PRODUCT MANUAL

ABB i-bus® KNX

VC/S 4.x.1

Valve drive controller

Table of contents

1 About this document

1.1 Using the product manual

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

1.2 Legal disclaimer

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The agreed properties are definitive for any orders placed. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

1.3 Explanation of symbols

1. 2. ⇨	Instructions in specified sequence and result
▸	Individual actions
a)	Priorities
1)	Processes run by the device in a specific sequence
•	List level 1
–	List level 2

Tab. 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 in a closed housing (distribution board).
- Operate the device only within the specified technical data.
- Mounting, installation, commissioning and maintenance must be carried out only by qualified electricians.
- Disconnect device from the supply of electrical power before mounting.

2.2 Qualification of the specialist personnel

Programming the device requires detailed specialist knowledge – particularly about the ETS commissioning software – through KNX training courses.

2.3 Proper use

The Valve Drive Controllers VC/S are intended to be used to activate floor heaters, radiators or cooling ceilings in a KNX environment.

3 Product overview

3.1 Device description

The devices are modular installation devices (MDRC) in the pro*M* design. They are designed for installation in electrical distribution boards and small housings with a 35 mm mounting rail (to EN 60715).

The devices are KNX-certified and can be used as products in a KNX system → EU declaration of conformity.

The devices are powered via the bus (ABB i-bus® KNX) and require no additional auxiliary voltage supply. The connection to the bus is made via a bus connection terminal on the front of the housing. The loads are connected to the outputs using screw terminals → terminal designation on the housing.

The software application Engineering Tool Software (ETS) is used for physical address assignment and parameterization.

3.1.1 Membrane keypad

Depending on the product variant, the devices can be operated manually using the membrane keypad.

Complete overview of operating and display elements → corresponding sub-chapter of the individual product variant.

3.2 Product name description

Abbreviation	Designation		
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.)

Tab. 2: Product name description

3.3 Ordering details

Description	MW	Type	Order no.	Packaging [pcs.]	Weight (incl. packaging) [kg]
Valve Drive Controller	8	VC/S 4.1.1	2CDG110216R0011	1	0.28
Valve Drive Controller	8	VC/S 4.2.1	2CDG110217R0011	1	0.29

Tab. 3: Ordering details

3.4 Connections

The devices possess the following connections:
- 12 inputs for sensors or analog room control units (SAF/A or SAR/A)
- 4 valve outputs for activating thermoelectric or magnetic valve drives.
- 1 bus connection

The tables below provide an overview of the maximum number of devices that can be connected to the individual product variants.

Valve outputs

	VC/S 4.1.1	VC/S 4.2.1
Thermoelectric Valve Drives (PWM)	4	4
Magnetic valve drives (open/closed)	4	4

Tab. 4: Valve outputs

Physical inputs

	VC/S 4.1.1	VC/S 4.2.1
Analog room control units	4	4
Binary sensors (floating)	12	12
Temperature sensors	8	8

Tab. 5: Physical inputs

3.4.1 Inputs

Function	a	b	c	d	e	f	g	h	i	j	k	l
Temperature sensor												
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	
Analog room control unit	x			x			x			x		
Binary sensor (floating)	x	x	x	x	x	x	x	x	x	x	x	x
Dew point sensor (floating)	x	x	x	x	x	x	x	x	x	x	x	x
Fill 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

Tab. 6: Function of the inputs

3.4.2 Outputs

3.4.2.1 Valve outputs

Function	A	B	C	D
Thermoelectric Valve Drives (PWM)	x	x	x	x
Magnetic valve drives (open/closed)	x	x	x	x
Fault detection (overload/short circuit)	x	x	x	x

