when blocking	off / on	Definition of the switching command when blocking.

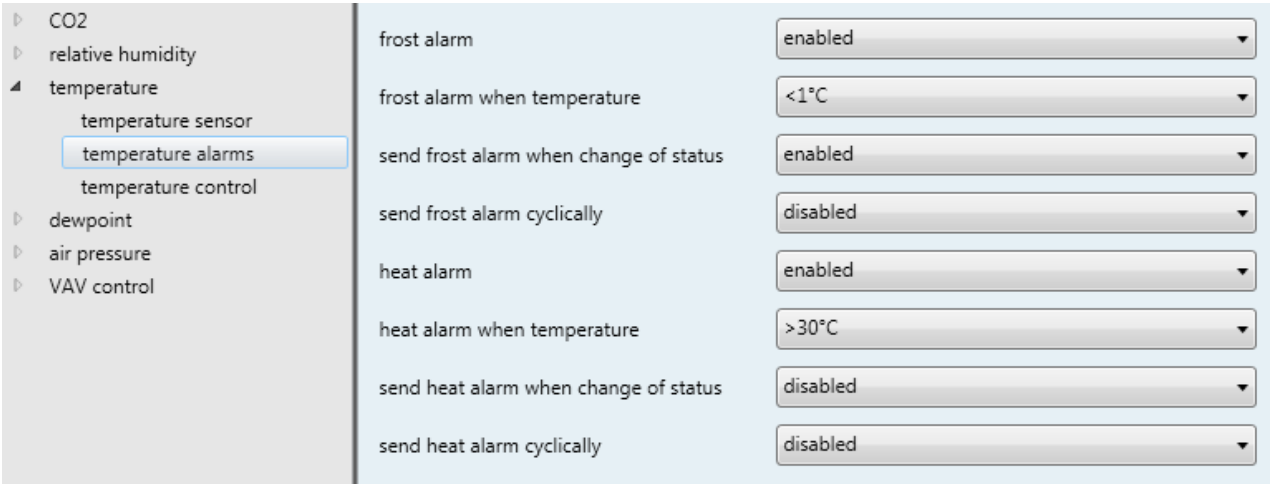
2.2 PI control for CO_2 and relative humidity“

(Picture shows PI control for CO_2 control)



Designation	Options		Description
Set point	Selection: 400 to 2000 ppm		Definition of the setpoint.
Proportional band	Selection: 100 to 2000 ppm		Definition of the proportional band.
Reset time (15…240min)	Selection: 15 to 240 Min.		Definition of the reset time.
Min. control value	Selection: 0% to 95%		Definition of the minimal control value. The control value is limited to this minimum value.
Max. control value	Selection: 5% to 100%		Definition of the maximum control value. The control value is limited to this maximum value.
Control value in case of sensor error	Selection: 0% to 100%		Definition of the control value in case of sensor error.
Blocking object	*Disabled*		If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented.
	Enabled	• Behavior when unblocking	Don´t send Send recent value There is no control value sent when unblocking. The recent value is sent when unblocking.
		• Behavior when blocking	Don´t send Send value There is no control value sent when blocking. The recent value is sent when blocking.
		Percent when blocking (0…100%)	Selection: 0 to 100% Definition of the percentage value when blocking.

