

PRODUCT MANUAL

ABB i-bus[®] KNX

VC/S 4.x.1

Valve Drive Controller



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1 General

1.1 Using the product manual

This manual provides detailed technical information relating to the function, installation and programming of the ABB i-bus[®] KNX device.

1.2 Legal disclaimer

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1.3 Explanation of symbols

1.	Instructions in specified sequence
2.	
▶	Individual actions
a)	Priorities
1)	Processes run by the device in a specific sequence
•	1st-level list
○	2nd-level list

Table 1: Explanation of symbols

Notes and warnings are represented as follows in this manual:



DANGER –

This symbol is a warning about electrical voltage and indicates high-risk hazards that will definitely result in death or serious injury unless avoided.



DANGER –

Indicates high-risk hazards that will definitely result in death or serious injury unless avoided.



WARNING –

Indicates medium-risk hazards that could result in death or serious injury unless avoided.



CAUTION –

Indicates low-risk hazards that could result in slight or moderate injury unless avoided.



CAUTION –

Indicates a risk of malfunctions or damage to property and equipment, but with no risk to life and limb.

Example:

For use in application, installation and programming examples

📘 Note

For use in tips on usage and operation

2 Safety

2.1 General safety instructions

- ▶ Protect the device from moisture, dirt and damage during transport, storage and operation.
- ▶ Operate the device only within the specified technical data.
- ▶ Operate the device only in a closed housing (distribution board).
- ▶ Mounting and installation must be carried out by qualified electricians.
- ▶ Disconnect the device from the supply of electrical power before mounting.

2.2 Proper use

The valve drive controller can be installed either centrally in an electrical distribution board or decentrally in a sub-distribution unit.

The device is a modular DIN rail component for installation in distribution boards on 35 mm mounting rails according to EN 60715.

ABB i-bus[®] KNX

Product Overview

3 Product Overview

3.1 Product Overview

The devices are of type modular DIN rail component (MDRC) in *Pro M* design. The module width of the devices is six space units. They are designed for installation in distribution boards on 35 mm mounting rails.

The devices are powered by the bus and require no additional auxiliary voltage supply. The device connects to the ABB i-bus[®] KNX via the front bus connection terminal.

Engineering Tool Software (ETS) is used for physical address assignment and parametrization.

The device is ready for operation after connecting the supply voltage.

Abbreviation	Description
V	Valve drive
C	Controller
/S	MDRC
x	4 = 4-fold
x	1 = Without manual operation
	2 = With manual operation
x	x = Version number (x = 1, 2 etc.)

Table 2: Product name description

	VC/S 4.1.1	VC/S 4.2.1
Manual operation	x	x
Contact scanning or temperature sensor	x	x
Analog room control unit	x	x
Electronic valves (PWM)	x	x

Table 3: Product Overview

ABB i-bus[®] KNX

Product Overview

3.2 Ordering details

Description	MB	Type	Order No.	Unit price [€]	Packaging unit [pcs.]	Weight 1 pc. [g]
Valve Drive Controller	8	VC/S 4.1.1	2CDG110216R0011		1	270
Valve Drive Controller	8	VC/S 4.2.1	2CDG110217R0011		1	275

Table 4: Ordering details

ABB i-bus[®] KNX Product Overview

3.3 Valve drive controller VC/S 4.1.1, MDRC



Fig. 1: Device illustration VC/S 4.1.1

The device is a modular DIN rail component (MDRC) in pro *M* design. It is intended for installation in distribution boards on 35 mm mounting rails. Physical address assignment and parametrization are carried out with ETS.

The device is powered via the ABB i-bus[®] KNX and requires no additional auxiliary voltage supply.

The device is ready for operation after connecting the bus voltage.

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ABB i-bus[®] KNX Product Overview

3.3.1

Dimension drawing

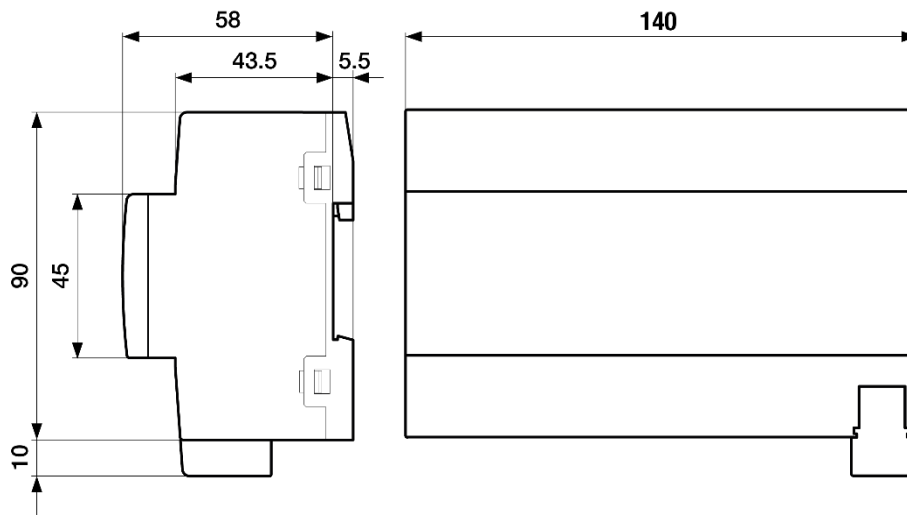


Fig. 2: Dimension drawing

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ABB i-bus[®] KNX Product Overview

3.3.2 Connection diagram

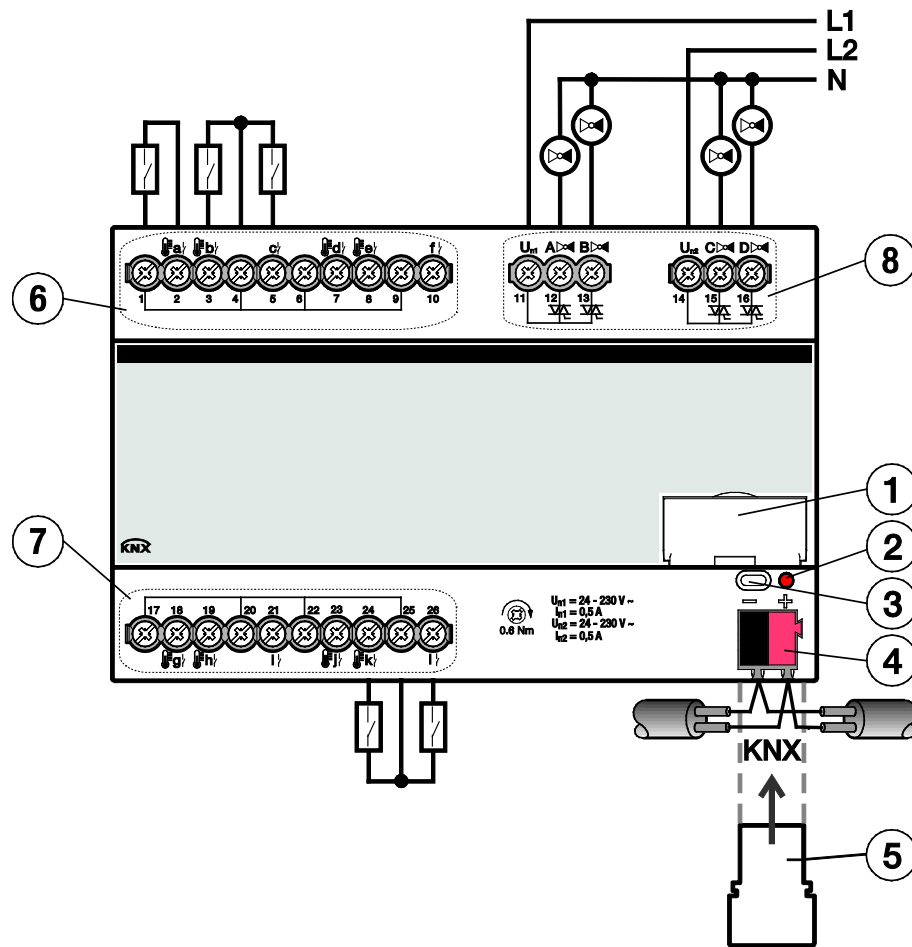


Fig. 3: Connection diagram VC/S 4.1.1

Legend

- 1 Label carrier
- 2 KNX programming LED (red)
- 3 KNX programming button
- 4 Bus connection terminal
- 5 Cover cap
- 6 Inputs (a, b, c; d, e, f)
- 7 Inputs (g, h, i; j, k, l)
- 8 Valve outputs (A, B, C, D)

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ABB i-bus[®] KNX

Product Overview

3.3.3

Operating and display elements


Button/LED	Description	LED indicator
	Assignment of the physical address	On: Device is in programming mode

Table 5: Operating and display elements – general

ABB i-bus[®] KNX

Product Overview

3.3.4 Technical data

3.3.4.1 General technical data

Power supply	Bus voltage	21...32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Maximum 250 mW
	Power loss, device	Maximum 3 W
	KNX connection	0.25 W
Connections	Electronic outputs	2.4 W
	KNX	Via bus connection terminal
Connection terminals	Inputs/outputs	Via screw terminals
	Screw terminal	Screw terminal with universal head (PZ1) 0.2...4 mm ² stranded, 2 x (0.2...2.5 mm ²) 0.2...6 mm ² solid, 2 x (0.2...4 mm ²)
Wire end ferrules	Wire end ferrule without plastic sleeve	0.25...2.5 mm ²
	Wire end ferrule with plastic sleeve	0.25...4 mm ²
	TWIN ferrules	0.5...2.5 mm ²
	Wire end ferrule contact pin length	At least 10 mm
	Tightening torque	Maximum 0.6 Nm
	Spacing	6.35
	Protection degree and class	Protection degree
Isolation category	Protection class	II according to EN 61140
	Overvoltage category	III according to EN 60664-1
SELV	Pollution degree	II according to EN 60664-1
	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	-5...+45 °C
	Transport	-25...+70 °C
	Storage	-25...+55 °C
Ambient conditions	Maximum atmospheric humidity	93 %, no condensation allowed
	Atmospheric pressure	Atmosphere up to 2,000 m
Design	Modular DIN rail component (MDRC)	Modular installation device
	Design	pro <i>M</i>
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 140 x 63.5 mm (H x W x D)
	Mounting width in space units	8x 17.5 mm modules
	Mounting depth	63.5 mm
Installation	35 mm mounting rail	According to EN 60715
	Mounting position	Any
	Weight	0.27 kg
Approvals	Fire classification	Flammability V-0 as per UL94
	KNX certification	According to EN 50491
	Certification	According to EN 60669
	CE marking	In accordance with the EMC and Low Voltage Directives

ABB i-bus[®] KNX

Product Overview

3.3.4.2 Device type

Device type	Valve Drive Controller	VC/S 4.1.1
	Application	Valve Drive Controller,4-f/...*
	Maximum number of group objects	298
	Maximum number of group addresses	300
	Maximum number of assignments	300

* ... = Current version number of the application. Please refer to the software information on our homepage for this.

3.3.4.3 Valve outputs (PWM)

Rated values	Quantity	4 (per channel 1)
	Non-floating	Yes
	U _n rated voltage	24...230 V AC (50/60 Hz)
	U _n rated voltage (per output pair)	0.5 A
	Continuous current at T _u up to 20 °C	0.25 A resistive load per channel
	Continuous current at T _u up to 45 °C	0.15 A resistive load per channel
	Starting current	Maximum 1.6 A, 10 s at T _u up to 45 °C
		T _u = ambient temperature
	Minimum load	1.2 VA per PWM output

ABB i-bus[®] KNX

Product Overview

3.3.4.4

Inputs

Rated values	Quantity	12
For analog room control unit	Quantity	4 (per channel 1)
Contact scanning	Scanning current	1 mA
	Scanning voltage	12 V
Resistance	Select	User-defined
	PT 1.000	2-conductor technology
	PT 100	2-conductor technology
	KT	1 k
	KTY	2 k
	NI	1 k
	NTC	10 k
	NTC	20 k
Cable length	Between sensor and device input	Maximum 100 m, one-way

3.4 Valve drive controller VC/S 4.2.1, manual operation, MDRC



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Fig. 4: Device illustration VC/S 4.2.1

The device is a modular DIN rail component (MDRC) in pro *M* design. It is intended for installation in distribution boards on 35 mm mounting rails. Physical address assignment and parametrization are carried out with ETS.

The device is powered via the ABB i-bus® KNX and requires no additional auxiliary voltage supply.

The device is ready for operation after connecting the bus voltage.

ABB i-bus[®] KNX Product Overview

3.4.1

Dimension drawing

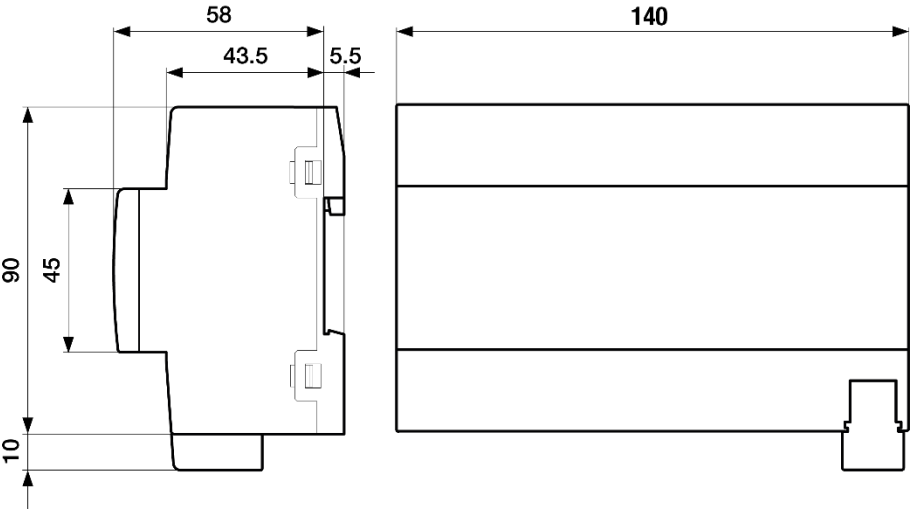


Fig. 5: Dimension drawing

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ABB i-bus® KNX

Product Overview

3.4.2 Connection diagram

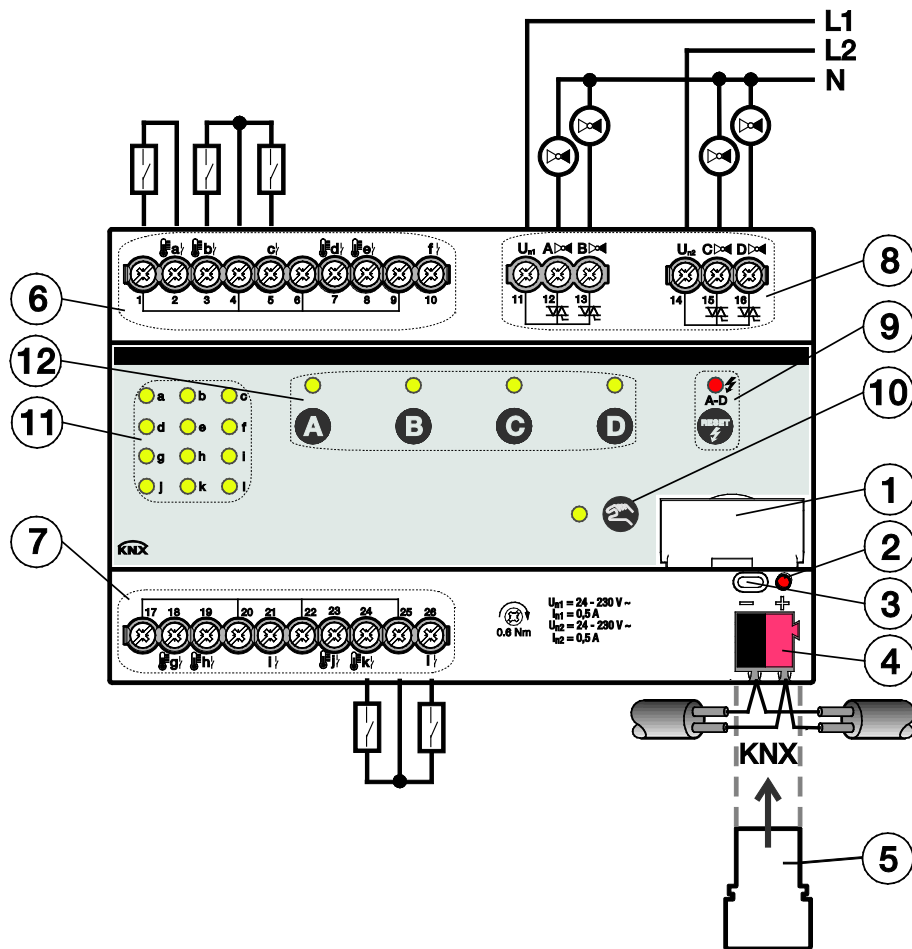


Fig. 6: Connection diagram VC/S 4.2.1

Legend

- | | | | |
|---|----------------------------|----|---|
| 1 | Label carrier | 9 | Valve output (A...D) reset/error button/LED |
| 2 | KNX programming LED (red) | 10 | Activate manual operation button/LED |
| 3 | KNX programming button | 11 | Inputs status indicator LEDs (a, b, c, d, e, f, g, h, i, j, k, l) |
| 4 | Bus connection terminal | 12 | Valve outputs switch/status indication buttons/LEDs |
| 5 | Cover cap | | |
| 6 | Inputs (a, b, c; d, e, f) | | |
| 7 | Inputs (g, h, i; j, k, l) | | |
| 8 | Valve outputs (A, B, C, D) | | |

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ABB i-bus[®] KNX Product Overview

3.4.3 Operating and display elements



Button/LED	Description	LED indicator
 	Assignment of the physical address	On: Device is in programming mode

Table 6: Operating and display elements – general

3.4.3.1 Manual operation



















Button/LED	Description	LED indicator
  Valve output X	Switches the valve output and status indication	On: Valve control value greater than 0 % Off: Valve control value equal to 0 % Flashing: Indicates a fault, e.g. overload/short circuit
 A-D  Error message and reset	Resets the outputs: Button must be pressed for at least 5 seconds	On: Indication of an output malfunction on at least one output
  Manual operation	Activates KNX mode with a short press of the button	On: The device is in Manual Off: The device is in the KNX mode
            Inputs a...x	Displays the LEDs according to which inputs are in use	Binary sensor: LED on: Contact closed LED off: Contact open Temperature sensor: LED on: Temperature sensor connected LED flashing: Error (cable break/short circuit)

Table 7: Operating and display elements – manual operation

ABB i-bus[®] KNX

Product Overview

3.4.3.2

KNX operation



















Button/LED	Description	LED indicator
	Button without function	On: Valve control value greater than 0 % Off: Valve control value equal to 0 %
 Valve output X		Flashing: Indicates a fault, e.g. overload/short circuit
 A-D  Error message and reset	Button without function	On: Indication of an output malfunction on at least one output
  Manual operation	Activates KNX mode with a short press of the button	On: The device is in Manual Off: The device is in the KNX mode
           	No button	Binary sensor: LED on: Contact closed LED off: Contact open Temperature sensor: LED on: Temperature sensor connected LED flashing: Error (cable break/short circuit)
Inputs a...x		

Table 8: Operating and display elements – KNX operation

ABB i-bus[®] KNX

Product Overview

3.4.4 Technical data

3.4.4.1 General technical data

Power supply	Bus voltage	21...32 V DC
	Current consumption, bus	< 12 mA
	Power loss, bus	Maximum 250 mW
	Power loss, device	Maximum 3 W
	KNX connection	0.25 W
Connections	Electronic outputs	2.4 W
	KNX	Via bus connection terminal
Connection terminals	Inputs/outputs	Via screw terminals
	Screw terminal	Screw terminal with universal head (PZ1) 0.2...4 mm ² stranded, 2 x (0.2...2.5 mm ²) 0.2...6 mm ² solid, 2 x (0.2...4 mm ²)
Wire end ferrules	Wire end ferrule without plastic sleeve	0.25...2.5 mm ²
	Wire end ferrule with plastic sleeve	0.25...4 mm ²
	TWIN ferrules	0.5...2.5 mm ²
	Wire end ferrule contact pin length	At least 10 mm
	Tightening torque	Maximum 0.6 Nm
	Spacing	6.35
	Protection degree and class	Protection degree
Isolation category	Protection class	II according to EN 61140
	Overvoltage category	III according to EN 60664-1
SELV	Pollution degree	II according to EN 60664-1
	KNX safety extra low voltage	SELV 24 V DC
Temperature range	Operation	-5...+45 °C
	Transport	-25...+70 °C
	Storage	-25...+55 °C
Ambient conditions	Maximum atmospheric humidity	93 %, no condensation allowed
	Atmospheric pressure	Atmosphere up to 2,000 m
Design	Modular DIN rail component (MDRC)	Modular installation device
	Design	pro <i>M</i>
	Housing/color	Plastic, gray
Dimensions	Dimensions	90 x 140 x 63.5 mm (H x W x D)
	Mounting width in space units	8x 17.5 mm modules
	Mounting depth	63.5 mm
Installation	35 mm mounting rail	According to EN 60715
	Mounting position	Any
	Weight	0.275 kg
Approvals	Fire classification	Flammability V-0 as per UL94
	KNX certification	According to EN 50491
	Certification	According to EN 60669
	CE marking	In accordance with the EMC and Low Voltage Directives

ABB i-bus[®] KNX

Product Overview

3.4.4.2 Device type

Device type	Valve Drive Controller	VC/S 4.2.1
	Application	Valve Drive Controller, manual operation, 4-f/...*
	Maximum number of group objects	300
	Maximum number of group addresses	300
	Maximum number of assignments	300

* ... = Current version number of the application. Please refer to the software information on our homepage for this.

3.4.4.3 Valve outputs (PWM)

Rated values	Quantity	4 (per channel 1)
	Non-floating	Yes
	U _n rated voltage	24...230 V AC (50/60 Hz)
	U _n rated voltage (per output pair)	0.5 A
	Continuous current at T _u up to 20 °C	0.25 A resistive load per channel
	Continuous current at T _u up to 45 °C	0.15 A resistive load per channel
	Starting current	Maximum 1.6 A, 10 s at T _u up to 45 °C
		T _u = ambient temperature
	Minimum load	1.2 VA per PWM output

ABB i-bus[®] KNX

Product Overview

3.4.4.4

Inputs

Rated values	Quantity	12
For analog room control unit	Quantity	4 (per channel 1)
Contact scanning	Scanning current	1 mA
	Scanning voltage	12 V
Resistance	Select	User-defined
	PT 1.000	2-conductor technology
	PT 100	2-conductor technology
	KT	1 k
	KTY	2 k
	NI	1 k
	NTC	10 k
	NTC	20 k
Cable length	Between sensor and device input	Maximum 100 m, one-way

4 Function

4.1 Functional overview

Cooling ceilings, floor heating and radiators are used to cool or heat the room. The required room temperature is achieved via these devices using a control.

The valve drive controller controls the flow valve and reduces or increases the quantity of hot or cold water to suit the demand for heat/cold in the room.

The valve is opened and closed during this process by an electrothermal valve drive. This drive is in turn connected to the valve drive controller.

For each of its four channels, the device has an output for the actuation of a thermoelectric valve drive (e.g. TSA/K)

In addition, three inputs are available per channel. These inputs can be used for the connection of temperature sensors as well as for monitoring a window, the formation of condensation or a collection tray. Additionally, one of the inputs can be used to connect a local analog room control unit (SAR/A). Such a device can be used for local adjustment of the setpoint temperature for the room. When another input is used, the room temperature additionally can be measured directly via the analog room control unit. The scanning voltage for the inputs is provided by the valve drive controller.

In addition to actuation via the integrated valve output, other devices for room temperature control can be actuated via group objects. For this purpose the control also includes a basic stage and an additional stage for heating and cooling.

The four channels of the device operate completely independently of each other such that it is possible to control four different rooms.

The variant VC/S 4.2.1 also has manual operation directly at the device.

Function/device	VC/S 4.1.1	VC/S 4.2.1
Integrated temperature controller for room temperature control	x	x
Number of channels	4	4
Type of valve actuation	PWM Off/On	PWM Off/On
Inputs for sensors per channel	3	3
Inputs for temperature measurement per channel	2	2
Input for the connection of an analog room control unit per channel	1	1
Manual operation	-	x

Table 9: Functional overview

4.2 Input functions

The following table provides an overview of the functions possible with the inputs of the VC/S and the application:

Functions	a	b	c	d	e	f	g	h	i	j	k	l
Connection of analog room control unit	x			x			x			x		
Binary signal input (floating)	x	x	x	x	x	x	x	x	x	x	x	x
Temperature sensor	x	x		x	x		x	x		x	x	
PT100	x	x		x	x		x	x		x	x	
PT1000	x	x		x	x		x	x		x	x	
KT/KTY	x	x		x	x		x	x		x	x	
KT/KTY user-defined	x	x		x	x		x	x		x	x	
NTC10k	x	x		x	x		x	x		x	x	
NTC20k	x	x		x	x		x	x		x	x	
NI-1000	x	x		x	x		x	x		x	x	
Dew point sensor (floating)	x	x	x	x	x	x	x	x	x	x	x	x
Filling level sensor (floating)	x	x	x	x	x	x	x	x	x	x	x	x
Window contact (floating)	x	x	x	x	x	x	x	x	x	x	x	x

Table 10: Functional overview of the inputs

4.3 Output functions

4.3.1 Valve outputs

Function	A	B	C	D
Electrothermal Valve Drive (PWM)	x	x	x	x
Solenoid valve (open/close)	x	x	x	x
Error detection				
Overload	x	x	x	x

Table 11: Valve output function



CAUTION –

A short circuit will cause irreparable damage to the channel, it will then no longer be possible to use the valve output.

4.4 Integration in the i-bus[®] Tool

The device possesses an interface to the i-bus[®] Tool.

The i-bus[®] Tool can be used to read out data and test functions on the device connected.

In addition, values can be simulated for test purposes. If there is no communication, output values are no longer output on the bus, even if they are simulated using the i-bus[®] Tool.

The i-bus[®] Tool can be used to specify controller parameters to test the correct adjustment of the supply flow temperature controller. It is also possible to switch between the various room states (Comfort, Standby, Economy, Building Protection) to test the device reaction. The device's physical inputs and outputs can be tested via the i-bus[®] Tool.

You can download the i-bus[®] Tool free of charge from our homepage (www.abb.de/knx).

A description of the functions is provided in the i-bus[®] Tool online help.

4.5 Special operating states

4.5.1 Reaction on bus voltage failure/recovery, download and ETS reset

The device's reaction on bus voltage failure/recovery, download and ETS reset can be set in the device parameters.



CAUTION –

If the allocation of the outputs is changed (e.g. *Actuate basic-stage heating via from Internal channel output (valve) to Group object*) when the device is parametrized, the device resets automatically to ensure the correct function of the outputs.

4.5.1.1 Bus voltage failure

Bus voltage failure describes the sudden drop in/failure of the bus voltage, e.g. due to a power failure.

4.5.1.2 Bus voltage recovery

Bus voltage recovery is the state after bus voltage is restored after failing previously due to a bus voltage failure.

4.5.1.3 ETS reset

Generally an ETS reset is defined as a reset of the device via ETS. To trigger an ETS reset, go to the ETS *Commissioning* menu and select *Reset device*. This stops and restarts the application.

4.5.1.4 Download

Downloading describes loading a modified or updated application onto the device with ETS.



Note

After the application is uninstalled or after an interrupted download, the device no longer functions.

ABB i-bus[®] KNX

Mounting and installation

5 Mounting and installation

5.1 Information about mounting

The mounting position can be selected as required.

The electrical connection is made using screw terminals. The connection to the bus is implemented using the supplied bus connection terminal. The terminal assignment is located on the housing.

The device is ready for operation after connection to the bus voltage.

i Note

The maximum permissible current of a KNX line must not be exceeded.
During planning and installation ensure that the KNX line is correctly dimensioned.
The device has a maximum current consumption of 12 mA.



DANGER – Severe injuries due to touch voltage

Feedback from differing phase conductors can produce touch voltages and lead to severe injuries.
Operate the device only in a closed housing (distribution board).
Disconnect all phases before working on the electrical connection.

ABB i-bus[®] KNX

Mounting and installation

5.2 Mounting on DIN rail

The device is fitted and removed without auxiliary tools.

Make sure the device is accessible for operation, testing, visual inspection, maintenance and repair.

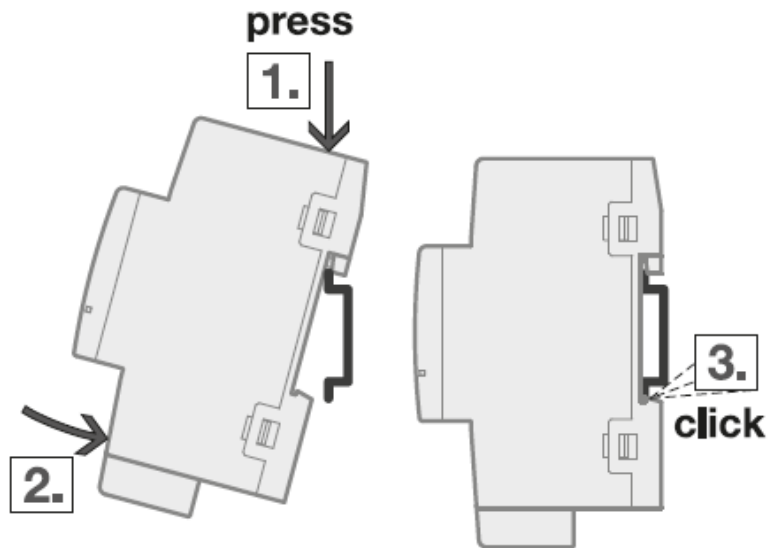


Fig. 7: Mounting on DIN rail

1. Place the DIN rail holder on the upper edge of the DIN rail and push down.
2. Push the lower part of the device toward the DIN rail until the DIN rail holder engages.
⇒ The device is now mounted on the DIN rail.
- ▶ Relieve the pressure on the top of the housing.

5.3 Supplied state

The device is supplied with the physical address 15.15.255. The application is preloaded.

The complete application can be reloaded if required. Downloads may take longer after an application is uninstalled or when changing applications.

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6 Commissioning

6.1 Prerequisites for commissioning

To commission the device, a PC with ETS is required along with a connection to the ABB i-bus[®], e.g. via a KNX interface.

The device is ready for operation after the bus voltage is applied.

6.2 Commissioning overview

The application *Valve Drive Controller,4-f/...** is available for the valve drive controller VC/S 4.1.1.

The application *Valve Drive Controller, manual operation,4-f/...** is available for the valve drive controller VC/S 4.2.1.

ETS from version 4 is required to parameterize the device.

For information on how to use the i-bus[®] Tool, see 4.4 [Integration in the i-bus[®] Tool](#)

The available functions are as follows:

Function	
Thermoelectric valve	Valve drives are actuated. Control is via PWM or as an open/close signal for solenoid valves
Inputs (per channel)	There are 3 inputs available. These are used to monitor and/or connect, e.g., window contacts, a condensation pan, dew point sensors or temperature sensors. As an option, an analog room control unit can be connected to the first input on each channel (a, d, g, j).

Table 12: Commissioning functions

6.3 Assignment of the physical address

The physical address, group address and parameters are assigned and programmed in ETS.

The device features a *Programming* button for physical address assignment. The red *Programming* LED lights up after the button has been pressed. It goes off once ETS has assigned the physical address or the *Programming* button is pressed again.

The device performs an ETS reset during physical address programming. This resets all states.

ABB i-bus[®] KNX

Commissioning

6.4 Software/application

6.4.1 Download response

Due to the complexity of the device, the progress bar for the download may take up to one and a half minutes before it appears depending on the PC used.

6.4.2 Copying, exchanging and converting

The *ABB Update Copy Convert* application can be used to copy or exchange parameter settings and to convert the application version. The application is available free of charge from the KNX online shop.

It also provides the following functions:

- *Update*: Changes the application program to a later or earlier version while retaining current configurations
- *Convert*: Transfers/adopts a configuration from an identical or compatible source device
- *Channel Copy*: Copies a channel configuration to other channels on a multichannel device
- *Channel Exchange*: Exchanges configurations between two channels on a multichannel device
- *Import/Export*: Saves and reads device configurations as external files

ABB i-bus[®] KNX Parameters

7 Parameters

7.1 General

ETS Engineering Tool Software is used to parametrize the device.

In ETS, the applications are in the Catalogs window under Manufacturers/ABB/Heating, ventilation, air conditioning/ Valve drive controller.

The following chapters describe the device parameters based on the parameter windows. Parameter windows are structured dynamically so that further parameters are enabled depending on the parametrization and function of the outputs.

The default values of the parameters are underlined, e.g.:

Options: No

Note

The applications for devices with manual operation were used as examples for the screen shots.

Note

This is a four-channel device. Because all channels have the same function, the function is described based on channel A as an example.

7.2 General parameter window

General	Sending and switching delay after bus voltage recovery	2 s
+ Manual operation	State after sending and switching delay has elapsed	<input checked="" type="radio"/> Last value received <input type="radio"/> Ignore received values
+ Channel A	Limit number of telegrams	<input checked="" type="radio"/> No <input type="radio"/> Yes
+ Channel B	Enable group object "In operation", 1 bit	<input checked="" type="radio"/> No <input type="radio"/> Yes
+ Channel C		
+ Channel D	Access to i-bus Tool	Full access

Fig. 8: General parameter window

7.2.1 Sending and switching delay after bus voltage recovery

Options: 2...255 s

During the sending and switching delay, telegrams are only received. However, the telegrams are not processed and the outputs remain unchanged. No telegrams are sent on the bus.

After the sending and switching delay, telegrams are sent and the state of the outputs is set to correspond with the parameterization or the group object values.

If group objects are read out via the bus during the sending and switching delay, e.g. by a visual display system, these requests are stored and a response is sent once the delay time has expired.

An initialization time of about two seconds is included in the delay time. The initialization time is the time that the processor requires before it is ready to function.

Note

After bus voltage recovery, the device always waits for the sending delay time to elapse before sending telegrams via the bus.

Note

In controller mode, the switching delay set does not apply to the parameterized behavior of the outputs

7.2.2 State after sending and switching delay has elapsed

Options: Last value received
Ignore received values

- *Last value received*: During the sending and switching delay, the inputs and outputs continue reading. They send the current value after the delay has elapsed.
- *Ignore received values*: No new values are accepted during the sending and switching delay. The first value received after the sending and switching delay has elapsed applies.

7.2.3 Limit number of telegrams

Options: No
Yes

This parameter limits the device-generated bus load. This limit relates to all telegrams sent by the device.

7.2.3.1 —

Dependent parameter

Maximum number of telegrams

Options: 1...20...50

This parameter defines the number of telegrams sent by the device within a certain period of time. The telegrams are sent as quickly as possible at the start of a period.

Note

The device counts the number of telegrams sent within the parametrized period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the KNX bus until the end of the period. A new period commences at the end of the previous period. The telegram counter is reset to zero, and sending of telegrams is allowed again. The current group object value at the time of sending is always sent.

The first period (break time) is not precisely predefined. It can be anywhere between zero seconds and the parametrized time. The subsequent sending times correspond with the parametrized time.

Example:

Maximum number of sent telegrams = 5, period = 5 s. 20 telegrams are ready to send. The device immediately sends 5 telegrams. The next 5 telegrams are sent after a maximum of 5 seconds. From this point, a further 5 telegrams are sent via KNX every 5 seconds. The telegrams are sent in the order in which they arise (first in - first out).

ABB i-bus[®] KNX Parameters

7.2.3.2

—

Dependent parameter

In period

Options: 1 second
 2 seconds
 5 seconds
 10 seconds
 30 seconds
 1 minute

This parameter defines the number of telegrams sent by the device within a certain period of time. The telegrams are sent as quickly as possible at the start of a period.

Note

The device counts the number of telegrams sent within the parametrized period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the KNX bus until the end of the period. A new period commences at the end of the previous period. The telegram counter is reset to zero, and sending of telegrams is allowed again. The current group object value at the time of sending is always sent.

The first period (break time) is not precisely predefined. It can be anywhere between zero seconds and the parametrized time. The subsequent sending times correspond with the parametrized time.

Example:

Maximum number of sent telegrams = 5, period = 5 s. 20 telegrams are ready to send. The device immediately sends 5 telegrams. The next 5 telegrams are sent after a maximum of 5 seconds. From this point, a further 5 telegrams are sent on the KNX every 5 seconds. The telegrams are sent in the order in which they arise (first in - first out).

7.2.4

Enable group object "In operation", 1 bit

Options: No
 Yes

- *yes*: The group object is enabled.
- *no*: The group object is not enabled.

ABB i-bus[®] KNX Parameters

7.2.4.1 —

Dependent parameter

Send

Options: Value 0
 Value 1

7.2.4.2 —

Dependent parameter

Sending cycle time

Options: 00:00:01...00:01:00...18:12:15 hh:mm:ss

The time interval at which the *In operation* group object cyclically sends a telegram is set here.

Note

After bus voltage recovery, the group object sends its value after the sending and switching delay set.