Tab. 7: Function of the valve outputs

3.5 Valve Drive Controller VC/S 4.1.1, MDRC

Fig. 1: Valve Drive Controller VC/S 4.1.1

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3.5.1 Dimension drawing

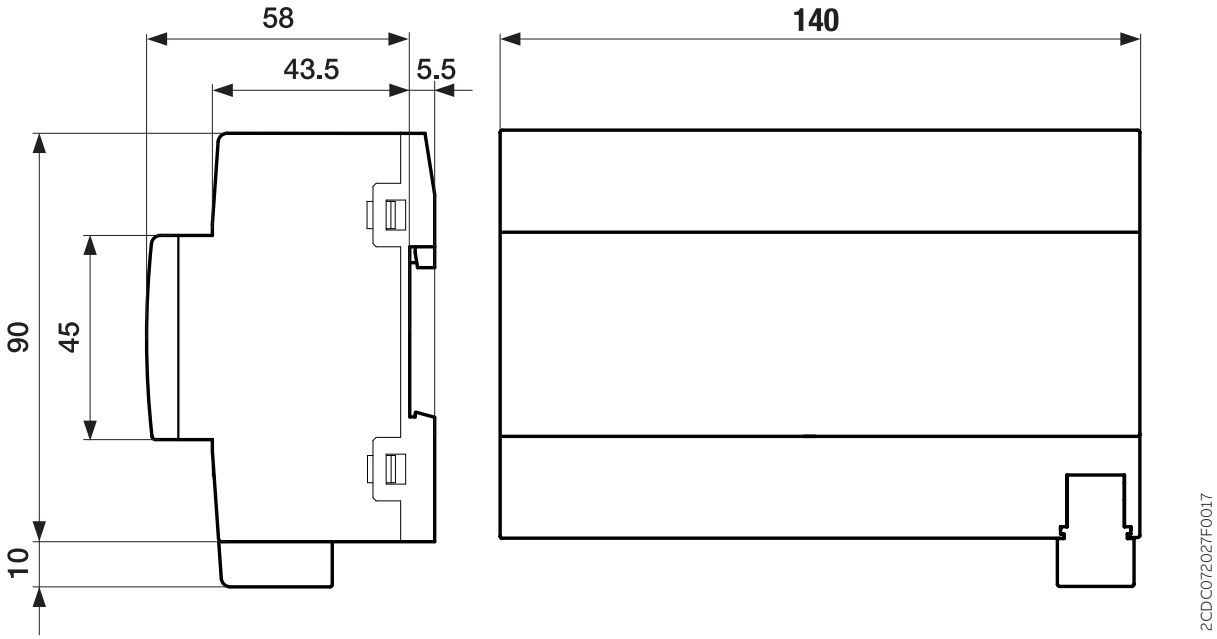

Fig. 2: Dimension drawing

3.5.2 Connection diagram

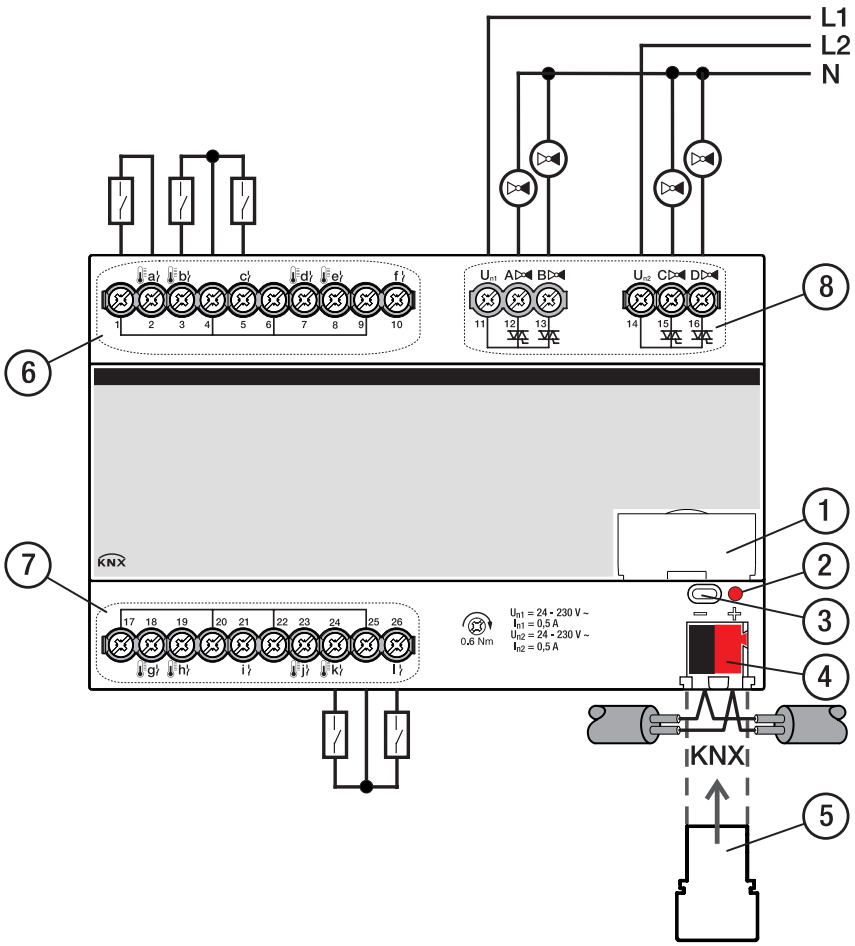

Fig. 3: Connection diagram VC/S 4.1.1

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Legend

2 *Programming* LED
3 *Programming* button
4 Bus connection terminal
5 Cover cap
6 Input
7 Binary input
8 Valve output

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3.5.3 Operating and display elements

Operating control/LED	Description/function	Display
 *Programming* button/LED	Assignment of the physical address	LED On: Device in programming mode

Tab. 8: Operating and display elements

3.5.4 Technical data

3.5.4.1 General technical data

Device	Dimensions	90 × 140 × 63.5 mm (H x W x D)
	Mounting width in space units	8 modules, 17.5 mm each
	Weight	0.27 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail
	Design	ProM
	Degree of protection	IP 20
	Protection class	II
	Overvoltage category	III
	Pollution degree	2
Materials	Housing	Polycarbonate, Makrolon FR6002, halogen free
Material note	Fire classification	Flammability V-0
Electronics	Rated voltage, bus	30 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3 W
	Power loss, bus	≤ 0.25 W
	KNX safety extra low voltage	SELV
Connections	Connection type, KNX bus	Plug-in terminal
	Cable diameter, KNX bus	0.6 … 0.8 mm, solid
	Connection type, inputs/outputs	Screw terminal with universal head (PZ 1)
	Pitch	6.35 mm
	Tightening torque, screw terminals	0.5 … 0.6 Nm
	Conductor cross-section, flexible	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, rigid	1 × (0.2 … 6 mm²) / 2 × (0.2 … 4 mm²)
	Conductor cross section with wire end ferrule without plastic sleeve	1 × (0.25 … 2.5 mm²)
	Conductor cross section with wire end ferrule with plastic sleeve	1 × (0.25 … 4 mm²)
	Conductor cross section with TWIN wire end ferrule	1 × (0.5 … 2.5 mm²)
	Length, wire end ferrule contact pin	≥ 10 mm
Certificates and declarations	Declaration of conformity CE	→ 2CDK508250D2701
Ambient conditions	Operation	-5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 95 %
	Condensation allowed	No
	Atmospheric pressure	≥ 80 kPa (corresponds to air pressure at 2,000 m above sea level)

Tab. 9: General technical data

3.5.4.2 Inputs

Rated values	Number of inputs	12
	Inputs for analog room control unit	4
Contact scanning	Scanning current	≤ 1 mA
	Scanning voltage	≤ 12 V DC
Resistance	Selection	User-defined
	PT 1.000	2-conductor technology
	PT100	2-conductor technology
	KT	1k
	KTY	2k
	NI	1k
	NTC	10k, 20k
Cable length	Between sensor and device input, one-way	≤ 100 m

Tab. 10: Inputs

3.5.4.3 Valve outputs – thermoelectric, PWM

Rated values	Number of outputs	4
	Non-floating	Yes
	Rated voltage U_n	230 V AC
	Voltage range	24 … 230 V AC
	Rated frequency	50/60 Hz
	Rated current I_n	0.5 A
	Continuous current at T_u Up to 20 °C	0.25 A resistive load per output
	Continuous current at T_u Up to 45 °C	0.15 A resistive load per output
	Inrush current at T_u Up to 45 °C	≤ 1.6 A (for 10 s)
		T_u = Ambient temperature
	Minimum load (per output)	1.2 W

Tab. 11: Valve outputs – thermoelectric, PWM

3.5.4.4 Device type

Device type	Valve Drive Controller	VC/S 4.1.1
	Application	Valve Drive Controller, 4f/ …
		… = current version number of the application
	Maximum number of group objects	298
	Maximum number of group addresses	300
	Maximum number of assignments	300

Tab. 12: Device type

Note
Observe software information on the website → www.abb.com/knx.