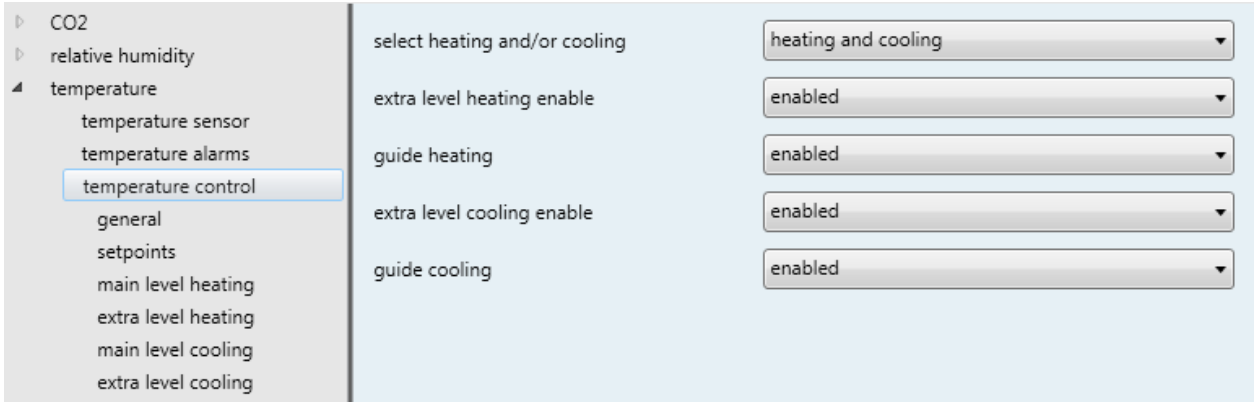
3. Temperature alarm



Designation	Options		Description
Frost alarm		• Disabled • Enabled	No reaction. If the alarm function is activated an alarm in the form of an object is sent when the temperature falls below a defined temperature threshold for frost alarm.
	Frost alarm when temperature	Selection: <1°C to <10°C	When falling below the defined temperature the object frost alarm is sent.
	Send frost alarm when change of status	• Disabled • Enabled	No reaction. If there is a change the recent control value is sent.
	Send frost alarm cyclically	• Disabled Selection: Disabled, every minute, every 2 Min. to 12 hours, once a day	No reaction. Cyclic sending of the recent control value.
Heat alarm		• Disabled • Enabled	No reaction. If the alarm function is activated an alarm in the form of an object is sent when the temperature exceeds a defined temperature threshold for heat alarm.
	Heat alarm when temperature	Selection: >20°C to >30°C	When exceeding the defined temperature the object heat alarm is sent.
	Send heat alarm when change of status	• Disabled • Enabled	No reaction. If there is a change the recent control value is sent.
	Send heat alarm cyclically	• Disabled Selection: Disabled, every minute, every 2 Min. to 12 hours, once a day	No reaction. Cyclic sending of the recent control value.

3. Temperature control

3.1 Temperature control – Heating and Cooling



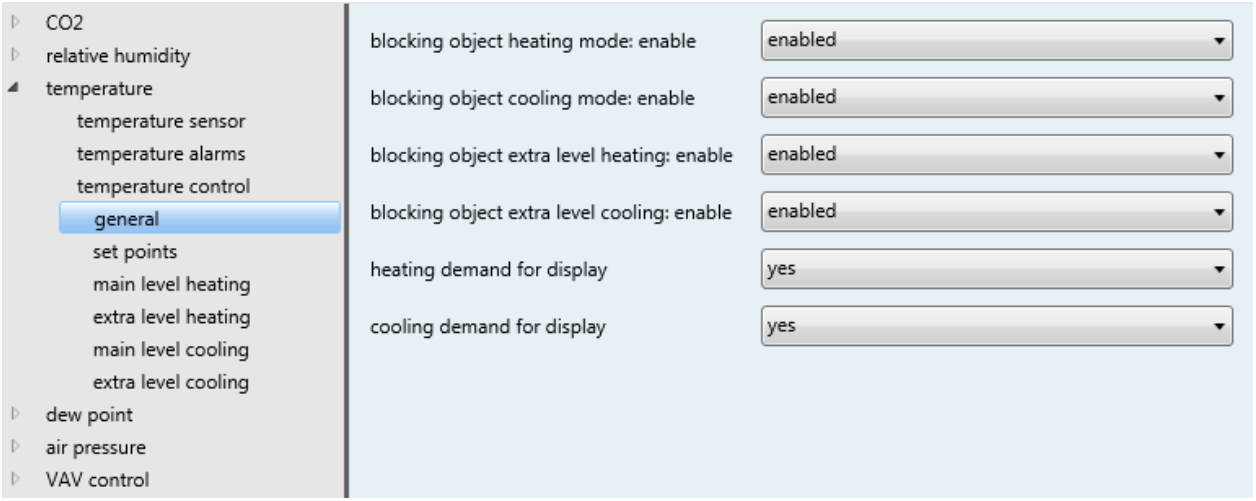
PI control: A PI control is a constant control that comprises a proportional part (P-part) and an integral share (I-share). The size of the P-part is indicated in Kelvin, the I-share in minutes. At a constant PI control the manipulated variables are operated in proportional steps up to a maximum value.