7.2.5 Access to i-bus[®] Tool

Options: Deactivated
 Value display only
 Full access

This parameter is used to restrict or forbid completely access by the ABB i-bus[®] Tool. If *Deactivated* is selected, access by the i-bus[®] Tool is completely disabled. If *Value display only* is selected, no values can be changed by the i-bus[®] Tool; only the status is displayed. If *Full access* is selected, the i-bus[®] Tool functions without restriction; values can be displayed and changed (see chapter 4.4 [Integration into the i-bus[®] Tool](#)).

7.3 Manual operation parameter window

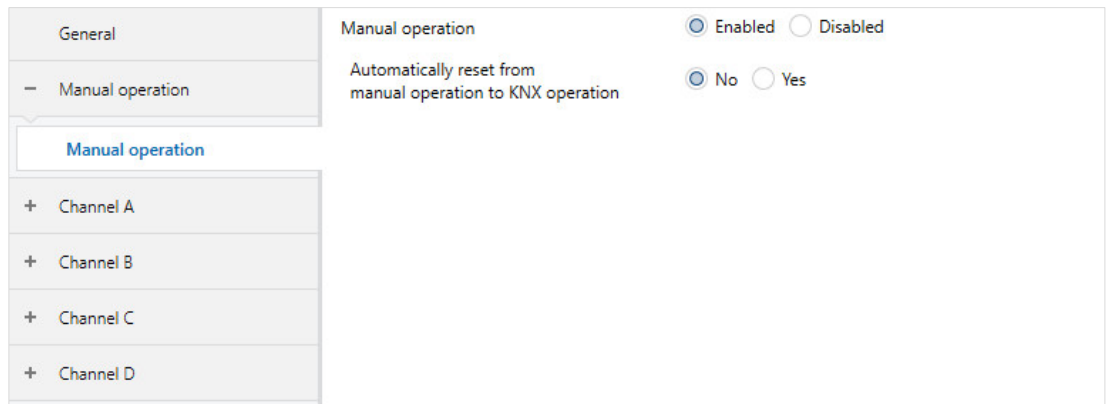


Fig. 9: Manual operation parameter window

7.3.1 Manual operation

Options: Enabled
 Disabled

This parameter defines if the changeover between the operating states *Manual operation* and *KNX operation* is possible via the *Manual operation* button on the device.

- *Enabled*: The operating states *Manual operation* and *KNX operation* can be switched over via the *Manual operation* button. The *Enable/disable manual operation* and *Status Manual operation* group objects are enabled.
The *Enable/disable manual operation* group object makes it possible to enable or disable manual operation via the bus.
The *Status Manual operation* group object indicates whether manual operation is active or inactive. The group object is sent automatically after a change.
- *Disabled*: Manual operation is generally disabled.

ABB i-bus[®] KNX Parameters

7.3.2 Automatically reset from manual operation to KNX operation

Options: No
Yes

This parameter is only visible if the *Enabled* option has been selected for the *Manual operation* parameter.

This parameter determines whether, after pressing the *Manual operation* button, the device will remain in *Manual operation* or will be reset back to KNX operation.

- yes: The device is reset to KNX operation depending on the parameterized time.

7.3.2.1 —

Dependent parameter

Time for automatic reset to KNX operation

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

This parameter determines how long, after pressing the *Manual operation* button, the device will remain in *Manual operation*.

The device remains in *Manual operation* after the last button press until either the *Manual operation* button is pressed again or the parameterized time has elapsed.

7.4 Application parameters parameter window

The basic settings necessary for the application are made in the *Application parameters* parameter window.

General	Channel function <input checked="" type="radio"/> Controller channel <input type="radio"/> Actuator channel
+ Manual operation	Channel is used with internal controller to control heating/cooling systems in the same room. KNX analog room control units in Slave mode can be used for operation.
- Channel A	Caution! A change to the parameterization in this section will result in an ETS reset after download
Application parameters	
Channel function	
+ Temperature controller	Basic-stage heating <input type="text" value="Convector (e.g. radiator)"/>
Setpoint manager	Additional-stage heating <input type="text" value="Deactivated"/>
Monitoring and safety	Basic-stage cooling <input type="text" value="Area cooling (e.g. cooling ceiling)"/>
Valve output A	Additional-stage cooling <input type="text" value="Deactivated"/>
Setpoint adjustment	Type of heating/cooling system <input type="radio"/> 2-pipe <input checked="" type="radio"/> 4-pipe
Input a	Toggle heating/cooling <input type="text" value="Automatically"/>
Input b	Caution! A change to the parameterization in this section will result in an ETS reset after download
Input c	Actuate basic-stage heating via <input checked="" type="radio"/> Internal channel output (valve) <input type="radio"/> Group object
+ Channel B	Actuate basic-stage cooling via <input type="text" value="Group object"/>
+ Channel C	Window contact input <input type="text" value="Deactivated"/>
+ Channel D	Dew point alarm input <input type="text" value="Deactivated"/>
	Fill level alarm input <input type="text" value="Deactivated"/>
	Temperature input <input type="text" value="Via physical device input"/>
	Note: Configure in 'Input' parameter window

Fig. 10: Application parameters parameter window

ABB i-bus[®] KNX

Parameters

7.4.1 Channel function

Options: Controller channel
 Actuator channel

The function of the channel is set using this parameter. It can be used with the controller activated and optional communication with an analog room control unit, or as a pure actuator channel for controlling a heating or a cooling application (floor heating, radiator heating or cooling ceiling). In the latter case, the control values for actuating the outputs must be sent by an external controller to the device.

- *Controller channel*: In this mode the channel operates independently – based only on the states (e.g. temperature) measured on the inputs (or received via KNX) and the setpoints/operating mode changeovers received via KNX. The necessary control values for the outputs are calculated independently from this information. The *Temperature controller* and *Setpoint manager* parameter windows, as well as group objects for the master/slave communication are activated. Here the channel acts as a master.
- *Actuator channel*: In this mode the channel acts as a pure actuator. The controller function must be undertaken by an external device and the control values sent to the actuator via KNX. The *Temperature controller* and *Setpoint manager* parameter windows are correspondingly deactivated.

ABB i-bus[®] KNX Parameters

7.4.1.1

—

Dependent parameter

Basic-stage heating

The following description applies in the case that the *Controller channel* option has been selected in the *Channel function* parameter.

Options: Deactivated
 Convector (e.g. radiator)
 Area heating (e.g. floor)
 Free configuration

The type of application for the heating stage is selected with this parameter. The controller is pre-configured based on this selection and can be used for the selected application.

- *Deactivated*: The heating stage is deactivated by selecting this option. All dependent parameters and parameter windows are also deactivated.
- *Convector (e.g. radiator)*: This option should be selected if a convector, e.g. a radiator, is used as the heating stage.
The *Basic-stage heating control value type* parameter is pre-parameterized to *PI continuous (0...100%)* with the corresponding P and I proportions.
- *Area heating (e.g. floor)*: This option should be selected if an area, e.g. floor heating, is used as the heating stage.
The *Basic-stage heating control value type* parameter is pre-parameterized to *PI continuous (0...100%)* with the corresponding P and I proportions.
- *Free configuration*: With this option it is possible to select freely the type of heating stage and also the type of control. This option can be selected if the type of application is not entirely clear or if specific adjustments are necessary.
The *Basic-stage heating control value type* parameter is pre-configured to *PI continuous (0...100 %)*, however it is possible to select freely between all control types.

Dependent parameters:

- *Additional-stage heating*
- *Type of heating/cooling system*
- *Heating/cooling changeover*
- *Actuate basic-stage heating via*

ABB i-bus[®] KNX

Parameters

7.4.1.1.1

—

Dependent parameter

Additional-stage heating

The following description applies in the case that the *Controller channel* option has been selected in the *Channel function* parameter and the *Basic-stage heating* parameter is not deactivated.

Options: Deactivated
 Convector (e.g. radiator)
 Area heating (e.g. floor)
 Free configuration

The type of application for the additional-stage heating is selected with this parameter. The controller is pre-configured based on this selection and can be used for the selected application.

- *Deactivated*: The additional-stage heating is deactivated by selecting this option. All dependent parameters and parameter windows are also deactivated.
- *Convector (e.g. radiator)*: This option should be selected if a convector, e.g. a radiator, is used as the additional-stage heating.
The *Additional-stage heating control value type* parameter is pre-parameterized to *PI continuous (0...100%)* with the corresponding P and I proportions.
- *Area heating (e.g. floor)*: This option should be selected if an area, e.g. floor heating, is used as the additional-stage heating.
The *Additional-stage heating control value type* parameter is pre-parameterized to *PI continuous (0...100%)* with the corresponding P and I proportions.
- *Free configuration*: With this option it is possible to select freely the type of additional-stage heating and also the type of control. This option can be selected if the type of application is not entirely clear or if specific adjustments are necessary.
The *Additional-stage heating control value type* parameter is pre-configured to *PI continuous (0...100%)*, however it is possible to select freely between all control types.

Dependent parameters:

- *Actuate additional-stage heating via*

ABB i-bus[®] KNX Parameters

7.4.1.2

—

Dependent parameter

Basic-stage cooling

The following description applies in the case that the *Controller channel* option has been selected in the *Channel function* parameter.

Options: Deactivated
 Area cooling (e.g. cooling ceiling)
 Free configuration

The type of application for the basic-stage cooling is selected with this parameter. The controller is pre-configured based on this selection and can be used for the selected application.

- *Deactivated*: The basic-stage cooling is deactivated by selecting this option. All dependent parameters and parameter windows are also deactivated.
- *Area cooling (e.g. cooling ceiling)*: This option should be selected if an area, e.g. cooling ceiling, is used as the basic-stage cooling.
The *Basic-stage cooling control value type* parameter is pre-parameterized to *PI continuous (0...100%)* with the corresponding P and I proportions.
- *Free configuration*: With this option it is possible to select freely the type of basic-stage cooling and also the type of control. This option can be selected if the type of application is not entirely clear or if specific adjustments are necessary.
The *Basic-stage cooling control value type* parameter is pre-configured to *PI continuous (0...100%)*, however it is possible to select freely between all control types.

Dependent parameters:

- *Additional-stage cooling*
- *Type of heating/cooling system*
- *Heating/cooling changeover*
- *Actuate basic-stage cooling via*

ABB i-bus[®] KNX Parameters

7.4.1.2.1

—

Dependent parameter

Additional-stage cooling

This parameter is visible if, in the *Channel function* parameter, the *Controller channel* option is selected and the *Basic-stage cooling* parameter is not deactivated.

Options: Deactivated
 Area cooling (e.g. cooling ceiling)
 Free configuration

The type of application for the additional-stage cooling is selected with this parameter. The controller is pre-configured based on this selection and can be used for the selected application.

- *Deactivated*: The additional-stage cooling is deactivated by selecting this option. All dependent parameters and parameter windows are also deactivated.
- *Area cooling (e.g. cooling ceiling)*: This option should be selected if an area, e.g. cooling ceiling, is used as the additional-stage cooling.
The *Basic-stage cooling control value type* parameter is pre-parameterized to *PI continuous (0...100%)* with the corresponding P and I proportions.
- *Free configuration*: With this option it is possible to select freely the type of additional-stage cooling and also the type of control. This option can be selected if the type of application is not entirely clear or if specific adjustments are necessary.
The *Basic-stage cooling control value type* parameter is pre-configured to *PI continuous (0...100%)*, however it is possible to select freely between all control types.

Dependent parameters:

- *Actuate additional-stage cooling via*

ABB i-bus[®] KNX Parameters

7.4.1.2.2

—

Dependent parameter

Type of heating/cooling system

This parameter is not visible if the *Basic-stage heating* or *Basic-stage cooling* parameters are deactivated.

Options: 2-pipe
 4-pipe

This parameter must be selected to suit the heating/cooling system in which the device is to be used. It affects the changeover behavior of the device between heating and cooling.

- *2-pipe*: This option is to be selected if the heating and cooling devices actuated are in a 2-pipe system. In this system, only one pipe is used to supply the device with hot and cold water. It is therefore only ever possible to heat or cool; a changeover is necessary to change. It follows that the device is not allowed to decide on a change between heating and cooling and the changeover must always be made via the bus. The *Heating/cooling changeover* parameter is correspondingly parameterized to *Only via object* and cannot be changed.
- *4-pipe*: This option is to be selected if the devices actuated are in a 4-pipe system. In a 4-pipe system, separate pipes are used for the hot and cold water supply. It is therefore possible to change between heating and cooling at any time. In this situation the decision can be made centrally, and also by the device. The *Heating/cooling changeover* parameter is correspondingly parameterized to *Automatically*.

ABB i-bus[®] KNX Parameters

7.4.1.2.3

—

Dependent parameter

Heating/cooling changeover

This parameter is not visible if the *Basic-stage heating* or *Basic-stage cooling* parameters are deactivated.

Options: Automatically
 Only via object
 Via slave and via object

The standard value for this parameter depends on the selection in the *Type of heating/cooling system* parameter.

- Selection of *4-pipe*:
 - *Automatically*: If the *Automatically* option is selected, the changeover is only made by the device controller depending on the setpoint temperature selected. Here the *Heating/cooling changeover* group object is hidden.
 - *Only via object*: If the changeover is only allowed to be made centrally by a visualization or a building management system, e.g. if the cooling equipment and heating equipment are not to operate at the same time for energy-saving reasons, this parameter can also be changed to *Only via object*. The *Heating/cooling changeover* group object is visible.
 - *Via slave and via object*: The *Heating/cooling changeover* and *Request heating/cooling (master)* group objects are visible. It is possible to trigger a change between heating and cooling via the bus using these group objects. The *Request heating/cooling (master)* group object is used for connecting to a slave analog room control unit in the context of master/slave communication.

- Selection of *2-pipe*:

If *2-pipe* has been selected, the standard value is set to *Only via object* and cannot be changed; the related *Heating/cooling changeover* group object is visible. In a 2-pipe system, the same pipe is used for the supply of hot and cold water. Because the device cannot detect which situation is present, the changeover must always be made centrally and sent to the device using a group object.

ABB i-bus[®] KNX Parameters

7.4.1.2.4

—

Dependent parameter

Actuate basic-stage heating via

This parameter is not visible if the *Basic-stage heating* parameter is deactivated.

Options: Internal channel output (valve)
 Group object

The way the control value for the basic-stage heating is to be output is set using this parameter.

- *Internal channel output (valve)*: If the internal output is selected, the control value is output directly on this physical output where it is converted into the corresponding output signal. In parallel to the actuation via the internal output, the control value is also output via the related *Status Control value Basic-stage heating* group object.
- *Group object*: If *Group object* has been selected as the option, there is no actuation via any of the internal outputs, instead the control value is only output on the bus. The control value is output via the related *Status Control value Basic-stage heating* group object.

Note

Depending on the option selected in the *Basic-stage heating* parameter, this parameter may have a different standard value.

The settings for the exact control parameters are made in the *Temperature controller – Basic-stage heating* parameter window.

The settings for the actuation of the control values via the valve output are made in the valve parameter window.

7.4.1.2.5

—

Dependent parameter

Actuate basic-stage cooling via

This parameter is not visible if the *Basic-stage cooling* parameter is deactivated.

Options: Internal channel output (valve)
 Group object

The way the control value for the basic-stage cooling is to be output is set using this parameter.

- *Internal channel output (valve)*: If the internal output is selected, the control value is output directly on this physical output where it is converted into the corresponding output signal. In parallel to the actuation via the internal output, the control value is also output via the related *Status Control value Basic-stage cooling* group object.

Note

(Selection in the *Type of heating/cooling system* parameter: *4-pipe*)

Depending on the selection in the *Actuate basic-stage heating via* parameter, it may not be possible to select all options. If the valve output has already been selected here, it cannot also be used as an output for the basic-stage cooling.

Example:

If the *Internal channel output (valve)* option has been selected as the output for the basic-stage heating, this cannot be selected as the output for the basic-stage cooling.

(Selection in the *Type of heating/cooling system* parameter: *2-pipe*)

In a 2-pipe system, heating and cooling are undertaken using the same device (e.g. cooling ceiling and floor heating). Here it is possible that either the same valve is used for heating and cooling or that two valves are used because the heat/cooling is output into the room via a dedicated heating/cooling coil.

For this reason it is therefore possible here to output the control values for heating and cooling on the same output.

- *Group object*: If *Group object* has been selected as the option, there is no actuation via any of the internal outputs, instead the control value is only output on the bus. The control value is output via the related *Status Control value Basic-stage cooling* group object.

Note

Depending on the option selected in the *Actuate basic-stage heating via* parameter, this parameter may have a different standard value.

The settings for the exact control parameters are made in the *Temperature controller – Basic-stage cooling* parameter window.

The settings for the actuation of the control values via the valve output are made in the valve parameter window.

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7.4.1.2.6

—

Dependent parameter

Actuate additional-stage heating via

This parameter is not visible if the *Additional-stage heating* parameter is deactivated.

This parameter is not visible if the *Actuator channel* option has been selected in the *Channel function* parameter.

Options: Internal channel output (valve)
 Group object

The way the control value for the additional-stage heating is to be output is set using this parameter.

The parameter options are dependent on the values selected in the *Additional-stage heating*, *Actuate basic-stage heating via* and *Actuate basic-stage cooling via* parameters.

- *Internal channel output (valve)*: If the internal output is selected, the control value is output directly on this physical output where it is converted into the corresponding output signal.
In parallel to the actuation via the corresponding internal output, the control value is also output via the related Status Control value Additional-stage heating group object.

Note

4-pipe system (selection in the *Type of heating/cooling system* parameter: *4-pipe*):
Depending on the selection in the *Actuate basic-stage heating via* and *Basic-stage cooling* parameters, it may not be possible to select all options. If the valve output has already been selected here, then it cannot also be used as an output for the additional-stage heating.

Example:

If the *Internal channel output (valve)* option has been selected as the output for the basic-stage heating, this cannot be selected as the output for the additional-stage heating.

2-pipe system (selection in the *Type of heating/cooling system* parameter: *2-pipe*):
In a 2-pipe system, heating and cooling are undertaken using the same device (e.g. cooling ceiling and floor heating). Here it is possible that either the same valve is used for heating and cooling or that two valves are used because the heat/cooling is output into the room via a dedicated heating/cooling coil. For this reason it is therefore possible here to output the control values for heating and cooling on the same output.

- *Group object*: If *Group object* has been selected as the option, there is no actuation via any of the internal outputs, instead the control value is only output on the bus.
The control value is output via the related *Status Control value Additional-stage heating* group object.

Note

The settings for the exact control parameters are made in the *Temperature controller – Additional-stage heating* parameter window.

The settings for the actuation of the control values via the valve output are made in the valve parameter window.

7.4.1.2.7

—

Dependent parameter

Actuate additional-stage cooling via

This parameter is not visible if the *Additional-stage cooling* parameter is deactivated.

This parameter is not visible if the *Actuator channel* option has been selected in the *Channel function* parameter.

Options: Internal channel output (valve)
 Group object

The way the control value for the additional-stage cooling is to be output is set using this parameter.

The parameter options are dependent on the values selected in the *Additional-stage heating*, *Actuate basic-stage heating via*, *Actuate basic-stage cooling via* and *Actuate additional-stage heating via* parameters.

- *Internal channel output (valve):*

If the internal output is selected, the control value is output directly on this physical output where it is converted into the corresponding output signal.

In parallel to the actuation via the corresponding internal output, the control value is also output via the related *Status Control value Additional-stage cooling* KNX group object.

Note

4-pipe system (selection in the *Type of heating/cooling system* parameter: *4-pipe*):

Depending on the selection in the *Actuate basic-stage heating via* and *Basic-stage cooling* parameters, it may not be possible to select all options. If one of the outputs has already been selected here, then it cannot also be used as an output for the basic-stage cooling.

Example:

If the *Internal channel output (valve)* option has been selected as the output for the basic-stage heating, this cannot be selected as the output for the additional-stage cooling.

2-pipe system (selection in the *Type of heating/cooling system* parameter: *2-pipe*):

In a 2-pipe system, heating and cooling are undertaken using the same device.

Here it is possible that either the same valve is used for heating and cooling or that two valves are used because the heat/cooling is output into the room via a dedicated heating/cooling coil. For this reason it is therefore possible here to output the control values for heating and cooling on the same output.

In parallel to the actuation via the corresponding internal output, the control value is also output via the related *Status Control value Basic-stage heating* group object.

ABB i-bus[®] KNX Parameters

- *Group object*: If *Group object* has been selected as the option, there is no actuation via any of the internal outputs, instead the control value is only output on the bus.
The control value is output via the related *Status Control value Additional-stage cooling* group object.

Note

The settings for the exact control parameters are made in the *Temperature controller – Additional-stage cooling* parameter window.

The settings for the actuation of the control values via a valve output are made in the valve parameter window.

7.4.1.3

—

Dependent parameter

Window contact input

This parameter is not visible if the *Channel function* parameter has been parameterized with the *Actuator channel* option.

Options: Deactivated
 Via physical device input
 Via group object

This parameter is used to inform the integrated controller whether it is to include the status of a window (open/closed) in the control.

- *Deactivated*: If *Deactivated* has been selected, the window status is not taken into account by the controller.
- *Via physical device input*: If this option is selected, the controller checks which of the physical device inputs has been parameterized for a window contact. The status of the window contact connected to this input is included in the control. The message: Configure in 'Inputs' parameter window appears.

Note

Only device inputs that have been parameterized as a window contact are detected as such.

If no input has been parameterized as a window contact, the function is considered deactivated.

If several inputs have been parameterized as a window contact, there is a logical OR link between these inputs. As soon as one of the contacts signals the status "Window open", the controller evaluates the status as "Window open". Conversely, if all inputs signal the status "Window closed", the controller evaluates the status as "Window closed".

- *Via group object*: The window status is received via a group object. The dependent *Window contact* group object appears. In addition, the dependent *Window open when* parameter is enabled.

ABB i-bus[®] KNX Parameters

7.4.1.3.1

—

Dependent parameter

Window open when

Options: Object value = 0
 Object value = 1

This parameter is used to select which object value is to be considered the window open status on reception.

- *Object value = 0*: On the reception of the object value 0, it is evaluated as the "Window open" status. Reception of the object value 1 signifies "Window closed".
- *Object value = 1*: On the reception of the object value 1, it is evaluated as the "Window open" status. Reception of the object value 0 signifies "Window closed".

The controller reacts to the reception of the "Window open" status by changing to Building Protection mode (building protection heating = frost protection, building protection cooling = protection against heat).

7.4.1.4

—

Dependent parameter

Dew point alarm input

This parameter is not visible if the *Channel function* parameter has been parameterized with the *Actuator channel* option.

This parameter is not visible if the *Basic-stage cooling* parameter is deactivated.

Options: Deactivated
 Via physical device input
 Via group object

This parameter is used to inform the integrated controller whether it is to include the dew point alarm (Alarm/No alarm) in the control.

- *Deactivated*: If *Deactivated* has been selected, the dew point alarm is not taken into account by the controller.
- *Via physical device input*: If this option is selected, the controller checks which of the physical device inputs has been parameterized for a dew point sensor. The status of the dew point sensor connected to this input is included in the control. The message: Configure in 'Inputs' parameter window appears.

Note

Only device inputs that have been parameterized as a dew point sensor are detected as such. If no input has been parameterized as a dew point sensor, the function is considered deactivated. If several inputs have been parameterized as a dew point sensor, there is a logical OR link between these inputs. As soon as one of the contacts signals the status "Dew point reached", the controller evaluates the status as "Dew point alarm". Conversely, if none of the inputs signals the status "Dew point reached", the controller evaluates the status as "No dew point alarm".

- *Via group object*: The dew point alarm is received via a group object. The dependent *Dew point alarm* group object appears. In addition, the dependent *Dew point reached when* parameter is enabled.

ABB i-bus[®] KNX Parameters

7.4.1.4.1

—

Dependent parameter

Dew point reached when

Options: Object value = 0
 Object value = 1

This parameter is used to select which object value is to be considered dew point reached on reception.

- *Object value = 0*: On the reception of the object value 0, it is evaluated as the "Dew point alarm" status. Reception of the object value 1 signifies "No dew point alarm".
- *Object value = 1*: On the reception of the object value 1, it is evaluated as the "Dew point alarm" status. Reception of the object value 0 signifies "No dew point alarm".

The controller reacts to the reception of the "Dew point alarm" status with the shutdown of the cooling and a changeover to Building Protection mode. This mode applies until the dew point alarm is cleared. However, a change to the heating mode (if possible) is allowed at any time. Here the device continues to operate normally because the dew point only relates to the cooling and heating counteracts the dropping below the dew point temperature.

Note

The dew point (or dew point temperature) is the temperature below which condensation is formed. At this temperature the relative humidity is 100 %. The air can therefore not absorb any moisture. Due to the formation of condensation, the building may be damaged (damp/formation of mold).

The dew point can be calculated based on the temperature and moisture values or measured by a sensor.

To prevent dropping below the dew point, the cooling must be reduced or stopped.

7.4.1.5

—

Dependent parameter

Fill level sensor input

This parameter is not visible if the *Channel function* parameter has been parameterized with the *Actuator channel* option.

This parameter is not visible if the *Basic-stage cooling* parameter is deactivated.

Options: Deactivated
 Via physical device input
 Via group object

This parameter is used to inform the integrated controller whether it is to include the level in a condensation tray (Alarm/No alarm) in the control.

- *Deactivated*: If *Deactivated* has been selected, the level alarm is not taken into account by the controller.
- *Via physical device input*: If this option is selected, the controller checks which of the physical device inputs has been parameterized for a fill level sensor. The status of the fill level sensor connected to this input is included in the control. The message: Configure in 'Inputs' parameter window appears.

Note

Only device inputs that have been parameterized as a fill level sensor are detected as such. If no input has been parameterized as a fill level sensor, the function is considered deactivated. If several inputs have been parameterized as a fill level sensor, there is a logical OR link between these inputs. As soon as one of the contacts signals the status "Fill level reached", the controller evaluates the status as "Fill level alarm". Conversely, if none of the inputs signals the status "Fill level reached", the controller evaluates the status as "No fill level alarm".

- *Via group object*: The fill level alarm is received via a group object. The dependent *Fill level alarm* group object appears. The fill level alarm must be connected to the group object using this object. In addition, the dependent *Fill level reached when* parameter is enabled.

ABB i-bus[®] KNX Parameters

7.4.1.5.1

—

Dependent parameter

Fill level reached when

Options: Object value = 0
 Object value = 1

This parameter is used to select which object value is to be considered fill level reached on reception.

- *Object value = 0*: On the reception of the object value 0, it is evaluated as the "Fill level alarm" status. Reception of the object value 1 signifies "No fill level alarm".
- *Object value = 1*: On the reception of the object value 1, it is evaluated as the "Fill level alarm" status. Reception of the object value 0 signifies "No fill level alarm".

The controller reacts to the reception of the "Fill level alarm" status with the shutdown of the cooling and a changeover to Building Protection mode. This mode applies until the fill level alarm is cleared. However, a change to the heating mode (if possible) is allowed at any time. Here the device continues to operate normally because the fill level only relates to the cooling.

Note

A fill level sensor is used to monitor a condensation tray. Because moisture often arises directly on the fins during cooling, a tray is installed underneath to collect the moisture.

These trays normally have an outlet to drain off the condensation. To monitor whether the outlet is functioning, fill level sensors are installed. These sensors signal if a specific level is exceeded.

To prevent further filling and the overflow of the condensation tray, cooling is deactivated in this situation.

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Parameters

7.4.1.6

—

Dependent parameter

Temperature input

This parameter is not visible if the *Channel function* parameter has been parameterized with the *Actuator channel* option.

Options: Via physical device input
 Via group object
 Via phys. device input and group object

This parameter specifies how the integrated controller receives the actual temperature. Because the controller cannot operate without information on the actual temperature, this parameter cannot be deactivated.

- *Via physical device input*: If this option is selected, the controller checks which of the physical device inputs has been parameterized for a temperature sensor. The value measured using this sensor is taken into account in the control.
The message: Configure in 'Inputs' parameter window appears.
- *Via group object*: If this option is selected, the actual temperature is received via group object(s). The temperature can then be measured in a different device and transmitted to the device via the bus. The dependent parameter *Number of temperature input objects* is enabled.
- *Via physical device input and group object*: If this option is selected, the controller checks which of the physical device inputs have been parameterized as a temperature sensor. Temperature values can also be received via the bus. The values measured on the inputs and received via the bus are weighted.
The message: Configure in 'Inputs' parameter window appears.
The dependent parameters *Number of temperature input objects*, *Weighting of internal measurement* and *Weighting of external measurement 1* appear.

Note

Only device inputs that have been parameterized as a temperature sensor are detected as such. If several inputs are parameterized as a temperature sensor, a mean value is formed from the values measured and this mean value is used as the actual temperature value.
If an option with the physical device inputs has been selected as the temperature input, it is to be ensured that a temperature sensor is also connected to one of the inputs. Otherwise, the controller changes to a fault mode.

With the aid of the parameters on the type of temperature input and the weighting of the different inputs, it is possible to represent even more complex room situations. The temperature values can flow into the calculation with different weightings.

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7.4.1.6.1

—

Dependent parameter

Number of temperature input objects

This parameter is visible if the *Via group object* or *Via physical device input and group object* option has been selected in the *Temperature input* parameter.

Options: $\frac{1}{2}$

This parameter is used to specify the number of group objects that can receive temperature values via the bus.

- 1: If this option is selected, the *External temperature 1* group object is enabled.
- 2: If this option is selected, the *External temperature 1* and *External temperature 2* group objects are enabled.

Using these two objects, temperature values measured using other devices can be received; these values are then used to determine the actual temperature.

If the 1 option has been selected and in the *Temperature input* parameter the *Via physical device input and group object* option is not selected, the temperature received in the *External temperature 1* group object is the actual temperature. If the 2 option has been selected, the dependent parameters *Weighting of external measurement 1* and *Weighting of external measurement 2* are enabled.

7.4.1.6.2

—

Dependent parameter

Weighting of internal measurement

This parameter is only visible if the *Via physical device input and group object* option has been selected in the *Temperature input* parameter.

Options: 0...100 %

This value specifies the weighting with which the internal measurement is to flow into the calculation of the actual temperature.

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7.4.1.6.3

—

Dependent parameter

Weighting of external measurement 1

This parameter is only visible if both the following cases apply:

- In the *Temperature input* parameter, the *Via physical device input and group object* option has been selected.
- In the *Temperature input* parameter, the *Via group object* option has been selected and in the *Number of temperature input objects* parameter, the 2 option has been selected.

Options: 0...50...100 %

This value specifies the weighting with which the external measurement 1 is to flow into the calculation of the actual temperature.

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7.4.1.6.4

—

Dependent parameter

Weighting of external measurement 2

This parameter is only visible if the 2 option has been selected in the *Number of temperature input objects* parameter.

Options: 0...50...100 %

This value specifies the weighting with which the external measurement 2 is to flow into the calculation of the actual temperature.

If the sum of the total weighting values is greater than 100 %, the ratio of the values is formed and the result then scaled back to 100 %.

Example 1:

Value 1 = 20 %

Value 2 = 80 %

Value 2 is taken into account with four times the weighting of value 1.

Expressed in figures:

Value 1: 20 °C; weighting 20 %

Value 2: 25 °C; weighting 80 %

$$((20\text{ °C} \times 0.2) + (25\text{ °C} \times 0.8)) / (0.8 + 0.2) = 24\text{ °C}$$

Example 2:

3 values: If 50 % is entered as the weighting for all three values, all values have the same weighting and a mean value is simply formed from the three values.

Example 3:

2 values: The weighting 80 % applies to value 1 and the weighting 40 % to value 2, value 1 is therefore taken into account in the calculation with twice the weighting of value 2.

Expressed in figures:

Value 1: 21 °C; weighting 80 %

Value 2: 24 °C; weighting 40 %

$$((21\text{ °C} \times 0.8) + (24\text{ °C} \times 0.4)) / (0.8 + 0.4) = 22\text{ °C}$$

Note

If only the external measurement is used and the value 0 % selected as the weighting for both measurements, the value received as external temperature 1 is always used as the valid temperature value.

7.5 Channel function parameter window

General	Heating/cooling mode after bus voltage recovery	As before bus voltage failure
+ Manual operation	Control value after bus voltage recovery	<input checked="" type="radio"/> As before bus voltage failure <input type="radio"/> Select
- Channel A	Heating/cooling mode after ETS download/reset	<input checked="" type="radio"/> Heating <input type="radio"/> Cooling
Application parameters	Control value after ETS download	<input checked="" type="radio"/> Unchanged <input type="radio"/> Select
Channel function		
+ Temperature controller		
Setpoint manager		
Monitoring and safety		
Valve output A		
Setpoint adjustment		
Input a		
Input b		
Input c		
+ Channel B		
+ Channel C		
+ Channel D		

Fig. 11: Channel function parameter window

7.5.1 Heating/cooling mode after bus voltage recovery

Options: As before bus voltage failure
Heating
Cooling

This parameter is used to specify the mode (heating or cooling) in which the device is to be after bus voltage recovery.

- *As before bus voltage failure*: The device is in the same mode as before bus voltage failure.
- *Heating*: The device is in the heating mode after bus voltage recovery.
- *Cooling*: The device is in the cooling mode after bus voltage recovery.

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7.5.2 Control value after bus voltage recovery

Options: As before bus voltage failure
Select

This parameter specifies which control value is to apply after bus voltage recovery until the controller has calculated a new control value or the device has received a new control value via the bus in the actuator mode.

- *As before bus voltage failure*: The same control value as before the bus voltage failure applies.
- *Select*: A control value can be specified. This control value applies until a new control value is calculated/a new setpoint is received via the bus. The *Control value* dependent parameter is displayed.

Note

The reaction parameterized here also applies during the sending and switching delay. After bus voltage recovery it can take up to 2 seconds until the device has started and the outputs can be switched/controlled again.

7.5.2.1 —

Dependent parameter

Control value

Options: 0...100 %

This parameter is used to specify the control value that is to apply after bus voltage recovery until a new setpoint is received.

7.5.3 Heating/cooling mode after ETS download/reset

Options: Heating
Cooling

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7.5.4 Control value after ETS download

Options: Unchanged
 Select

This parameter specifies which control value is to apply after a download until the controller has calculated a new control value.

In the actuator mode, the value specified here applies until a new control value has been received via the bus.

- *Unchanged*: The same control value as before the download applies.
- *Select*: A control value can be specified. This control value then applies until a new control value is calculated/a new setpoint is received via the bus. The *Control value* dependent parameter is displayed.

7.5.4.1 —

Dependent parameter

Control value

Options: 0...100 %

This parameter is used to specify the control value that is to apply after bus voltage recovery until a new setpoint is received.

7.6 Temperature controller parameter window

In actuator mode, this window is deactivated and hidden.

General settings for the temperature controller are made in this window. These settings affect above all the basic load, the sending of control values for the inactive type of operation and the behavior on sending the actual room temperature (actual temperature).

General	Controller options
+ Manual operation	Minimum control value for basic load > 0 <input type="radio"/> Activate via object <input checked="" type="radio"/> Always active
- Channel A	Basic load active when controller off <input checked="" type="radio"/> No <input type="radio"/> Yes
Application parameters	Send inactive control values cyclically <input checked="" type="radio"/> No <input type="radio"/> Yes
Channel function	
+ Temperature controller	Send current room temp. cyclically (0 = cyclical sending deactivated) <input type="text" value="15"/> Min
Setpoint manager	Temperature change for sending current room temperature <input type="text" value="00,5"/> K
Monitoring and safety	
Valve output A	
Setpoint adjustment	
Input a	
Input b	
Input c	
+ Channel B	
+ Channel C	
+ Channel D	

Fig. 12: Temperature controller parameter window

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7.6.1 Minimum control value for basic load > 0

Options: Activate via object
 Always active

This parameter is used to specify whether the basic load for the individual heating and cooling stages is to be always active or whether it is to be possible to activate or deactivate it via a group object.

- *Activate via object*: On the selection of this option, the *Min. control value (basic load)* function can be activated (1) or deactivated (0) via the *Activate minimum control value (basic load)* group object. If it is activated, then the heating medium is always pumped through the system with at least the minimum control value. If it is deactivated, the control value can be reduced to zero by the controller. The dependent *Activate minimum control value (basic load)* group object is enabled.
- *Always active*: On the selection of this option, the basic load is always active

Note

The settings for the basic load can be specified independently for each stage. This setting is specified in the *Temperature controller - Basic-stage heating*, *Temperature controller - Additional-stage heating*, *Temperature controller - Basic-stage cooling*, *Temperature controller - Additional-stage cooling* parameter window. Here the minimum control value for the basic load that is not allowed to be dropped below is specified.

This value can only be specified for the PI control types.

The basic load is always activated for all stages, but only applies to the currently active heating or cooling type of operation.

One sample application for the basic load is floor heating, for which a certain control value must not be fallen below to protect the installation.

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7.6.2 Basic load active when controller off

Options: No
 Yes

This parameter is used to specify whether the basic load is to be active if the controller has been switched off via the *Request On/Off (master)* group object.

- *no*: The basic load is also switched off if the controller is switched off.
- *yes*: The basic load remains active even if the controller is switched off.

7.6.3 Send inactive control values cyclically

This parameter is enabled if the controller has been parameterized both for heating and for cooling. For this purpose, *Deactivated* must not be selected for the parameters *Basic-stage heating* and *Basic-stage cooling* in the *Application parameters* parameter window.

Options: No
 Yes

The parameter is used to influence the behavior on sending the controller control value output. This parameter can be used to specify whether the control values for the type of operation not currently active (heating or cooling) are to be sent or not.