3.6 Valve Drive Controller VC/S 4.2.1, MDRC

Fig. 4: Valve Drive Controller VC/S 4.2.1

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3.6.1 Dimension drawing

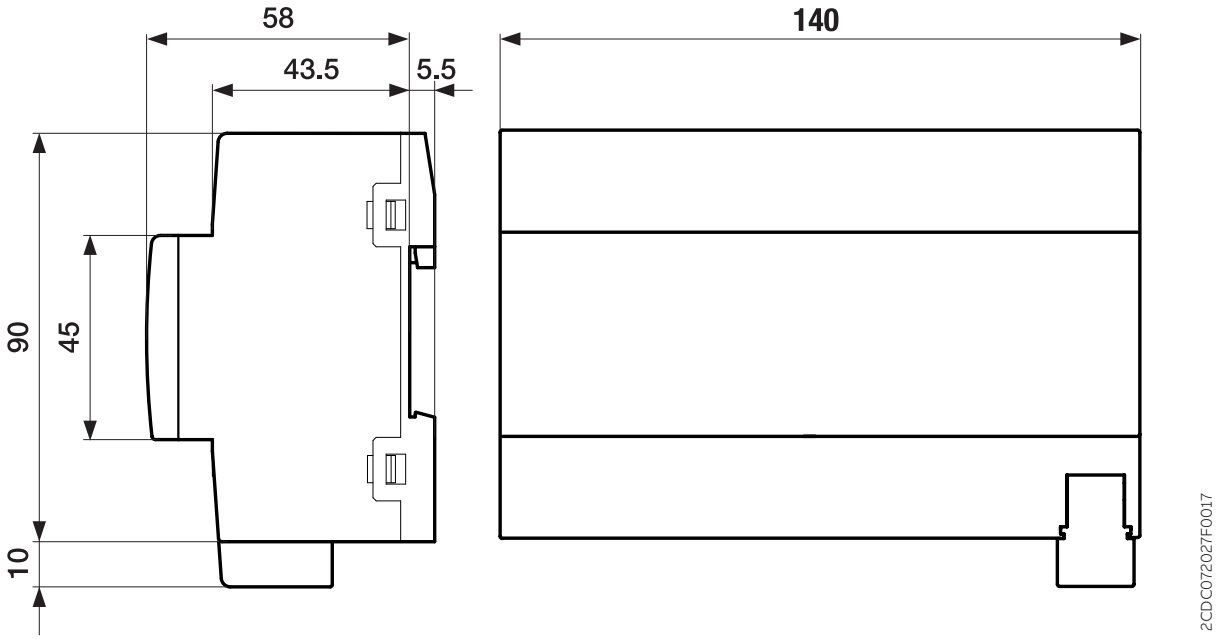

Fig. 5: Dimension drawing

3.6.2 Connection diagram

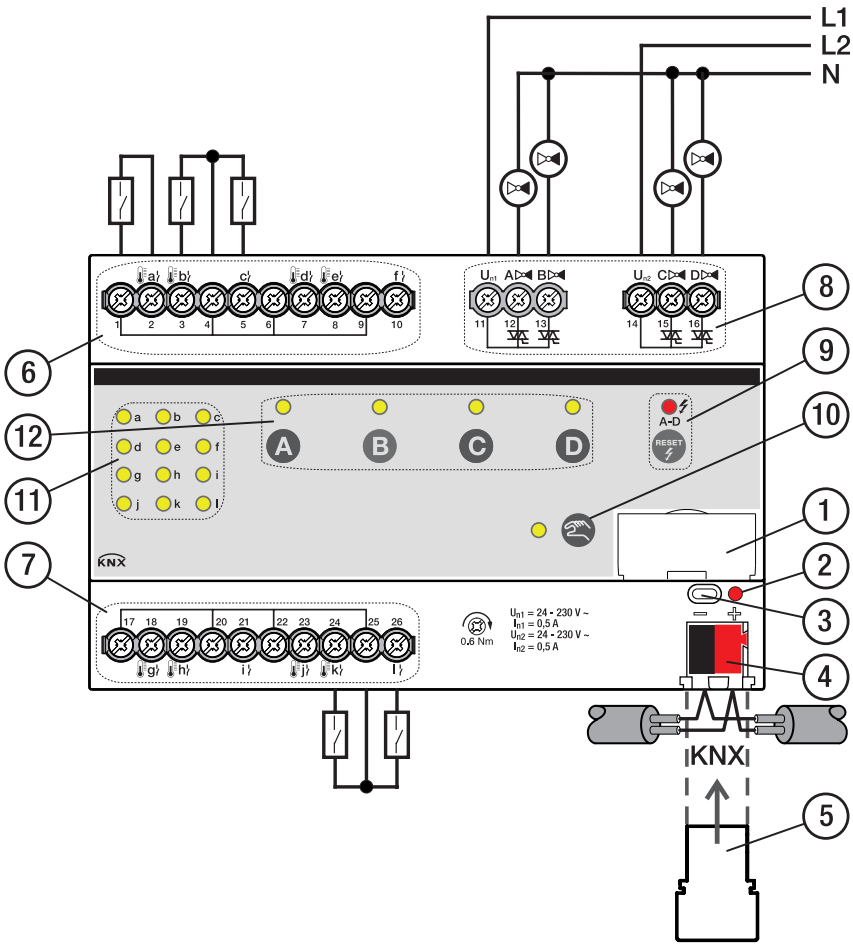

Fig. 6: Connection diagram VC/S 4.2.2

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Legend

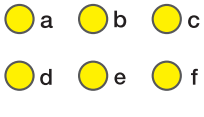
1 Label carriers
2 *Programming* LED
3 *Programming* button
4 Bus connection terminal
5 Cover cap
6 Input
7 Binary input
8 Valve output
9 Reset button / valve output error LED
10 *Manual operation* button/LED
11 *Input* LED
12 *Valve output switching* button/LED

3.6.3 Operating and display elements

Operating control/LED	Description/function	Display
 *Programming* button/LED	Assignment of the physical address	LED On: Device in programming mode