2-stage-control: A two-stage control only sends two conditions for the manipulated variable, on and off. The control turns on when falling below a desired temperature and turns off when exceeding it. Set point and switching hysteresis are defined in advance.

Main level and Extra level: In addition to the main level (e.g. underfloor heating) an extra level (e.g. electric heating) can be helpful for slow systems controlled by main level. This can shorten in the mentioned example the slow heat-up phase of an underfloor heating. You can choose between a PI or two-stage controller for the additional object.

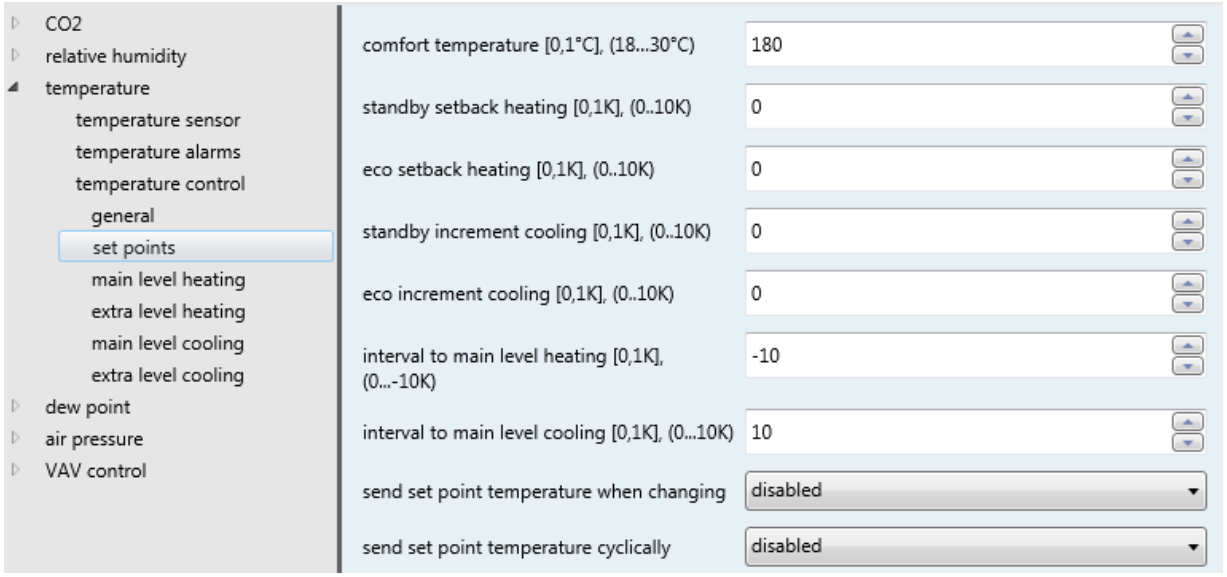
Designation	Options	Description
Select heating and/or cooling	Selection: Disabled, Heating, Cooling, Heating and cooling	Definition of the type of controller for the temperature control.
Extra level heating or cooling	• Disabled • **Enabled**	In addition to the main level (e.g. underfloor heating) an extra level (e.g. electric heating) can be helpful for lazy systems. It can shorten the slow heat-up phase of an underfloor heating. You can choose between a PI or two-stage controller for the additional object.
Guide heating or cooling	• Disabled • **Enabled**	With the parameter guiding it is possible to adjust the set point linearly depending on any reference variable which is captured through an external sensor. In general an outdoor temperature reset control is realized. With an appropriate parameterization the constant raising or lowering of the set value is possible. The parameterization is carried-out together with the definition of the set points.