This setting is necessary for systems that have only one control value input for heating and cooling. In this situation, both output objects for the control value (*Status Control value Basic-stage heating* and *Status Control value Basic-stage cooling*) must be linked to the same input object.

The cyclic sending of both control values in this situation means that the active and inactive value continuously overwrite each other. To prevent this action from arising, the cyclic sending of the inactive control value can be inhibited.

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Parameters

The following example makes the behavior clear:

- Active type of operation: Heating
- Heating control value: 50 %
- Cooling control value: 0 %
- Sending cycle time: 5 minutes (for both types of operation)
- Valve drive actuator: 2-pipe system for heating and cooling (only one control value input)
 - Sending heating control value: control value received: 50 %
 - Valve drive actuator output control value: 50 %
 - Sending cooling control value: control value received: 0 %
 - Valve drive actuator output control value: 0 %
- *no*: The cyclic sending of the inactive control values is inhibited. Only the control values for the type of operation (heating or cooling) currently active are sent.
- *yes*: The cyclic sending of the inactive control values remains active. All control values are always sent corresponding to the cycle time selected.

The cycle times for the individual control values can be set in the related parameter window (e.g. Basic-stage heating) in *Extended settings* in the *Send control value cyclically* parameter.

7.6.4 Send current room temperature cyclically (0 = cyclical sending deactivated)

Options: 0...15...255 min

This parameter is used to specify the cycle with which the room temperature determined is to be sent via the *Actual temperature* group object. This temperature is the room temperature calculated from the different values.

7.6.5 Temperature change for sending current room temperature

Options: 0.01...00.5...10.0 K

This parameter is used to specify the temperature change after which the room temperature determined is to be sent via the *Actual temperature* group object. If the temperature changes by the value parameterized here, the new value is sent on the bus.

Note

The actual room temperature is made up of various values, depending on the selection in the *Temperature input parameter (Application parameters parameter window)*. The values measured via the physical device inputs and received via group objects (*External temperature 1 & External temperature 2*) are used in the calculation.

This value is the actual room temperature (actual temperature).

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7.6.6 Basic-stage heating parameter window

This window is only visible if the *Deactivated* option has not been selected in the *Basic-stage heating* parameter in the *Application parameters* parameter window.

In actuator mode, this window is deactivated and hidden.

The basic-stage heating of the temperature controller is parameterized in this window. The settings for the control type, limitation of the control range, the behavior on sending the control value and the limit temperature are made.

General	Basic-stage heating control value type	PI continuous (0...100%)
+ Manual operation	P-proportion	01,5 K
- Channel A	I-proportion	100 Min
Application parameters	Extended settings	<input checked="" type="radio"/> No <input type="radio"/> Yes
Channel function		
- Temperature controller		
Basic-stage heating		
Basic-stage cooling		

Fig. 13: Basic-stage heating parameter window

7.6.6.1 Basic-stage heating control value type

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

This parameter is used to specify the control and control value type for the basic-stage heating.

The standard value for the parameter is dependent on the selection in the *Basic-stage heating* and *Actuate basic-stage heating via parameters* (*Application parameters* parameter window).

On the selection of the physical device output for the actuation of the basic-stage heating or on output via KNX group object, the controller has a fixed pre-configuration that cannot be changed. The pre-configured controller type is dependent here on the option selected in the *Basic-stage heating* parameter.

The only exception is on the selection of *Free configuration*. In this situation, everything can be selected and set freely.

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The following table shows the dependencies:

Option selected: Basic-stage heating	Pre-configured controller type: Type of heating control value	Controller type can be changed
Convector (e.g. radiator)	PI continuous (0...100 %)	No
Area (e.g. floor heating)	PI continuous (0...100 %)	No
Electric heater (in room)	2-point 1 bit (On/Off)	No
Free configuration	PI continuous (0...100 %)	Yes

Table 13: Table of controller configuration dependencies

The differences between the individual controller types are explained in the following:

- **2-point 1 bit (On/Off):** 2-point control is the simplest form of control. The controller switches on if the room temperature has dropped below a specific level (setpoint temperature minus hysteresis) and off as soon as a specific value (setpoint temperature plus hysteresis) is exceeded. The switch-on and switch-off commands are sent as 1-bit commands. The dependent *Status Control value Basic-stage heating* group object is enabled as a 1-bit group object.
- **2-point 1 byte (0/100 %):** This is also two-point control as above. The difference is that switch-on and switch-off commands are sent as 1-byte values (0 %/100 %). The dependent *Status Control value Basic-stage heating* group object is enabled as a 1-byte group object.
- **PI continuous (0...100 %):** The PI controller adjusts its output value, between 0 % and 100 %, to the difference between the actual value and setpoint and permits exact regulation of the room temperature to the setpoint. It outputs the control value on the bus as a 1-byte value (0...100 %). To reduce the bus load, the control value is only sent if it has changed by a previously specified percentage in relation to the value sent last. In addition, the control value can be sent cyclically. The dependent *Status Control value Basic-stage heating* group object is enabled as a 1-byte group object.
- **PI PWM (On/Off):** This is also a PI controller. The output is as a 1-bit command. For this purpose the control value calculated is implemented using a pulse-pause ratio. The dependent *Status Control value Basic-stage heating* group object is enabled as a 1-bit group object.

Note

For a detailed description of the individual controller types, see [Explanation of controller function, page 234](#).

ABB i-bus[®] KNX Parameters

7.6.6.1.1 2-point 1 bit (On/Off), 2-point 1 byte (0/100 %)

The following parameters are enabled if the *2-point 1 bit (On/Off)* or *2-point 1 byte (0/100%)* option has been selected in the *Basic-stage heating control value type* parameter.

7.6.6.1.1.1

—

Dependent parameter

Extended settings

Options: No
 Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the Yes option.

7.6.6.1.1.2

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate basic-stage heating via* parameter in the *Application parameters* parameter window.

Options: Normal
 Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value On/100 %
Control value Off/0 % => telegram value Off/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

ABB i-bus[®] KNX

Parameters

7.6.6.1.1.3

—

Dependent parameter

Hysteresis

Options: 0.3...0.5...25.5 K

This parameter is used to specify the hysteresis that is to apply to the setpoint to prevent continuous switching of the controller.

- Upper switching point = setpoint + hysteresis
- Lower switching point = setpoint – hysteresis

Heating controller:

- If the actual temperature is below the lower switching point, the controller switches on.
- If the actual temperature is above the upper switching point, the controller switches off.

Cooling controller:

- If the actual temperature is below the lower switching point, the controller switches off.
- If the actual temperature is above the upper switching point, the controller switches on.

7.6.6.1.1.4

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is floor heating, where exceeding a specific temperature must be prevented to protect the material of the floor.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

ABB i-bus[®] KNX Parameters

7.6.6.1.1.4.1

—

Dependent parameter

Limit temperature

Options: 20...30...50 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.6.1.1.4.2

—

Dependent parameter

Limit temperature hysteresis

Options: 0.05...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

ABB i-bus® KNX Parameters

7.6.6.1.1.4.3

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
 Via physical device input a
 Via physical device input b

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Basic-stage heating limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

ABB i-bus[®] KNX Parameters

7.6.6.1.2 PI continuous (0...100%), PI PWM (On/Off)

The following parameters are enabled if the *PI continuous (0...100%), PI PWM (On/Off)* option has been selected in the *Basic-stage heating control value type* parameter.

7.6.6.1.2.1

—

Dependent parameter

I-proportion

Options: 0...100...255 min

The standard value depends on the option selected in the *Basic-stage heating* parameter in the *Application parameters* parameter window.

The I-proportion stands for the integral time in a control. The integral proportion causes the room temperature to approach the setpoint slowly and also to reach it finally. Depending on the system type used, the integral time may need to have different values. In principle the following applies: The more sluggish the overall system, the larger the integral time is.

7.6.6.1.2.2

—

Dependent parameter

P-proportion

Options: 01.0...01.0...10.0 K

The standard value depends on the option selected in the *Basic-stage heating* parameter in the *Application parameters* parameter window.

The P-proportion stands for the proportional range in a control. It fluctuates around the setpoint and in a PI control is used to change the speed of the control. The smaller the value set, the faster the control reacts. However, the value should not be set too small because otherwise there may be a risk of overshoot.

7.6.6.1.2.3

—

Dependent parameter

Extended settings

Options: No
Yes

ABB i-bus[®] KNX

Parameters

7.6.6.1.2.3.1

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate basic-stage heating via* parameter in the *Application parameters* parameter window.

Options: Normal
 Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value On/100 %
Control value Off/0 % => telegram value Off/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

7.6.6.1.2.3.2

—

Dependent parameter

Control value difference for sending control value

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 2 %
 5 %
 10%
 Only send cyclically

The control values for the PI continuous controller 0...100 % are not sent after each calculation, but when there is a difference in the calculation compared to the last value sent and sending is appropriate. This value difference can be entered here.

ABB i-bus[®] KNX Parameters

7.6.6.1.2.3.3

—

Dependent parameter

Send control value cyclically (0 = cyclical sending disabled)

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 0...15...60 min

This parameter is used to specify the cycle time with which the control value is to be sent.

On the selection of the value 0, cyclic sending is deactivated.

Note

If the control value is only output via a group object, this value should not be set to 0 because otherwise it will not be ensured that the actuator receives its control value.
In particular, in combination with the *Control value difference for sending control value* parameter and the *Only send cyclically* option that can be selected there, the value 0 is not allowed to be selected. This configuration would mean that the control value is never output.

7.6.6.1.2.3.4

—

Dependent parameter

Heating PWM cycle

This parameter is only visible on the selection of the *PI PWM (On/Off)* option.

Options: 0...15...60 min

Using the value set here, the cycle time for the control value for the PWM signal calculated from the PI controller's control value is specified. Depending on the control value, the selected cycle time is divided into an On and Off signal.

Therefore, a control value output of 33 % with a PWM cycle of 15 min signifies an On phase of five minutes and an Off phase of 10 min.

Note

The value is only sent if the control value changes (from 0 to 1 or vice versa).
At the start of a cycle a 1 is output and, corresponding to the control value, a 0 after the time x.
If the control value is 0 %, on reaching this control value a 0 is output once. The next value is only sent if the control value changes.

ABB i-bus[®] KNX Parameters

Example:

Heating PWM cycle: 15 min
Control value: 33 %

Times	Sent value
0 min	1
5 min	0
15 min	1
20 min	0
30 min	1
...	...
New control value: 0%	
Times	Sent value
60 min	0
75 min	–
90 min	–
...	...
New control value: 66 %	
Times	Sent value
120 min	1
130 min	0
135 min	1
145 min	0
...	...

ABB i-bus[®] KNX Parameters

7.6.6.1.2.3.5

—

Dependent parameter

Max. control value

Options: 0...100 %

The maximum control value from the PI controller specifies the maximum value that the controller outputs. If a maximum value below 255 is selected, then this value is not exceeded even if the controller calculates a higher control value.

7.6.6.1.2.3.6

—

Dependent parameter

Min. control value (basic load)

Options: 0...100 %

The minimum control value from the PI controller specifies the minimum value that the controller outputs. If a minimum value greater than zero is selected, then this value is not dropped below even if the controller calculates a lower control value.

This parameter is used to set a basic load, e.g. for the operation of floor heating. Even if the controller calculates the control value zero, heating medium flows through the floor heating to prevent the floor from cooling down completely.

In the *Temperature controller* parameter window it can be set whether this basic load is to be active permanently or is to be switched via the *Basic load* group object. In addition, it can be set here whether the basic load is also to be active if the controller is switched off.

7.6.6.1.2.3.7

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is floor heating, where exceeding a specific temperature must be prevented to protect the material of the floor.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

ABB i-bus[®] KNX

Parameters

7.6.6.1.2.3.7.1

—

Dependent parameter

Limit temperature

Options: 20...30...50 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.6.1.2.3.7.2

—

Dependent parameter

Limit temperature hysteresis

Options: 00.5...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

7.6.6.1.2.3.7.3

—

Dependent parameter

I-proportion on limitation

This parameter is only visible if the *PI continuous (0...100%)*, *PI PWM (On/Off)* has been selected in the *Basic-stage heating control value type* parameter.

Options: Freeze
Reset

This parameter decides what is to happen to the I-proportion on reaching the limit temperature.

- *Freeze*: The I-proportion is frozen at the actual value. As soon as the controller is active again, it continues to operate with the same I-proportion as before reaching the limit.
- *Reset*: The I-proportion is reset to 0. Once the controller becomes active again, the I-proportion starts at 0.

ABB i-bus[®] KNX Parameters

7.6.6.1.2.3.7.4

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
Via physical device input a
Via physical device input b

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Basic-stage heating limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

7.6.7 Additional-stage heating parameter window

This window is only visible if the *Deactivated* option has not been selected in the *Additional-stage heating* parameter in the *Application parameters* parameter window.

In actuator mode, this window is deactivated and hidden.

The additional-stage heating of the temperature controller is parameterized in this window. The settings for the control type, limitation of the control range, the behavior on sending the control value and the limit temperature are made.

The additional stage is used as a boost for the basic stage. If there are large deviations between the actual and setpoint temperature, the additional stage is activated to accelerate reaching the setpoint temperature.

Fig. 14: Additional-stage heating parameter window

7.6.7.1 Additional-stage heating control value type

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

This parameter is used to specify the control and control value type for the additional-stage heating.

The standard value for the parameter is dependent on the selection in the *Additional-stage heating* and *Actuate additional-stage heating via parameters* (*Application parameters* parameter window).

On the selection of the physical device output for the actuation of the additional-stage heating, the controller has a fixed pre-configuration that cannot be changed. The pre-configured controller type is dependent here on the option selected in the *Additional-stage heating* parameter.

The only exception is on the selection of *Free configuration*. In this situation, everything can be selected and set freely.

ABB i-bus[®] KNX Parameters

The following table shows the dependencies:

Option selected: Basic-stage heating	Pre-configured controller type: Type of heating control value	Controller type can be changed
Convector (e.g. radiator)	PI continuous (0...100 %)	No
Area (e.g. floor heating)	PI continuous (0...100 %)	No
Electric heater (in room)	2-point 1 bit (On/Off)	No
Free configuration	PI continuous (0...100 %)	Yes

Table 14: Table of controller configuration dependencies

The differences between the individual controller types are explained in the following:

- **2-point 1 bit (On/Off):** 2-point control is the simplest form of control. The controller switches on if the room temperature has dropped below a specific level (setpoint temperature minus hysteresis) and off as soon as a specific value (setpoint temperature plus hysteresis) is exceeded. The switch-on and switch-off commands are sent as 1-bit commands. The dependent *Status Control value Additional-stage heating* group object is enabled as a 1-bit group object.
- **2-point 1 byte (0/100 %):** This is also two-point control as above. The difference is that switch-on and switch-off commands are sent as 1-byte values (0 %/100 %). The dependent *Status Control value Additional-stage heating* group object is enabled as a 1-byte group object.
- **PI continuous (0...100 %):** The PI controller adjusts its output value, between 0 % and 100 %, to the difference between the actual value and setpoint and permits exact regulation of the room temperature to the setpoint. It outputs the control value on the bus as a 1-byte value (0...100 %). To reduce the bus load, the control value is only sent if it has changed by a previously specified percentage in relation to the value sent last. In addition, the control value can be sent cyclically. The dependent *Status Control value Additional-stage heating* group object is enabled as a 1-byte group object.
- **PI PWM (On/Off):** This is also a PI controller. The output is as a 1-bit command. For this purpose the control value calculated is implemented using a pulse-pause ratio. The dependent *Status Control value Additional-stage heating* group object is enabled as a 1-bit group object.

Note

For a detailed description of the individual controller types, see [Explanation of controller function, page 234](#).

ABB i-bus[®] KNX

Parameters

7.6.7.1.1 2-point 1 bit (On/Off), 2-point 1 byte (0/100 %)

The following parameters are enabled if the *2-point 1 bit (On/Off)* or *2-point 1 byte (0/100%)* option has been selected in the *Additional-stage heating control value type* parameter.

7.6.7.1.1.1

—

Dependent parameter

Temperature difference from basic-stage heating

Options: 00.0...02.0...25.5 K

The temperature difference from basic-stage heating specifies the value from which or up to which the additional-stage heating is to be active. If the actual temperature is below the setpoint temperature by the value selected here, the additional stage is active.

This action occurs both if the actual temperature drops below the threshold and if it is already below the threshold.

Example 1:

Temperature difference from basic-stage heating: 2 K

Setpoint temperature: 23 °C

Actual temperature: 19 °C

Additional stage is active until the actual temperature reaches 21 °C.

Example 2:

Temperature difference from basic-stage heating: 2 K

Setpoint temperature: 23 °C

Actual temperature: 22 °C

Additional stage is inactive as long as the actual temperature is above 21 °C.

ABB i-bus[®] KNX Parameters

7.6.7.1.1.2

—

Dependent parameter

Extended settings

Options: No
 Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the Yes option.

7.6.7.1.1.2.1

—

Dependent parameter

Hysteresis

Options: 0.0...0.5...25.5

This parameter is used to specify the hysteresis that is to apply to the setpoint to prevent continuous switching of the controller.

- Upper switching point = setpoint + hysteresis
- Lower switching point = setpoint – hysteresis

Heating controller:

- If the actual temperature is below the lower switching point, the controller switches on.
- If the actual temperature is above the upper switching point, the controller switches off.

Cooling controller:

- If the actual temperature is below the lower switching point, the controller switches off.
- If the actual temperature is above the upper switching point, the controller switches on.

ABB i-bus[®] KNX

Parameters

7.6.7.1.1.2.2

—

Dependent parameter

Send control value cyclically (0 = cyclical sending disabled)

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 0...15...60

This parameter is used to specify the cycle time with which the control value is to be sent.

On the selection of the value 0, cyclic sending is deactivated.

7.6.7.1.1.2.3

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is floor heating, where exceeding a specific temperature must be prevented to protect the material of the floor.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

7.6.7.1.1.2.3.1

—

Dependent parameter

Limit temperature

Options: 20...30...50 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

ABB i-bus[®] KNX Parameters

7.6.7.1.1.2.3.2

—

Dependent parameter

Limit temperature hysteresis

Options: 00.5...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

7.6.7.1.1.2.3.3

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
Via physical device input a
Via physical device input b

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Additional-stage heating limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

ABB i-bus[®] KNX

Parameters

7.6.7.1.2 PI continuous (0...100%), PI PWM (On/Off)

The following parameters are enabled if the *PI continuous (0...100%), PI PWM (On/Off)* option has been selected in the *Additional-stage heating control value type* parameter.

7.6.7.1.2.1

—

Dependent parameter

Temperature difference from basic-stage heating

Options: 00.0...02.0...25.5 K

The temperature difference from basic-stage heating specifies the value from which or up to which the additional-stage heating is to be active. If the actual temperature is below the setpoint temperature by the value selected here, the additional stage is active.

This action occurs both if the actual temperature drops below the threshold and if it is already below the threshold.

Example 1:

Temperature difference from basic-stage heating: 2 K

Setpoint temperature: 23 °C

Actual temperature: 19 °C

Additional stage is active until the actual temperature reaches 21 °C.

Example 2:

Temperature difference from basic-stage heating: 2 K

Setpoint temperature: 23 °C

Actual temperature: 22 °C

Additional stage is inactive as long as the actual temperature is above 21 °C.

7.6.7.1.2.2

—

Dependent parameter

P-proportion

Options: 01.0...01.5...10.0 K

The standard value depends on the option selected in the *Additional-stage heating* parameter in the *Application parameters* parameter window.

The P-proportion stands for the proportional range in a control. It fluctuates around the setpoint and in a PI control is used to change the speed of the control. The smaller the value set, the faster the control reacts. However, the value should not be set too small because otherwise there may be a risk of overshoot.

ABB i-bus[®] KNX Parameters

7.6.7.1.2.3

—

Dependent parameter

I-proportion

Options: 0...100...255 min

The standard value depends on the option selected in the *Additional-stage heating* parameter in the *Application parameters* parameter window.

The I-proportion stands for the integral time in a control. The integral proportion causes the room temperature to approach the setpoint slowly and also to reach it finally. Depending on the system type used, the integral time may need to have different values. In principle the following applies: The more sluggish the overall system, the larger the integral time is.

7.6.7.1.2.4

—

Dependent parameter

Extended settings

Options: No
Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the *Yes* option.

7.6.7.1.2.4.1

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate additional-stage heating via* parameter in the *Application parameters* parameter window.

Options: Normal
Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value On/100 %
Control value Off/0 % => telegram value Off/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

ABB i-bus[®] KNX Parameters

7.6.7.1.2.4.2

—

Dependent parameter

Control value difference for sending control value

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 2 %
 5 %
 10%
 Only send cyclically

The control values for the PI continuous controller 0...100 % are not sent after each calculation, but when there is a difference in the calculation compared to the last value sent and sending is appropriate. This value difference can be entered here.

7.6.7.1.2.4.3

—

Dependent parameter

Send control value cyclically (0 = cyclical sending disabled)

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 0...15...60 min

This parameter is used to specify the cycle time with which the control value is to be sent.

On the selection of the value 0, cyclic sending is deactivated.

Note

If the control value is only output via a group object, this value should not be set to 0 because otherwise it will not be ensured that the actuator receives its control value.

In particular, in combination with the *Control value difference for sending control value* parameter and the *Only send cyclically* option that can be selected there, the value 0 is not allowed to be selected.

This configuration would mean that the control value is never output.

ABB i-bus[®] KNX Parameters

7.6.7.1.2.4.4

—

Dependent parameter

Heating PWM cycle

This parameter is only visible on the selection of the *PI PWM (On/Off)* option.

Options: 0...15...60 min

Using the value set here, the cycle time for the control value for the PWM signal calculated from the PI controller's control value is specified. Depending on the control value, the selected cycle time is divided into an On and Off signal.

Therefore, a control value output of 33 % with a PWM cycle of 15 min signifies an On phase of five minutes and an Off phase of 10 min.

Note

The value is only sent if the control value changes (from 0 to 1 or vice versa).
At the start of a cycle a 1 is output and, corresponding to the control value, a 0 after the time x.
If the control value is 0 %, on reaching this control value a 0 is output once. The next value is only sent if the control value changes.

Example:

Heating PWM cycle: 15 min
Control value: 33 %

Times	Sent value
0 min	1
5 min	0
15 min	1
20 min	0
30 min	1
...	...
New control value: 0%	
Times	Sent value
60 min	0
75 min	—
90 min	—
...	...
New control value: 66 %	
Times	Sent value
120 min	1
130 min	0
135 min	1
145 min	0
...	...

ABB i-bus[®] KNX

Parameters

7.6.7.1.2.4.5

—

Dependent parameter

Max. control value

Options: 0...100 %

The maximum control value from the PI controller specifies the maximum value that the controller outputs. If a maximum value below 255 is selected, then this value is not exceeded even if the controller calculates a higher control value.

7.6.7.1.2.4.6

—

Dependent parameter

Min. control value (basic load)

Options: 0...100 %

The minimum control value from the PI controller specifies the minimum value that the controller outputs. If a minimum value greater than zero is selected, then this value is not dropped below even if the controller calculates a lower control value.

This parameter is used to set a basic load, e.g. for the operation of floor heating. Even if the controller calculates the control value zero, heating medium flows through the floor heating to prevent the floor from cooling down completely.

In the *Temperature controller* parameter window it can be set whether this basic load is to be active permanently or is to be switched via the *Basic load* group object. In addition, it can be set here whether the basic load is also to be active if the controller is switched off.

7.6.7.1.2.4.7

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is floor heating, where exceeding a specific temperature must be prevented to protect the material of the floor.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

ABB i-bus[®] KNX Parameters

7.6.7.1.2.4.7.1

—

Dependent parameter

Limit temperature

Options: 20...30...50 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.7.1.2.4.7.2

—

Dependent parameter

Limit temperature hysteresis

Options: 00.5...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

7.6.7.1.2.4.7.3

—

Dependent parameter

I-proportion on limitation

This parameter is only visible if the *PI continuous (0...100%)*, *PI PWM (On/Off)* has been selected in the *Additional-stage heating control value type* parameter.

Options: Freeze
Reset

This parameter decides what is to happen to the I-proportion on reaching the limit temperature.

- *Freeze*: The I-proportion is frozen at the actual value. As soon as the controller is active again, it continues to operate with the same I-proportion as before reaching the limit.
- *Reset*: The I-proportion is reset to 0. Once the controller becomes active again, the I-proportion starts at 0.

ABB i-bus[®] KNX

Parameters

7.6.7.1.2.4.7.4

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
Via physical device input a
Via physical device input b

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Additional-stage heating limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

ABB i-bus[®] KNX Parameters

7.6.8 Basic-stage cooling parameter window

This window is only visible if the *Deactivated* option has not been selected in the *Basic-stage cooling* parameter in the *Application parameters* parameter window.

In actuator mode, this window is deactivated and hidden.

The basic-stage cooling of the temperature controller is parameterized in this window. The settings for the control type, limitation of the control range, the behavior on sending the control value and the limit temperature are made.

General	Basic-stage cooling control value type	PI continuous (0..100%)
+ Manual operation	P-proportion	05,0 K
- Channel A	I-proportion	240 Min
Application parameters	Extended settings	<input checked="" type="radio"/> No <input type="radio"/> Yes
Channel function		
- Temperature controller		
Basic-stage heating		
Basic-stage cooling		

Fig. 15: Basic-stage cooling parameter window

7.6.8.1 Basic-stage cooling control value type

Options:

- 2-point 1 bit (On/Off)
- 2-point 1 byte (0/100%)
- PI continuous (0...100 %)
- PI PWM (On/Off)

This parameter is used to specify the control and control value type for the basic-stage cooling.

The standard value for the parameter is dependent on the selection in the *Basic-stage cooling* and *Actuate basic-stage cooling via parameters* (*Application parameters* parameter window).

On the selection of the physical device output for the actuation of the basic-stage cooling, the controller has a fixed pre-configuration that cannot be changed. The pre-configured controller type is dependent here on the option selected in the *Basic-stage cooling* parameter.

The only exception is on the selection of *Free configuration*. In this situation, everything can be selected and set freely.

ABB i-bus[®] KNX Parameters

The following table shows the dependencies:

Option selected: Basic-stage cooling	Pre-configured controller type: Type of cooling control value	Controller type can be changed
Area cooling (e.g. cooling ceiling)	PI continuous (0...100 %)	No
Free configuration	PI continuous (0...100 %)	Yes

Table 15: Table of controller configuration dependencies

The differences between the individual controller types are explained in the following:

- **2-point 1 bit (On/Off):** 2-point control is the simplest form of control. The controller switches on if the room temperature has dropped below a specific level (setpoint temperature minus hysteresis) and off as soon as a specific value (setpoint temperature plus hysteresis) is exceeded. The switch-on and switch-off commands are sent as 1-bit commands. The dependent *Status Control value Basic-stage cooling* group object is enabled as a 1-bit group object.
- **2-point 1 byte (0/100 %):** This is also two-point control as above. The difference is that switch-on and switch-off commands are sent as 1-byte values (0%/100%). The dependent *Status Control value Basic-stage cooling* group object is enabled as a 1-byte group object.
- **PI continuous (0...100 %):** The PI controller adjusts its output value, between 0% and 100%, to the difference between the actual value and setpoint and permits exact regulation of the room temperature to the setpoint. It outputs the control value on the bus as a 1-byte value (0...100%). To reduce the bus load, the control value is only sent if it has changed by a previously specified percentage in relation to the value sent last. In addition, the control value can be sent cyclically. The dependent *Status Control value Basic-stage cooling* group object is enabled as a 1-byte group object.
- **PI PWM (On/Off):** This is also a PI controller. The output is as a 1-bit command. For this purpose the control value calculated is implemented using a pulse-pause ratio. The dependent *Status Control value Basic-stage cooling* group object is enabled as a 1-bit group object.

Note

For a detailed description of the individual controller types, see [Explanation of controller function, page 234](#).

ABB i-bus[®] KNX Parameters

7.6.8.1.1 2-point 1 bit (On/Off), 2-point 1 byte (0/100 %)

The following parameters are enabled if the *2-point 1 bit (On/Off)* or *2-point 1 byte (0/100%)* option has been selected in the *Basic-stage cooling control value type* parameter.

7.6.8.1.1.1

—

Dependent parameter

Extended settings

Options: No
Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the *Yes* option.

7.6.8.1.1.1.1

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate basic-stage cooling via* parameter in the *Application parameters* parameter window.

Options: Normal
Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value On/100 %
Control value Off/0 % => telegram value Off/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

ABB i-bus[®] KNX Parameters

7.6.8.1.1.1.2

—

Dependent parameter

Hysteresis

Options: 0.3...0.5...25.5 K

This parameter is used to specify the hysteresis that is to apply to the setpoint to prevent continuous switching of the controller.

- Upper switching point = setpoint + hysteresis
- Lower switching point = setpoint – hysteresis

Heating controller:

- If the actual temperature is below the lower switching point, the controller switches on.
- If the actual temperature is above the upper switching point, the controller switches off.

Cooling controller:

- If the actual temperature is below the lower switching point, the controller switches off.
- If the actual temperature is above the upper switching point, the controller switches on.

7.6.8.1.1.1.3

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is floor heating, where exceeding a specific temperature must be prevented to protect the material of the floor.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

ABB i-bus[®] KNX Parameters

7.6.8.1.1.1.3.1

—

Dependent parameter

Limit temperature

Options: 20...30...50 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.8.1.1.1.3.2

—

Dependent parameter

Limit temperature hysteresis

Options: 0.05...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

7.6.8.1.1.1.3.3

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
 Via physical device input a
 Via physical device input b

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Basic-stage cooling limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

ABB i-bus[®] KNX Parameters

7.6.8.1.2 PI continuous (0...100%), PI PWM (On/Off)

The following parameters are enabled if the *PI continuous (0...100%), PI PWM (On/Off)* option has been selected in the *Basic-stage cooling control value type* parameter.

7.6.8.1.2.1

—

Dependent parameter

P-proportion

Options: 01.0...01.5...10.0 K

The standard value depends on the option selected in the *Basic-stage cooling* parameter in the *Application parameters* parameter window.

The P-proportion stands for the proportional range in a control. It fluctuates around the setpoint and in a PI control is used to change the speed of the control. The smaller the value set, the faster the control reacts. However, the value should not be set too small because otherwise there may be a risk of overshoot.

7.6.8.1.2.2

—

Dependent parameter

I-proportion

Options: 0...100...255 °C

The standard value depends on the option selected in the *Basic-stage cooling* parameter in the *Application parameters* parameter window.

The I-proportion stands for the integral time in a control. The integral proportion causes the room temperature to approach the setpoint slowly and also to reach it finally. Depending on the system type used, the integral time may need to have different values. In principle the following applies: The more sluggish the overall system, the larger the integral time is.

ABB i-bus[®] KNX

Parameters

7.6.8.1.2.3

—

Dependent parameter

Extended settings

Options: No
Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the Yes option.

7.6.8.1.2.3.1

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate basic-stage cooling via* parameter in the *Application parameters* parameter window.

Options: Normal
Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value On/100 %
Control value Off/0 % => telegram value Off/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

7.6.8.1.2.3.2

—

Dependent parameter

Control value difference for sending control value

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 2 %
5 %
10%
Only send cyclically

The control values for the PI continuous controller 0...100 % are not sent after each calculation, but when there is a difference in the calculation compared to the last value sent and sending is appropriate. This value difference can be entered here.

ABB i-bus[®] KNX Parameters

7.6.8.1.2.3.3

—

Dependent parameter

Send control value cyclically (0 = cyclical sending disabled)

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 0...15...60 min

This parameter is used to specify the cycle time with which the control value is to be sent.

On the selection of the value 0, cyclic sending is deactivated.

Note

If the control value is only output via a group object, this value should not be set to 0 because otherwise it will not be ensured that the actuator receives its control value.

In particular, in combination with the *Control value difference for sending control value* parameter and the *Only send cyclically* option that can be selected there, the value 0 is not allowed to be selected.

This configuration would mean that the control value is never output.

7.6.8.1.2.3.4

—

Dependent parameter

Cooling PWM cycle

This parameter is only visible on the selection of the *PI PWM (On/Off)* option.

Options: 0...15...60 min

Using the value set here, the cycle time for the control value for the PWM signal calculated from the PI controller's control value is specified. Depending on the control value, the selected cycle time is divided into an On and Off signal.

Therefore, a control value output of 33 % with a PWM cycle of 15 min signifies an On phase of five minutes and an Off phase of 10 min.

Note

The value is only sent if the control value changes (from 0 to 1 or vice versa).

At the start of a cycle a 1 is output and, corresponding to the control value, a 0 after the time x.

If the control value is 0 %, on reaching this control value a 0 is output once. The next value is only sent if the control value changes.

ABB i-bus[®] KNX Parameters

Example:

Heating PWM cycle: 15 min
Control value: 33 %

Times	Sent value
0 min	1
5 min	0
15 min	1
20 min	0
30 min	1
...	...
New control value: 0%	
Times	Sent value
60 min	0
75 min	–
90 min	–
...	...
New control value: 66 %	
Times	Sent value
120 min	1
130 min	0
135 min	1
145 min	0
...	...

7.6.8.1.2.3.5

—

Dependent parameter

Max. control value

Options: 0...100 %

The maximum control value from the PI controller specifies the maximum value that the controller outputs. If a maximum value below 255 is selected, then this value is not exceeded even if the controller calculates a higher control value.

ABB i-bus[®] KNX Parameters

7.6.8.1.2.3.6

—

Dependent parameter

Min. control value (basic load)

Options: 0...100 %

The minimum control value from the PI controller specifies the minimum value that the controller outputs. If a minimum value greater than zero is selected, then this value is not dropped below even if the controller calculates a lower control value.

This parameter is used to set a basic load, e.g. for the operation of floor heating. Even if the controller calculates the control value zero, heating medium flows through the floor heating to prevent the floor from cooling down completely.

In the *Temperature controller* parameter window it can be set whether this basic load is to be active permanently or is to be switched via the *Basic load* group object. In addition, it can be set here whether the basic load is also to be active if the controller is switched off.

7.6.8.1.2.3.7

—

Dependent parameter

Activate temperature limitation

Options: No
 Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is a cooling ceiling, where dropping below a specific temperature must be prevented to protect the material of the ceiling against excessive cooling.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

ABB i-bus® KNX

Parameters

7.6.8.1.2.3.7.1

—

Dependent parameter

Limit temperature

Options: 1...10...30 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.8.1.2.3.7.2

—

Dependent parameter

Limit temperature hysteresis

Options: 00.5...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

7.6.8.1.2.3.7.3

—

Dependent parameter

I-proportion on limitation

This parameter is only visible if the *PI continuous (0...100%)*, *PI PWM (On/Off)* has been selected in the *Basic-stage cooling control value type* parameter.

Options: Freeze
Reset

This parameter decides what is to happen to the I-proportion on reaching the limit temperature.

- *Freeze*: The I-proportion is frozen at the actual value. As soon as the controller is active again, it continues to operate with the same I-proportion as before reaching the limit.
- *Reset*: The I-proportion is reset to 0. Once the controller becomes active again, the I-proportion starts at 0.

ABB i-bus[®] KNX Parameters

7.6.8.1.2.3.7.4

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
Via physical device input a
Via physical device input b

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Basic-stage cooling limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

7.6.9 Additional-stage cooling parameter window

This window is only visible if the *Deactivated* option has not been selected in the *Additional-stage cooling* parameter in the *Application parameters* parameter window.

In actuator mode, this window is deactivated and hidden.

The additional-stage cooling of the temperature controller is parameterized in this window. The settings for the control type, limitation of the control range, the behavior on sending the control value and the limit temperature are made.

Fig. 16: Additional-stage cooling parameter window

7.6.9.1 Additional-stage cooling control value type

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

This parameter is used to specify the control and control value type for the additional-stage cooling.

The standard value for the parameter is dependent on the selection in the *Additional-stage cooling* and *Actuate additional-stage cooling via parameters* (*Application parameters* parameter window).

On the selection of the physical device output for the actuation of the additional-stage cooling, the controller has a fixed pre-configuration that cannot be changed. The pre-configured controller type is dependent here on the option selected in the *Additional-stage cooling* parameter.

The only exception is on the selection of *Free configuration*. In this situation, everything can be selected and set freely.

ABB i-bus[®] KNX Parameters

The following table shows the dependencies:

Option selected: Additional-stage cooling	Pre-configured controller type: Additional-stage cooling control value type	Controller type can be changed
Area cooling (e.g. cooling ceiling)	PI continuous (0...100 %)	No
Free configuration	PI continuous (0...100 %)	Yes

Table 16: Table of controller configuration dependencies

The differences between the individual controller types are explained in the following:

- **2-point 1 bit (On/Off):** 2-point control is the simplest form of control. The controller switches on if the room temperature has dropped below a specific level (setpoint temperature minus hysteresis) and off as soon as a specific value (setpoint temperature plus hysteresis) is exceeded. The switch-on and switch-off commands are sent as 1-bit commands. The dependent *Status Control value Additional-stage cooling* group object is enabled as a 1-bit group object.
- **2-point 1 byte (0/100 %):** This is also two-point control as above. The difference is that switch-on and switch-off commands are sent as 1-byte values (0 %/100 %). The dependent *Status Control value Additional-stage cooling* group object is enabled as a 1-byte group object.
- **PI continuous (0...100 %):** The PI controller adjusts its output value, between 0 % and 100 %, to the difference between the actual value and setpoint and permits exact regulation of the room temperature to the setpoint. It outputs the control value on the bus as a 1-byte value (0...100 %). To reduce the bus load, the control value is only sent if it has changed by a previously specified percentage in relation to the value sent last. In addition, the control value can be sent cyclically. The dependent *Status Control value Additional-stage cooling* group object is enabled as a 1-byte group object.
- **PI PWM (On/Off):** This is also a PI controller. The output is as a 1-bit command. For this purpose the control value calculated is implemented using a pulse-pause ratio. The dependent *Status Control value Additional-stage cooling* group object is enabled as a 1-bit group object.