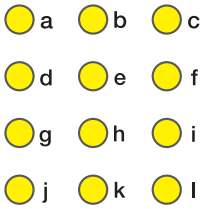
Tab. 13: Operating and display elements

3.6.3.1 Manual mode

Operating control/LED	Description/function	Display
 *Manual operation* button/LED	Activates the *KNX mode* with a short button push	LED On: *Manual operation* active LED Off: *KNX operation* active
 *Input* LED	Indication according to use of the inputs	Binary sensor: • LED On: Contact closed • LED Off: Contact open Temperature sensor: • LED On: Temperature sensor connected • LED flashing: Fault (cable break/short circuit) Analog control panel: • LED On: Control panel connected • LED flashing: Fault (cable break/short circuit)
 *Reset* button / *valve output error* LED	Resets the outputs with long button push > 5 s	LED On: Error on at least one output
 *Valve output* button/LED	Opens/closes valve output	LED flashing: Error (overload/malfunction) Magnetic valve drive: • LED On: Valve open • LED Off: Valve closed Thermoelectric Valve Drive: • LED On: Valve opening/open • LED Off: Valve closing/closed

Tab. 14: Operating and display elements

3.6.3.2 KNX operation

Operating control/LED	Description/function	Display
 *Manual operation* button/LED	Activates the *Manual operation* mode with long button push > 5 s	LED On: *Manual operation* active LED Off: *KNX operation* active LED flashes when button is pushed: *Manual operation* deactivated via ETS
 *Input* LED	Indication according to use of the inputs	Binary sensor: • LED On: Contact closed • LED Off: Contact open Temperature sensor: • LED On: Temperature sensor connected • LED flashing: Fault (cable break/short circuit) Analog control panel: • LED On: Control panel connected • LED flashing: Fault (cable break/short circuit)
 *Reset* button / *valve output error* LED	Button without function	LED On: Error on at least one output
 *Valve output* button/LED	Button without function	LED flashing: Error (overload/malfunction) Magnetic valve drive: • LED On: Valve open • LED Off: Valve closed Thermoelectric Valve Drive: • LED On: Valve opening/open • LED Off: Valve closing/closed

Tab. 15: Operating and display elements

3.6.4 Technical data

3.6.4.1 General technical data

Device	Dimensions	90 × 140 × 63.5 mm (H x W x D)
	Mounting width in space units	8 modules, 17.5 mm each
	Weight	0.28 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail
	Design	ProM
	Degree of protection	IP 20
	Protection class	II
	Overvoltage category	III
	Pollution degree	2
Materials	Housing	Polycarbonate, Makrolon FR6002, halogen free
Material note	Fire classification	Flammability V-0
Electronics	Rated voltage, bus	30 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3 W
	Power loss, bus	≤ 0.25 W
	KNX safety extra low voltage	SELV
Connections	Connection type, KNX bus	Plug-in terminal
	Cable diameter, KNX bus	0.6 … 0.8 mm, solid
	Connection type, inputs/outputs	Screw terminal with universal head (PZ 1)
	Pitch	6.35 mm
	Tightening torque, screw terminals	0.5 … 0.6 Nm
	Conductor cross-section, flexible	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, rigid	1 × (0.2 … 6 mm²) / 2 × (0.2 … 4 mm²)
	Conductor cross section with wire end ferrule without plastic sleeve	1 × (0.25 … 2.5 mm²)
	Conductor cross section with wire end ferrule with plastic sleeve	1 × (0.25 … 4 mm²)
	Conductor cross section with TWIN wire end ferrule	1 × (0.5 … 2.5 mm²)
	Length, wire end ferrule contact pin	≥ 10 mm
Certificates and declarations	Declaration of conformity CE	→ 2CDK508251D2701
Ambient conditions	Operation	-5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 95 %
	Condensation allowed	No
	Atmospheric pressure	≥ 80 kPa (corresponds to air pressure at 2,000 m above sea level)

Tab. 16: General technical data

3.6.4.2 Inputs

Rated values	Number of inputs	12
	Inputs for analog room control unit	4
Contact scanning	Scanning current	≤ 1 mA
	Scanning voltage	≤ 12 V DC
Resistance	Selection	User-defined
	PT 1.000	2-conductor technology
	PT100	2-conductor technology
	KT	1k
	KTY	2k
	NI	1k
	NTC	10k, 20k
Cable length	Between sensor and device input, one-way	≤ 100 m

Tab. 17: Inputs

3.6.4.3 Valve outputs – thermoelectric, PWM

Rated values	Number of outputs	4
	Non-floating	Yes
	Rated voltage U_n	230 V AC
	Voltage range	24 … 230 V AC
	Rated frequency	50/60 Hz
	Rated current I_n	0.5 A
	Continuous current at T_u Up to 20 °C	0.25 A resistive load per output
	Continuous current at T_u Up to 45 °C	0.15 A resistive load per output
	Inrush current at T_u Up to 45 °C	≤ 1.6 A (for 10 s)
		T_u = Ambient temperature
	Minimum load (per output)	1.2 W

Tab. 18: Valve outputs – thermoelectric, PWM

3.6.4.4 Device type

Device type	Valve Drive Controller	VC/S 4.2. 1
	Application	Valve Drive Controller, 4f/ …
		… = current version number of the application
	Maximum number of group objects	300
	Maximum number of group addresses	300
	Maximum number of assignments	300

Tab. 19: Device type

Note
Observe software information on the website → www.abb.com/knx.

4 Function

4.1 Device functions

The following device functions for each channel are available for activating floor heating systems, radiators and cooling ceilings:
- Controller channel
- Actuator channel

The four device channels are independent of each other. It is possible to control four different rooms.

Controller channel

The internal controller is activated in the function as a controller channel. The controller is used to process the data received at the inputs (actual values) or via the bus (ABB i-bus® KNX) (actual values, setpoints and operating mode changes). The control values are calculated from the data received and transmitted to the outputs.

Actuator channel

The internal controller is deactivated in the function as an actuator channel. The control values for activating the outputs are calculated by an external controller and received via the bus (ABB i-bus® KNX).