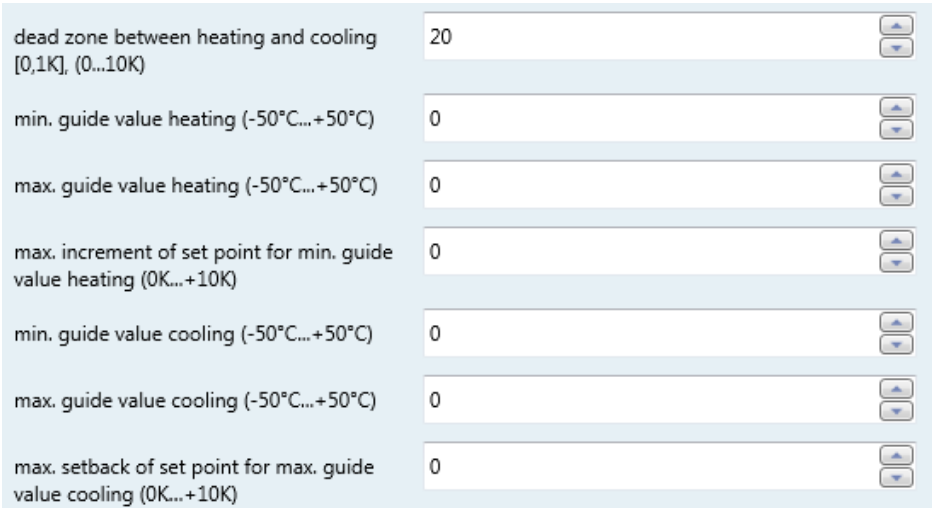
3.2 Temperature control – General



Designation	Options		Description
Blocking object heating mode or cooling mode: enable	• Disabled • **Enabled**	Blocking object: Enabled	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented (e.g. do not heat if a window is open).
Blocking object extra level heating or cooling: enable	• Disabled • **Enabled**	Blocking object: Enabled	If the blocking object is activated, the reception of an external object can prevent the sending of the manipulated variable. Thereby an undesirable starting of actors can be prevented (e.g. do not cool if a window is open).
Heating or cooling demand for display	• No • **Yes**	Demand for display	These objects are status objects to send the status of heating and cooling (active or not). It can be used to visualize the status on a display.