Note

For a detailed description of the individual controller types, see [Explanation of controller function, page 234](#).

ABB i-bus[®] KNX

Parameters

7.6.9.1.1 2-point 1 bit (On/Off), 2-point 1 byte (0/100 %)

The following parameters are enabled if the *2-point 1 bit (On/Off)* or *2-point 1 byte (0/100%)* option has been selected in the *Additional-stage cooling control value type* parameter.

7.6.9.1.1.1

—

Dependent parameter

Temperature difference from basic-stage cooling

Options: 00.0...02.0...25.5 K

The temperature difference from basic-stage cooling specifies the value from which or up to which the additional-stage cooling is to be active. If the actual temperature is below the setpoint temperature by the value selected here, the additional stage is active.

This action occurs both if the actual temperature drops below the threshold and if it is already below the threshold.

Example 1:

Temperature difference from basic-stage cooling: 2 K

Setpoint temperature: 23 °C

Actual temperature: 27 °C

Additional stage is active until the actual temperature reaches 25 °C.

Example 2:

Temperature difference from basic-stage cooling: 2 K

Setpoint temperature: 23 °C

Actual temperature: 24 °C

Additional stage is inactive as long as the actual temperature is above 25 °C.

ABB i-bus[®] KNX Parameters

7.6.9.1.1.2

—

Dependent parameter

Extended settings

Options: No
 Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the Yes option.

7.6.9.1.1.2.1

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate additional-stage cooling via* parameter in the *Application parameters* parameter window.

Options: Normal
 Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value On/100 %
Control value Off/0 % => telegram value Off/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

ABB i-bus[®] KNX Parameters

7.6.9.1.1.2.2

—

Dependent parameter

Hysteresis

Options: 0.3...0.5...25.5 K

This parameter is used to specify the hysteresis that is to apply to the setpoint to prevent continuous switching of the controller.

- Upper switching point = setpoint + hysteresis
- Lower switching point = setpoint – hysteresis

Heating controller:

- If the actual temperature is below the lower switching point, the controller switches on.
- If the actual temperature is above the upper switching point, the controller switches off.

Cooling controller:

- If the actual temperature is below the lower switching point, the controller switches off.
- If the actual temperature is above the upper switching point, the controller switches on.

7.6.9.1.1.2.3

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is a cooling ceiling, where dropping below a specific temperature must be prevented to protect the material of the ceiling against excessive cooling.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

ABB i-bus[®] KNX Parameters

7.6.9.1.1.2.3.1

—

Dependent parameter

Limit temperature

Options: 20...30...50 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.9.1.1.2.3.2

—

Dependent parameter

Limit temperature hysteresis

Options: 0.05...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

ABB i-bus® KNX Parameters

7.6.9.1.1.2.3.3

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
 Via physical device input a
 Via physical device input b

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Additional-stage cooling limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

ABB i-bus[®] KNX Parameters

7.6.9.1.2 PI continuous (0...100%), PI PWM (On/Off)

The following parameters are enabled if the *PI continuous (0...100%), PI PWM (On/Off)* option has been selected in the *Additional-stage cooling control value type* parameter.

7.6.9.1.2.1

—

Dependent parameter

Temperature difference from basic-stage cooling

Options: 00.0...02.0...25.5 K

The temperature difference from basic-stage cooling specifies the value from which or up to which the additional-stage cooling is to be active. If the actual temperature is below the setpoint temperature by the value selected here, the additional stage is active.

This action occurs both if the actual temperature drops below the threshold and if it is already below the threshold.

Example 1:

Temperature difference from basic-stage cooling: 2 K

Setpoint temperature: 23 °C

Actual temperature: 27 °C

Additional stage is active until the actual temperature reaches 25 °C.

Example 2:

Temperature difference from basic-stage cooling: 2 K

Setpoint temperature: 23 °C

Actual temperature: 24 °C

Additional stage is inactive as long as the actual temperature is above 25 °C.

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7.6.9.1.2.2

—

Dependent parameter

P-proportion

Options: 01.0...01.5...10.0 K

The standard value depends on the option selected in the *Additional-stage cooling* parameter in the *Application parameters* parameter window.

The P-proportion stands for the proportional range in a control. It fluctuates around the setpoint and in a PI control is used to change the speed of the control. The smaller the value set, the faster the control reacts. However, the value should not be set too small because otherwise there may be a risk of overshoot.

7.6.9.1.2.3

—

Dependent parameter

I-proportion

Options: 0...100...255 min

The standard value depends on the option selected in the *Additional-stage cooling* parameter in the *Application parameters* parameter window.

The I-proportion stands for the integral time in a control. The integral proportion causes the room temperature to approach the setpoint slowly and also to reach it finally. Depending on the system type used, the integral time may need to have different values. In principle the following applies: The more sluggish the overall system, the larger the integral time is.

7.6.9.1.2.4

—

Dependent parameter

Extended settings

Options: No
Yes

Extended settings can be enabled using this parameter. This parameter is displayed on the selection of the Yes option.

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7.6.9.1.2.4.1

—

Dependent parameter

Control value direction

This parameter is only visible if the *Via group object* option has been selected for the *Actuate additional-stage cooling via* parameter in the *Application parameters* parameter window.

Options: Normal
 Inverted

This parameter is used to specify the control value direction if it is only output via a group object. The setting is used to actuate NC (normally closed) or NO (normally opened) valves.

If one of the physical device outputs is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

- *Normal*: The control value is output normally.
Control value On/100 % => telegram value Off/100 %
Control value on/0 % => telegram value On/0 %
- *Inverted*: The control value is output inverted.
Control value On/100% => telegram Off/0 %
Control value Off/0 % => telegram On/100%

7.6.9.1.2.4.2

—

Dependent parameter

Control value difference for sending control value

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 2 %
 5 %
 10%
 Only send cyclically

The control values for the PI continuous controller 0...100 % are not sent after each calculation, but when there is a difference in the calculation compared to the last value sent and sending is appropriate. This value difference can be entered here.

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7.6.9.1.2.4.3

—

Dependent parameter

Send control value cyclically (0 = cyclical sending disabled)

This parameter is only visible on the selection of the *PI continuous (0...100%)* option.

Options: 0...15...60 min

This parameter is used to specify the cycle time with which the control value is to be sent.

On the selection of the value 0, cyclic sending is deactivated.

Note

If the control value is only output via a group object, this value should not be set to 0 because otherwise it will not be ensured that the actuator receives its control value.

In particular, in combination with the *Control value difference for sending control value* parameter and the *Only send cyclically* option that can be selected there, the value 0 is not allowed to be selected.

This configuration would mean that the control value is never output.

7.6.9.1.2.4.4

—

Dependent parameter

Cooling PWM cycle

This parameter is only visible on the selection of the *PI PWM (On/Off)* option.

Options: 0...15...60 min

Using the value set here, the cycle time for the control value for the PWM signal calculated from the PI controller's control value is specified. Depending on the control value, the selected cycle time is divided into an On and Off signal.

Therefore, a control value output of 33 % with a PWM cycle of 15 min signifies an On phase of five minutes and an Off phase of 10 min.

Note

The value is only sent if the control value changes (from 0 to 1 or vice versa).

At the start of a cycle a 1 is output and, corresponding to the control value, a 0 after the time x.

If the control value is 0 %, on reaching this control value a 0 is output once. The next value is only sent if the control value changes.

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Example:

Heating PWM cycle: 15 min
Control value: 33 %

Times	Sent value
0 min	1
5 min	0
15 min	1
20 min	0
30 min	1
...	...
New control value: 0%	
Times	Sent value
60 min	0
75 min	–
90 min	–
...	...
New control value: 66 %	
Times	Sent value
120 min	1
130 min	0
135 min	1
145 min	0
...	...

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Parameters

7.6.9.1.2.4.5

—

Dependent parameter

Max. control value

Options: 0...100 %

The maximum control value from the PI controller specifies the maximum value that the controller outputs. If a maximum value below 255 is selected, then this value is not exceeded even if the controller calculates a higher control value.

7.6.9.1.2.4.6

—

Dependent parameter

Min. control value (basic load)

Options: 0...100 %

The minimum control value from the PI controller specifies the minimum value that the controller outputs. If a minimum value greater than zero is selected, then this value is not dropped below even if the controller calculates a lower control value.

This parameter is used to set a basic load, e.g. for the operation of floor heating. Even if the controller calculates the control value zero, heating medium flows through the floor heating to prevent the floor from cooling down completely.

In the *Temperature controller* parameter window it can be set whether this basic load is to be active permanently or is to be switched via the *Basic load* group object. In addition, it can be set here whether the basic load is also to be active if the controller is switched off.

7.6.9.1.2.4.7

—

Dependent parameter

Activate temperature limitation

Options: No
Yes

A controller temperature limitation can be activated using this parameter. Using the temperature limitation, the controller's control value for this stage can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the temperature limitation is a cooling ceiling, where dropping below a specific temperature must be prevented to protect the material of the ceiling against excessive cooling.

- *no*: The temperature limitation is deactivated.
- *yes*: The temperature limitation is activated. The following dependent parameters are also displayed.

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7.6.9.1.2.4.7.1

—

Dependent parameter

Limit temperature

Options: 1...10...30 °C

The value set here specifies the limit temperature that is not allowed to be exceeded (heating) or dropped below (cooling). If the temperature reaches this value, the control value is immediately set to 0.

The value set here is compared with the value received via a group object or via one of the physical device inputs (depending on the option selected, in the *Input for temperature limit sensor* parameter).

7.6.9.1.2.4.7.2

—

Dependent parameter

Limit temperature hysteresis

Options: 00.5...01.0...05.0 K

The hysteresis on the limit temperature specifies the value by which the limit temperature must be dropped below again (heating) or exceeded (cooling) before the controller becomes active again.

7.6.9.1.2.4.7.3

—

Dependent parameter

I-proportion on limitation

This parameter is only visible if the *PI continuous (0...100%)*, *PI PWM (On/Off)* has been selected in the *Additional-stage cooling control value type* parameter.

Options: Freeze
Reset

This parameter decides what is to happen to the I-proportion on reaching the limit temperature.

- *Freeze*: The I-proportion is frozen at the actual value. As soon as the controller is active again, it continues to operate with the same I-proportion as before reaching the limit.
- *Reset*: The I-proportion is reset to 0. Once the controller becomes active again, the I-proportion starts at 0.

7.6.9.1.2.4.7.4

—

Dependent parameter

Input for temperature limit sensor

Options: Via group object
Via physical device input a
Via physical device input b

- *Via group object*: The temperature value is received via a dedicated group object. The dependent *Additional-stage cooling limit temperature* group object is enabled.
- *Via physical device input x*: The temperature value is acquired via a temperature sensor connected (to the selected input).

Note

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the limit temperature function does not work. If one of the device inputs is selected here as the input for the limit temperature, this input is no longer used to acquire the room temperature. It is therefore not possible to use the same temperature sensor for the measurement of the room temperature and for the measurement of the limit temperature.

7.7 Setpoint manager parameter window

General	Operating modes	Comfort, Standby, Economy, Building Protection
+ Manual operation	Operating mode after bus voltage recovery, ETS download and reset	Comfort
- Channel A	Comfort heating setpoint = Comfort cooling setpoint	<input checked="" type="radio"/> No <input type="radio"/> Yes
Application parameters	Setpoint specification and adjustment	<input type="radio"/> Absolute <input checked="" type="radio"/> Relative
Channel function	Comfort heating setpoint	21 °C
+ Temperature controller	Standby heating reduction	2 K
Setpoint manager	Economy heating reduction	4 K
Monitoring and safety	Comfort cooling setpoint	25 °C
Valve output A	Increase for Standby cooling	2 K
Setpoint adjustment	Increase for Economy cooling	4 K
Input a	Setpoint for frost protection (Building Protection heating)	7 °C
Input b	Heat protection setpoint (Building Protection cooling)	35 °C
Input c	Send current setpoint	<input type="radio"/> After a change and cyclically <input checked="" type="radio"/> After a change
+ Channel B	Base setpoint is	Comfort heating setpoint
+ Channel C	Summer compensation	<input checked="" type="radio"/> No <input type="radio"/> Yes
+ Channel D		

Fig. 17: Setpoint manager parameter window

7.7.1 Operating modes

Options: Comfort, Standby, Economy, Building Protection
Comfort, Standby, Building Protection
Comfort, Building Protection

This parameter is used to select which operating modes are to be used. Depending on the selection, the operating modes not listed are removed.

One possible application for the restriction of the operating modes used is buildings in which, e.g. Economy is not used because the change is always between Comfort and Standby.

If the device is requested via a group object to change to one of the operating modes not available, the device remains in or changes instead to Comfort.

Explanation of the operating modes:

- *Comfort*: The room is used actively by a person/persons. The setpoint temperature is set correspondingly. In the Comfort mode the controller actively attempts to reach the room temperature specified (by heating or cooling).
- *Standby*: On a change to Standby, the temperature is allowed to drop (heating) or increase (cooling) to a specified value. Only once this temperature is reached is the heating or cooling activated again. Typically the setpoints are 2-3 °C below/above the Comfort setpoint temperature. The Standby mode is also used to increase/reduce the room temperature after a nighttime reduction (Economy) and expected imminent change to the Comfort mode such that it does not take too long to reach the Comfort temperatures. The change between Comfort and Standby can be made using the *Operating mode* group object, or, with presence detection in the room, via the *Presence detector (master)* group object. The reception of the presence value always results in a change to Comfort.
- *Economy*: This is also called nighttime reduction. Here the temperatures are allowed to drop (heating) or increase (cooling) to a different, lower/higher setpoint. The purpose is to obtain further energy savings during extended periods without use (e.g. overnight or during the weekend) because less energy must be used to maintain this temperature. The setpoints for Economy are typically 2-3 °C below/above the values for the Standby setpoint temperature. The change between Comfort and Standby can be made using the *Operating mode* group object, or, with presence detection in the room, via the *Presence detector (master)* group object. The reception of the presence value always results in a change to Comfort.

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7.7.2 Operating mode after bus voltage recovery, ETS download and reset

Options: Comfort
 Standby
 Economy
 Building Protection

The parameter defines which operating mode is to apply after bus voltage recovery, ETS download and reset. The operating mode remains active until a new operating mode is set, e.g. via the *Operating mode* group object.

Note

This operating mode should be defined during the planning phase. If the operating mode is defined incorrectly, there may be a loss of comfort or increased energy consumption.

7.7.3 Comfort heating setpoint = Comfort cooling setpoint

This parameter is enabled if the controller has been parameterized both for heating and for cooling. For this purpose, *Deactivated* must not be selected for the parameters *Basic-stage heating* and *Basic-stage cooling* in the *Application parameters* parameter window.

Options: No
 Yes

This parameter defines how the comfort values for heating and cooling depend on each other.

- *no*: Two separate comfort setpoints are used for heating and cooling. The related active setpoint is output via the *Current setpoint* object. The changeover between heating and cooling is undertaken using the method defined in the *Application parameters* parameter window in the *Heating/cooling changeover* parameter. On the selection of the *Automatically* option, the changeover between heating and cooling is dependent on the absolute temperatures set for Comfort heating/cooling.
- *yes*: The device has one and the same setpoint for heating and cooling in the Comfort mode. The changeover to heating takes place on dropping below the setpoint minus the hysteresis. The changeover to cooling takes place on exceeding the setpoint plus the hysteresis. The hysteresis is parameterizable. The *Comfort heating setpoint* and *Comfort cooling setpoint* parameters are replaced by the *Comfort heating and cooling setpoint* parameter. In addition, the *Hysteresis for Toggle heating/cooling* parameter is displayed.

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7.7.3.1 No

7.7.3.1.1 —

Dependent parameter

Comfort heating setpoint

This parameter is only visible if the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window, and the *No* option has been selected for the *Comfort heating setpoint = Comfort cooling setpoint* parameter.

Options: 10...21...40 °C

This value defines the setpoint for the heating comfort temperature. If the device is in the type of operation heating and is changed to the Comfort operating mode, the device regulates to this temperature.

7.7.3.1.2 —

Dependent parameter

Comfort cooling setpoint

This parameter is only visible if the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window, and the *No* option has been selected for the *Comfort heating setpoint = Comfort cooling setpoint* parameter.

Options: 10...25...40 °C

This value defines the setpoint for the comfort cooling temperature. If the device is the type of operation cooling and is changed to the Comfort operating mode, the device regulates to this temperature.

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7.7.3.2 Yes

7.7.3.2.1 —

Dependent parameter

Hysteresis for Toggle heating/cooling

This parameter is only visible if the Yes option has been selected in the *Comfort heating setpoint = Comfort cooling setpoint* parameter window.

Options: 0.05...02.0...10.0 K

The parameter defines the hysteresis for the changeover between heating and cooling. If the room temperature exceeds the setpoint temperature plus hysteresis, the changeover is to cooling. If the room temperature drops below the setpoint temperature minus hysteresis, the changeover is to heating.

Note

A change between heating and cooling is only possible in the Comfort mode.

7.7.3.2.2 —

Dependent parameter

Comfort heating and cooling setpoint

This parameter is only visible if the Yes option has been selected in the *Comfort heating setpoint = Comfort cooling setpoint* parameter window.

Options: 10...21...40 °C

This value defines the setpoint for the comfort temperature for heating and cooling. If the operating mode is changed to Comfort, the device regulates to this temperature in both types of operation heating and cooling.

7.7.4 Setpoint specification and adjustment

Options: Absolute
 Relative

This parameter is used to set the manner in which the setpoints are configured, as well as whether this can be changed.

- **Absolute:** Absolute values are used to enter the values for Standby and Economy heating and Standby and Economy cooling. I.e. the setpoint that is to become active on the activation of the related operating mode is specified. It is possible to change the values parameterized here using a dedicated group object. As such each operating mode setpoint can be changed independent of all other values. There is no common change due to the basic setpoint. The dependent objects *Comfort heating setpoint*, *Standby heating setpoint*, *Economy heating setpoint*, *Building Protection heating setpoint*, *Comfort cooling setpoint*, *Standby cooling setpoint*, *Economy cooling setpoint* and *Building Protection cooling setpoint* are displayed. The dependent parameters *Standby heating setpoint*, *Economy heating setpoint*, *Standby cooling setpoint* and *Economy cooling setpoint* are displayed.

Note

The values entered must, according to the type of operation (heating or cooling), be higher (cooling) or lower (heating) than the Comfort setpoint:

Comfort heating setpoint > Standby heating setpoint > Economy heating setpoint > Setpoint for frost protection (Building Protection heating).

Comfort cooling setpoint < Standby cooling setpoint < Economy cooling setpoint < Heat protection setpoint (Building Protection cooling).

Failure to observe the sequence for the values may result in incorrect room temperature regulation.

- **Relative:** The setpoints for Standby and Economy heating and Standby and Economy cooling are entered as values relative to the related Comfort heating or Comfort cooling setpoint. It is only possible to change all values at the same time using the *Base setpoint* group object. The base setpoint is defined using the *Base setpoint is* parameter. Depending on the value received via the *Base setpoint* group object, all other values are changed to suit the reduction or increase parameterized.
It is not possible to change the setpoint for heat protection or the setpoint for frost protection via KNX using this method.
The dependent *Base setpoint* group object is displayed.
The dependent parameters *Standby heating reduction*, *Economy heating reduction*, *Increase for Standby cooling*, *Increase for Economy cooling* and *Base setpoint is* are displayed.

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Parameters

7.7.4.1 Selection of Absolute

7.7.4.1.1 —

Dependent parameter

Standby heating setpoint

This parameter is only visible if the device has been parameterized for heating and the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Absolute* option.

Options: 10...19...40 °C

This parameter is used to set the temperature that is to apply in the Standby operating mode in the type of operation heating.

Note

The temperature stated here must be lower than the temperature selected in the *Comfort heating setpoint* or *Comfort heating and cooling setpoint* parameter. A temperature that is at least 2 °C lower is recommended.

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not dropped below on a reduction in the actual temperature.

7.7.4.1.2 —

Dependent parameter

Economy heating setpoint

This parameter is only visible if the device has been parameterized for heating and the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Absolute* option.

Options: 10...17...40 °C

This parameter is used to set the temperature that is to apply in the Standby operating mode in the type of operation heating.

Note

The temperature stated here must be lower than the temperature selected in the *Standby heating setpoint* parameter. A temperature that is at least 2 °C lower is recommended.

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not dropped below on a reduction in the actual temperature.

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7.7.4.1.3

—

Dependent parameter

Standby cooling setpoint

This parameter is only visible if the device has been parameterized for cooling and the *Deactivated* option has not been selected for the *Basic-stage cooling* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Absolute* option.

Options: 10...19...40 °C

This parameter is used to set the temperature that is to apply in the Standby operating mode in the type of operation cooling.

Note

The temperature stated here must be lower than the temperature selected in the *Comfort cooling setpoint* or *Comfort heating and cooling setpoint* parameter. A temperature that is at least 2 °C lower is recommended.

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not dropped below on a reduction in the actual temperature.

7.7.4.1.4

—

Dependent parameter

Economy cooling setpoint

This parameter is only visible if the device has been parameterized for cooling and the *Deactivated* option has not been selected for the *Basic-stage cooling* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Absolute* option.

Options: 10...17...40 °C

This parameter is used to set the temperature that is to apply in the Economy operating mode in the type of operation cooling.

Note

The temperature stated here must be lower than the temperature selected in the *Standby cooling setpoint* parameter. A temperature that is at least 2 °C lower is recommended.

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not dropped below on a reduction in the actual temperature.

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7.7.4.2 Selection of Relative

7.7.4.2.1 —

Dependent parameter

Standby heating reduction

This parameter is only visible if the device has been parameterized for heating and the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Relative* option.

Options: 0...2...15 K

This parameter is used to set the temperature that is to apply in the Standby operating mode in the type of operation cooling. This is defined here as the reduction in relation to the Comfort heating setpoint.

Note

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not exceeded on an increase in the actual temperature.

7.7.4.2.2 —

Dependent parameter

Economy heating reduction

This parameter is only visible if the device has been parameterized for heating and the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Relative* option.

Options: 0...4...15 K

This parameter is used to set the temperature that is to apply in the Economy operating mode in the type of operation cooling. This is defined here as the reduction in relation to the Comfort heating setpoint.

Note

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not exceeded on an increase in the actual temperature.

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7.7.4.2.3

—

Dependent parameter

Increase for Standby cooling

This parameter is only visible if the device has been parameterized for cooling and the *Deactivated* option has not been selected for the *Basic-stage cooling* parameter in the *Application parameters* parameter window, and the *No* option has been selected for the *Comfort heating setpoint = Comfort cooling setpoint* parameter.

Options: 0...2...15 K

This value defines the setpoint for the comfort cooling temperature. If the device is the type of operation cooling and is changed to the Comfort operating mode, the device regulates to this temperature.

Note

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not exceeded on an increase in the actual temperature.

7.7.4.2.4

—

Dependent parameter

Increase for Economy cooling

This parameter is only visible if the device has been parameterized for cooling and the *Deactivated* option has not been selected for the *Basic-stage cooling* parameter in the *Application parameters* parameter window, and the *Setpoint specification and adjustment* parameter has been parameterized with the *Relative* option.

Options: 0...4...15 K

This parameter is used to set the temperature that is to apply in the Economy operating mode in the type of operation cooling. This is defined here as the increase in relation to the comfort cooling setpoint.

Note

The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not exceeded on an increase in the actual temperature.

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7.7.4.2.5

—

Dependent parameter

Base setpoint is

This parameter is only visible if the *Setpoint specification and adjustment* parameter has been parameterized with the *Relative* option.

Options: Comfort heating setpoint
 Comfort cooling setpoint
 Mean value between Comfort heating and cooling

If the device has been configured only for the type of operation heating or the type of operation cooling, the base setpoint is automatically the same as the Comfort setpoint for this stage and can also not be changed.

This parameter is used to define which value corresponds to the base setpoint. It is possible to change the setpoints parameterized for Comfort, Standby and Economy via the KNX bus using the base setpoint. Depending on the option selected, the new base setpoint changes the value selected directly. All other values are changed according to their relative distance from this value. The values parameterized are overwritten with this change.

Note

It is not possible to change the setpoints for frost protection and heat protection using the base setpoint. If the basic-stage heating or the basic-stage cooling has been deactivated, the base setpoint is fixed to the other comfort value for the existing type of operation.

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Parameters

7.7.5 Setpoint for frost protection (building protection, heating)

This parameter is only visible if the device has been parameterized for heating and the *Deactivated* option has not been selected for the *Basic-stage heating* parameter in the *Application parameters* parameter window.

Options: 5...7...15 °C

This parameter is used to set the temperature that is to apply in the Building Protection operating mode in the type of operation heating.

Note

This setpoint temperature also becomes active if the controller receives the information "Window open", or is deactivated via the *Request On/Off (Master)* group object. The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not dropped below on a reduction in the actual temperature.

Note

This setpoint is used to protect the building and the installation against damage, and at the same time to prevent unnecessary energy wastage. For this reason the temperature should not be selected too low, and also not too high.

An example of this aspect is the opening of a window: As long as the window is open, further heating will waste energy. However, if the outside temperature is very low (e.g. 0 °C), the room temperature will continuously approach this temperature. Here there is a risk of the installation freezing and also frost damage to the equipment in the room. To prevent this situation from arising, the controller becomes active again on reaching the temperature set and attempts to prevent dropping below this temperature. However, if the setpoint for frost protection is selected too high, the controller starts this attempt much earlier, e.g. at a time that is acceptable during normal airing, and wastes unnecessary energy.

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7.7.6 Heat protection setpoint (building protection, cooling)

This parameter is only visible if the device has been parameterized for cooling and the *Deactivated* option has not been selected for the *Basic-stage cooling* parameter in the *Application parameters* parameter window.

Options: 27...35...45 °C

This parameter is used to set the temperature that is to apply in the Building Protection operating mode in the type of operation cooling.

Note

This setpoint temperature also becomes active if the controller receives the information "Window open", "Fill level alarm" or "Dew point alarm", or is deactivated via the *Request On/Off (Master)* group object. The controller does not change the type of operation to reach this temperature, instead it ensures this temperature is not dropped below on a reduction in the actual temperature.

Note

This setpoint is used to protect the building and the installation against damage, and at the same time to prevent unnecessary energy wastage. For this reason the temperature should not be selected too low, and also not too high.

An example of this aspect is the opening of a window: As long as the window is open, further cooling will waste energy. However, if the outside temperature is very high (e.g. 50 °C), the room temperature will continuously approach this temperature. Here there is a risk of persons becoming too hot and also damage to the installation and the equipment in the room. To prevent this situation from arising, the controller becomes active again on reaching the temperature set and attempts to prevent exceeding this temperature.

However, if the setpoint for heat protection is selected too high, the controller starts this attempt much earlier, e.g. at a time that is acceptable on opening a window, and wastes unnecessary energy.

7.7.7 Send current setpoint

Options: After a change and cyclically
After a change

This parameter is used to define when the setpoint currently valid is to be sent via the *Current setpoint* group object.

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7.7.7.1 —

Dependent parameter

Send current setpoint cyclically

This parameter is only visible if the *After a change and cyclically* option has been selected in the *Send current setpoint* parameter.

Options: 5...240 min

The cycle time with which the current setpoint is to be sent is specified here.

7.7.8 **Summer compensation**

This parameter is only visible if the device has been parameterized for cooling and the *Deactivated* option has not been selected for the *Basic-stage cooling* parameter in the *Application parameters* parameter window.

Options: No
 Yes

The summer compensation in the device can be activated using this parameter. The summer compensation is used to obtain energy savings by increasing the setpoint depending on the outside temperature to prevent large temperature differences between room and outside temperature and the related risk of a heat shock.

Note

Information about the function of the summer compensation, explanation of the function of the summer compensation

- *no*: The summer compensation is deactivated
- *yes*: The summer compensation is activated. The dependent group objects *Outside temperature for summer compensation* and *Summer compensation active/inactive* are displayed. The dependent parameters (*Lower*) *starting temperature for summer compensation*, *Setpoint temperature offset when summer compensation starts*, (*Upper*) *escape temperature for summer compensation* and *Setpoint temperature offset when summer compensation ends* are displayed.

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7.7.8.1

—

Dependent parameter

(Lower) starting temperature for summer compensation

This parameter is only visible if the Yes option has been selected for the *Summer compensation* parameter.

Options: 10...21...50 °C

7.7.8.2

—

Dependent parameter

Setpoint temperature offset when summer compensation starts

Options: 0.00...12.7 °C

7.7.8.3

—

Dependent parameter

(Upper) escape temperature for summer compensation

Options: 10...32...50 °C

7.7.8.4

—

Dependent parameter

Setpoint temperature offset when summer compensation ends

Options: 0...06.0...12.7 °C

7.8 Monitoring and safety parameter window

General	Use forced operation	No
+ Manual operation		
- Channel A		
Application parameters		
Channel function		
+ Temperature controller		
Setpoint manager		
Monitoring and safety		
Valve output A		
Setpoint adjustment		
Input a		
Input b		
Input c		
+ Channel B		
+ Channel C		
+ Channel D		

Cyclical monitoring Deactivated Activated

Fig. 18: Monitoring and safety parameter window

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7.8.1 Use forced operation

Options: No
 Forced operation 1 bit; 1 active
 Forced operation 1 bit; 0 active
 Forced operation 2 bit

The usage of forced operation can be activated using this parameter. In addition, the selection of the parameter defines which type of forced operation is used.

The forced operation is used to place the outputs on the device in a pre-defined state by switching a 1- or 2-bit group object. Forced operation overrides the normal control of the device (controller, value specifications via group objects). For the device to function normally, forced operation must be actively disabled.

- *Forced operation 1 bit; 1 active*: Forced operation is enabled. The dependent group object *Forced operation 1 bit* is activated. Forced operation is activated on receiving a "1" via this group object. If a "0" is received, forced operation is deactivated. The dependent parameters *Control value*, *Relay output* are enabled.
- *Forced operation 1 bit; 0 active*: Forced operation is enabled. The dependent group object *Forced operation 1 bit* is activated. Forced operation is activated on receiving a "0" via this group object. If a "1" is received, forced operation is deactivated. The dependent parameters *Control value*, *Relay output* are enabled.
- *Forced operation 2 bit*: Forced operation is enabled. The dependent group object *Forced operation 2 bit* is activated. The dependent parameters *Control value for forced operation ON*, *Relay output for forced operation ON*, *Control value for forced operation OFF* and *Relay output for forced operation OFF* are enabled.

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Note

With forced operation 2 bit there can be two forced operation states (forced operation On and forced operation Off). These states are activated using the 2-bit group object. The first bit defines whether the forced operation is active (bit 1 (high) = 1) or inactive (bit 1 (high) = 0), the second bit decides on the Off (bit 2 (low) = 0) or On (bit 2 (low) = 1) state.

Value	Bit 1	Bit 0	Status
0	0	0	Inactive
1	0	1	Inactive
2	1	0	Forced OFF
3	1	1	Forced ON

Table 17: Forced operation states

For information on the priority of the forced operation in comparison to the other properties of the device, see Priorities.

Note

The state of the forced operation is saved on bus voltage failure and retrieved again on bus voltage recovery. If forced operation was active on bus voltage failure, it is also active after bus voltage recovery.

Note

Forced operation is deactivated on an ETS reset.

Forced operation overrides the outputs and places them in a defined state. However, this action has no effect on the control values sent by the controller via the bus or the master/slave communication; this communication continues to take place.

So that an actuator actuated by the controller in this device behaves the same, forced operation must be correspondingly parameterized also on this device and it must be linked to the same group address.

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Parameters

7.8.1.1 Forced operation dependent parameters

The following parameters are available with forced operation activated. On the usage of the *Forced operation, 2 bit* option, these parameters are available twice, once for the ON state and once for the OFF state.

7.8.1.1.1 —

Dependent parameter

Control value / Control value for forced operation ON / Control value for forced operation OFF

Options: 0...100 %

This parameter is used to specify the control value that is to apply with forced operation active (for 2-bit in the related state, ON or OFF).

The control value refers only to the valve for the currently active type of operation (heating or cooling).

7.8.2 Cyclical monitoring

Options: Deactivated
Activated

The cyclical monitoring is used to monitor specific, selected group objects for the correct function of the device. For each group object monitored it is possible to define a monitoring time during which the group object monitored must be received.

If the group object is received in the defined time, the monitoring time starts again immediately after the reception of the group object. If the group object is not received in this time, it can be specified how the device is to behave.

- *Deactivated*: The cyclical monitoring is deactivated.
- *Activated*: The cyclical monitoring is activated. The dependent parameters for monitoring the individual group objects are displayed. For each group object it is possible to decide separately whether it is to be monitored or not.

Note

For all cyclically monitored group objects it is important to set the behavior of the sending device correctly. The group objects must be sent cyclically and the cycle time must be less (= more frequent) than the receive time monitored.

Recommendation: Monitoring time = 2 × sending cycle time

Do not select times that are too low because this configuration can cause a high bus load and the probability of an error increases.

Dependent parameter

Temperature input monitoring

This parameter is only visible if the *Channel function* parameter has been parameterized with the *Controller channel* option.

Options: Deactivated
 Via group object
 On physical temperature inputs

The reception of a temperature value can be monitored using this parameter. Unlike the other group objects to be monitored, here it is also possible to monitor a physical device input instead of a group object. This is possible because the correct function of the temperature input is imperative for the correct function of the device.

- *Deactivated*: The monitoring of the temperature input is deactivated.
- *Via group object*: The *External temperature 1* and *External temperature 2* (only if activated) group objects are monitored. As soon as a new value is received in one of the two group objects, the monitoring time for the related group object starts again. The dependent parameters *Time interval for cyclical monitoring* and *Control value after exceeding monitoring time* as well as the *Fault: actual temperature (master)* group object are enabled.

Note

It is necessary that a value is received in both group objects within the monitoring time to prevent the triggering of the cyclical monitoring.

- *On physical temperature inputs*: The temperature sensors connected to the inputs for this channel are monitored. If the inputs do not deliver a valid temperature value for more than a minute, the fault value parameterized is used. The Control value on input fault dependent parameter is displayed.

Note

For the monitoring to work, at least one input must also be parameterized as a temperature sensor and a temperature sensor must be connected to it. This setting is specified in the parameter window for the related input.

So that the temperature sensor connected also has an effect on the controller, the sensor must also be assigned to the controller in the *Application parameters* parameter window in the *Temperature input* parameter by selecting the corresponding options (*Via physical device input* or *Via physical device input and group object*).

Monitoring of one of the physical inputs is not allowed if *Temperature input - Via group object* has been selected in the controller. This will result in the monitoring time being exceeded, because the device inputs are monitored using very short times.

ABB i-bus[®] KNX Parameters

7.8.2.1.1

—

Dependent parameter

Control value after exceeding monitoring time / Control value on input fault

This parameter is only visible if the *Temperature input monitoring* parameter has not been deactivated.

The name of the parameter is dependent on whether the group objects or a physical input is monitored as the temperature input.

Options: 0...25...100 %

The control value specified here becomes active if the monitoring time is exceeded or if there is an error on the device input monitored. The control value applies to heating or cooling, depending on which was active at the time of the alarm. In addition, the device changes to the Building Protection operating mode.

The monitoring of the temperature value is important because the controller cannot calculate any control values for the outputs without a valid room temperature value. To protect the system, using this parameter it is possible to specify a certain control value to prevent, e.g., cooling of the room.

The control value set here remains active until the error on the input has been rectified or a new temperature value has been received via the bus.

Note

If a physical device input is monitored, the device automatically checks every minute whether the input is signaling an error. If this is the case, the device changes to the control value set. For this reason it is not necessary to specify a time for monitoring an input.

7.8.2.1.2

—

Dependent parameter

Monitor receipt of group object "Operating mode"

This parameter is only visible if the *Channel function* parameter has been parameterized with the *Controller channel* option.

Options: Deactivated
 Activated

The monitoring of the *Operating mode* group object is activated using this parameter. The regular changeover of the operating mode can be monitored using this parameter. Because this changeover is generally triggered by a higher-level device, such as a visualization or building control system, it is therefore also monitored whether the higher-level device is active.

- *Deactivated*: The monitoring of the *Operating mode* group object is deactivated.
- *Activated*: The monitoring of the group object is active. The dependent parameters *Time interval for cyclical monitoring and Operating mode after exceeding monitoring time* as well as the *Error: operating mode receipt* group object are enabled.

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Parameters

7.8.2.1.2.1

—

Dependent parameter

Time interval for cyclical monitoring

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: operating mode receipt* alarm object is changed to alarm and the value set in the *Operating mode after exceeding monitoring time* parameter applies.