4.2 Software functions

4.2.1 Functional overview

Valve activation

The following valve drives can be activated using the valve drive controller VC/S:
- Thermoelectric Valve Drives (2-point)
- Magnetic valve drives (2-point)

Manual operation on the device is additionally possible with the following product variants:
- VC/S 4.2.1

4.2.2 Safety mode

The safety mode is an operating state triggered by the device if cyclical monitoring is activated and the following errors or faults are present:

Fault: actual temperature

The following actions will be performed if no valid temperature is measured at the input for longer than one minute:
- Group object *Fault Actual temperature (master)* is set to "Error"
- Value in the parameter *Control value on input fault* becomes valid

If no value is received on the group object *External temperature 1* or *External temperature 2* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Fault Actual temperature (master)* is set to "Error"
- Value in the parameter *Control value after exceeding monitoring time* becomes valid

The monitoring is activated in the parameter *Temperature input monitoring*.

Error Operating mode receipt

If no value is received on group object *Operating mode normal (master)* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Operating mode" receipt* is set to "Error"
- Value in the parameter *Operating mode after exceeding monitoring time* becomes valid

The monitoring is activated in the parameter *Monitor receipt of group object "Operating mode normal (master)"*.

Error Window status receipt

If no value is received on group object *Window contact (master/slave)* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Window contact" receipt* is set to "Error"
- Until a new value is received on group object *Window contact (master/slave)*, the controller is in *Building Protection* operating mode

The monitoring is activated in the parameter *Monitor receipt of group object "Window contact"*.

Error Dew point status receipt

If no value is received on group object *Dew point alarm* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Dew point alarm" receipt* is set to "Error"
- Until a new value is received on group object *Dew point alarm*, the controller is in *Building Protection* operating mode

The monitoring is activated in the parameter *Monitor receipt of group object "Dew point alarm"*.

Error Fill level status receipt

If no value is received on group object *Fill level alarm* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Fill level alarm" receipt* is set to "Error"
- Until a new value is received on group object *Fill level alarm*, the controller sets the control value for cooling to 0

The monitoring is activated in the parameter *Monitor receipt of group object "Fill level alarm"*.

Error Heating/cooling changeover receipt

If no value is received on group object *Heating/cooling changeover* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Heating/cooling changeover" receipt* is set to "Error"
- Value in the parameter *Heating/cooling mode when monitoring time exceeded* becomes valid

The monitoring is activated in the parameter *Monitor receipt of group object "Heating/cooling changeover"*.

Error Heating /cooling control value receipt

If no value is received on the group object *Control value Heating* or *Control value Cooling* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Control value" receipt* is set to "Error"
- Value in the parameter *Control value after exceeding monitoring time* becomes valid

The monitoring is activated in the parameter *Monitor receipt of "Control value heating/cooling" group objects*.

4.3 Integration into i-bus® Tool

i-bus® Tool can be used to read the data from the connected device. It can also be used to simulate values and test the following functions:

- Setting the room thermostat
- Switching between the operating modes
- Function of the physical inputs and outputs

If there is no communication between the device and i-bus® Tool, the simulated values cannot be sent on the bus.

For more information → parameter *I-bus® Tool access*.

i-bus® Tool can be downloaded free of charge from the company homepage (www.abb.com/knx).

4.4 Special operating states

The device's reaction if there is a bus voltage failure, after bus voltage recovery and after ETS download can be set in the device parameters.

4.4.1 Reaction on bus voltage failure (BSA)

Bus voltage failure describes the failure of the bus voltage, e.g. due to a power failure.

4.4.2 Reaction after bus voltage recovery (BSW)

Bus voltage recovery is the state that exists after the bus voltage is restored. The device will restart after bus voltage recovery.

The time set in the parameter *Sending and switching delay after bus voltage recovery* elapses before the device performs an action.

4.4.3 Reaction on ETS reset

ETS reset designates device reset via ETS. An ETS reset restarts the ETS application in the device. ETS reset can be performed in ETS using the Commissioning menu item, in the function *Reset device*.

Note
After an ETS reset the *Comfort* operating mode is always set.

4.4.4 Reaction on download (DL)

Downloading describes loading a modified or updated ETS application onto the device. The device is not ready to operate during a download.

Note

The device will no longer operate after the application is uninstalled or the download is canceled.

- Download again.

5 Mounting and installation

5.1 Information about mounting

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.

The device can be mounted in any position as required on a 35 mm mounting rail.

The electrical connection to the loads is made using screw terminals. The connection to the bus (ABB i-bus® KNX) is made using the bus connection terminal supplied. The terminal assignment is located on the housing.

Note
The maximum permissible current consumption on 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.

5.2 Mounting on mounting rail

Note
No additional tools are required for mounting on a mounting rail.

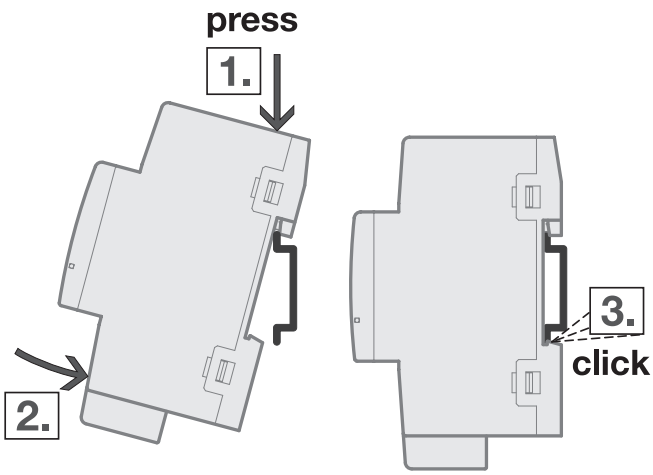


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Fig. 7: Mounting on mounting rail

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

5.3 Connecting analog room control unit

1. Connect analog room control unit to input a.
2. Connect temperature sensor to a different input (recommendation: input b).
3. Parametrize the temperature-sensor input as follows:

- Temperature sensor type: NTC
- NTC type: NTC10-02

6 Commissioning

6.1 Prerequisites for commissioning

A PC with ETS and a connection to the bus (ABB i-bus® KNX), e.g. via a KNX interface, are required to commission the device.

- Required ETS version: 4.0 or higher
  - from application V1.1: 5.0 or higher
- Product-specific application: installed

6.2 Commissioning overview

After the bus voltage is activated for the first time, the following factory settings will be selected automatically:
- Physical address of the device: 15.15.255
- ETS application: preloaded
- Manual operation: enabled

The device can be programmed only using ETS.