3.3 Temperature control – Set points

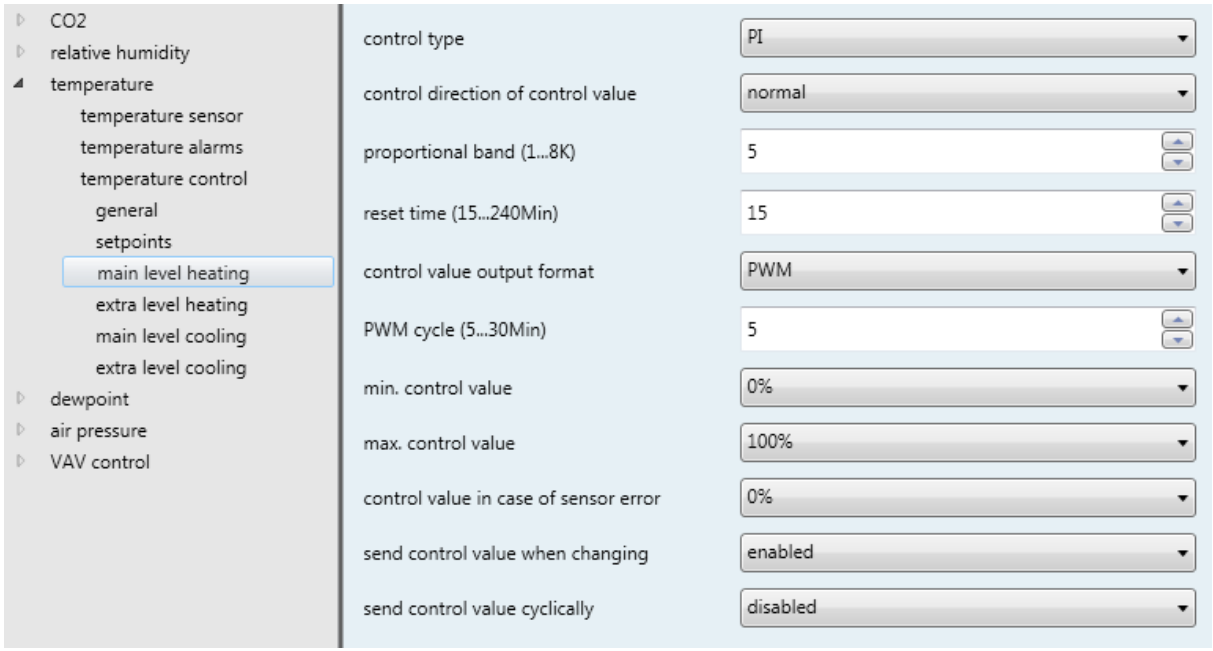




Designation	Options		Description
Comfort temperature	18° to 30°C	In 0,1°C steps	Definition of the comfort temperature.
Setback of standby heating and increment of standby cooling	0 to 10K	In 0,1K steps	Definition of the difference to the comfort temperature in Kelvin.
Setback of eco heating and increment of eco cooling	0 to 10K	In 0,1K steps	Definition of the difference to the comfort temperature in Kelvin.
Interval to main level heating and cooling	0 to -10K and 0 – 10K	In 0,1K steps	To get a faster compensation for big differences between the recent value and setpoint, an extra level for heating / cooling can be activated. The distance to the main level gives the difference of recent value and setpoint at which the extra level should be activated.
Send setpoint temperature when changing		• Disabled • Enabled	No reaction. If there is a change the recent control value is sent.
Send setpoint temperature cyclically		• Disabled Selection: Disabled, every minute, every 2 Min. to 12 hours, once a day	No reaction. Cyclic Sending of the recent control value.
Dead zone between heating and cooling	0 to 10K	In 0,1K steps	Definition of the dead zone between heating and cooling. Recent value < Set point = Heating Recent value > Set point + dead zone = Cooling
Min. guide value heating	-50°C to +50°C	In 1°C steps	Lower guide value for outdoor temperature reset.
Max. guide value heating	-50°C to +50°C	In 1°C steps	Upper guide value for outdoor temperature reset.
Max. increment min. guide value heating	0 to 10K	In 0,1K steps	Increment of the set temperature at minimum guide value.
Min. guide value cooling	-50°C to +50°C	In 1°C steps	Lower guide value for outdoor temperature reset.
Max. guide value cooling	-50°C to +50°C	In 1°C steps	Upper guide value for outdoor temperature reset.
Max. setback for max. guide value cooling	0 to 10K	In 0,1K steps	Setback of the set temperature at maximum guide value.

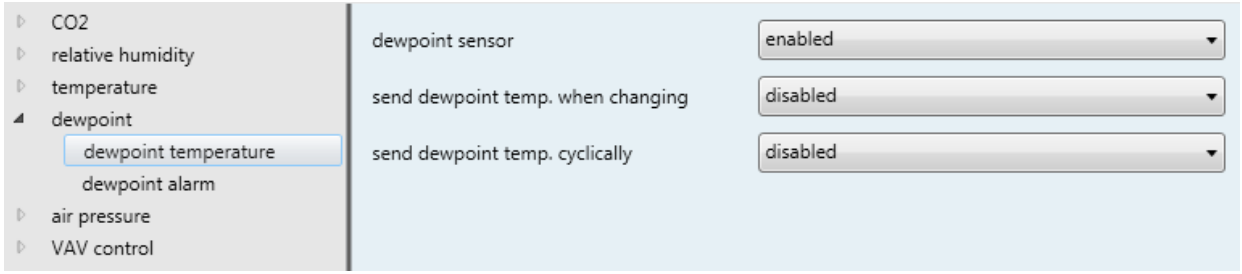
3.4 Temperature control main level and extra level

(Picture shows main level heating PI control with control value output format PWM)