7.8.2.1.2.2

—

Dependent parameter

Operating mode after exceeding monitoring time

Options: Building Protection
Comfort
Standby
Economy

The selection made here defines which operating mode is to apply on the erroneous reception of the *Operating mode* group object. This mode remains active until a new value is received in the group object monitored.

7.8.2.1.3

—

Dependent parameter

Monitor receipt of group object "Heating/cooling changeover"

The parameter is only visible if in the *Heating/cooling changeover* parameter in the *Application parameters* parameter window, the *Only via object* or *Via slave and via object* option has been selected.

Options: Deactivated
Activated

The monitoring of the *Heating/cooling changeover* group object is enabled using this parameter. The change in the type of operation can be monitored using this parameter.

- *Deactivated*: The monitoring of the *Heating/cooling changeover* group object is deactivated.
- *Activated*: The monitoring of the group object is active. The dependent parameters *Time interval for cyclical monitoring* and *Heating/cooling mode when monitoring time exceeded* as well as the *Error: heating/cooling receipt* group object are enabled.

ABB i-bus[®] KNX Parameters

7.8.2.1.3.1

—

Dependent parameter

Time interval for cyclical monitoring

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: heating/cooling receipt* alarm object is changed to alarm and the value set in the *Heating/cooling mode when monitoring time exceeded* parameter applies.

7.8.2.1.3.2

—

Dependent parameter

Heating/cooling mode when monitoring time exceeded

Options: Unchanged
Heating
Cooling

The selection made here defines which type of operation is to apply on the erroneous reception of the *Heating/cooling changeover* group object. This type of operation remains active until a new value is received in the group object monitored. If the *Unchanged* option is selected, the current type of operation remains active.

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7.8.2.1.4

—

Dependent parameter

Monitor receipt of group object "Control value"

This parameter is only visible if the *Device function* parameter has been parameterized with the *Controller* option, that is the device is operated with a controller.

Options: Deactivated
 Activated

With the monitoring of the Control value group object, the device can monitor the regular reception of the control value in the actuator mode. If the control value is not received, a pre-defined control value can be set that is used in the currently active type of operation (heating or cooling). With this monitoring it is possible to use a pre-defined control value on the failure of the device that sets the control value, until a new value is received.

- *Deactivated*: The cyclic monitoring of the Control value group object is deactivated.
- *Activated*: The cyclic monitoring is activated, the following dependent parameters are also displayed.

7.8.2.1.4.1

—

Dependent parameter

Time interval for cyclical monitoring

Options: 00:00:30...00:05:00...18:12:15

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: control value receipt* alarm object is changed to alarm and the value set in the *Control value after exceeding monitoring time* parameter applies.

7.8.2.1.4.2

—

Dependent parameter

Control value after exceeding monitoring time

Options: 0...25...100

The control value set here is valid as soon as a control value has not been received by the device within the monitoring time parameterized. The value set here remains active until a control value has been received again.

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7.8.2.1.5

—

Dependent parameter

Monitor receipt of group object "Window contact"

This parameter is only visible if the *Channel function* parameter has been parameterized with the *Controller channel* option.

This parameter is only visible if the *Via group object* option has been selected for the *Window status input* parameter in the *Application parameters* parameter window.

Options: Deactivated
 Activated

The monitoring of the *Window contact* group object is activated using this parameter. The regular reception of the window status can be monitored using this parameter.

- *Deactivated*: The monitoring of the *Window contact* group object is deactivated.
- *Activated*: The monitoring of the group object is active. The dependent parameter *Time interval for cyclical monitoring* and the *Error: window contact receipt* group object are enabled.

7.8.2.1.5.1

—

Dependent parameter

Time interval for cyclical monitoring

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: window contact receipt* alarm object is changed to alarm and the controller reacts as if the window were open. This means that the controller changes over to the Building Protection mode.

This mode remains active until a new value is received in the group object monitored.

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7.8.2.1.6

—

Dependent parameter

Monitor receipt of group object "Dew point alarm"

This parameter is only visible if the *Channel function* parameter has been parameterized with the *Controller channel* option.

This parameter is only visible if the *Via group object* option has been selected for the *Dew point alarm input* parameter in the *Application parameters* parameter window.

Options: Deactivated
 Activated

The monitoring of the *Dew point alarm* group object is activated using this parameter. The regular reception of the dew point alarm can be monitored using this parameter.

- *Deactivated*: The monitoring of the *Dew point alarm* group object is deactivated.
- *Activated*: The monitoring of the group object is active. The dependent parameter *Time interval for cyclical monitoring* and the *Error: dew point alarm receipt* group object are enabled.

7.8.2.1.6.1

—

Dependent parameter

Time interval for cyclical monitoring

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: dew point alarm receipt* alarm object is changed to alarm and the controller reacts as if the dew point alarm were active. This means that the controller changes to the Building Protection operating mode, which results in the closing of the cooling output. As long as the fill level alarm is active, this mode for cooling cannot be left again. This state remains active until a new value is received in the group object monitored that clears the alarm.

Note

If the device is changed to the heating mode (on a device that is used for heating and cooling), the device continues to function as before, without the alarm having any effect, because the alarm only relates to cooling.

For more information on the dew point, see *Application parameters* parameter window.

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7.8.2.1.7

—

Dependent parameter

Monitor receipt of group object "Fill level alarm"

This parameter is only visible if the *Channel function* parameter has been parameterized with the *Controller channel* option.

This parameter is only visible if the *Via group object* option has been selected for the *Dew point alarm input* parameter in the *Application parameters* parameter window.

Options: Deactivated
 Activated

The monitoring of the *Fill level alarm* group object is activated using this parameter. The regular reception of the fill level alarm can be monitored using this parameter.

- *Deactivated*: The monitoring of the *Fill level alarm* group object is deactivated.
- *Activated*: The monitoring of the group object is active. The dependent parameter *Time interval for cyclical monitoring* and the *Error: fill level alarm receipt* group object are enabled.

7.8.2.1.7.1

—

Dependent parameter

Time interval for cyclical monitoring

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: dew point alarm receipt* alarm object is changed to alarm and the controller reacts as if the dew point alarm were active. This means that the controller changes to the Building Protection operating mode, which results in the closing of the cooling output. As long as the fill level alarm is active, this mode for cooling cannot be left again. This state remains active until a new value is received in the group object monitored that clears the alarm.

Note

If the device is changed to the heating mode (on a device that is used for heating and cooling), the device continues to function as before, without the alarm having any effect, because the alarm only relates to cooling.

For more information on the fill level, see Application parameters parameter window.

7.9 Valve output A parameter window

General	Valve output	Thermoelectric (PWM)
+ Manual operation	Valve drive operating principle, de-energized	<input checked="" type="radio"/> Closed <input type="radio"/> Open
- Channel A	PWM cycle time	180 s
Application parameters	Valve drive opening/closing time	180 s
Channel function	Send status values	After a change or on request
+ Temperature controller	Enable manual valve override	<input checked="" type="radio"/> No <input type="radio"/> Yes
Setpoint manager	Valve purge	Automatically or triggered by object
Monitoring and safety	Purge cycle in weeks	4
Valve output A	Reset purge cycle from control value greater than or equal to	99 %
Setpoint adjustment	Send group object "Status Valve purge"	No, update only
Input a		
Input b		
Input c		
+ Channel B		
+ Channel C		
+ Channel D		

Fig. 19: Valve output A parameter window

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7.9.1 Valve output

Options: Thermoelectric (PWM)
 Open/Close signal
 Deactivated

This parameter defines the type of valve that is connected to the output. The control values received (from the internal controller or via the bus) at the valve are converted to the correct output signal depending on the valve type selected. The dependent group objects *Status byte valve A*, *Status Control value* and *Fault: valve output* are displayed as long as the output is not deactivated.

Note

The control value is assigned to the valve in the Application – Application parameters parameter window. Here it is defined which control value from the controller is to be output on the valve output.

- *Thermoelectric (PWM)*: If the Thermoelectric (PWM) option is selected, the output is used for the connection of thermoelectric valves with PWM actuation. For this purpose the control value received is converted into a PWM signal. The parameter for setting the PWM cycle time is displayed.
- *Open/Close signal*: With this selection, the continuous control value is converted into an OPEN or CLOSE signal from a parameterized value. The parameter for entering the threshold value is displayed.
- *Deactivated*: The output is deactivated.

Note

If a control value has been assigned to the valve in the Application – Application parameters parameter window, this control value is not output if the output is deactivated.

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Parameters

7.9.1.1 Selection of Thermoelectric (PWM)

7.9.1.1.1 —

Dependent parameter

Valve drive operating principle, de-energized

This parameter is visible if, in the *Valve output* parameter, the *Thermoelectric (PWM)* or *Open/Close signal* option has been selected.

Options: Closed
Open

This parameter determines the function of the valve drive.

- *Closed*: If no current flows in the valve drive, the valve is closed. If current flows in the valve drive, the valve opens.
- *Open*: If no current flows in the valve drive, the valve opens. If current flows in the valve drive, the valve then closes.

7.9.1.1.2 —

Dependent parameter

PWM cycle time

Options: 10...180...900 s

For setting the cycle time for the pulse width modulation.

7.9.1.1.3 —

Dependent parameter

Valve drive opening/closing time

This parameter is visible if, in the *Valve output* parameter, the *Thermoelectric (PWM)* or *Open/Close signal* option has been selected.

Options: 10...60...900 s

With this parameter, a time is set in seconds that the connected valve requires to move from position 0 % (valve closed) to position 100 % (valve fully open), or the valve requires to move from 100 % to 0 %.

Note

The time should be taken from the technical data of the valve, and it corresponds with the total runtime.

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7.9.1.2 Open/close signal

7.9.1.2.1 —

Dependent parameter

Valve drive operating principle, de-energized

This parameter is visible if, in the *Valve output* parameter, the *Thermoelectric (PWM)* or *Open/Close signal* option has been selected.

Options: Closed
 Open

This parameter determines the function of the valve drive.

- *Closed*: If no current flows in the valve drive, the valve is closed. If current flows in the valve drive, the valve opens.
- *Open*: If no current flows in the valve drive, the valve opens. If current flows in the valve drive, the valve then closes.

7.9.1.2.2 —

Dependent parameter

Open if control value greater than or equal to

Options: 1...100 %

The output switches ON continuously if the value parameterized here is greater than or equal to the received control value. If a control value less than the parameterized value is received, the output switches OFF.

7.9.1.2.3

—

Dependent parameter

Valve drive opening/closing time

This parameter is visible if, in the *Valve output* parameter, the *Thermoelectric (PWM)* or *Open/Close signal* option has been selected.

Options: 10...60...900 s

With this parameter, a time is set in seconds that the connected valve requires to move from position 0 % (valve closed) to position 100 % (valve fully open), or the valve requires to move from 100 % to 0 %.

Note

The time should be taken from the technical data of the valve, and it corresponds with the total runtime.

7.9.2

Send status values

Options: After a change
 Cyclically
 On request
 After a change or on request
 After a change or request and cyclically

This parameter defines when the valve output status values are to be sent. It affects the group objects *Status byte valve A*, *Fault: valve output A* and *Status Control value* for the valve drive.

- *After a change*: The values are sent after a change in the object values (e.g. change from 0 to 1). With the *Status Control value* group object the values are only sent if the change in the control value is at least 1 %.
- *Cyclically*: If this option is selected, the status values are sent automatically after an adjustable time has elapsed. Displays the dependent parameter *All*.
- *On request*: The valve output status values are sent on the receipt of a command via the *Request status values* group object.
- *After a change or request*: The values are sent on request and on a change.
- *After a change or request and cyclically*: The values are sent on request and on a change and cyclically. Displays the dependent parameter *All*.

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7.9.2.1

—

Dependent parameter

Every

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

This parameter is used to set the time after which the status values are to be sent cyclically. The group objects are sent after each cycle.

7.9.3

Enable manual valve override

Options: No
Yes

Manual valve override is enabled using this parameter. This feature is used to specify valve control values directly; the control value from the controller is overridden. This action may be necessary during the commissioning phase, for example, to test the function of the system. A further possible application is the specific overriding of controller.

- *no*: The manual valve override is deactivated
- *Yes*: The manual override is enabled. The two group objects *Enable/disable manual override valve A* and *Override valve control value* are enabled. The former is used to activate or deactivate the manual override. The manual valve control value is specified using the second group object. Only if the manual override has been activated via the first group object is the value in the second group object sent to the valve. As soon as the manual override is ended using the *Enable/disable manual override valve A* group object, the valve output reacts again to the controller (controller mode) or the control values received via the bus (actuator mode).

Note

As soon as the manual override is activated via the *Enable/disable manual override valve A* group object, the value currently in the *Override valve control value* group object is written to the valve. If, while the override was disabled, a value was written to this group object, this value will become active as soon as the override is enabled.

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Parameters

7.9.4 Valve purge

Options: Deactivated
 Automatically or triggered by object
 Triggered by object

Valve purging by the device is enabled using this parameter. This parameter is used to trigger a device opening and closing cycle during times when the valve is not in use to prevent the valve from seizing.

- *Deactivated:* Valve purging is deactivated.
- *Automatically or triggered by object:* Valve purging can be triggered via a group object or it occurs automatically after an adjustable time has elapsed. The group objects *Status Valve purge* and *Activate valve purge* as well as the parameters *Purge cycle in weeks*, *Reset purge cycle from control value greater than or equal to* and *Send group object "Status Valve purge"* are enabled.
- *Triggered by object:* The valve purging can be triggered via a group object. The group objects *Status Valve purge* and *Activate valve purge* as well as the parameters *Reset purge cycle from control value greater than or equal to* and *Send group object "Status Valve purge"* are enabled.

During the valve purging, the valve is opened completely once and closed again, corresponding to the values set in the *Valve drive opening/closing time* parameter.

The purging cycle time is restarted if automatic valve purging has been activated at start-up of the device.

The purging cycle time will be restarted at the end of the actual purging period. The parameterized period of valve purging is included here.

The purging cycle with an active automatic valve purge is reset and restarted if:

- A manual valve purge is triggered via the group object *Activate purge*.
- The parameterized value (in *Reset purge cycle from...*) is exceeded. The purging cycle is only restarted once the parameterized value is reached or exceeded.

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7.9.4.1

—

Dependent parameter

Purge cycle in weeks

This parameter is only visible if the *Automatically or triggered by object* option has been selected.

Options: 1...4...12

The cycle for the automatic valve purging is set using this parameter.

The internal automatic purge timer starts directly after a download. The time is reset with each download.

The time is reset as soon as purging is completed. This can occur either through automatic purging or via the group object *Trigger purge*.

Note

After bus voltage recovery and download, the automatic purging cycle is restarted. The time before bus voltage failure is not considered.

7.9.4.2

—

Dependent parameter

Reset purge cycle from control value greater than or equal to

Options: 1...99 %

Hereby, the purge cycle is reset to the set control value if it is exceeded.

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7.9.4.3

—

Dependent parameter

Send group object "Status Valve purge"

Options: No, update only
 After a change
 Cyclically
 On request
 After a change or on request
 After a change or request and cyclically

This parameter defines when the *Status Valve purge* group object is to be sent.

- *No, update only*: With this option only the object value for the group object is updated, however this value is not sent over the bus.
- *On request*: The valve purging status value is sent on the receipt of a command via the *Request status values* group object.
- *After a change*: The value is sent on a change in the object value (e.g. change from 0 to 1).
- *Cyclically*: If this option is selected, the status value is sent automatically after an adjustable time has elapsed. Displays the dependent parameter *All*.
- *After a change or request*: The status is sent on request and on a change.
- *After a change or request and cyclically*: The status is sent on request and on a change and cyclically. Displays the dependent parameter *All*.

7.9.4.3.1

—

Dependent parameter

Every

Options: 00:00:30...00:05:00...18:12:15 hh:mm:ss

This parameter is used to set the time after which the status values are to be sent cyclically. The group objects are sent after each cycle.

7.10 Setpoint adjustment parameter window

In actuator mode, this window is deactivated and hidden.

The parameters here allow you to determine how room users can adjust setpoints – either via an analog room control unit connected directly to the device, or via KNX.

You can also set which data point types to use for setpoint adjustment.

General	Connect analog room control unit to physical device input <input checked="" type="radio"/> No <input type="radio"/> Yes
+ Manual operation	
- Channel A	
Application parameters	
Channel function	
+ Temperature controller	
Setpoint manager	
Monitoring and safety	
Valve output A	
Setpoint adjustment	
Input a	
Input b	
Input c	
+ Channel B	
+ Channel C	
+ Channel D	
	Max. manual increase in heating mode via KNX <input type="text" value="3"/> K
	Max. manual reduction in heating mode via KNX <input type="text" value="3"/> K
	Max. manual increase in cooling mode via KNX <input type="text" value="3"/> K
	Max. manual reduction in cooling mode via KNX <input type="text" value="3"/> K
	Manual setpoint adjustment via KNX with <input type="text" value="DPT 9.001 (absolute temperature value)"/>
	Caution: This type of setpoint adjustment only works with ABB devices that support the new master/slave concept
	Reset manual adjustment via KNX when base setpoint received <input type="radio"/> No <input checked="" type="radio"/> Yes
	Reset manual adjustment via KNX when operating mode changes <input type="radio"/> No <input checked="" type="radio"/> Yes
	Reset manual adjustment via KNX using group object <input type="radio"/> No <input checked="" type="radio"/> Yes
	Slave display indicates <input checked="" type="radio"/> Absolute <input type="radio"/> Relative

Fig. 20: Setpoint adjustment parameter window

ABB i-bus® KNX Parameters

7.10.1 Connect analog room control unit to physical device input a

Options: No
Yes

This parameter determines whether an analog room control unit should be connected to the device to adjust setpoints.

- *no*: No analog room control unit is connected.
- *yes*: An analog room control unit is connected to the device.

Note

If the *Yes* option is selected, the setpoint for the device can no longer be adjusted by a KNX analog room control unit. The parameter for setpoint adjustment via KNX is hidden.

When the device is in controller mode, setpoint adjustments made on the analog room control unit are forwarded directly to the internal controller. The *Request setpoint adjustment (master)*, *Confirm setpoint adjustment (master)* group objects are hidden.

Device input a is set to *Analog room control unit*. Consequently, this input can only be used to connect the control unit.

The dependent parameters *Maximum setpoint increase* and *Maximum setpoint reduction* appear.

The *Setpoint temperature request (slave)* objects are shown in the actuator mode.

These group objects transmit manual adjustments to the controller.

Note

The group objects used for confirmation are hidden, because the actuator cannot evaluate value confirmation. Caution! This may result in a discrepancy between the analog room control unit and the setpoint actually set. Since the analog room control unit is manual and cannot send a value back to the device, someone may set a value that the external controller will not permit.

The easiest way to prevent this is by using the device's own controller instead of an external one.

Alternatively, either ensure that changes made via the analog room control unit are implemented by the controller, or accept that discrepancies between the actual setpoint and the one set on the device are inevitable.

ABB i-bus[®] KNX Parameters

Note

Along with the temperature setpoint option, the analog room control unit also permits measurement of the room temperature using a temperature sensor.

To use this, connect the analog room control unit output designated for setpoint adjustment (terminal a) to device input a.

It cannot be connected to any other input of the channel.

Only connect one analog room control unit to the device. Connecting multiple controllers will cause operating faults.

The analog room control unit still works without the thermostat feature connected.

The output for the temperature measurement can be connected to any other input on the device.

This input must then only be parametrized for the correct temperature value:

- Temperature sensor type: NTC
- NTC type: NTC 20 [0...+100 °C]

We recommend using device input b for this.

There are two versions of the analog room control unit: one with setpoint and fan adjustment, and one with setpoint adjustment only. The latter can also be connected for use.

The following device variants are available as analog room control units:

- SAF/A 1.0.1-24 Room Temperature and Fan Coil Control Panel *
- SAR/A 1.0.1-24 Room Temperature Control Panel

* With this variant the fan adjustment can however not be used because the device cannot actuate a fan. It can only be used for temperature measurement and temperature setpoint adjustment.

ABB i-bus[®] KNX Parameters

7.10.1.1 No

7.10.1.1.1 —

Dependent parameter

Max. manual increase in heating mode via KNX

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: 0...3...9 K

The parameter determines the maximum setpoint increase that can be manually set via KNX in heating mode. You can use the *Request setpoint adjustment* group object to increase the Comfort heating setpoint by a maximum of the value set here.

Note

If the object receives a value that exceeds the value set here, the maximum possible increase is applied, and a request with the new temperature is sent via KNX in the *Confirm setpoint adjustment* group object.

7.10.1.1.2 —

Dependent parameter

Max. manual reduction in heating mode via KNX

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: 0...3...9 K

The parameter determines the maximum setpoint reduction that can be manually set via KNX in Heating mode. You can use the *Request setpoint adjustment* group object to increase the Comfort heating setpoint by a maximum of the value set here.

Note

If the object receives a value below the value set here, the maximum possible reduction is applied, and a request with the new temperature is confirmed in the *Confirm setpoint adjustment* group object.

ABB i-bus[®] KNX Parameters

7.10.1.1.3

—

Dependent parameter

Max. manual increase in cooling mode via KNX

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: 0...3...9 K

The parameter determines the maximum setpoint increase that can be manually set via KNX in Cooling mode. Use the *Request setpoint adjustment* group object to increase the Comfort cooling setpoint by a maximum of the value set here.

Note

If the object receives a value that exceeds the value set here, the maximum possible increase is applied, and the request confirmed with the adjusted value in the *Confirm setpoint adjustment* group object.

7.10.1.1.4

—

Dependent parameter

Max. manual reduction in cooling mode via KNX

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: 0...3...9 K

The parameter determines the maximum setpoint increase that can be manually set via KNX in Cooling mode. You can use the *Request setpoint adjustment* group object to reduce the Comfort cooling setpoint by a maximum of the value set here.

Note

If the object receives a value that exceeds the value set here, the maximum possible reduction is applied, and the request confirmed with the adjusted value in the *Confirm setpoint adjustment* group object.

ABB i-bus® KNX Parameters

7.10.1.1.5

—

Dependent parameter

Manual setpoint adjustment via KNX with

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: DPT 6.010 (meter pulses)
 DPT 9.001 (absolute temperature value)
 DPT 9.002 (relative temperature value)

This parameter determines the data point type used to adjust the setpoint via group objects *Request setpoint adjustment* and *Confirm setpoint adjustment*.

- *DPT 6.010 (meter pulses)*: This is the only viable option if you are using legacy ABB devices.
- *DPT 9.001 (absolute temperature value)*: The setpoint adjustment is an absolute temperature value. The new setpoint temperature is set to adjust the setpoint. Likewise, the *Confirm setpoint adjustment* group object sends the new temperature as an absolute value.
- *DPT 9.002 (relative temperature value)*: The setpoint adjustment is a relative temperature value. The change in the setpoint temperature (e.g. +2 °C) is sent. Likewise, the *Confirm setpoint adjustment* group object sends the new temperature as a relative value.

Note

DPT 9.001 and DPT 9.002 temperature adjustment will not work on legacy ABB devices that do not yet support the latest version of the master/slave concept. For these devices, DPT 6.010 is the only option, which means that other equipment (such as display systems) cannot read the setpoint adjustment. However, they can read or display the current setpoint temperature via the *Current setpoint* group object. Before adjusting a setpoint with an analog room control unit, please check which setpoint adjustment format the controller supports.

You can also communicate a setpoint change to the device via the group object *Base setpoint* or the group object *Comfort heating setpoint* or *Comfort cooling setpoint*. This value is then also applied as a new setpoint and implemented.

Caution! Note that changing the base setpoint also changes the Standby and Economy temperatures. To prevent this, use absolute rather than relative setpoint adjustment (*Setpoint manager – Setpoint specification and adjustment*). However, note that with both types of adjustment, the parametrized maximum setpoint increase/reduction limits are no longer taken into account.

ABB i-bus[®] KNX Parameters

7.10.1.1.6

—

Dependent parameter

Reset manual adjustment via KNX when base setpoint received

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: No
 Yes

If the *Yes* option has been selected in this parameter, the manual setpoint adjustment is reset when a value is received via the *Base setpoint* group object.

If the *No* option has been selected in this parameter, the manual setpoint adjustment is added to the new setpoint when a value is received via the *Base setpoint* group object.

Example:

Old base setpoint 21 °C + manual adjustment 1.5 °C = 22.5 °C. Group object receives a new base setpoint of 18 °C + previous manual adjustment of 1.5 °C = 19.5 °C.

7.10.1.1.7

—

Dependent parameter

Reset manual adjustment via KNX when operating mode changes

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: No
 Yes

- *no*: When the device changes operating modes, the manual adjustment is cleared from active parameters and replaced with the parametrized setpoint temperature for the new mode plus any change sent via the *Base setpoint* group object.

Example:

Comfort temperature 21 °C + manual adjustment 1.5 °C = 22.5 °C. Change to Eco mode with a parametrized temperature of 17 °C. The device adjusts the temperature to 17 °C because the manual adjustment has been cleared.

- *yes*: This option factors in the manual setpoint adjustment on top of the new operating mode temperature.

Example:

Comfort temperature 21 °C + manual adjustment 1.5 °C = 22.5 °C. Change to Eco mode with a parametrized temperature of 17 °C. The device regulates to 18.5 °C because the manual adjustment is factored in.

ABB i-bus[®] KNX Parameters

7.10.1.1.8

—

Dependent parameter

Reset manual adjustment via KNX using group object

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: No
 Yes

When this option is activated, the manual adjustment can be cleared at any time via the *Reset manual setpoint adjustment* group object.

Selecting *No* hides the group object *Reset manual setpoint adjustment* and it is no longer possible to reset the manual setpoint adjustment via a group object.

Example:

Resetting manual adjustment of all the devices in a building using a time scheduler in the system.

7.10.1.1.9

—

Dependent parameter

Slave display indicates

This parameter is only displayed if you select *No* when setting *Connect analog room control unit to physical device input a*.

Options: Absolute
 Relative

This parameter determines whether a slave displays a setpoint as absolute or relative.

Example:

Resetting manual adjustment of all the devices in a building using a time scheduler in the system.

ABB i-bus[®] KNX Parameters

7.10.1.2 **Yes**

7.10.1.2.1 —

Dependent parameter

Maximum setpoint increase

Options: 0...3...5 K

This parameter determines the maximum adjustment that the analog control unit can make when increasing the setpoint temperature in Comfort mode. The Comfort value set cannot be increased by more than this.

Note

The possible temperature adjustment range is from the center position of the rotary knob on the analog room control unit all the way to the right. If the knob is as far to the right as possible, then the increase is as high as possible (e.g. 3 K).

7.10.1.2.2 —

Dependent parameter

Maximum setpoint reduction

Options: 0...3...5 K

This parameter determines the maximum adjustment that the analog control unit can make when reducing the setpoint temperature in Comfort mode. The Comfort value set cannot be reduced by more than this.

Note

The possible temperature adjustment range is from the center position of the rotary knob on the analog room control unit all the way to the left. If the knob is as far to the left as possible, the temperature is reduced by the maximum (e.g. 3 K).

7.11 Input x parameter window

Note

In the following, the possible settings for inputs a...c are explained using input a as an example. The setting options are identical for all inputs.

Note

When using input a to connect an analog room control unit, parametrize the input on the *Setpoint adjustment* page.

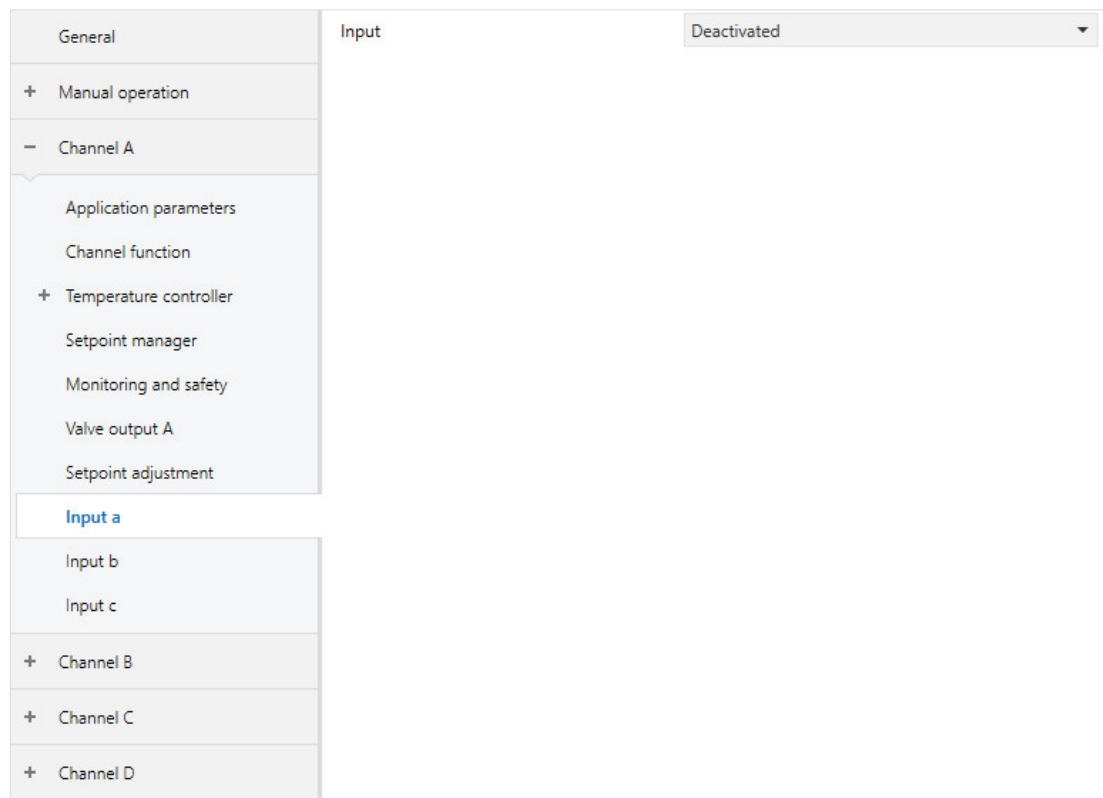


Fig. 21: Input x parameter window

7.11.1 Input

Options: Deactivated
Window contact
Dew point sensor
Fill level sensor
Temperature sensor
Binary signal input
Analog room control unit

This parameter sets the type of operation for the input. Dependent parameters appear according to the selected option.

ABB i-bus[®] KNX Parameters

7.11.1.1 Window contact

Select the *Window contact* option to use the input to connect a floating contact that monitors the open/closed state of the window. Select the *Via physical device input* option in the *Window contact* parameter on the Application parameters page to take the status of this input into account in room temperature control. Without this setting, the input value is sent on the bus but not taken into account in the controller.

Note

If several inputs are set to this option and the controller runs an evaluation, all inputs are internally linked by an OR operation. This means that as long as one of the contacts is open, the controller responds as if all of the inputs are open. Once all contacts signal are signaling the state window closed, the controller evaluates this as window closed.

Note

Inputs are scanned after a bus voltage recovery, download or ETS reset. Their current status is sent on the bus when the sending and switching delay is complete.

7.11.1.1.1

—

Dependent parameter

Window open when

Options: Contact open
 Contact closed

This parameter determines whether the contact connected to the input is normally open or normally closed.

- *Contact open*: The window is considered open if the contact is open.
- *Contact closed*: The window is considered open if the contact is closed.

ABB i-bus[®] KNX Parameters

7.11.1.1.2

—

Dependent parameter

Send status value

Options: After a change
After a change and cyclically

- *After a change*: Sends the value only after a change.
- *After a change and cyclically*: Sends the value after a change, and cyclically. Enables the dependent parameter *Send input status cyclically*.

7.11.1.1.2.1

—

Dependent parameter

Send input status cyclically

Options: 00:00:30...18:12:15 hh:mm:ss

7.11.1.2

Dew point sensor

Select the *Dew point alarm* option to use the input to connect a floating contact that monitors the dew point. Select the *Via physical device input* option has been selected in the Dew point alarm parameter on the *Application parameters* page to take the status of this input into account in room temperature control. Without this setting, the input value is sent on the bus but not taken into account in the controller.

Note

If several inputs are set to this option and the controller runs an evaluation, all inputs are internally linked by an OR operation. This means that as long as one of the contacts is open, the controller responds as if all of the inputs are open. Once all contacts signal no dew point alarm, the controller evaluates this as no dew point alarm.

Note

Inputs are scanned after a bus voltage recovery, download or ETS reset. Their current status is sent on the bus when the sending and switching delay is complete.

ABB i-bus[®] KNX Parameters

7.11.1.2.1

—

Dependent parameter

Dew point reached when

Options: Contact open
 Contact closed

This parameter defines how the input reacts if the dew point is evaluated as reached or not reached. You can also define whether the dew point sensor is a normally closed or normally open contact.

- *Contact open*: The dew point is considered reached if the contact is open.
- *Contact closed*: The dew point is considered reached if the contact is closed.

7.11.1.2.2

—

Dependent parameter

Send status value

Options: After a change
 After a change and cyclically

- *After a change*: Sends the value only after a change.
- *After a change and cyclically*: Sends the value after a change, and cyclically. Enables the dependent parameter *Send input status cyclically*.

7.11.1.3

Fill level sensor

Selecting *Fill level sensor* uses the input to connect a floating contact that monitors the fill level of a condensation pan. Select the *Via physical device input* option in the *Fill level sensor* parameter on the *Application parameters* page to take the status of this input into account in room temperature control. Without this setting, the input value is sent on the bus but not taken into account in the controller.

Note

If several inputs are set to this option and the controller runs an evaluation, all inputs are internally linked by an OR operation. This means that as long as one of the contacts is open, the controller responds as if all of the inputs are open. Once all contacts signal no fill level alarm, the controller evaluates this as no alarm.

Note

Inputs are scanned after a bus voltage recovery, download or ETS reset. Their current status is sent on the bus when the sending and switching delay is complete.

ABB i-bus[®] KNX Parameters

7.11.1.3.1

—

Dependent parameter

Fill level reached when

Options: Contact open
 Contact closed

This parameter defines how the input reacts if the fill level is evaluated as reached or not reached. You can also define whether the fill level sensor is a normally closed or normally open contact.

- *Contact open*: The fill level is considered reached if the contact is open.
- *Contact closed*: The fill level is considered reached if the contact is closed.

7.11.1.3.2

—

Dependent parameter

Send status value

Options: After a change
 After a change and cyclically

- *After a change*: Sends the value only after a change.
- *After a change and cyclically*: Sends the value after a change, and cyclically. Enables the dependent parameter *Send input status cyclically*.

ABB i-bus[®] KNX Parameters

7.11.1.4 Temperature sensor

This option is only available for inputs a and b.

Select the *Temperature sensor* option to use the input for temperature measurement. It can then be used to measure the room temperature or to measure a temperature limitation value.

Select the *Via physical device input* option in the *Temperature input* parameter on the *Application parameters* page to take the status of this input into account in room temperature control. Without this setting, the input value is sent on the bus but not taken into account in the controller.

In the Basic-stage heating, Additional-stage heating, Basic-stage cooling and Additional-stage cooling parameter windows, selecting Activate temperature limitation, Yes and Input for *temperature limitation sensor*, *Input a* means that the temperature sensor value measured here will only be used for temperature limitation and can no longer be used to measure room temperature.

The temperature value is output via the 2-byte group object *Input x – Temperature*. You can also establish whether there is a fault on the input, e.g. a short circuit or cable break. A fault is reported if the resistance falls below 50 ohms or exceeds 100 kohms.

Faults are reported via the 1-bit group object *Input a – Input fault*. If a fault occurs, this object changes state from 0 to 1. These two group objects are sent depending on the reaction parametrized in *Send status values*.

Note

If several inputs are set to this option and the controller runs an evaluation, it calculates the average value of all the temperature inputs. Temperature inputs used as temperature limitation sensors are excluded from this calculation.

Note

Inputs are scanned after a bus voltage recovery, download or ETS reset. Their current status is sent on the bus when the sending and switching delay is complete.

ABB i-bus® KNX Parameters

7.11.1.4.1

—

Dependent parameter

Temperature sensor type

Options: PT100 [-30...+110 °C]
 PT1000 [-30...+110 °C]
 NTC
 KTY [-15...+110]
 NI1000 - 01 [-30...+110 °C]
 NI1000 - 02 [-30...+110 °C]

This parameter indicates which type of temperature sensor is connected. Please refer to the sensor's datasheet for technical information. The measurable range for each type of sensor appears in square brackets after the type.

- *NTC*: Selecting this type of sensor opens the dependent parameter window *NTC type* so that you can select an NTC subtype.
- *KTY*: Selecting this type of sensor opens the dependent parameter window *KTY type* so that you can select a KTY subtype:

7.11.1.4.1.1

—

Dependent parameter

NTC type

Options: NTC10-01 [-15...+100°C]
 NTC10-02 [-15...+100°C]
 NTC10-03 [-15...+100°C]
 NTC20 [0...+100°C]

This parameter allows you to choose the NTC sensor type that is connected. An NTC10 sensor has a resistance of 10 kohms at 25 °C. An NTC20 has a resistance of 20 kohms. Individual types vary in terms of their resistance curves.