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

6.3 Putting device into operation

CAUTION
Setting a reversing time that is too short can damage the connected drive.
▸ Observe the technical data of the connected drive.

1. Connect the device to the bus (ABB i-bus® KNX).
2. Switch on bus voltage.
   ⇨ All switching contacts are open.
3. Switch on power supply of the connected loads.

⇨ Device is ready for operation.

6.4 Assignment of the physical address

Note
If it is set in ETS that the application is to be downloaded during programming, the download will begin after assignment of the physical address.

Triggering assignment of the physical address via ETS:
1. Press *Programming* button.
   ⇨ Programming mode active. *Programming* LED lights up.
2. Start programming process in ETS.

⇨ Physical address is assigned. Device restarts.

Note
The device performs an ETS reset during assignment of the physical address. All states are reset.

6.5 Software/application

6.5.1 Download reaction

Depending on the PC, it can take up to 90 seconds for the progress bar to appear during a download.

Using an interface that supports download via "long frames" (e.g. USB/S 1.2 or IPR/S 3.5.1) can greatly shorten the download time.

6.5.2 Copying, exchanging and converting

The following functions can be performed with the ETS application ABB*Update Copy Convert*:

- *Update*: Changes the application program to a higher or lower version while retaining the current configurations
- *Convert*: Transfers/adopts a configuration from an identical or compatible source device
- *Copy channel*: 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

The ETS application ABB*Update Copy Convert* can be downloaded free of charge from the KNX Shop → www.KNX.org.

7 Parameters

7.1 General

Note
ETS (Engineering Tool Software) is used to parameterize the device.

The following sections describe the device parameters based on the parameter windows. The parameter windows have a dynamic design. Parameters are shown or hidden depending on the outputs' parameterization and function.

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

No (checkbox cleared)

Yes (checkbox ticked)

Note
The default values in the ETS application can vary from the values stated in the product manual depending on the product variant.

Note
The screenshots show an application for devices with manual operation.

7.2 Parameter window

7.2.1 Parameter window Basic settings

The basic settings for operating the device can be made in this parameter window.

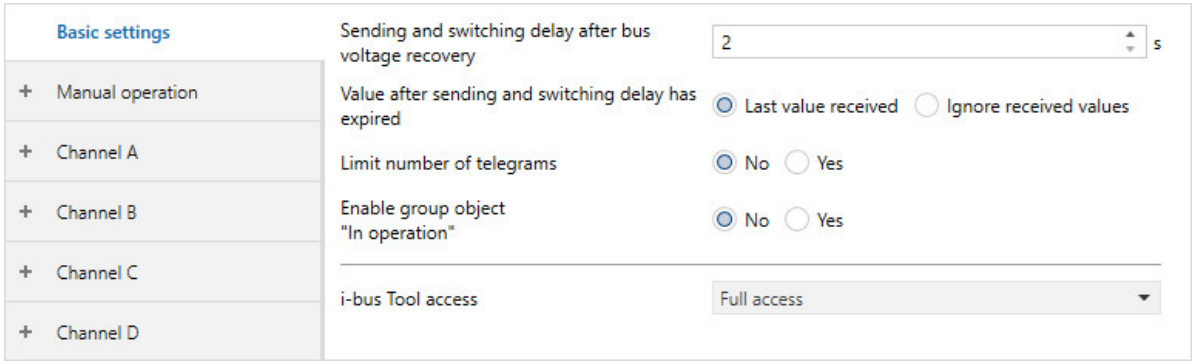

Fig. 8: Parameter window Basic settings

This parameter window includes the following parameters:

→ Sending and switching delay after bus voltage recovery, Page 111
→ Value after sending and switching delay has expired, Page 139
→ Limit number of telegrams, Page 61
  → Maximum number of telegrams, Page 98
  → In period (0 = deactivated), Page 92
→ Enable group object "In operation", Page 94
  → Send value group object "In operation", Page 138
  → Sending cycle, Page 111
→ I-bus® Tool access, Page 142

Prerequisites for visibility

- The parameter window is always visible.

7.2.2 Parameter window Manual operation

The following settings can be made in this parameter window:

- Enable operating state *Manual operation*
- Automatically reset the device to operating state *KNX operation*

More information: → Manual operation, Page 170.

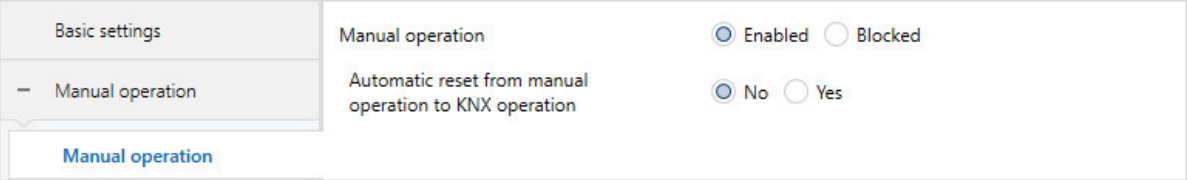

Fig. 9: Parameter window Manual operation

This parameter window includes the following parameters:

→ Manual operation, Page 96

→ Automatic reset from manual operation to KNX operation, Page 67

→ Time for automatic reset to KNX operation, Page 67

Prerequisites for visibility

- Product variant:
  - VC/S 4.2.1

7.2.3 Parameter window Channel X

7.2.3.1 Parameter window Application parameters

The basic device settings can be made in this parameter window.