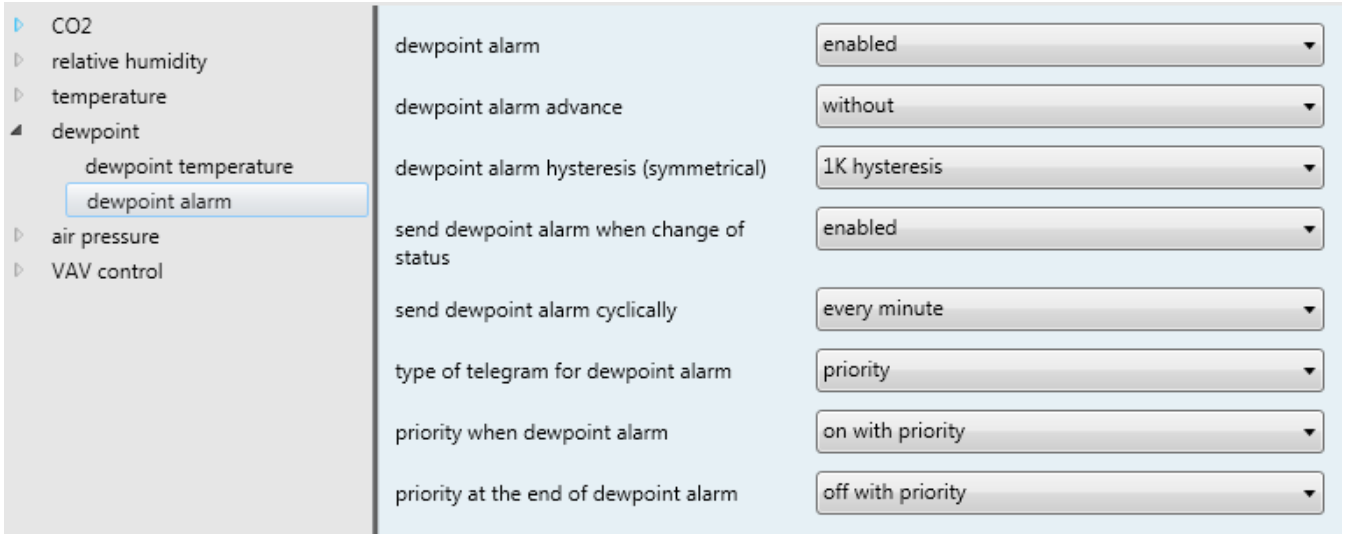
Designation	Options		Description
Main level or extra level heating or cooling	Control type	PI control 2-point control	Selection of control type.
	Control direction of control value	Normal Inverted	
	Proportional band	1 to 8 K	In 1K steps	
	Reset time	15 to 240 Min.	In 1 Min. steps	
	Control value output format	Percent, Byte or PWM	Definition of the control value output format.
	PWM cycle	5 to 30 Min.	In 1 Min. steps	Depending on the output format the cycle is defined in percent, byte or minutes.
	Min. control value	0% to 95% 0 to 240 byte	In 5% steps In 10 Byte steps	Depending on the output format the minimum control value is defined in percent or byte here.
	Max. control value	5% to 100% 0 to 255 byte	In 5% steps In 10 Byte steps	Depending on the output format the maximum control value is defined in percent or byte here.
	Control value in case of sensor error	0% to 100% 0 to 255 byte	In 5% steps In 1 Byte steps	Depending on the output format the control value is defined in percent or byte here.
	Send control value when changing	Disabled Enabled	No reaction. If there is a change the recent control value is sent.
	Send control value cyclically	Selection: Disabled, every minute, every 2 Min. to 12 hours, once a day	No reaction or cyclic sending of the recent control value.

4. Dew point temperature



Designation	Options	Description
Dew point sensor	Disabled Enabled	No reaction. Sending of the recent condition.
Send dew point temp. when changing	Disabled Selection: Send when there is a change from 0,1K to 10K	No reaction. If there is a change the recent control value is sent.
Send dew point temp. cyclically	Disabled Selection: every minute, every 2 Min. to 12 hours, once a day	No reaction. Cyclic sending of the recent control value.