ABB i-bus® KNX Parameters

7.11.1.4.1.2

—

Dependent parameter

KTY type

Options:

- KT 100 / 110 / 130
- KT 210 / 230
- KTY 10-5 / 11-5 / 13-5
- KTY 10-6 / 10-62 / 11-6 / 13-6 / 16-6 / 19-6
- KTY 10-7 / 11-7 / 13-7
- KTY 21-5 / 23-5
- KTY 21-6 / 23-6
- KTY 21-7 / 23-7
- KTY 81-110 / 81-120 / 81-150
- KTY 82-110 / 82-120 / 82-150
- KTY 81-121 / 82-121
- KTY 81-122 / 82-122
- KTY 81-151 / 82-151
- KTY 81-152 / 82-152
- KTY 81-210 / 81-220 / 81-250
- KTY 82-210 / 82-220 / 82-250
- KTY 81-221 / 82-221
- KTY 81-222 / 82-222
- KTY 81-251 / 82-251
- KTY 81-252 / 82-252
- KTY 83-110 / 83-120 / 83-150
- KTY 83-121
- KTY 83-122
- KTY 83-151
- User-defined

This parameter allows you to select a predefined KTY sensor.

- *User-defined*: This displays the dependent parameters Resistance in ohms at -20...+120 °C.

Note

When using a KTY sensor that is not in the list, you can use the *User-defined* option to enter its characteristic.

To ensure that the analog input works properly with respect to user-defined entries, the resistance values as visible for the preset values must be in ascending order.

An incorrect entry can result in unrealistic output values.

ABB i-bus[®] KNX Parameters

7.11.1.4.1.2.1

—

Dependent parameter

Resistance in ohms at -20...+120 °C

Options: 650...4,600

A resistance characteristic can be entered via these 8 parameters. Please refer to the sensor manufacturer's technical documentation for this data.

7.11.1.4.1.3

—

Dependent parameter

Filter

Options: Inactive
Low (floating mean value over 30 seconds)
Medium (floating mean value over 60 seconds)
High (floating mean value over 120 seconds)

This parameter sets a filter (floating mean value filter). This can be used to set the output value as a mean value using three different options.

- *Inactive*: Filter is not active
- *Low*: floating mean value over 30 seconds
- *Medium*: floating mean value over 60 seconds
- *High*: floating mean value over 120 seconds

Note

Using the filter "smooths" the output via the mean value so that it is available for further processing. The filter therefore has immediate effects on thresholds and calculation values. The higher the degree of filtering, the smoother the result. This means that changes to the output value become slower. Example: On an erratic change in the sensor signal on the *Medium* setting, it will take 30 seconds for the output value to propagate.

ABB i-bus[®] KNX Parameters

7.11.1.4.2

—

Dependent parameter

Temperature offset

Options: -10.0...00.0...+10.0 K

A maximum offset of ± 10 °C can be added to the recorded temperature with this parameter.

7.11.1.4.3

—

Dependent parameter

Cable error compensation

Options: None
 Via cable length
 Via cable resistance

- Via cable length: Cable error is compensated by entering the cable length.

Note

This method may only be used for copper cables.

- *Via cable resistance*: Cable error is compensated by entering the cable resistance value.

ABB i-bus[®] KNX Parameters

7.11.1.4.3.1

—

Dependent parameter

Cable length, one-way distance

Options: 01.0...10.0...100.0 m

- Via cable length: Cable error is compensated by entering the cable length.

Sets the one-way cable length of the connected temperature sensor.

Note

The maximum cable length permitted between the sensor and device input is 100 m.

7.11.1.4.3.2

—

Dependent parameter

Cross-section of conductor, Value * 0.01 mm²

Options: 1...100...150

Note

The 150 option corresponds to a cross-section of 1.5 mm².

The cross-section of the conductor to which the temperature sensor is connected is entered using this parameter.

7.11.1.4.3.3

—

Dependent parameter

Cable resistance [total of fwd and rtn conductor]

Options: 0...500...10,000 mohms

This parameter sets the cable resistance level of the connected temperature sensor.

Note

To measure the cable resistance correctly, the conductors must be shorted together at the end of the cable and should not be connected to the analog input.

ABB i-bus[®] KNX Parameters

7.11.1.4.4

—

Dependent parameter

Filter

Options: Inactive
Low (floating mean value over 30 seconds)
Medium (floating mean value over 60 seconds)
High (floating mean value over 120 seconds)

This parameter sets a filter (floating mean value filter). This can be used to set the output value as a mean value using three different options.

- *Inactive*: Filter is not active
- *Low*: floating mean value over 30 seconds
- *Medium*: floating mean value over 60 seconds
- *High*: floating mean value over 120 seconds



Note

Using the filter "smooths" the output via the mean value so that it is available for further processing. The filter therefore has immediate effects on thresholds and calculation values. The higher the degree of filtering, the smoother the result. This means that changes to the output value become slower. Example: On an erratic change in the sensor signal with the *Medium* setting, it will take 60 seconds for the output value to propagate.

ABB i-bus[®] KNX Parameters

7.11.1.4.5

—

Dependent parameter

Send temperature value

Options:

- After a change
- Cyclically
- After a change and cyclically
- On request
- After a change or on request
- On request and cyclically
- After a change or request and cyclically

This parameter defines how the output value should be sent.

- *After a change*: Sends the output value after a change.
- *Cyclically*: Sends the output value cyclically.
- *After a change and cyclically*: Sends the output value after a change, and cyclically.
- *On request*: Sends the output value on request.
- *After a change or on request*: Sends the output value after a change and after a request.
- *On request and cyclically*: Sends the output value on request, and cyclically.
- *After a change or request and cyclically*: Sends the output value after a change, on request, and cyclically.

The value is sent on request on the receipt of a value in the *General – Request status values group object*.

ABB i-bus[®] KNX

Parameters

7.11.1.4.5.1

—

Dependent parameter

Value is sent from a change of

This is displayed if the *Send temperature value* parameter option includes After a change.

Options: 00.0...01.0...10.0 K

This parameter determines the temperature change that triggers sending the output value.

7.11.1.4.5.2

—

Dependent parameter

Every

This is displayed if the *Send temperature value* parameter option includes After a change.

Options: 00:00:30...18:12:15 hh:mm:ss

This additional parameter sets the interval for cyclic sending.

7.11.1.5

Binary signal input

7.11.1.5.1

—

Dependent parameter

Maximum dead time

The maximum dead time is 200 ms.

The maximum dead time prevents unwanted multiple operations on the input, e.g. due to bouncing of the contact.

7.11.1.5.1.1

What is maximum dead time?

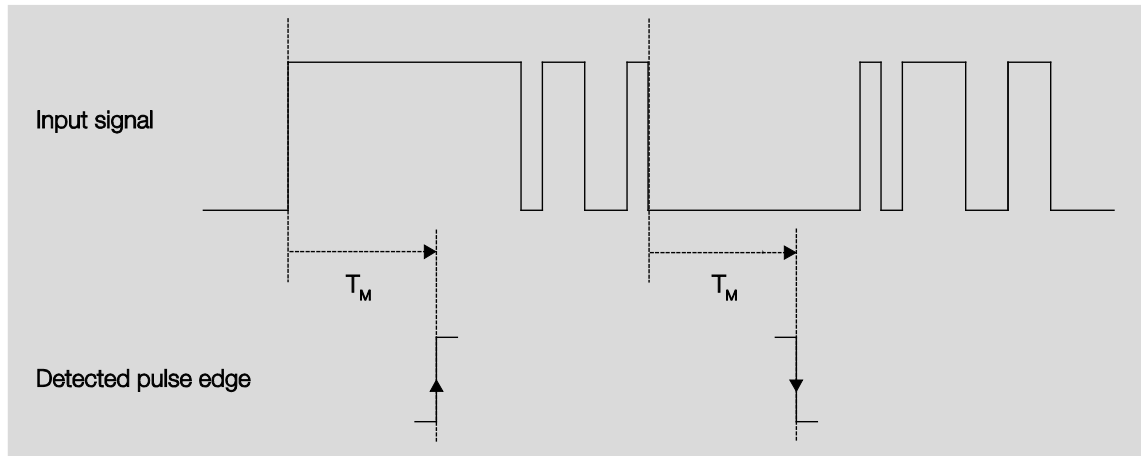
An edge change at the input is assessed with a maximum dead time (delay) value of 200 ms. This time may vary from 0 ms to 200 ms.

Note

No further bouncing is possible.

7.11.1.5.1.2

Example: Maximum dead time of the input signal for a detected edge



2CDC072059F0217

Fig. 22: Maximum dead time of the input signal for a detected edge

After detection of an edge on the input, further edges are ignored for the maximum dead time T_D .

ABB i-bus[®] KNX Parameters

7.11.1.5.2

—

Dependent parameter

Distinction between long and short operation

Options: No
Yes

This parameter determines whether the input differentiates between short and long operation.

- yes: After opening/closing the contact, it must first of all be ascertained if a long or short operation has occurred. Then a possible reaction will be triggered.

The following diagram shows the function in detail:

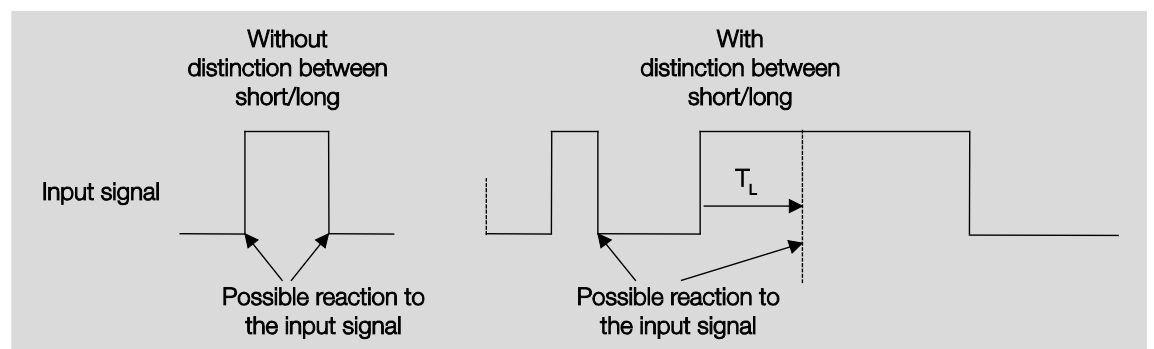


Fig. 23: Distinguishing between a long/short operation

Note

T_L is the time before a long operation is detected.

2CDC072061F02.17

ABB i-bus[®] KNX Parameters

7.11.1.5.2.1

No

If the parameter *Distinction between long and short operation* is set to *No*, the following parameters appear:

General	Input	Binary signal input
+ Manual operation	Maximum dead time: 200 ms	
- Channel A	Distinction between long and short operation	<input checked="" type="radio"/> No <input type="radio"/> Yes
Application parameters	Open contacts: event 0	
Channel function	Close contacts: event 1	
+ Temperature controller	Activate minimum signal duration	<input checked="" type="radio"/> No <input type="radio"/> Yes
Setpoint manager	1-bit group object "Disable input"	<input checked="" type="radio"/> No <input type="radio"/> Yes
Monitoring and safety	Reaction on event 0	Off
Valve output A	Reaction on event 1	On
Setpoint adjustment	Send status value	<input checked="" type="radio"/> After a change <input type="radio"/> After a change and cyclically
Input a	Scan input after download, ETS reset and bus voltage recovery	<input type="radio"/> No <input checked="" type="radio"/> Yes
Input b		
Input c		
+ Channel B		
+ Channel C		
+ Channel D		

Fig. 24: No

i Note

Opening of the contacts -> event 0
Closing of the contacts -> event 1

2CDC078063F0218

ABB i-bus[®] KNX Parameters

7.11.1.5.2.1.1

—

Dependent parameter

Activate minimum signal duration

Options: No
 Yes

7.11.1.5.2.1.2

—

Dependent parameter

When contact opens

Options: 0...1...100 s

7.11.1.5.2.1.3

—

Dependent parameter

When contact closes

Options: 0...1...100 s

7.11.1.5.2.1.4

What is minimum signal duration?

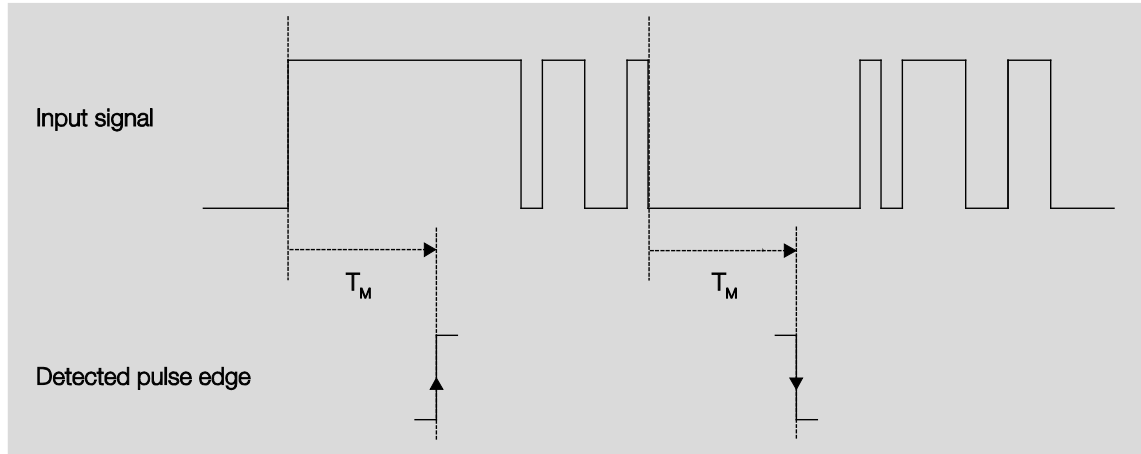
In contrast to the maximum dead time, a telegram only sent once the minimum signal duration has elapsed.

In more detail:

If an edge is detected on the input, the minimum signal duration starts to run. No telegrams are sent on the bus at this time. The signal on the input is observed for the minimum signal duration. If a further edge appears at the input during the minimum signal duration, it is interpreted as a new operation, and the minimum signal duration restarts. If no further edges occur after the minimum signal duration starts, a telegram is sent on the bus after it has elapsed.

7.11.1.5.2.1.5

Example: Minimum signal duration of the input signal for a detected edge



2CDC072059F0217

Fig. 25: Minimum signal duration of the input signal for a detected edge

There are only two cases where no further edge changes occur within the minimum signal duration T_M after a change of edge. For this reason, only these two cases are detected as valid.

i Note

The minimum signal duration is not considered after a download and/or ETS reset.

i Note

After a bus voltage recovery, the minimum signal duration starts once the inputs can be scanned. When the sending and switching delay has elapsed, the current state at that point is sent on the bus.

ABB i-bus[®] KNX Parameters

7.11.1.5.2.1.6

—
Dependent parameter

Activate minimum signal duration

Options: No
Yes

7.11.1.5.2.2

Yes

If the parameter *Distinction between long and short operation* is set to *Yes*, the following parameters appear:

General	Input	Binary signal input
+ Manual operation	Maximum dead time: 200 ms	
- Channel A	Distinction between long and short operation	<input type="radio"/> No <input checked="" type="radio"/> Yes
Application parameters	Short operation: event 0	
Channel function	Long operation: event 1	
+ Temperature controller	Input on operation	<input type="radio"/> Contact open <input checked="" type="radio"/> Contact closed
Setpoint manager	Long operation after	01,0 s
Monitoring and safety	1-bit group object "Disable input"	<input checked="" type="radio"/> No <input type="radio"/> Yes
Valve output A	Reaction on event 0	Off
Setpoint adjustment	Reaction on event 1	On
Input a	Send status value	<input checked="" type="radio"/> After a change <input type="radio"/> After a change and cyclically
Input b	Scan input after download, ETS reset and bus voltage recovery	<input type="radio"/> No <input checked="" type="radio"/> Yes
Input c		
+ Channel B		
+ Channel C		
+ Channel D		

Fig. 26: Yes

Note

Opening the contact -> event 0
Closing the contact -> event 1

ABB i-bus[®] KNX Parameters

7.11.1.5.2.2.1

—

Dependent parameter

Input on operation

Options: Contact open
 Contact closed

- *Open*: The operation opens the input.
- *Closed*: The operation closes the input.

If a normally open contact is connected to the input, select *Closed*; for a normally closed contact, select *Open*.

7.11.1.5.2.2.2

—

Dependent parameter

Long operation after

Options: 01.0...10.0 s

The time period T_L after which an operation is considered "long" is defined here.

7.11.1.5.3

—

Dependent parameter

Enable group object "Block" 1-bit

Options: No
 Yes

- *yes*: Enables the 1-bit group object Block. This can be used to disable the input.

If the input is disabled and the option *Send cyclically* is set, the last state is still sent regardless of the block. The *Block* option blocks the physical input; sending continues internally.

When the input is blocked there is essentially no reaction to a signal change on the input, but:

- Waiting for a long button push or a minimum signal duration is suspended
- Parameterized cyclic sending is not interrupted
- It is still possible to write the *Switch* group object

ABB i-bus[®] KNX

Parameters

If the input state changes during the block phase, the new group object value is sent immediately after the block is released. If the input state remains the same during the block phase, the group object value is not sent. The minimum signal duration does not start until the Block has finished.

Block is deactivated after an ETS reset, a bus voltage recovery or a download.

7.11.1.5.4

—

Dependent parameter

Reaction on event X

The following apply to the *Reaction on event 0* and *Reaction on event 1* parameters.

Options:

- No edge evaluation
- On
- Off
- Toggle
- End cyclic transmission

The standard value for *Reaction on event 1* is *On*. The standard value for *Reaction on event 0* is *Off*.

This determines how the group object reacts. If the *Distinction between long and short operation* parameter is set to *Yes*, the reaction occurs with a short or long operation. If it is set to *No*, it occurs with each edge change.

Note

If it is set to *End cyclic transmission*, it is important to note that this is only effective if the *Send status value* parameter is set to *After a change and cyclically*.

ABB i-bus[®] KNX Parameters

7.11.1.5.5

—

Dependent parameter

Send status value

Options: After a change
 After a change and cyclically

- *After a change*: Sends the value only after a change.
- *After a change and cyclically*: Sends the value after a change, and cyclically. Displays the dependent parameters *Telegram is repeated every* and *On object value*.

Note

Cyclic sending

Cyclic sending enables the Switch group object to send automatically at a fixed interval. If cyclic sending applies to a specific object value only (ON or OFF), this condition refers to the value of the group object. It is therefore possible in principle to start cyclic sending by sending a value to the Switch group object. As this behavior is unwanted, the Write and Update flags of the group object are deleted in the preliminary setting so that they cannot be changed via the bus. If this functionality is required irrespectively, set these flags accordingly. When the group object Switch changes and after bus voltage recovery (after the sending delay time has elapsed), the group object value is sent immediately on the bus, and the sending cycle time restarts.

7.11.1.5.5.1

—

Dependent parameter

Telegram is repeated every

Options: 00:00:30...18:12:15 hh:mm:ss

This additional parameter sets the interval for cyclic sending.

7.11.1.5.5.2

—

Dependent parameter

On object value

Options: 0
 1
 0 or 1

- *1*: Sends the group object value 1 cyclically.
- *0*: Sends the group object value 0 cyclically.
- *0 or 1*: Sends the group object values 0 or 1 cyclically.

ABB i-bus[®] KNX Parameters

7.11.1.5.6

—

Dependent parameter

Scan input after download, ETS reset and bus voltage recovery

Options: No
 Yes

- *no*: The object value is not scanned after a download, ETS reset or bus voltage recovery.
- *yes*: The object value is scanned after a download, ETS reset or bus voltage recovery.

Note

Scanning starts once the device is ready for normal operation again after the download, ETS reset or bus voltage recovery. This can take up to 2 seconds.

7.11.1.6

Connect analog room control unit

In the *Setpoint adjustment* parameter window, you can set the *Connect analog room control unit to physical device input a* parameter to allow an analog room control unit to be connected to the input. You will not be able to change this in the *Input a* window unless you deactivate your selection in the *Setpoint adjustment* window first.

This setting displays the dependent parameters *Send Status value* and *Send input status cyclically*.

7.11.1.6.1

—

Dependent parameter

Send status value

Options: After a change
 After a change and cyclically

- *After a change*: Sends the value only after a change.
- *After a change and cyclically*: Sends the value after a change, and cyclically. Enables the dependent parameter *Send input status cyclically*.

8 Group objects

8.1 Summary of group objects VC/S

No.	Object function	Name	DPT	Length	Flags				
					C	R	W	T	U
1	In operation	General	1.002	1 bit	X	X		X	
3	Request status values	General	1.017	1 bit	X		X		
4	Status Manual operation	General	1.011	1 bit	X	X		X	
5	Enable/disable manual operation	General	1.003	1 bit	X		X		
10	Forced operation 2 bit	Channel A – General	2.001	2 bit	X		X		
11	Forced operation 1 bit	Channel A – General	1.002	1 bit	X		X		
12	Error: heating/cooling receipt	Channel A – General	1.002	1 bit	X	X		X	
13	Error: window contact receipt	Channel A – General	1.002	1 bit	X	X		X	
14	Error: dew point alarm receipt	Channel A – General	1.002	1 bit	X	X		X	
15	Error: fill level alarm receipt	Channel A – General	1.002	1 bit	X	X		X	
16	Error: operating mode receipt	Channel A – General	1.002	1 bit	X	X		X	
16	Error: control value receipt	Channel A – General	1.002	1 bit	X	X		X	
17	Status byte channel	Channel A – General	Non DPT	1 byte	X	X		X	
18	Status byte valve A	Channel A – Valve A	Non DPT	1 byte	X	X		X	
19	Status Valve A control value	Channel A – Valve A	5.001	1 byte	X	X		X	
20	Fault: valve output A	Channel A – Valve A	1.002	1 bit	X	X		X	
21	Status Valve purge A	Channel A – Valve A	1.011	1 bit	X	X		X	
22	Reset fault on valve output A	Channel A – Valve A	1.015	1 bit	X		X		
23	Activate valve purge A	Channel A – Valve A	1.017	1 bit	X		X		
24	Enable/disable manual valve override A	Channel A – Valve A	1.003	1 bit	X		X		
25	Override valve control value A	Channel A – Valve A	5.001	1 byte	X		X		
27	Temperature	Channel A – Input a	9.001	2 bytes	X	X		X	
28	Error: input	Channel A – Input a	1.002	1 bit	X	X		X	
29	Switch	Channel A – Input a	1.001	1 bit	X	X		X	
29	Window contact	Channel A – Input a	1.019	1 bit	X	X		X	
29	Dew point alarm	Channel A – Input a	1.005	1 bit	X	X		X	
29	Fill level alarm	Channel A – Input a	1.005	1 bit	X	X		X	
30	Disable input	Channel A – Input a	1.003	1 bit	X		X		
31	Channel A – Input b								
...	Group objects as for input a								
34									
35	Channel A – Binary input c								
...	Group objects as for input a								
36									
37	Status Heating/Cooling	Channel A – Controller	1.100	1 bit	X	X		X	
38	Status Control value Basic-stage heating	Channel A – Controller	5.001	1 byte	X	X		X	

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Group objects

No.	Object function	Name	DPT	Length	Flags				
					C	R	W	T	U
38	Status Control value Basic-stage heating	Channel A – Controller	1.001	1 bit	X	X		X	
39	Status Control value Additional-stage heating	Channel A – Controller	5.001	1 byte	X	X		X	
39	Status Control value Additional-stage heating	Channel A – Controller	1.001	1 bit	X	X		X	
40	Status Control value Basic-stage cooling	Channel A – Controller	5.001	1 byte	X	X		X	
40	Status Control value Basic-stage cooling	Channel A – Controller	1.001	1 bit	X	X		X	
41	Status Control value Additional-stage cooling	Channel A – Controller	5.001	1 byte	X	X		X	
41	Status Control value Additional-stage cooling	Channel A – Controller	1.001	1 bit	X	X		X	
43	Actual temperature	Channel A – Controller	9.001	2 bytes	X	X		X	
44	External temperature 1	Channel A – Controller	9.001	2 bytes	X		X	X	X
45	External temperature 2	Channel A – Controller	9.001	2 bytes	X		X	X	X
46	Fault: actual temperature (master)	Channel A – Controller	1.002	1 bit	X	X		X	
47	Current setpoint	Channel A – Controller	9.001	2 bytes	X	X		X	
48	Operating mode normal (master)	Channel A – Controller	20.102	1 byte	X		X	X	X
49	Operating mode override (master)	Channel A – Controller	20.102	1 byte	X		X	X	X
50	Window contact (master/slave)	Channel A – Controller	1.019	1 bit	X		X		
51	Presence detector (master/slave)	Channel A – Controller	1.018	1 bit	X		X		
52	Status Heating	Channel A – Controller	1.001	1 bit	X	X		X	
53	Status Cooling	Channel A – Controller	1.001	1 bit	X	X		X	
54	Activate minimum control value (basic load)	Channel A – Controller	1.003	1 bit	X		X		
55	Heating/cooling changeover	Channel A – Actuator	1.100	1 bit	X		X	X	X
55	Heating/cooling changeover	Channel A – Controller	1.100	1 bit	X		X	X	X
56	Base setpoint	Channel A – Controller	9.001	2 bytes	X		X		
57	Reset manual setpoint adjustment	Channel A – Controller	1.017	1 bit	X		X		
58	Dew point alarm	Channel A – Controller	1.005	1 bit	X		X		
59	Fill level alarm	Channel A – Controller	1.005	1 bit	X		X		
60	Outside temperature for summer compensation	Channel A – Controller	9.001	2 bytes	X		X		
61	Summer compensation active/inactive	Channel A – Controller	1.002	1 bit	X	X		X	
62	Setpoint reached	Channel A – Controller	1.002	1 bit	X	X		X	
63	Request On/Off (master)	Channel A – Controller	1.001	1 bit	X		X		
64	Confirm On/Off (master)	Channel A – Controller	1.001	1 bit	X	X		X	
65	Setpoint display (master)	Channel A – Controller	9.002	2 bytes	X	X		X	
66	Request setpoint adjustment (master)	Channel A – Controller	9.001	2 bytes	X		X		
66	Request setpoint adjustment (master)	Channel A – Controller	9.002	2 bytes	X		X		
66	Request setpoint adjustment (master)	Channel A – Controller	6.010	1 byte	X		X		
66	Request setpoint adjustment (slave)	Channel A – Actuator	9.002	2 bytes	X		X		
66	Request setpoint adjustment (slave)	Channel A – Actuator	6.010	1 byte	X		X		
67	Confirm setpoint adjustment (master)	Channel A – Controller	9.001	2 bytes	X	X		X	
67	Confirm setpoint adjustment (master)	Channel A – Controller	9.002	2 bytes	X	X		X	
67	Confirm setpoint adjustment (master)	Channel A – Controller	6.010	1 byte	X	X		X	
68	Request heating/cooling (master)	Channel A – Controller	1.100	1 bit	X		X		

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Group objects



No.	Object function	Name	DPT	Length	Flags				
					C	R	W	T	U
73	Controller RHCC status	Channel A – Controller	22.101	2 bytes	X	X		X	
74	Controller HVAC status (master)	Channel A – Controller	5.001	1 byte	X	X		X	
75	Current HVAC operating mode	Channel A – Controller	20.102	1 byte	X	X		X	
76	Comfort heating setpoint	Channel A – Controller	9.001	2 bytes	X		X		
76	Setpoint for Comfort heating and cooling	Channel A – Controller	9.001	2 bytes	X		X		
77	Comfort cooling setpoint	Channel A – Controller	9.001	2 bytes	X		X		
78	Economy heating setpoint	Channel A – Controller	9.001	2 bytes	X		X		
79	Economy cooling setpoint	Channel A – Controller	9.001	2 bytes	X		X		
80	Standby heating setpoint	Channel A – Controller	9.001	2 bytes	X		X		
81	Standby cooling setpoint	Channel A – Controller	9.001	2 bytes	X		X		
82	Building Protection heating setpoint	Channel A – Controller	9.001	2 bytes	X		X		
83	Building Protection cooling setpoint	Channel A – Controller	9.001	2 bytes	X		X		
84	Heating control value	Channel A – Actuator	5.001	1 byte	X	X	X	X	
85	Cooling control value	Channel A – Actuator	5.001	1 byte	X	X	X	X	
86	Basic-stage heating limit temperature	Channel A – Controller	9.001	2 bytes	X		X	X	X
87	Additional-stage heating limit temperature	Channel A – Controller	9.001	2 bytes	X		X	X	X
88	Basic-stage cooling limit temperature	Channel A – Controller	9.001	2 bytes	X		X	X	X
89	Additional-stage cooling limit temperature	Channel A – Controller	9.001	2 bytes	X		X	X	X

Table 19: Group objects – overview

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Group objects

8.2 Group objects General

No.	Object function	Name	Data type	Flags
1	In operation	General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the <i>Yes</i> option has been selected for the <i>Enable group object "In operation"</i>, 1 bit parameter in the <i>General</i> parameter window.</p> <p>To monitor regularly the presence of the device on the KNX bus, an In operation telegram is sent cyclically on the bus. As long as the group object is activated, it sends a parameterizable In operation telegram. The telegram value depends on the option selected in the <i>Send</i> parameter.</p>				
3	Request status values			
<p>This group object is always enabled.</p> <p>When this group object receives a telegram with the value 0 or 1, all <i>Status</i> group objects are sent on the bus if they were parametrized with the <i>On request</i> option.</p>				
4	Status Manual operation	General	1 bit DPT 1.017	C, W
<p>The group object is enabled if the <i>Manual operation</i> parameter is set to <i>Enabled</i> in the <i>Manual operation</i> parameter window. This group object indicates whether manual operation is activated on the device.</p> <p> Note</p> <p>Only the variant VC/S 4.2.1 has manual operation</p>				
5	Enable/disable manual operation	General	1 bit DPT 1.011	C, R, T
<p>The group object is enabled if the <i>Manual operation</i> parameter is set to <i>Enabled</i> in the <i>Manual operation</i> parameter window. This group object activates or deactivates manual operation. If the device is in manual operation, manual operation is deactivated again as soon as the value 0 is received.</p> <p> Note</p> <p>Only the variant VC/S 4.2.1 has manual operation</p>				

8.3 Group objects Channel A – General

No.	Object function	Name	Data type	Flags
10	Forced operation 2 bit	Channel A – General	2 bit DPT 2.001	C, W
<p>This group object is enabled if the parameter <i>Use forced operation</i> is set to <i>Forced operation 2 bit</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object activates and deactivates forced operation.</p> <p>Telegram value</p> <p>(Bit 1 Bit 0: Status of forced operation):</p> <ul style="list-style-type: none"> • 0 0: Forced operation inactive • 0 1: Forced operation inactive • 1 0: Forced operation active, forced OFF • 1 1: Forced operation active, forced ON 				
11	Forced operation 1 bit	Channel A – General	1 bit DPT 1.002	C, W
<p>The group object is enabled if the parameter <i>Use forced operation</i> is set to <i>Forced operation 1 bit; 0 active</i> or <i>Forced operation 1 bit; 1 active</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object activates and deactivates forced operation.</p> <p>Depending on the selected option, forced operation is activated with a 1 or 0 and deactivated with a 0 or 1.</p>				
12	Error: heating/cooling receipt	Channel A – General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Monitor receipt of heating/cooling changeover group object</i> is set to <i>Activated</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object changes to the value 1 if the parametrized monitoring time was exceeded without a value being received on the group object.</p> <p>The status changes back to 0 when the group object is received again.</p> <p>The group object is sent on each state change (0 > 1 or 1 > 0).</p>				
13	Error: window contact receipt	Channel A – General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Monitor receipt of group object "Window contact"</i> is set to <i>Activated</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object changes to the value 1 if the parametrized monitoring time was exceeded without the group object being received.</p> <p>The status changes back to 0 when the group object is received again.</p> <p>The group object is sent on each state change (0 > 1 or 1 > 0).</p>				

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Group objects

No.	Object function	Name	Data type	Flags
14	Error: dew point alarm receipt	Channel A – General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Monitor receipt of group object "Dew point alarm"</i> is set to <i>Activated</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object changes to the value 1 if the parametrized monitoring time was exceeded without the group object being received.</p> <p>The status changes back to 0 when the group object is received again.</p> <p>The group object is sent on each state change (0 > 1 or 1 > 0).</p>				
15	Error: fill level alarm receipt	Channel A – General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Monitor receipt of group object "Fill level alarm"</i> is set to <i>Activated</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object changes to the value 1 if the parametrized monitoring time was exceeded without the group object being received.</p> <p>The status changes back to 0 when the group object is received again.</p> <p>The group object is sent on each state change (0 > 1 or 1 > 0).</p>				
16	Error: operating mode receipt	Channel A – General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Monitor receipt of group object "Operating mode"</i> is set to <i>Activated</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object changes to the value 1 if the parametrized monitoring time was exceeded without the group object being received.</p> <p>The status changes back to 0 when the group object is received again.</p> <p>The group object is sent on each state change (0 > 1 or 1 > 0).</p>				
16	Error: control value receipt	Channel A – General	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Monitor receipt of group object "Control value"</i> parameter is set to <i>Activated</i> in the <i>Monitoring and safety</i> parameter window. This parameter is only visible in the actuator mode.</p> <p>This group object changes to the value 1 if the parametrized monitoring time was exceeded without the group object being received.</p> <p>The status changes back to 0 when the group object is received again.</p> <p>The group object is sent on each state change (0 > 1 or 1 > 0).</p>				

8.4 Group objects Channel A – Valve A

No.	Object function	Name	Data type	Flags
17	Status byte channel	Channel A – General	1 byte Non DPT	C, R, T
<p>This group object is always enabled and indicates the current device state. It indicates whether the device is working normally or whether manual override is in effect.</p> <p>This group object maps the following information:</p> <ul style="list-style-type: none"> • Bit 0: Operating mode overridden The controller was overridden via the Operating mode override group object. This bit is always 0 in actuator mode. 0: No override - 1: Override active • Bit 1: Building Protection The device is in Building Protection mode due to dew point/fill level alarm or an open window This bit is always 0 in actuator mode. - 0: Building Protection - 1: Building Protection active • Bit 2: Forced operation Forced operation has been activated. - 0: Forced operation inactive - 1: Forced operation active • Bit 3: Manual override The valve has been overridden manually via a group object. - 0: Manual override inactive - 1: Manual override active • Bit 4: Direct operation/membrane keypad Manual operation via the device's membrane keypad is active This option is available only for devices with membrane keypad - 0: Manual operation inactive - 1: Manual operation active • Bit 5: Security Mode The device is in the Security mode, e.g. due to temperature value or control value failure, a predefined control value (Cyclical monitoring parameter, page 145) applies. <p>Note</p> <p>When in controller mode, the device is also in Security Mode after booting up, because the controller has not yet received a valid temperature value. This does not depend on whether cyclic monitoring was activated for the temperature.</p> <p>The device is operating normally when the group object value is 0 (= all individual bits = 0).</p>				

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Group objects

No.	Object function	Name	Data type	Flags
18	Status byte valve A	Channel A – Valve A	1 byte Non DPT	C, R, T
<p>This group object is enabled if <i>Deactivated</i> has not been selected for the valve output. This group object indicates the current valve status.</p> <ul style="list-style-type: none"> Bit 0: Setpoint received/control value received This bit indicates whether or not the valve has received a valid control value. <ul style="list-style-type: none"> – 0: Setpoint/control value received – 1: Setpoint/control value not received <p>Note</p> <p>This bit retains the value 0 during the entire run time if cyclical monitoring is not used (for the operating mode in controller mode or for the control value in actuator mode), because no cycle time was defined during which a new value must be received.</p> <ul style="list-style-type: none"> Bit 1: Output error The bit indicates whether there is an error on the valve output. This may be a short circuit or overload. <ul style="list-style-type: none"> – 0: No error – 1: Error at output Bit 2: Forced operation Indicates whether forced operation is active or not. <ul style="list-style-type: none"> – 0: Forced operation inactive – 1: Forced operation active Bit 3: Valve purge The bit indicates whether or not valve purge is active. <ul style="list-style-type: none"> – 0: Valve purge inactive – 1: Valve purge active 				
19	Status Valve A control value	Channel A – Valve A	1 byte DPT 5.001	C, R, T
<p>This group object is enabled if <i>Deactivated</i> has not been selected for the valve output. The group object indicates the active valve control value from 0...100 %.</p>				
20	Fault: valve output A	Channel A – Valve A	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if <i>Deactivated</i> has not been selected for the valve output. If there is a fault on the output, e.g. due to short circuit or overload, the fault LED for the valve outputs flashes. At the same time the group object sends a telegram with the value 1. The output is switched off in the event of a fault. The group object value is 0 after the fault has been rectified.</p> <p>Note</p> <p>Indication by LED only on devices with manual operation.</p>				