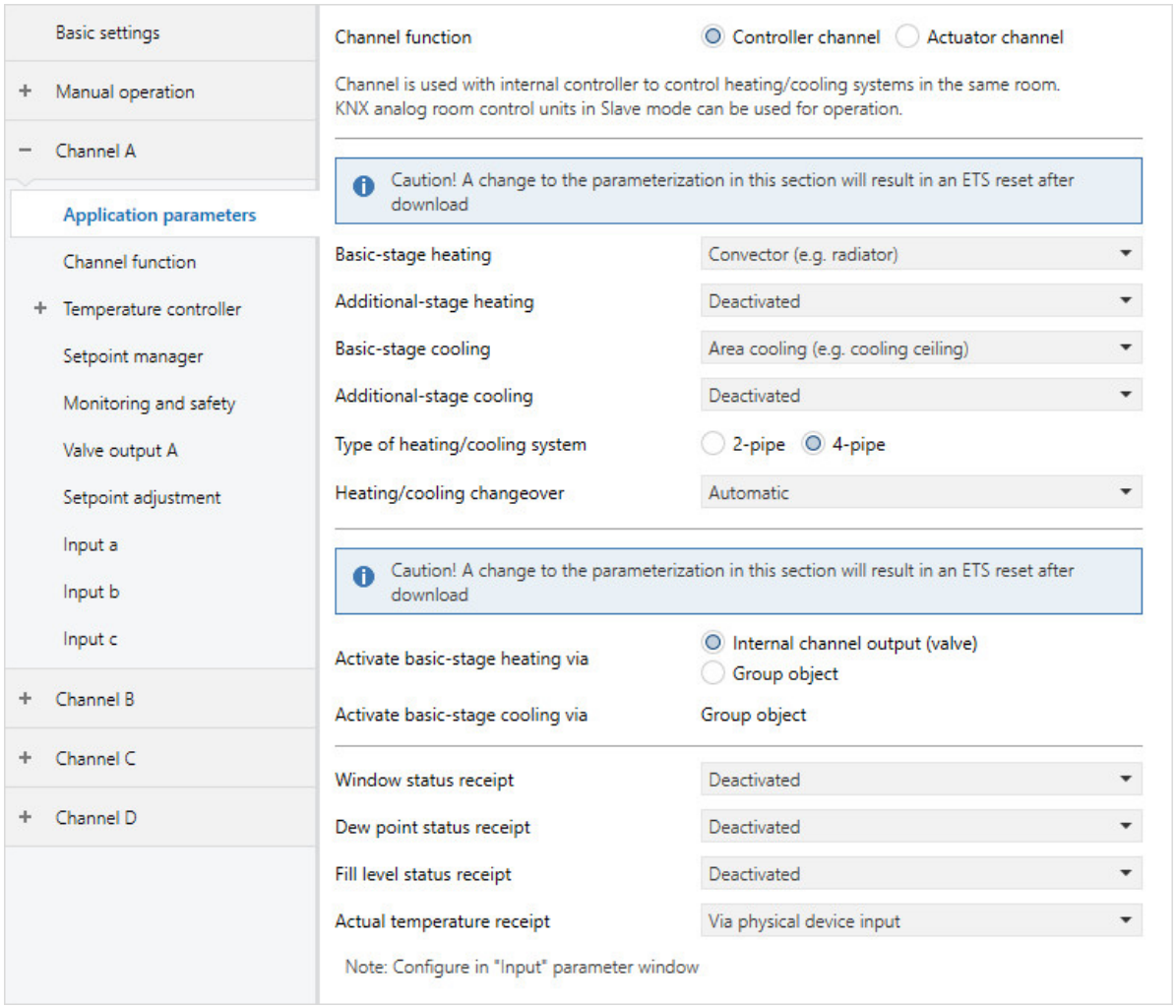

Fig. 10: Parameter window Application parameters

This parameter window includes the following parameters:

Prerequisites for visibility

- The parameter window is in the parameter window *Channel X*.

7.2.3.2 Parameter window Channel function

The following settings can be made in this parameter window:

- Reaction after bus voltage recovery
- Reaction after ETS download/reset

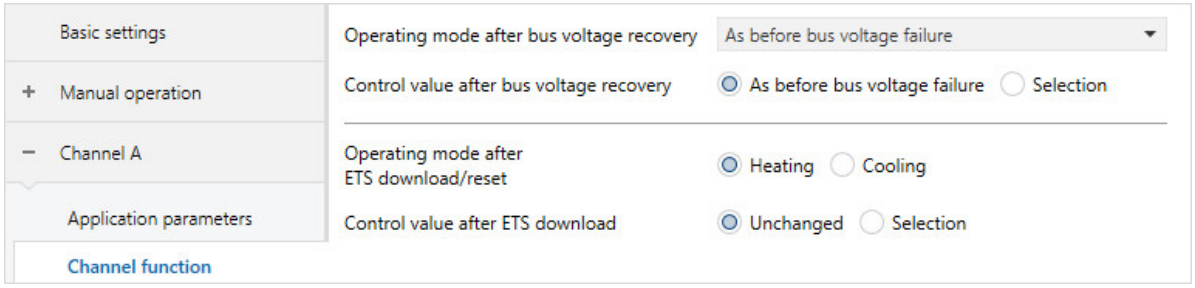

Fig. 11: Channel function parameter window

This parameter window includes the following parameters:

→ Operating mode after bus voltage recovery, Page 72
→ Control value after bus voltage recovery, Page 124
→ Control value, Page 122
→ Operating mode after ETS download/reset, Page 72
→ Control value after ETS download, Page 124

Prerequisites for visibility

- The parameter window is in the parameter window *Channel X*.

7.2.3.3 Parameter window Temperature controller

The following settings can be made in this parameter window:

- Parameterizing basic load
- Send behavior of control values for the inactive operating mode
- Sending behavior of the current room temperature (actual temperature)

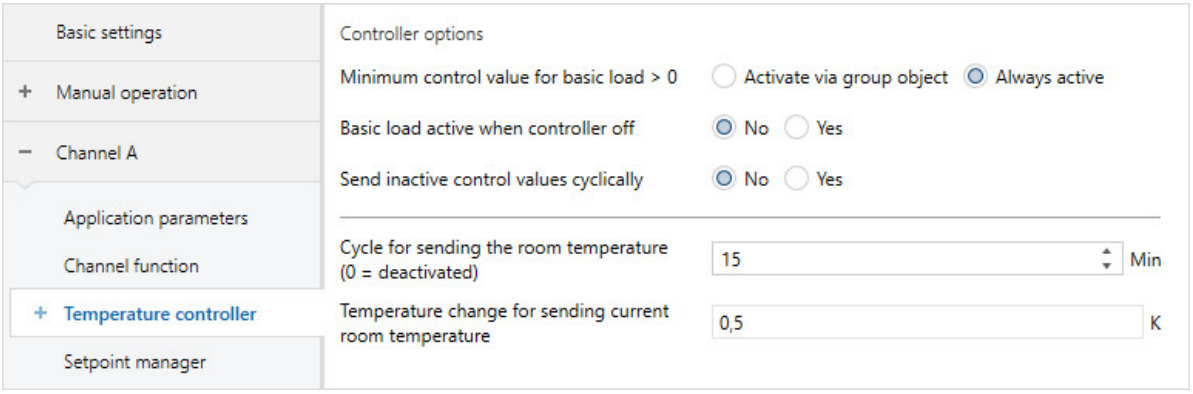

Fig. 12: Parameter window Temperature controller

This parameter window includes the following parameters:

→ Minimum control value for basic load > 0, Page 103
→ Basic load active when controller off, Page 84
→ Send inactive control values cyclically, Page 147
→ Cycle for sending the room temperature (0 = deactivated), Page 147
→ Temperature change for sending current room temperature, Page 126

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter window is in the parameter window *Channel X*.