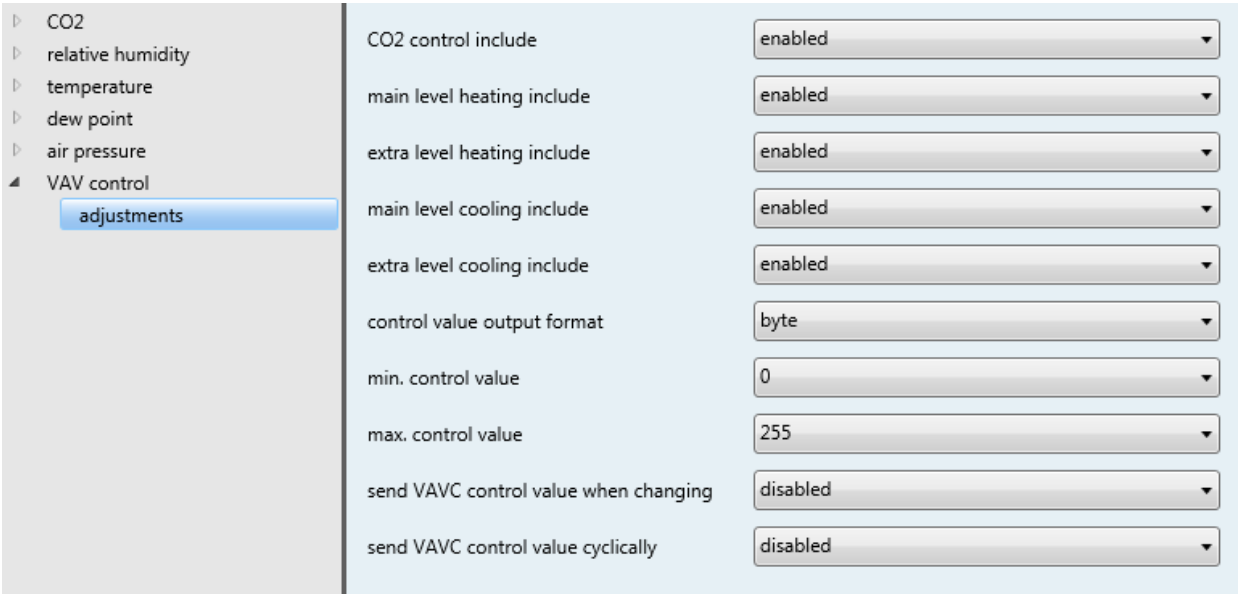
5. Dew point alarm



Designation	Options		Description
Dew point alarm	Dew point alarm	• Disabled • Enabled	No reaction. If the alarm function is activated an alarm in form of an object is sent when the defined dew point is exceeded or fallen below.
	Dew point alarm advance	Selection: Without; 1K to 5K	The dew point alarm can be initiated in advance with a defined offset.
	Dew point alarm hysteresis (symmetrical)	Selection: Without hysteresis, 1K to 5K hysteresis	No reaction or if there is a change, the recent control value is sent.
	Send dew point alarm when change of status	• Disabled • Enabled	No reaction. If there is a change, the recent control value is sent.
	Send dew point alarm cyclically	• Disabled Selection: Disabled, every minute, every 2 Min. to 12 hours, once a day	No reaction. Cyclic sending of the recent control value.
	Type of telegram for dew point alarm	Selection: Switching command; priority; percent; byte; scene	Definition of the type of telegram which is used.
	Priority when dew point alarm	Selection: Depending on the type of telegram	Definition of the value that is sent when the dew point alarm starts.
	Priority at the end of dew point alarm	Selection: Depending on the type of telegram	Definition of the value that is sent when the dew point alarm ended.

6. VAV control

This is only for those controllers that are working as PI controllers.



Function of the VAV control:
The highest value of all activated PI controls of the values from CO_2, relative humidity and temperature is sent in one object.

Designation	Options	Description
CO_2 control include	Disabled Enabled	No reaction. Sending of the CO_2 PI controller values if they are valid.
Relative humidity control include	Disabled Enabled	No reaction. Sending of the relative humidity PI controller values if they are valid.
Main level heating include	Disabled Enabled	No reaction. Sending of the main level PI controller values if they are valid.
Extra level heating include	Disabled Enabled	No reaction. Sending of the extra level PI controller values if they are valid.
Main level cooling include	Disabled Enabled	No reaction. Sending of the main level cooling PI controller values if they are valid.
Extra level cooling include	Disabled Enabled	No reaction. Sending of the extra level cooling PI controller values if they are valid.
Control value output format	Percent Byte	Definition of the output format (percent or byte) of the control value.
Min. control value	Selection: Percent: 0% to 95% byte: 0 to 240	The values of the PI controllers are limited to the minimum value.
Max. control value	Selection: Percent: 5% to 100% byte: 10 to 255	The values of the PI controllers are limited to the maximum value.
Send VAVC control value when changing	Selection: Disabled, at a change from 1 to 50	No reaction or cyclic sending of the recent value.
Send VAVC control value cyclically	Selection: Disabled, every minute, every 2 Min. to 12 hours, once a day	No reaction or cyclic sending of the recent control value.