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21	Status Valve purge A	Channel – Valve A	1 bit DPT 1.011	C, R, T
<p>This group object is enabled via the parameter <i>Valve purge</i> in the <i>Valve output A</i> parameter window unless the <i>Deactivated</i> option is selected. The status of the valve purge is displayed via this group object.</p> <p>The status is sent depending on the option selected in the parameter <i>Send group object "Status Valve purge"</i>.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0 = Valve purge inactive • 1 = Valve purge active 				
22	Reset fault on valve output A	Channel – Valve A	1 bit DPT 1.015	C, W
<p>If there is an active fault on the valve output, a reset can be performed with the telegram value 1 via this group object.</p> <p>A reset is only successful if the fault has been repaired and is no longer present.</p> <p>The LED turns off after it is successfully reset.</p> <p>The fault can also be reset by restarting or by an ETS reset.</p> <p>The device can be restarted by disconnecting and reconnecting the bus voltage.</p> <p>Note</p> <p>Indication by LED only on devices with manual operation.</p>				
23	Activate valve purge A	Channel – Valve A	1 bit DPT 1.017	C, W
<p>This group object is enabled via the parameter <i>Valve purge</i> in the <i>Valve output A</i> parameter window unless the <i>Deactivated</i> option is selected.</p> <p>This group object can initiate a valve purge.</p>				
24	Enable/disable manual override valve A	Channel – Valve A	1 bit DPT 1.003	C, W
<p>This group object is enabled by selecting <i>Yes</i> in the parameter <i>Enable manual valve override</i>.</p> <p>If manual valve override is enabled, the value in group object <i>Override valve control value</i> is written directly to the valve output. The value specified by the controller, or specified via a group object <i>Control value</i> in actuator mode, is overridden.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Manual override disabled • 1: Manual override enabled <p>When a 0 is received on this group object, manual override is immediately blocked and the value specified by the controller, or specified via group object <i>Control value</i> in actuator mode, applies again.</p>				
25	Override valve control value A	Channel – Valve A	1 byte DPT 5.001	C, W
<p>This group object is enabled by selecting <i>Yes</i> in the parameter <i>Enable manual valve override</i>.</p> <p>This group object can send a manual valve control value for overriding the valve, e.g. for test purposes.</p> <p>The value in this group object becomes active only if the override has been enabled by the <i>Enable/disable manual override valve</i> group object. A block via this group object immediately cancels the overridden value.</p> <p>Note</p> <p>A value received in this object is only processed once. If the override is disabled again after the receipt of a value (<i>Enable/disable manual valve override group object</i>), this value is not set again if the override is activated again. A new value must be received or have been received again after the disable.</p>				

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Group objects

8.5 Group objects Channel A – Input a

No.	Object function	Name	Data type	Flags
27	Temperature	Channel A – Input a	2 bytes DPT 9.001	C, R, T
<p>This group object is enabled if the parameter <i>Input</i> is set to <i>Temperature sensor</i> in the <i>Input a</i> parameter window. This group object sends the temperature value measured at the input on the bus depending on the reaction parametrized in the parameter <i>Send temperature value</i>.</p>				
28	Error: input	Channel A – Input a	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Input</i> is set to <i>Temperature sensor</i> in the <i>Input a</i> parameter window. This group object is also enabled if the parameter <i>Connect analog room control unit to physical device input a</i> is set to <i>Yes</i> in the <i>Setpoint adjustment</i> parameter window. This group object changes its status to 1 if a fault (idling or short circuit) is found at the input and it is therefore no longer possible to send measured values. If there is not fault at the input, this group object value is 0.</p>				
29	Switch	Channel A – Input a	1 bit DPT 1.001	C, R, T
<p>This group object is enabled if the parameter <i>Input</i> is set to <i>Binary signal input</i> in the <i>Input a</i> parameter window. Depending on the selected parametrization, this group object indicates the contact position of the binary sensor connected to the input.</p>				
29	Window contact	Channel A – Input a	1 bit DPT 1.019	C, R, T
<p>This group object is enabled if the parameter <i>Input</i> is set to <i>Window contact</i> in the <i>Input a</i> parameter window. Depending on the selected parametrization, this group object indicates the state of the window contact connected to the input.</p>				
29	Dew point alarm	Channel A – Input a	1 bit DPT 1.005	C, R, T
<p>This group object is enabled if the parameter <i>Input</i> is set to <i>Dew point sensor</i> in the <i>Input a</i> parameter window. Depending on the selected parametrization, this group object indicates the state of the dew point sensor connected to the input.</p>				
29	Fill level alarm	Channel A – Input a	1 bit DPT 1.005	C, R, W
<p>This group object is enabled if the parameter <i>Input</i> is set to <i>Fill level sensor</i> in the <i>Input a</i> parameter window. Depending on the selected parametrization, this group object indicates the state of the fill level sensor connected to the input.</p>				

8.6 Group objects Channel A – Controller

No.	Object function	Name	Data type	Flags
37	Status Heating/Cooling	Channel A – Controller	1 bit DPT 1.100	C, R, T
<p>This group object is enabled if the controller was parametrized for both heating and cooling. For this purpose, <i>Deactivated</i> must not be selected for the parameters <i>Basic-stage heating</i> and <i>Basic-stage cooling</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object indicates whether the system is currently heating or cooling. Heating/cooling switchover takes place for controlled devices depending on this group object.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Cooling • 1: Heating 				
38	Status Control value Basic-stage heating	Channel A – Controller	1 byte / 1 bit DPT 5.001 / 1.001	C, R, T
<p>The group object is enabled if <i>Deactivated</i> was not selected for the parameter <i>Basic-stage heating</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object data point type depends on the selected application and the associated control.</p> <p>Output is via a 1-byte value (DPT 5.001) when the following control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 byte (0/100%) • PI continuous (0...100 %) <p>Output is via a 1-bit value (DPT 1.001) when the following control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 bit (On/Off) • PI PWM (On/Off) <p>Note</p> <p>The control type is preselected by the parameter <i>Basic-stage heating</i> in this case. A certain type of control is preset depending on the selected application. The control type is freely selectable if <i>Free configuration</i> is selected in this parameter.</p> <p>This group object outputs the control value for Basic-stage heating. Use of a physical device output (e.g. valve) for basic-stage heating:</p> <ul style="list-style-type: none"> • The group object contains the control value that the controller uses to control the output. <p>Basic-stage heating is controlled only via group object (no internal use):</p> <ul style="list-style-type: none"> • The group object sends the control value for controlling a different actuator. <p>Note</p> <p>Depending on the input group objects of the actuator, it could be necessary to change the output of the control value between 1 byte and 1 bit. This is performed via the parameters described above.</p> <p>Note</p> <p>Cyclical sending and sending after a change in the control value can be set in <i>Extended settings</i> in the <i>Temperature controller – Basic-stage heating</i> parameter window.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
39	Status Control value Additional-stage heating	Channel A – Controller	1 byte / 1 bit DPT 5.001 / 1.001	C, R, T
<p>The group object is enabled if <i>Deactivated</i> was not selected for the parameter <i>Additional-stage heating</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object data point type depends on the selected application and the associated control.</p> <p>Output is via a 1-byte value (DPT 5.001) when the following control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 byte (0/100%) • PI continuous (0...100 %) <p>Output is via a 1-bit value (DPT 1.001) when the control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 bit (On/Off) • PI PWM (On/Off) <p>Note</p> <p>The control type is preselected by the parameter <i>Additional-stage heating</i> in this case.</p> <p>A certain type of control is preset depending on the selected application. The control type is freely selectable if <i>Free configuration</i> is selected in this parameter.</p> <p>This group object outputs the control value for Additional-stage heating.</p> <p>Use of a physical device output (e.g. valve) for additional-stage heating:</p> <ul style="list-style-type: none"> • The group object contains the control value that the controller uses to control the output. <p>Additional-stage heating is controlled only via group object (no internal use):</p> <ul style="list-style-type: none"> • The group object sends the control value for controlling a different actuator. <p>Note</p> <p>Depending on the input group objects of the actuator, it could be necessary to change the output of the control value between 1 byte and 1 bit. This is performed via the parameters described above.</p> <p>Note</p> <p>Cyclical sending and sending after a change in the control value can be set in <i>Extended settings</i> in the <i>Temperature controller – Additional-stage heating</i> parameter window.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
40	Status Control value Basic-stage cooling	Channel A – Controller	1 byte / 1 bit DPT 5.001 / 1.001	C, R, T
<p>The group object is enabled if <i>Deactivated</i> was not selected for the parameter <i>Basic-stage cooling</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object data point type depends on the selected application and the associated control.</p> <p>Output is via a 1-byte value (DPT 5.001) when the following control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 byte (0/100%) • PI continuous (0...100 %) <p>Output is via a 1-bit value (DPT 1.001) when the control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 bit (On/Off) • PI PWM (On/Off) <p>Note</p> <p>The control type is preselected by the parameter <i>Basic-stage cooling</i> in this case.</p> <p>A certain type of control is preset depending on the selected application. The control type is freely selectable if <i>Free configuration</i> is selected in this parameter.</p> <p>This group object outputs the control value for Basic-stage cooling.</p> <p>Use of a physical device output (e.g. valve) for basic-stage cooling:</p> <ul style="list-style-type: none"> • The group object contains the control value that the controller uses to control the output. <p>Basic-stage cooling is controlled only via group object (no internal use):</p> <ul style="list-style-type: none"> • The group object sends the control value for controlling a different actuator. <p>Note</p> <p>Depending on the input group objects of the actuator, it could be necessary to change the output of the control value between 1 byte and 1 bit. This is performed via the parameters described above.</p> <p>Note</p> <p>Cyclical sending and sending on a change in the control value can be set in <i>Extended settings</i> in the <i>Temperature controller – Basic-stage cooling</i> parameter window.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
41	Status Control value Additional-stage cooling	Channel A – Controller	1 byte / 1 bit DPT 5.001 / 1.001	C, R, T
<p>The group object is enabled if the <i>Deactivated</i> option was not selected for the <i>Additional-stage cooling</i> parameter in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object data point type depends on the selected application and the associated control.</p> <p>Output is via a 1-byte value (DPT 5.001) when the following control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 byte (0/100%) • PI continuous (0...100 %) <p>Output is via a 1-bit value (DPT 1.001) when the control types are selected:</p> <ul style="list-style-type: none"> • 2-point 1 bit (On/Off) • PI PWM (On/Off) <p>Note</p> <p>The control type is preselected by the parameter <i>Additional-stage cooling</i> in this case.</p> <p>A certain type of control is preset depending on the selected application. The control type is freely selectable if <i>Free configuration</i> is selected in this parameter.</p> <p>This group object outputs the control value for Additional-stage cooling.</p> <p>Use of a physical device output (e.g. valve) for additional-stage cooling:</p> <ul style="list-style-type: none"> • The group object contains the control value that the controller uses to control the output. <p>Additional-stage cooling is controlled only via group object (no internal use):</p> <ul style="list-style-type: none"> • The group object sends the control value for controlling a different actuator. <p>Note</p> <p>Depending on the input group objects of the actuator, it could be necessary to change the output of the control value between 1 byte and 1 bit. This is performed via the parameters described above.</p> <p>Note</p> <p>Cyclical sending and sending after a change in the control value can be set in <i>Extended settings</i> in the <i>Temperature controller – Additional-stage cooling</i> parameter window.</p>				
43	Actual temperature	Channel A – Controller	2 bytes DPT 9.001	C, R, T
<p>This group object is always enabled in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object indicates the current actual temperature value (room temperature) that the controller is using.</p> <p>This value consists of the value(s) measured via the physical device inputs and the values received via the two group objects <i>External temperature 1</i> and <i>External temperature 2</i>.</p> <p>The values recorded via the inputs are averaged, and this mean value is then combined with the values received via the group object. A weighting factor can be defined for the combination process.</p> <p>The transmission reaction of this group object is set in the <i>Temperature controller</i> parameter window.</p> <p>Note</p> <p>This group object can also be used for display on analog room control units and visual display systems.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
44	External temperature 1	Channel A – Controller	2 bytes DPT 9.001	C, W, T, U
<p>This group object is enabled if the parameter <i>Temperature input</i> is set to <i>Via group object</i> or <i>Via physical device input and group object</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object cannot be activated in actuator mode.</p> <p>This group object can receive a temperature value via the KNX bus to be included in determining the actual temperature (room temperature).</p> <p>Note</p> <p>This group object value is evaluated after the device is restarted.</p>				
45	External temperature 2	Channel A – Controller	2 bytes DPT 9.001	C, W, T, U
<p>This group object is enabled if the parameter <i>Temperature input</i> is set to <i>Via group object</i> or <i>Via physical device input and group object</i> and the <i>Number of temperature input objects</i> is set to 2 in the <i>Application parameters</i> parameter window.</p> <p>This group object cannot be activated in actuator mode.</p> <p>This group object can receive a temperature value via the KNX bus to be included in determining the actual temperature (room temperature).</p> <p>Note</p> <p>This group object value is evaluated after the device is restarted.</p>				
46	Fault: actual temperature (master)	Channel A – Controller	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Temperature input monitoring</i> is not set to <i>Deactivated</i> in the <i>Monitoring and safety</i> parameter window.</p> <p>This group object cannot be activated in actuator mode.</p> <p>If the temperature monitoring time of the input is exceeded or if a fault is found on the monitored input, the group object changes the status to 1 to indicate the fault.</p> <p>This group object is sent on every status change.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> 0: No fault 1: Fault: actual temperature <p>Note</p> <p>If a slave is used: To indicate fault mode, this group object must be connected to the slave's group object <i>Fault: actual temperature (slave)</i>.</p>				
47	Current setpoint	Channel A – Controller	2 bytes DPT 9.001	C, R, T
<p>This group object is always visible in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object outputs the current setpoint temperature value.</p> <p>This consists of the current operating mode and the manual setpoint adjustment.</p> <p>The group object is controlled by manually changing the setpoint or by changing the operating mode, the basic setpoint temperature and the setpoint temperature for the individual operating modes.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
48	Operating mode normal (master)	Channel A – Controller	1 byte DPT 20.102	C, W, T, U
<p>This group object is always visible in controller mode. This group object is hidden in actuator mode. The group object receives the operating mode to be set as a 1-byte value. Telegram value:</p> <ul style="list-style-type: none"> • 1: Comfort • 2: Standby • 3: Economy • 4: Frost/heat protection <p>The operating mode switches between different operating states of the room:</p> <ul style="list-style-type: none"> • Comfort: Room occupied. The setpoint temperature is set to a default value perceived as pleasant by most users. • Standby: Room is briefly/recently vacant. The setpoint temperature is decreased (heating) or increased (cooling) • Economy: The room is unused for an extended period (e.g. overnight), and the temperature is markedly decreased (heating) or increased (cooling). • Frost/heat protection: The room or building is unused for an extended period (e.g. school during vacation). The setpoint temperatures are adjusted to the minimum (heating – frost protection) or maximum (cooling – heat protection) values that are still acceptable without damaging the installation. <p>Switchover between the operating modes usually takes place via a central schedule or via Intelligent Building Control.</p> <p>i Note</p> <p>The group objects and states <i>Override mode</i>, <i>Fill level alarm</i>, <i>Dew point alarm</i>, <i>Window contact</i>, <i>Request On/Off (Master)</i>, <i>Presence detector</i> and <i>Operating mode</i> (listed in decreasing priority) determine the controller's setpoint temperature in addition to manual setpoint adjustment and basic setpoint adaptation.</p> <p>i Note</p> <p>If a slave is used: To indicate the operating mode on a slave, this group object must be connected to the slave's group object <i>Operating mode (slave)</i>.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
49	Operating mode override (master)	Channel A – Controller	1 byte DPT 20.102	C, W, T, U
<p>This group object is always visible in controller mode. This group object is hidden in actuator mode. The group object receives the operating mode to be set as a 1-byte value. Telegram value:</p> <ul style="list-style-type: none"> • 0: Automatic/no override • 1: Comfort • 2: Standby • 3: Economy • 4: Frost/heat protection <p>The group object overrides the room's operating mode. The operating mode set here overrides all other priorities except for the reaction on bus voltage failure. For example, this group object can override a malfunction on a connected sensor (e.g. faulty window contact) that would actually cause the operating mode to change.</p> <p>Note</p> <p>For the device to function normally and react normally to adjustment by the user, this group object must be set to the value <i>0 Automatic/no override</i>.</p> <p>Note</p> <p>The group objects and states <i>Override mode</i>, <i>Fill level alarm</i>, <i>Dew point alarm</i>, <i>Window contact</i>, <i>Request On/Off (Master)</i>, <i>Presence detector</i> and <i>Operating mode</i> (listed in decreasing priority) determine the controller's setpoint temperature in addition to manual setpoint adjustment and basic setpoint adaptation.</p> <p>Note</p> <p>If a slave is used: To indicate the operating mode on a slave, this group object must be connected to the slave's group object <i>Operating mode overridden (slave)</i>.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
50	Window contact (master/slave)	Channel A – Controller	1 bit DPT 1.019	C, W
<p>This group object is enabled if the parameter <i>Window status input</i> is set to <i>Via group object</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can receive the window status via KNX.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Window closed • 1: Window open <p>This group object changes the device's operating mode to frost/heat protection when the "window open" information is received.</p> <p>A higher-priority group object can override the operating mode.</p> <p>Note</p> <p>The group objects and states <i>Override mode</i>, <i>Fill level alarm</i>, <i>Dew point alarm</i>, <i>Window contact</i>, <i>Request On/Off (Master)</i>, <i>Presence detector</i> and <i>Operating mode</i> (listed in decreasing priority) determine the controller's setpoint temperature in addition to manual setpoint adjustment and basic setpoint adaptation.</p> <p>Note</p> <p>If a slave is used: To indicate the operating mode on a slave, the group address associated with this group object must also be connected to the slave's group object <i>Window contact (slave)</i>.</p>				
51	Presence detector (master/slave)	Channel A – Controller	1 bit DPT 1.018	C, W
<p>This group object is always enabled in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can receive the presence status (person in the room) via KNX.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Room vacant • 1: Room occupied <p>When the presence information is received, this group object changes the device's operating mode to Comfort. When the room vacant information is received the operating mode is set back to the operating mode set via the group object <i>Operating mode</i>.</p> <p>A higher-priority group object can override the operating mode.</p> <p>Note</p> <p>If a slave is used: To indicate the operating mode on a slave, the group address associated with this group object must also be connected to the slave's group object <i>Presence detector (slave)</i>.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
52	Status Heating	Channel A – Controller	1 bit DPT 1.001	C, R, T
<p>This group object is enabled if the controller was parametrized for heating. For this purpose, <i>Deactivated</i> must not be selected for the parameter <i>Basic-stage heating</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The device uses the group object to indicate whether it is currently active in the type of operation, i.e. whether the control value is greater than 0.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Heating control value = 0 • 1: Heating control value > 0 				
53	Status Cooling	Channel A – Controller	1 bit DPT 1.001	C, R, T
<p>This group object is enabled if the controller was parametrized for cooling. For this purpose, <i>Deactivated</i> must not be selected for the parameter <i>Basic-stage cooling</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>The device uses the group object to indicate whether it is currently active in the type of operation, i.e. whether the control value is greater than 0.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Cooling control value = 0 • 1: Cooling control value > 0 				
54	Activate minimum control value (basic load)	Channel A – Controller	1 bit DPT 1.003	C, W
<p>The group object is enabled if the parameter <i>Minimum control value for basic load > 0</i> is set to <i>Activate via group object</i> in the <i>Temperature controller</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>Sending the value 1 on this group objects activates the basic load.</p> <p>The basic load is a minimum control value that must not be fallen below. The basic load value can be defined for each heating and cooling stage, but only for control types for which the control value is output with 0...100 %.</p> <p>The basic load is always activated jointly for all stages, but it is active only for the active heating or cooling type of operation in each case.</p> <p>The control value can decrease to 0 % again when the basic load is inactive.</p> <p>One sample application for the basic load is floor heating, for which a certain control value must not be fallen below to protect the installation.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Basic load inactive • 1: Basic load active 				
55	Heating/cooling changeover	Channel A – Actuator	1 bit DPT 1.100	C, W, T, U
<p>This group object is enabled if the actuator was parametrized for both heating and cooling. For this purpose, <i>Deactivated</i> must not be selected for the parameters <i>Basic-stage heating</i> and <i>Basic-stage cooling</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object changes between heating and cooling types of operation.</p> <p>Changing between heating and cooling is possible only via this group object in actuator mode.</p> <p>The respective control value is considered active and is sent to the selected output depending on this group object value.</p> <p>Incoming group objects on the inactive control value are not processed during this time.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Cooling • 1: Heating 				

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Group objects

No.	Object function	Name	Data type	Flags
56	Base setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>The group object is enabled if the parameter Setpoint specification and adjustment is set to Relative in the Setpoint manager parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can change the parametrized basic setpoint. In this way the setpoints assigned to the individual operating modes (Comfort, Standby, Economy) can be shifted.</p> <p>The relative distances between the setpoints remain the same, the Comfort value is shifted accordingly.</p> <p>Depending on the selection in the parameter Base setpoint is, the base setpoint is the Comfort heating setpoint, Comfort cooling setpoint or the Mean value between Comfort heating and cooling.</p> <p>The basic setpoint is set to the temperature value received via this group object.</p> <p>However, the value must not lie outside the value range valid for the basic setpoint (10...40 °C).</p> <p>The setpoint temperatures for frost and heat protection remain unaffected by this change.</p>				
57	Reset manual setpoint adjustment	Channel A – Controller	1 bit DPT 1.017	C, W
<p>This group object is enabled if the parameter <i>Connection of an analog room control unit to physical device input a</i> in the <i>Setpoint adjustment</i> parameter window is set to <i>No</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can reset the setpoint adjustment performed via KNX (via the group object <i>Request setpoint adjustment</i>). Activating this group object resets the setpoints to the parametrized setpoints.</p>				
58	Dew point alarm	Channel A – Controller	1 bit DPT 1.005	C, W
<p>This group object is enabled if the parameter <i>Dew point alarm input</i> is set to <i>Via group object</i> in the <i>Application parameters</i> parameter window.</p> <p>The device must be parametrized for cooling or heating mode for this parameter to be visible.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can receive the dew point status via KNX.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Dew point alarm inactive • 1: Dew point alarm active <p>When the dew point alarm information is received, this group object changes the device's operating mode to heat protection to protect the building.</p> <p>ⓘ Note</p> <p>Dew formation, which occurs when reaching the dew point temperature, can damage the building substance.</p> <p>The alarm is valid as long as the device is in the cooling type of operation or until the alarm is canceled by reception of the value 0.</p> <p>The operating mode is recalculated when changing to heating type of operation. Heating can take place as normal, because the dew point is not a problem during heating.</p> <p>A higher-priority group object can override the operating mode.</p> <p>The group objects and states <i>Override mode</i>, <i>Fill level alarm</i>, <i>Dew point alarm</i>, <i>Window contact</i>, <i>Request On/Off (Master)</i>, <i>Presence detector</i> and <i>Operating mode</i> (listed in decreasing priority) determine the controller's setpoint temperature in addition to manual setpoint adjustment and basic setpoint adaptation.</p> <p>ⓘ Note</p> <p>If a slave is used:</p> <p>To indicate the operating mode on a slave, the group address associated with this group object must also be connected to the slave's group object <i>Dew point alarm (slave)</i>.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
59	Fill level alarm	Channel A – Controller	1 bit DPT 1.005	C, W
<p>This group object is enabled if the parameter <i>Fill level sensor input</i> is set to <i>Via group object</i> in the <i>Application parameters</i> parameter window.</p> <p>The device must be parametrized for cooling or heating mode for this parameter to be visible.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can receive the fill level status via KNX.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Fill level alarm inactive • 1: Fill level alarm active <p>When the fill level alarm information is received, this group object changes the device's operating mode to heat protection to protect the building.</p> <p>Note</p> <p>The fill level alarm message means that the fill level in the condensate tray has exceeded a predefined limit. More condensate formation would cause the condensate tray to overflow and thereby damage the building. The alarm is valid as long as the device is in the cooling type of operation or until the alarm is canceled by reception of the value 0.</p> <p>The operating mode is recalculated when changing to heating type of operation. Heating can take place as normal, because the dew point is not a problem during heating.</p> <p>A higher-priority group object can override the operating mode.</p> <p>The group objects and states <i>Override mode</i>, <i>Fill level alarm</i>, <i>Dew point alarm</i>, <i>Window contact</i>, <i>Request On/Off (Master)</i>, <i>Presence detector</i> and <i>Operating mode</i> (listed in decreasing priority) determine the controller's setpoint temperature in addition to manual setpoint adjustment and basic setpoint adaptation.</p> <p>Note</p> <p>If a slave is used:</p> <p>To indicate the operating mode on a slave, the group address associated with this group object must also be connected to the slave's group object <i>Dew point alarm (slave)</i>.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
60	Outside temperature for summer compensation	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Summer compensation</i> in the <i>Setpoint management</i> parameter window is parametrized with <i>Yes</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object receives the outside temperature so that the device can check whether or not summer compensation must be active.</p> <p>For this purpose, a starting temperature from which summer compensation must become active is set using a parameter.</p> <p>For a more detailed description of summer compensation: Explanation of summer compensation.</p>				
61	Summer compensation active/inactive	Channel A – Controller	1 bit DPT 1.002	C, R, T
<p>This group object is enabled if the parameter <i>Summer compensation</i> in the <i>Setpoint management</i> parameter window is parametrized with <i>Yes</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object indicates whether summer compensation is active.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Summer compensation inactive • 1: Summer compensation active 				
62	Setpoint reached	Channel A – Controller	1 bit DPT 1.002	C, R, T
<p>This group object is always visible in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object signals on the bus that the set setpoint has been reached in Comfort mode. The function is started by activating Comfort or Presence mode.</p> <p>This group object value is 0 as long as the setpoint has not been reached.</p> <p>The state changes from 1 to 0 when switching over to another operating mode or setting a new setpoint.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Comfort setpoint not reached • 1: Comfort setpoint reached 				
63	Request On/Off (master)	Channel A – Controller	1 bit DPT 1.001	C, W
<p>This group object is always visible in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can switch the controller off. The controller changes to frost/heat protection operating mode when the value 0 is received. This causes control to switch off (except if the frost/heat protection temperatures have already been reached). All control values are set to 0.</p> <p>The device activates itself automatically when the frost/heat protection temperatures are reached.</p> <p>Control can also be reactivated by sending the value 1 on this group object.</p> <p>Additionally, the slave can use this group object to request the controller (master) to switch of control. Switch-off and non-switch-off is confirmed via the group object <i>Confirm On/Off (master)</i>.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 0: Deactivate control (Off) • 1: Activate control (On) <p> Note</p> <p>If a slave is used: This group object must be connected to the corresponding group object of the slave for master/slave operation to function.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
64	Confirm On/Off (master)	Channel A – Controller	1 bit DPT 1.001	C, R, T
<p>This group object is always visible in controller mode. This group object is hidden in actuator mode. The device signals whether control is active (On) or inactive (Off) using this group object. Telegram value:</p> <ul style="list-style-type: none"> • 0: Control active (On) • 1: Control inactive (Off) 				
65	Setpoint display (master)	Channel A – Controller	2 bytes DPT 9.002	C, R, T
<p>This group object is always visible in controller mode. This group object is hidden in actuator mode. This group object synchronizes between the controller (master) and the slave. This group object must be connected to the slave's group object of the same name for this purpose. This group object transmits the setpoint to be displayed.</p>				
66	Request setpoint adjustment (master)	Channel A – Controller	2 bytes / 2 bytes / 1 byte DPT 9.001 / 9.002 / 6.010	C, W
<p>This group object is enabled if the parameter <i>Connection of an analog room control unit to physical device input a</i> in the <i>Setpoint adjustment</i> parameter window is set to <i>No</i>. This group object is hidden in actuator mode. The group object transmits a setpoint change between the controller (master) and the slave or any other device. Using this group object a setpoint adjustment can be made within the limits allowed (see parameter Max. manual increase in heating mode via KNX, page 166, Max. manual reduction in heating mode via KNX, page 166, Max. manual increase in cooling mode via KNX, page 167, Max. manual reduction in cooling mode via KNX, page 167). The group object's data point type depends on the data point type selected in the parameter <i>Manual setpoint adjustment via KNX with</i> in the <i>Setpoint adjustment</i> parameter window. The type of DPTs used can be selected to ensure usability of setpoint adjustment with other devices as well. DPT 6.010 must be selected for existing systems and for ABB devices that do not use the current controller version (ClimaECO master/slave concept) yet. With this method, the temperature is converted to an integer value before it is sent and the adjustment is transmitted in steps. With newer devices, the DPTs 9.001 or 9.002 can be selected for the purpose of absolute or relative setpoint adjustment via temperature values. The setpoint temperature (e.g. 22 °C) or the change in the setpoint temperature (e.g. +2 °C) must be sent to the group object for this purpose.</p> <p>Note</p> <p>All ABB devices still support adjustment via DPT 6.010.</p> <p>If the required temperature is outside the permitted setpoint range, the maximum/minimum possible value will be set. For this purpose, the master device checks the received value and returns the set value via the group object <i>Confirm setpoint adjustment (master)</i>.</p> <p>Note</p> <p>If a slave is used: This group object must be connected to the corresponding group object of the slave for master/slave operation to function.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
66	Request setpoint adjustment (slave)	Channel A – Actuator	2 bytes / 1 byte DPT 9.002 / 6.010	C, W
<p>This group object is enabled if the device was parametrized for actuator mode and the parameter <i>Connection of an analog room control unit to physical device input a</i> is set to <i>Yes</i> in the <i>Setpoint adjustment</i> parameter window.</p> <p>The group object sends a setpoint change of the analog room control unit connected to the actuator to the controller.</p> <p>The group object's data point type depends on the data point type selected in the parameter <i>Manual setpoint adjustment via KNX</i> with in the <i>Setpoint adjustment</i> parameter window.</p> <p>The type of DPT used can be selected to ensure usability of setpoint adjustment with other devices as well.</p> <p>DPT 6.010 must be selected for the existing systems and for ABB devices that do not use the current controller version (ClimaECO master/slave concept) yet. With this method, the temperature is converted to an integer value before it is sent and the adjustment is transmitted in steps.</p> <p>With newer devices, the DPTs 9.001 or 9.002 can be selected for the purpose of absolute or relative setpoint adjustment via temperature values. The setpoint temperature (e.g. 22 °C) or the change in the setpoint temperature (e.g. +2 °C) must be sent to the group object for this purpose.</p> <p>Note</p> <p>All ABB devices still support adjustment via DPT 6.010.</p>				
67	Confirm setpoint adjustment (master)	Channel A – Controller	2 bytes / 2 bytes / 1 byte DPT 9.001 / 9.002 / 6.010	C, R, T
<p>This group object is enabled if the parameter <i>Connection of an analog room control unit to physical device input a</i> in the <i>Setpoint adjustment</i> parameter window is set to <i>No</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object transmits a setpoint change between the controller (master) and the slave or any other device. This group object confirms a setpoint adjustment requested via the group object <i>Request setpoint adjustment</i> so that the new value becomes known to the requesting device as well.</p> <p>Refer to group object 95 for the various data point types. The data point type of this group object depends on the same settings.</p> <p>Note</p> <p>If a slave is used: This group object must be connected to the corresponding group object of the slave for master/slave operation to function.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
68	Request heating/cooling (master)	Channel A – Controller	1 bit DPT 1.100	C, W
<p>This group object is visible in controller mode only if the parameter <i>Heating/cooling changeover</i> is set to <i>Via slave and via group object</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object synchronizes between the controller (master) and the slave.</p> <p>This group object must be connected to the slave's group object of the same name for this purpose.</p> <p>The group object synchronizes the heating/cooling status between the controller (master) and the slave.</p>				
73	Controller RHCC status	Channel A – Controller	2 bytes DPT 22.101	C, R, T
<p>This group object is always visible in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>The group object outputs the heating/cooling type of operation, active/inactive operation, frost and heat alarm, as well as any malfunction (failure of actual temperature measurement) according to the specification for the RHCC status (Room Heating Cooling Controller).</p> <p>Note</p> <p>The status of the object is sent only after receipt of a valid actual temperature.</p>				
74	Controller HVAC status (master)	Channel A – Controller	1 byte DPT 5.001	C, R, T
<p>This group object is always visible in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object must be connected to the slave's group object of the same name. The group object synchronizes between the controller (master) and the slave.</p> <p>The group object sends the actual operating mode, the type of operation heating/cooling, active/inactive operation, frost alarm and the dew point alarm to the slave.</p> <p>The group object is used to synchronize the heating/cooling status between the controller (master) and the slave.</p> <p>Note</p> <p>The status of the object is sent only after receipt of a valid actual temperature.</p>				
75	Current HVAC operating mode	Channel A – Controller	1 bit DPT 20.102	C, R, T
<p>This group object is always visible in controller mode.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object outputs the currently valid HVAC operating mode after evaluation of all priorities and influences.</p> <p>The group object indicates the current controller operating mode.</p> <p>The group object sends the current operating mode as a 1-byte value.</p> <p>Telegram value:</p> <ul style="list-style-type: none"> • 1: Comfort • 2: Standby • 3: Economy • 4: Frost/heat protection 				

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Group objects

No.	Object function	Name	Data type	Flags
76	Comfort heating setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> is set to <i>Absolute</i> and the parameter <i>Comfort heating setpoint = Comfort cooling setpoint</i> is set to <i>No</i> in the <i>Setpoint manager</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Comfort heating. The value received via this group object is permanently stored and serves as the new Comfort heating setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p>				
76	Setpoint for Comfort heating and cooling	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> is set to <i>Absolute</i> and the parameter <i>Comfort heating setpoint = Comfort cooling setpoint</i> is set to <i>Yes</i> in the <i>Setpoint manager</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Comfort heating and cooling. The value received via this group object is permanently stored and serves as the new Comfort heating and cooling setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p>				
77	Comfort cooling setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> is set to <i>Absolute</i> and the parameter <i>Comfort heating setpoint = Comfort cooling setpoint</i> is set to <i>no</i> in the <i>Setpoint manager</i> parameter window.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Comfort cooling. The value received via this group object is permanently stored and serves as the new Comfort cooling setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p>				
78	Economy heating setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> in the <i>Setpoint manager</i> parameter window is parametrized with <i>Absolute</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Economy heating. The value received via this group object is permanently stored and serves as the new Economy heating setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p> <p>The value must be less than the value for comfort heating. If a value is not below this value, the device will automatically classify it below this value.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
79	Economy cooling setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> in the <i>Setpoint manager</i> parameter window is parametrized with <i>Absolute</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Economy cooling. The value received via this group object is permanently stored and serves as the new Economy cooling setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p> <p>The value must be greater than the value for comfort cooling. If a value is not below this value, the device will automatically classify it below this value.</p>				
80	Standby heating setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> in the <i>Setpoint manager</i> parameter window is parametrized with <i>Absolute</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Standby heating. The value received via this group object is permanently stored and serves as the new Standby heating setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p> <p>The value must be less than the value for comfort heating. If a value is not below this value, the device will automatically classify it below this value.</p>				
81	Standby cooling setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> in the <i>Setpoint manager</i> parameter window is parametrized with <i>Absolute</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for Standby cooling. The value received via this group object is permanently stored and serves as the new Standby cooling setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 10...40 °C. A value outside this range is limited to this range.</p> <p>The value must be greater than the value for comfort cooling. If a value is not below this value, the device will automatically classify it below this value.</p>				
82	Building Protection heating setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is enabled if the parameter <i>Setpoint specification and adjustment</i> in the <i>Setpoint manager</i> parameter window is parametrized with <i>Absolute</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for building protection heating (frost protection). The value received via this group object is permanently stored and serves as the new building protection heating setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 5...15 °C. A value outside this range is limited to this range.</p> <p>The value must be less than the value for comfort heating. If a value is not below this value, the device will automatically classify it below this value.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
83	Building Protection cooling setpoint	Channel A – Controller	2 bytes DPT 9.001	C, W
<p>This group object is hidden in actuator mode.</p> <p>This group object can directly influence and overwrite the stored setpoint for building protection cooling (heat protection). The value received via this group object is permanently stored and serves as the new building protection cooling setpoint. Manual setpoint adjustment acts on this setpoint.</p> <p>The value must lie in the valid value range of 27...45 °C. A value outside this range is limited to this range.</p> <p>The value must be greater than the value for comfort cooling. If a value is not below this value, the device will automatically classify it below this value.</p>				
84	Heating control value	Channel A – Actuator	1 byte DPT 5.001	C, W, T, U
<p>This group object is enabled if, in actuator mode, the parameter <i>Basic-stage heating</i> is set to <i>Activated</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in controller mode.</p> <p>This group object receives the control value for heating in actuator mode.</p> <p>This control value is issued on the selected output when heating operation is active.</p>				
85	Cooling control value	Channel A – Actuator	1 byte DPT 5.001	C, W, T, U
<p>This group object is enabled if, in actuator mode, the parameter <i>Basic-stage cooling</i> is set to <i>Activated</i> in the <i>Application parameters</i> parameter window.</p> <p>This group object is hidden in controller mode.</p> <p>This group object receives the control value for cooling in actuator mode.</p> <p>This control value is issued on the selected output when cooling operation is active.</p>				
86	Basic-stage heating limit temperature	Channel A – Controller	2 bytes DPT 9.001	C, W, T, U
<p>This group object is enabled if the parameter <i>Activate temperature limitation</i> is set to <i>Yes</i> in the <i>Temperature controller – Basic-stage heating</i> parameter window and the parameter <i>Input for limit temperature sensor</i> is set to <i>Via group object</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object receives the limit temperature for Basic-stage heating.</p> <p>The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the parameter <i>Limit temperature</i> is exceeded.</p>				
87	Additional-stage heating limit temperature	Channel A – Controller	2 bytes DPT 9.001	C, W, T, U
<p>This group object is enabled if the parameter <i>Activate temperature limitation</i> is set to <i>Yes</i> in the <i>Temperature controller – Additional-stage heating</i> parameter window and the parameter <i>Input for limit temperature sensor</i> is set to <i>Via group object</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object receives the limit temperature for Additional-stage heating.</p> <p>The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the parameter <i>Limit temperature</i> is exceeded.</p>				

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Group objects

No.	Object function	Name	Data type	Flags
88	Basic-stage cooling limit temperature	Channel A – Controller	2 bytes DPT 9.001	C, W, T, U
<p>This group object is enabled if the parameter <i>Activate temperature limitation</i> is set to <i>Yes</i> in the <i>Temperature controller – Basic-stage cooling</i> parameter window and the parameter <i>Input for limit temperature sensor</i> is set to <i>Via group object</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object receives the limit temperature for Basic-stage cooling.</p> <p>The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the parameter <i>Limit temperature</i> is fallen below.</p>				
89	Additional-stage cooling limit temperature	Channel A – Controller	2 bytes DPT 9.001	C, W, T, U
<p>This group object is enabled if the parameter <i>Activate temperature limitation</i> is set to <i>Yes</i> in the <i>Temperature controller – Additional-stage cooling</i> parameter window and the parameter <i>Input for limit temperature sensor</i> is set to <i>Via group object</i>.</p> <p>This group object is hidden in actuator mode.</p> <p>This group object receives the limit temperature for Additional-stage cooling.</p> <p>The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the parameter <i>Limit temperature</i> is fallen below.</p>				

9 Operation

9.1 Manual operation

Special device functions can be undertaken using the operating keys on the membrane keypad.

Operation via the membrane keypad is available and functions identically for all devices VC/S 4.2.1.

For a complete overview of the control elements, see Product overview.

Manual operation facilitates on-site operation of the device. Manual operation is enabled as standard and can be switched on and off using the *Manual operation* button.

Manual operation can be permanently deactivated in the ETS.

The group object *Status Manual operation* indicates whether manual operation is enabled/disabled.

Switching on manual operation:

- ▶ Press and hold the *Manual operation* button for 5 seconds until the yellow LED illuminates continuously.

Switching off manual operation:

- ▶ Briefly press the *Manual operation* button.

⇒ The yellow LED goes off.

The device is in KNX operation after connection to the KNX, bus voltage recovery, ETS download or ETS reset. The LED is off.

Note

The LED remains off if manual operation is disabled in general or disabled via the *Enable/disable manual operation* group object.

A switchover from *KNX operation* to the *Manual operation* mode does not occur.

Note

The control values calculated by the controller or received via KNX are overridden and ignored during manual operation.

Changes due to manual operation are valid only while manual operation is active.

Manual operation cannot override forced operation or a safety state of the device.

Any override of the individual functions becomes effective only when they are changed for the first time by pressing a button. Until then, the outputs continue to react to values received from the controller or via KNX.

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Maintenance and cleaning

10 Maintenance and cleaning

10.1 Maintenance

The device is maintenance-free. In the event of damage, e.g. during transport and/or storage, repairs are not allowed to be made.

10.2 Cleaning

Disconnect the device from the supply of electrical power before cleaning. If devices become dirty, they can be cleaned using a dry cloth or a cloth dampened with a soapy solution. Corrosive agents or solutions must never be used.

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Disassembly and disposal

11 Disassembly and disposal

11.1 Removal

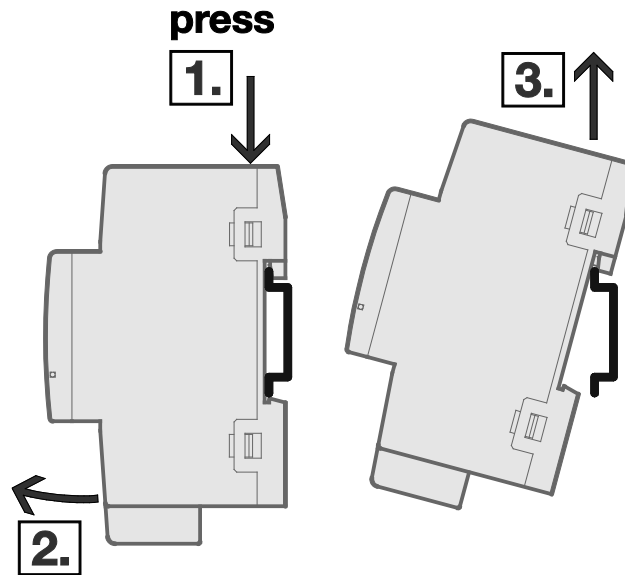


Fig. 27: Removal from the DIN rail

1. Press on the top of the device.
2. Release the bottom of the device from the DIN rail.
3. Lift the device up and off the DIN rail.

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Disassembly and disposal

11.2 Environment

Consider environmental protection.

Used electrical and electronic devices must not be disposed of as domestic waste.



The device contains valuable resources that can be recycled. Therefore, please bring the device to a suitable recycling center. All packaging materials and devices are provided with markings and test seals for proper disposal. Always dispose of packaging material and electrical devices or their components at collection points or disposal companies authorized for this purpose. The products comply with the statutory requirements, particularly the law on electrical and electronic equipment and the REACH regulation. (EU directive 2012/19/EU WEEE and 2011/65/EU RoHS) (EU REACH regulation and the law implementing the regulation (EC) no.1907/2006)

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Planning and application

12 Planning and application

12.1 Introduction

In this chapter you will find some tips and application examples for practical use of the device.

Application examples and practical tips on the topic of temperature control, valve drives, characteristic curve adjustment etc., can be found in the Application manual Heating/Ventilation/Air-Conditioning at www.abb.com/knx.

12.2 Valve drives, valves and controller

12.2.1 Electromotor Valve Drives

Electromotor Valve Drives open and close valves via a small electric motor. Electromotor Valve Drives are offered as proportional or as 2 or 3-way valve drives.

Proportional valve drives are controlled via an analog signal, e.g. 0...10 V. 2 or 3-point valve drives are controlled via switching of the supply voltage.

2-point valve drives are controlled via the values Open and Close. The valve knows only the states "Open" and "Closed". 2-point valves are controlled via a 2-point control or pulse width modulation (PWM).

3-point valve drives are connected via three connecting cables. The opening and closing lines are connected to terminals A and B. Using 3-point valve drives, the valve can be opened by any desired percentage and this position can be retained without further energy expenditure. If the valve does not move, no voltage is applied to the motor.

The control usually used in most cases is continuous control.

The VC/S can actuate electromotor valve drives only via PWM because there is only one valve output available on each channel.

12.2.2 Electrothermal Valve Drives

Electrothermal Valve Drives are adjusted due to heat expansion of a material caused by a flow of electric current. Electrothermal Valve Drives are controlled by pulse width modulation or two-point control.

Electrothermal Valve Drives are offered in the de-energized closed and de-energized open variants. Depending on the variant, the valve is opened when voltage is applied and closed when no voltage is applied, or vice versa.

Electrothermal Valve Drives are connected via two connection cables to the device.

12.2.3 Compatibility with different drive types

For information about the compatibility of individual device variants with the respective drive types, see [Functional overview, page 27](#).

12.2.4 Control types

The following control types are commonly used for the control of valves in heating, air-conditioning and ventilation applications:

- Continuous control
- Pulse width modulation (PWM)
- 2-point control

12.3 Priorities

12.3.1 Controller channel

Valve

- a) Bus voltage failure
- b) Operating mode overridden
- c) Safety (dew point or filling level sensor or window contact)
- d) Forced operation
- e) i-bus Tool
- f) Direct operation via membrane keypad (only VC/S 4.2.1)
- g) Manual valve override
- h) Normal operation of control (operating mode normal/presence)
- i) Bus voltage recovery

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12.3.2

Actuator channel

Valve

- a) Bus voltage failure
- b) Forced operation
- c) i-bus Tool
- d) Direct operation via membrane keypad (only VC/S 4.2.1)
- e) Manual valve override
- f) Control value normal operation
- g) Bus voltage recovery

12.4 Explanation of controller function

The various control types possible with this device are described below.

12.4.1 2-point controller

A 2-point controller possesses two output states (On/Off) that change depending on the actual value. If the actual value is higher than the parametrized setpoint, the associated control value is 0.

If the actual value is less than the parametrized setpoint, the associated control value is 1.

Application for a 2-point controller:

- As the control value oscillates only between the two On and Off states, the controller can control an electrothermal valve connected to a switch actuator or a valve drive actuator.
- Control of an electric heater via a relay output, as a distinction is also made only between On and Off with this heater.



CAUTION –

The number of relay operating cycles must be observed. The relay switches each time the control value changes. The maximum number of relay operating cycles, particularly under load, is limited. This can quickly exceed the relay's service life, especially when controlling an electric heater (which often represents high loads).

Example:

If the control value changes only ten times per day, this already amounts to 3,650 operating cycles per year.

If the control value changes 50 times per day, this already amounts to 18,250 operating cycles per year.

A 2-point controller can quickly compensate for control deviations in case of large changes in the command variable (setpoint temperature). However, it never settles and it tends to lead to system overshoot (exceeding the setpoint temperature) in this process. To avoid overshooting the initial states, 2-point controllers always feature integrated hysteresis that fluctuates around the setpoint.

The function of hysteresis is to allow the control value to switch only when the control value is exceeded/fallen below by a certain value. This reduces number of control value changes and therefore leads to smoother control.

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Correctly adjusting the hysteresis can also limit the number of relay operating cycles.

Example:

If the heating-operation setpoint is 21 °C and the hysteresis is 1.0 K, the controller will switch on when the temperature falls below 20.5 °C and will switch off again when the temperature exceeds 21.5 °C.

The *Hysteresis* parameter should be set based on the following factors:

- How quickly the heater can heat the room or how quickly the cooler can cool it
- How people in the room perceive the temperature.

Note

The selected hysteresis should not be too small, because a switching valve drive would constantly open and close in this case.

The selected hysteresis should not be too large, because the temperature fluctuations in the room would be too large in this case.

12.4.1.1 Pulse width modulation (PWM)

With pulse width modulation, the valve is operated as with 2-point control exclusively in the positions fully opened and fully closed. In contrast to 2-point control, the position is not controlled via limit values, but rather by calculated control values similar to continuous control.

The control value is fixed for a timed cycle and recalculated in the duration for valve opening. The control value 20% at a cycle time of 15 minutes, for example, will be converted to a valve opening time of three minutes. The control value 50% results in a valve opening time of 7.5 minutes.

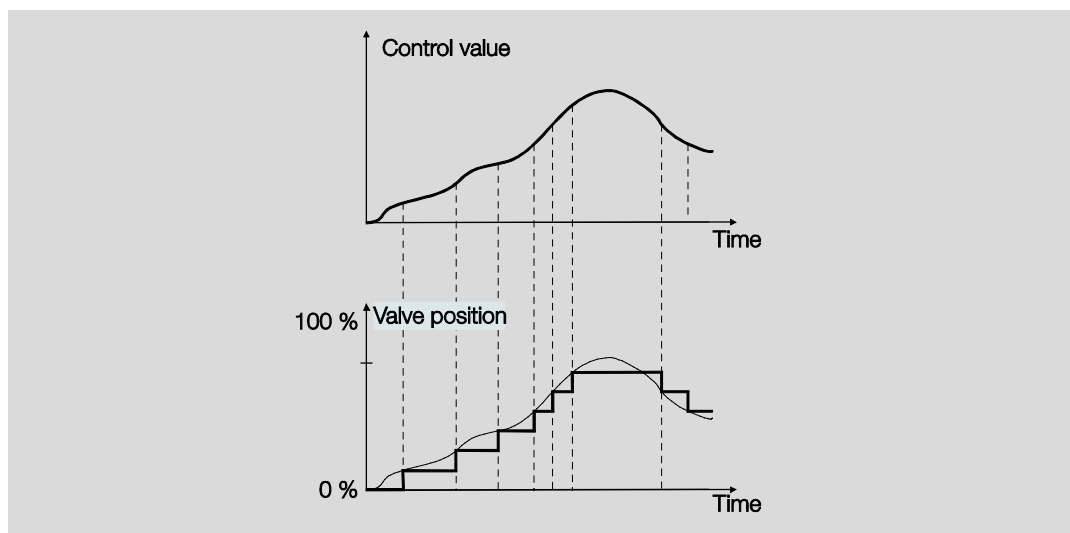


Fig. 28: Pulse width modulation (PWM)

With pulse width modulation, a relatively accurate setting of the temperature can be achieved without any resulting overshoots. Simple valve drives can be used. The positioning frequency of the valve drive is relatively high.

Pulse width modulation can be used with the device in conjunction with Electromotor or Electrothermal Valve Drives.

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12.4.1.1.1 Example

When the device receives a 1-byte control value (continuous control) as an input signal, this value together with the parameterized cycle time from a PWM calculation is converted into a signal for 2-point control (ON-OFF-ON).

With PWM control, the received control value (0...100 %) calculated in the control algorithm is converted to a pulse width modulation. The conversion is based on a constant cycle time. If the device receives a control value of 20 % and the cycle time is 15 minutes, the valve will be opened for 3 minutes (20 % of 15 minutes) and closed for 12 minutes (80 % of 15 minutes).

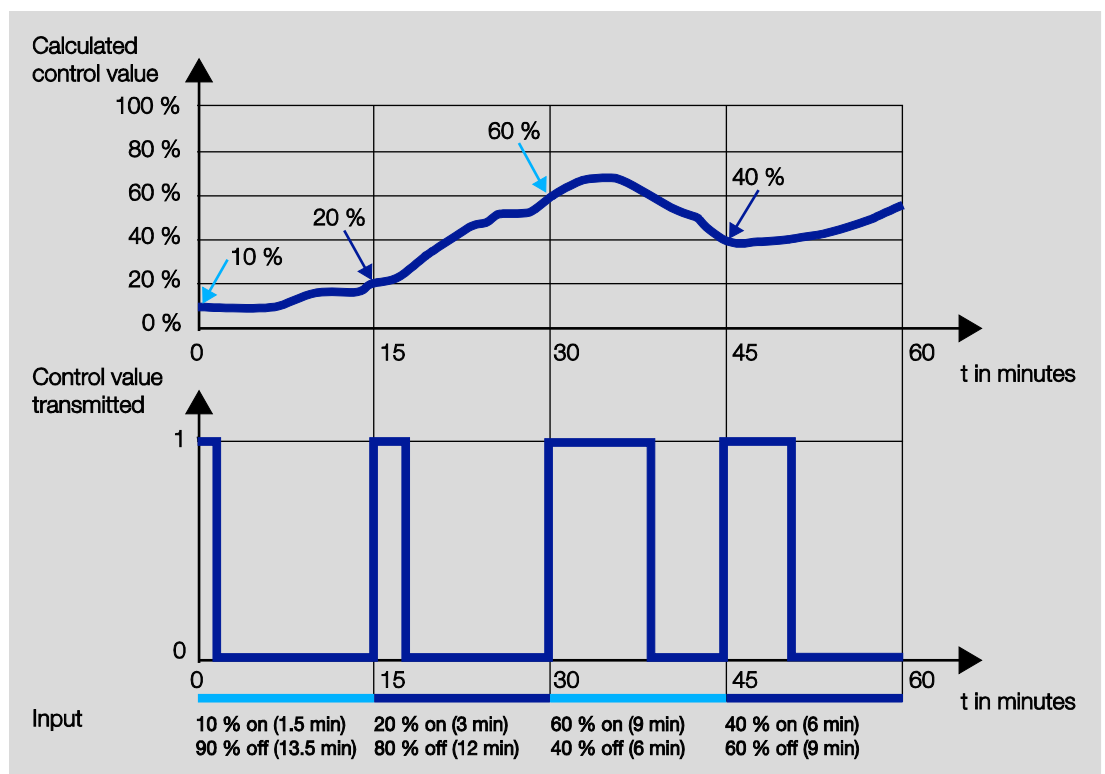


Fig. 29: Example

12.4.1.1.2

Calculation

With pulse width modulation, control is implemented by a variable mark-space ratio.

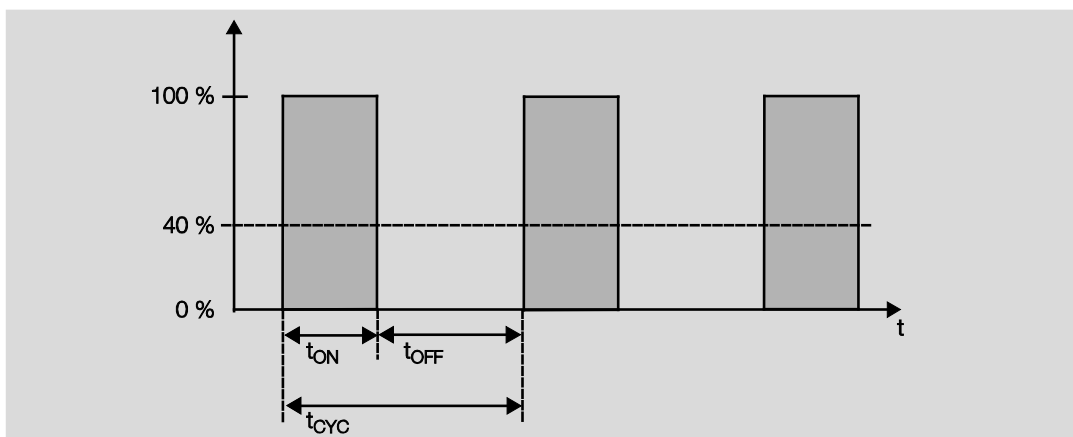


Fig. 30: Calculation

During the time t_{ON} the valve is opened and during the time t_{OFF} it is closed.

On account of $t_{ON} = 0.4 \times t_{CYC}$ the valve is set to about 40 %. t_{CYC} is the so-called PWM cycle time for continuous control.

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12.4.2 PI controller (continuous)

12.4.2.1 Continuous control

With continuous control, a control value is calculated based on the setpoint temperature and the actual temperature, and is used to optimally set the temperature. The valve is brought to a position corresponding to the calculated control value. With this method the valve can be fully opened, fully closed and even positioned in every intermediate position.

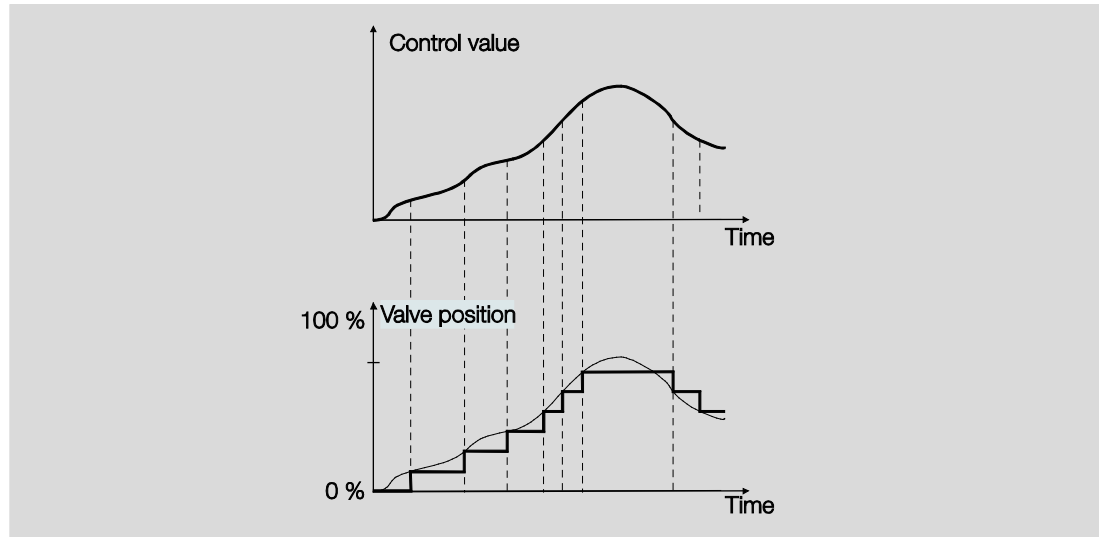


Fig. 31: Continuous control

Continuous control is the most precise form of temperature control. At the same time, the positioning frequency of the valve drive can be kept low. Continuous control can be implemented with the device for Electromotor 3-Point Valve Drives. This is implemented via 1-byte control.

i Note

What is 1-byte control?

For 1-byte control, a value of 0...255 (corresponds to 0%...100 %) is preset by the room thermostat. The valve is fully closed at 0 % and fully open at 100 %, for example.

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12.4.3 PI controller (PWM)

The PI controller (PWM) basically operates exactly like the PI controller (continuous). The only difference is that the control value of a PI controller (PWM) is converted to a 1 bit PWM switch-on/switch-off ratio before it is output.

If a control value of 70 % is output and the preset cycle time is 10 minutes, the switch-on time will be 7 minutes and the switch-off time will be 3 minutes.

Using the PI controller (PWM) transfers the advantages offered by continuous control (precise attainment of the setpoint temperature) to drives that are designed only for switch-on/switch-off signals (e.g. electrothermal drives).

The "PWM control value cycle time" is adjustable to optimize the control characteristics of the heating or cooling system. The type of heating or cooling and the valve drive used must be taken into account.

- **Electrothermal Valve Drive:**
Depending on the manufacturer, it takes around 2 to 3 minutes to open a control valve with electrothermal drive. A cycle time of 15 minutes has proven useful in practice. Other times must be correspondingly adapted to the heating/cooling system.
- **Floor heating:**
The time constant of a floor heater is very large (sluggish). A cycle time of 20 minutes suffices.
- **Water heating:**
A cycle time of 15 minutes produces excellent control results.
- **Electric convector heating:**
Depending on the electric heating and the room situation, cycle times between 10 and 15 minutes are recommended.

13 Appendix

13.1 Scope of delivery

The valve drive controller is supplied together with the following components. The delivered items should be checked against the list below:

- 1 x valve drive controller, VC/S 4.1.1, MDRC or
- 1x valve drive controller, VC/S 4.2.1, manual operation, MDRC
- 1 x installation and operating instructions
- 1 x bus connection terminal (red/black)
- 1x KNX connection cover cap

13.2 Status byte Valve

Bit No.	7	6	5	4	3	2	1	0
8-bit value	Not assigned	Not assigned	Not assigned	Not assigned	Valve purge	Forced operation	Output error	Setpoint received
0	0							
1	1							X
2	2						X	
3	3						X	X
4	4							
5	5					X		X
6	6					X	X	
7	7					X	X	X
8	8				X			
9	9				X			X
10	0A				X		X	
11	0B				X		X	X
12	0C				X	X		
13	0D				X	X		X
14	0E				X	X	X	
15	0F				X	X	X	X
16	10			X				
17	11			X				X
18	12			X			X	
19	13			X			X	X
20	14			X		X		
21	15			X		X		X
22	16			X		X	X	
23	17			X		X	X	X
24	18			X	X			
25	19			X	X			X
26	1A			X	X		X	
27	1B			X	X		X	X
28	1C			X	X	X		
29	1D			X	X	X		X
30	1E			X	X	X	X	
31	1F			X	X	X	X	X
32	20		X					
33	21		X					X
34	22		X				X	
35	23		X				X	X
36	24		X			X		
37	25		X			X	X	
38	26		X			X	X	X
39	27		X			X	X	X
40	28		X		X			
41	29		X		X			X
42	2A		X		X		X	
43	2B		X		X		X	X
44	2C		X		X	X		
45	2D		X		X	X		X
46	2E		X		X	X	X	
47	2F		X		X	X	X	X
48	30		X	X				
49	31		X	X				X
50	32		X	X			X	
51	33		X	X			X	X
52	34		X	X		X		
53	35		X	X		X		X
54	36		X	X		X	X	
55	37		X	X		X	X	X
56	38		X	X	X			
57	39		X	X	X			X
58	3A		X	X	X		X	
59	3B		X	X	X		X	X
60	3C		X	X	X	X		
61	3D		X	X	X	X		X
62	3E		X	X	X	X	X	
63	3F		X	X	X	X	X	X
64	40		X					
65	41		X					X
66	42		X				X	
67	43		X				X	X
68	44		X			X		
69	45		X			X		X
70	46		X			X	X	
71	47		X			X	X	X
72	48		X			X		
73	49		X		X			X
74	4A		X		X		X	
75	4B		X		X		X	X
76	4C		X		X		X	
77	4D		X		X	X		X
78	4E		X		X	X	X	
79	4F		X		X	X	X	X
80	50		X		X			
81	51		X		X			X
82	52		X		X		X	
83	53		X		X		X	X
84	54		X		X		X	
85	55		X		X		X	X

Bit No.	7	6	5	4	3	2	1	0
8-bit value	Not assigned	Not assigned	Not assigned	Not assigned	Valve purge	Forced operation	Output error	Setpoint received
86	56		X					
87	57		X				X	X
88	58		X		X		X	X
89	59		X		X			X
90	5A		X		X			
91	5B		X		X		X	X
92	5C		X		X	X		
93	5D		X		X	X	X	X
94	5E		X		X	X	X	X
95	5F		X		X	X	X	X
96	60		X	X				
97	61		X	X				X
98	62		X	X			X	
99	63		X	X			X	X
100	64		X	X		X		
101	65		X	X		X		X
102	66		X	X		X	X	
103	67		X	X		X	X	X
104	68		X	X		X		
105	69		X	X		X		X
106	6A		X	X		X	X	
107	6B		X	X		X	X	X
108	6C		X	X		X	X	
109	6D		X	X		X	X	X
110	6E		X	X		X	X	X
111	6F		X	X		X	X	X
112	70		X	X	X			
113	71		X	X	X			X
114	72		X	X	X		X	
115	73		X	X	X		X	X
116	74		X	X	X		X	
117	75		X	X	X		X	X
118	76		X	X	X		X	X
119	77		X	X	X		X	X
120	78		X	X	X	X		
121	79		X	X	X	X		X
122	7A		X	X	X	X	X	
123	7B		X	X	X	X	X	X
124	7C		X	X	X	X	X	
125	7D		X	X	X	X	X	X
126	7E		X	X	X	X	X	X
127	7F		X	X	X	X	X	X
128	80	X						
129	81	X						X
130	82	X					X	
131	83	X					X	X
132	84	X					X	
133	85	X					X	X
134	86	X					X	X
135	87	X					X	X
136	88	X				X		
137	89	X				X		X
138	8A	X				X	X	
139	8B	X				X	X	X
140	8C	X				X	X	X
141	8D	X				X	X	X
142	8E	X				X	X	X
143	8F	X				X	X	X
144	90	X				X		
145	91	X			X			X
146	92	X			X		X	
147	93	X			X		X	X
148	94	X			X		X	X
149	95	X			X		X	X
150	96	X			X		X	X
151	97	X			X		X	X
152	98	X			X	X		
153	99	X			X	X		X
154	9A	X			X	X		X
155	9B	X			X	X		X
156	9C	X			X	X	X	
157	9D	X			X	X	X	X
158	9E	X			X	X	X	X
159	9F	X			X	X	X	X
160	A0	X			X			
161	A1	X			X			X
162	A2	X			X			X
163	A3	X			X			X
164	A4	X			X			X
165	A5	X			X		X	X
166	A6	X			X		X	X
167	A7	X			X		X	X
168	A8	X			X		X	X
169	A9	X			X		X	X
170	AA	X			X		X	X
171	AB	X			X		X	X

Bit No.	7	6	5	4	3	2	1	0
8-bit value	Not assigned	Not assigned	Not assigned	Not assigned	Valve purge	Forced operation	Output error	Setpoint received
172	AC	X			X	X		
173	AD	X			X	X		X
174	AE	X			X	X	X	
175	AF	X			X	X	X	X
176	B0	X		X	X			
177	B1	X		X	X			X
178	B2	X		X	X			X
179	B3	X		X	X			X
180	B4	X		X	X	X		X
181	B5	X		X	X	X		X
182	B6	X		X	X	X	X	
183	B7	X		X	X	X	X	X
184	B8	X		X	X	X		
185	B9	X		X	X	X		X
186	BA	X		X	X	X	X	
187	BB	X		X	X	X	X	X
188	BC	X		X	X	X	X	
189	BD	X		X	X	X	X	X
190	BE	X		X	X	X	X	X
191	BF	X		X	X	X	X	X
192	C0	X	X					
193	C1	X	X					X
194	C2	X	X					X
195	C3	X	X					X
196	C4	X	X			X		
197	C5	X	X			X		X
198	C6	X	X			X	X	
199	C7	X	X			X	X	X
200	C8	X	X			X		
201	C9	X	X			X		X
202	CA	X	X			X		X
203	CB	X	X			X		X
204	CC	X	X			X	X	
205	CD	X	X			X	X	X
206	CE	X	X			X	X	X
207	CF	X	X			X	X	X
208	D0	X	X		X			
209	D1	X	X		X			X
210	D2	X	X		X			X
211	D3	X	X		X			X
212	D4	X	X		X		X	
213	D5	X	X		X		X	X
214	D6	X	X		X		X	X
215	D7	X	X		X		X	X
216	D8	X	X		X	X		
217	D9	X	X		X	X		X
218	DA	X	X		X	X		X
219	DB	X	X		X	X		X
220	d.c.	X	X		X	X	X	
221	DD	X	X		X	X	X	X
222	EN	X	X		X	X	X	X
223	DF	X	X		X	X	X	X
224	E0	X	X	X				
225	E1	X	X	X				X
226	E2	X	X	X				X
227	E3	X	X	X				X
228	E4	X	X	X			X	
229	E5	X						

13.3 Status byte channel

Bit No.	7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	Not assigned	Not assigned	Security Mode	Direct operation via membrane keypad	Manual valve override	Forced operation	Building protection Dew point/Fill level/Window	Operating mode overridden
0	0							X	
1	1							X	
2	2						X	X	
3	3						X	X	
4	4					X		X	
5	5					X		X	
6	6					X	X	X	
7	7					X	X	X	
8	8				X			X	
9	9				X			X	
10	0A				X		X	X	
11	0B				X		X	X	
12	0C				X	X		X	
13	0D				X	X		X	
14	0E				X	X	X	X	
15	0F				X	X	X	X	
16	10			X				X	
17	11			X				X	
18	12			X			X	X	
19	13			X			X	X	
20	14			X		X		X	
21	15			X		X		X	
22	16			X		X	X	X	
23	17			X		X	X	X	
24	18			X	X			X	
25	19			X	X			X	
26	1A			X	X		X	X	
27	1B			X	X		X	X	
28	1C			X	X	X		X	
29	1D			X	X	X		X	
30	1E			X	X	X	X	X	
31	1F			X	X	X	X	X	
32	20		X					X	
33	21		X					X	
34	22		X				X	X	
35	23		X				X	X	
36	24		X			X		X	
37	25		X			X		X	
38	26		X			X	X	X	
39	27		X			X	X	X	
40	28		X	X				X	
41	29		X	X				X	
42	2A		X	X			X	X	
43	2B		X	X			X	X	
44	2C		X	X	X			X	
45	2D		X	X	X			X	
46	2E		X	X	X	X		X	
47	2F		X	X	X	X	X	X	
48	30		X	X				X	
49	31		X	X				X	
50	32		X	X			X	X	
51	33		X	X			X	X	
52	34		X	X		X		X	
53	35		X	X		X		X	
54	36		X	X		X	X	X	
55	37		X	X		X	X	X	
56	38		X	X	X			X	
57	39		X	X	X			X	
58	3A		X	X	X		X	X	
59	3B		X	X	X		X	X	
60	3C		X	X	X	X		X	
61	3D		X	X	X	X		X	
62	3E		X	X	X	X	X	X	
63	3F		X	X	X	X	X	X	
64	40		X					X	
65	41		X					X	
66	42		X				X	X	
67	43		X				X	X	
68	44		X			X		X	
69	45		X			X		X	
70	46		X			X	X	X	
71	47		X			X	X	X	
72	48		X		X			X	
73	49		X		X			X	
74	4A		X		X		X	X	
75	4B		X		X		X	X	
76	4C		X		X	X		X	
77	4D		X		X	X		X	
78	4E		X		X	X	X	X	
79	4F		X		X	X	X	X	
80	50		X	X				X	
81	51		X	X				X	
82	52		X	X			X	X	
83	53		X	X			X	X	
84	54		X	X		X		X	
85	55		X	X		X		X	

Bit No.	7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	Not assigned	Not assigned	Security Mode	Direct operation via membrane keypad	Manual valve override	Forced operation	Building protection Dew point/Fill level/Window	Operating mode overridden
86	56		X		X		X	X	
87	57		X		X		X	X	
88	58		X		X	X		X	
89	59		X		X	X		X	
90	5A		X		X	X	X	X	
91	5B		X		X	X	X	X	
92	5C		X		X	X	X	X	
93	5D		X		X	X	X	X	
94	5E		X		X	X	X	X	
95	5F		X		X	X	X	X	
96	60		X	X				X	
97	61		X	X				X	
98	62		X	X			X	X	
99	63		X	X			X	X	
100	64		X	X		X		X	
101	65		X	X		X		X	
102	66		X	X		X	X	X	
103	67		X	X		X	X	X	
104	68		X	X		X		X	
105	69		X	X	X			X	
106	6A		X	X	X		X	X	
107	6B		X	X	X		X	X	
108	6C		X	X	X	X		X	
109	6D		X	X	X	X		X	
110	6E		X	X	X	X	X	X	
111	6F		X	X	X	X	X	X	
112	70		X	X	X			X	
113	71		X	X	X			X	
114	72		X	X	X		X	X	
115	73		X	X	X		X	X	
116	74		X	X	X	X		X	
117	75		X	X	X	X		X	
118	76		X	X	X	X	X	X	
119	77		X	X	X	X	X	X	
120	78		X	X	X	X		X	
121	79		X	X	X	X		X	
122	7A		X	X	X	X	X	X	
123	7B		X	X	X	X	X	X	
124	7C		X	X	X	X	X	X	
125	7D		X	X	X	X	X	X	
126	7E		X	X	X	X	X	X	
127	7F		X	X	X	X	X	X	
128	80	X						X	
129	81	X						X	
130	82	X					X	X	
131	83	X					X	X	
132	84	X				X		X	
133	85	X				X		X	
134	86	X				X	X	X	
135	87	X				X	X	X	
136	88	X				X		X	
137	89	X				X		X	
138	8A	X				X	X	X	
139	8B	X				X	X	X	
140	8C	X				X	X	X	
141	8D	X				X	X	X	
142	8E	X				X	X	X	
143	8F	X				X	X	X	
144	90	X		X				X	
145	91	X		X				X	
146	92	X		X			X	X	
147	93	X		X			X	X	
148	94	X		X		X		X	
149	95	X		X		X		X	
150	96	X		X		X	X	X	
151	97	X		X		X	X	X	
152	98	X		X	X			X	
153	99	X		X	X			X	
154	9A	X		X	X		X	X	
155	9B	X		X	X		X	X	
156	9C	X		X	X	X		X	
157	9D	X		X	X	X		X	
158	9E	X		X	X	X	X	X	
159	9F	X		X	X	X	X	X	
160	A0	X	X					X	
161	A1	X	X					X	
162	A2	X	X				X	X	
163	A3	X	X				X	X	
164	A4	X	X			X		X	
165	A5	X	X			X		X	
166	A6	X	X			X	X	X	
167	A7	X	X			X	X	X	
168	A8	X	X		X			X	
169	A9	X	X		X			X	
170	AA	X	X		X		X	X	
171	AB	X	X		X		X	X	

Bit No.	7	6	5	4	3	2	1	0	
8-bit value	Hexadecimal	Not assigned	Not assigned	Security Mode	Direct operation via membrane keypad	Manual valve override	Forced operation	Building protection Dew point/Fill level/Window	Operating mode overridden
172	AC	X		X		X	X	X	
173	AD	X		X		X	X	X	
174	AE	X		X		X	X	X	
175	AF	X		X		X	X	X	
176	B0	X		X	X			X	
177	B1	X		X	X			X	
178	B2	X		X	X			X	
179	B3	X		X	X			X	
180	B4	X		X	X		X	X	
181	B5	X		X	X		X	X	
182	B6	X		X	X		X	X	
183	B7	X		X	X		X	X	
184	B8	X		X	X	X		X	
185	B9	X		X	X	X		X	
186	BA	X		X	X	X		X	
187	BB	X		X	X	X		X	
188	BC	X		X	X	X	X	X	
189	BD	X		X	X	X	X	X	
190	BE	X		X	X	X	X	X	
191	BF	X		X	X	X	X	X	
192	C0	X	X					X	
193	C1	X	X					X	
194	C2	X	X					X	
195	C3	X	X					X	
196	C4	X	X					X	
197	C5	X	X					X	
198	C6	X	X				X	X	
199	C7	X	X				X	X	
200	C8	X	X			X		X	
201	C9	X	X			X		X	
202	CA	X	X			X	X	X	
203	CB	X	X			X	X	X	
204	CC	X	X			X	X	X	
205	CD	X	X			X	X	X	
206	CE	X	X			X	X	X	
207	CF	X	X			X	X	X	
208	D0	X	X	X				X	
209	D1	X	X	X				X	
210	D2	X	X	X				X	
211	D3	X	X	X				X	
212	D4	X	X	X			X	X	
213	D5	X	X	X			X	X	
214	D6	X	X	X			X	X	
215	D7	X	X	X			X	X	
216	D8	X	X	X	X			X	
217	D9	X	X	X	X			X	
218	DA	X	X	X	X		X	X	
219	DB	X	X	X	X		X	X	
220	d.c	X	X	X	X	X		X	
221	DD	X	X	X	X	X		X	
222	DE	X	X	X	X	X	X	X	
223	DF	X	X	X	X	X	X	X	
224	E0	X	X	X	X			X	
225	E1	X	X	X	X			X	

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