7.2.3.3.1 Parameter window Basic-stage heating

The following settings can be made in this parameter window:

- Control type
- Limitation of the control range
- Sending behavior of the control value
- Activation and setting of temperature limitation

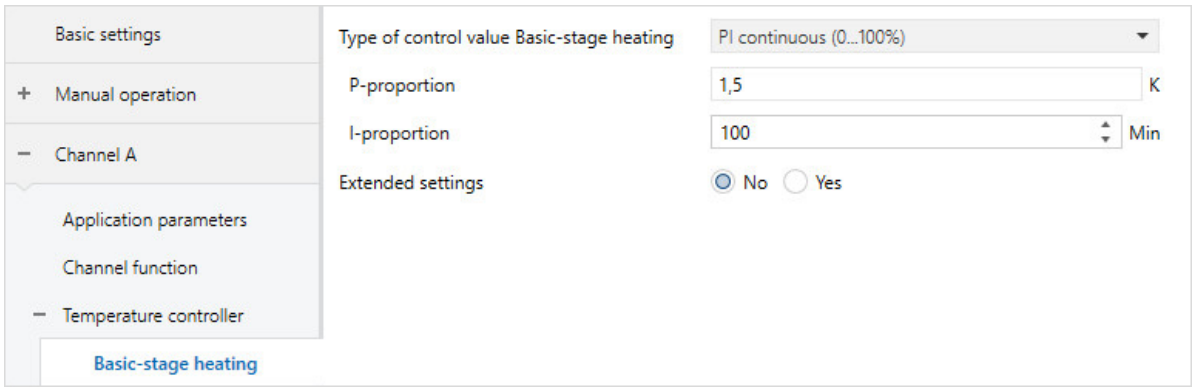

Fig. 13: Basic-stage heating parameter window

This parameter window includes the following parameters:

→ Type of control value Basic-stage heating, Page 62
  → P-proportion, Page 106
  → I-proportion, Page 90
→ Extended settings, Page 81
  → Control value direction, Page 141
  → Hysteresis, Page 86
  → Control value difference for sending the control value, Page 125
  → Cycle for sending the control value (0 = deactivated), Page 148
  → PWM cycle X, Page 107
  → Maximum control value, Page 100
  → Min. control value (basic load), Page 102
  → Activate temperature limitation, Page 127
    → [Heating] limit temperature, Page 69
    → Limit temperature hysteresis, Page 88
    → I-proportion at temperature limitation, Page 91
    → Input for temperature limit sensor, Page 78

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- The parameter window is in the parameter window *Channel X* \ Parameter window *Temperature controller*.

7.2.3.3.2 Parameter window Basic-stage cooling

The following settings can be made in this parameter window:

- Control type
- Limitation of the control range
- Sending behavior of the control value
- Activation and setting of temperature limitation

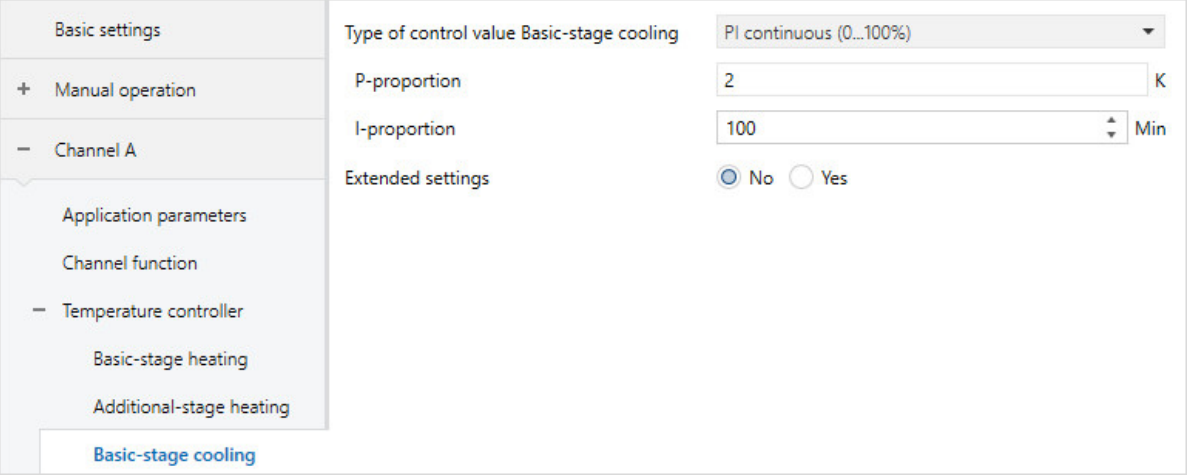

Fig. 14: Basic-stage cooling parameter window

This parameter window includes the following parameters:

→ Type of control value Basic-stage cooling, Page 63
  → P-proportion, Page 106
  → I-proportion, Page 90
→ Extended settings, Page 81
  → Control value direction, Page 141
  → Hysteresis, Page 86
  → Control value difference for sending the control value, Page 125
  → Cycle for sending the control value (0 = deactivated), Page 148
  → PWM cycle X, Page 107
  → Maximum control value, Page 100
  → Min. control value (basic load), Page 102
  → Activate temperature limitation, Page 127
    → Limit temperature [cooling], Page 70
    → Limit temperature hysteresis, Page 88
    → I-proportion at temperature limitation, Page 91
    → Input for temperature limit sensor, Page 78

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter window is in the parameter window *Channel X* \ Parameter window *Temperature controller*.

7.2.3.3.3 Parameter window Additional-stage heating

The following settings can be made in this parameter window:

- Control type
- Limitation of the control range
- Sending behavior of the control value
- Activation and setting of temperature limitation
- Temperature difference from basic-stage heating

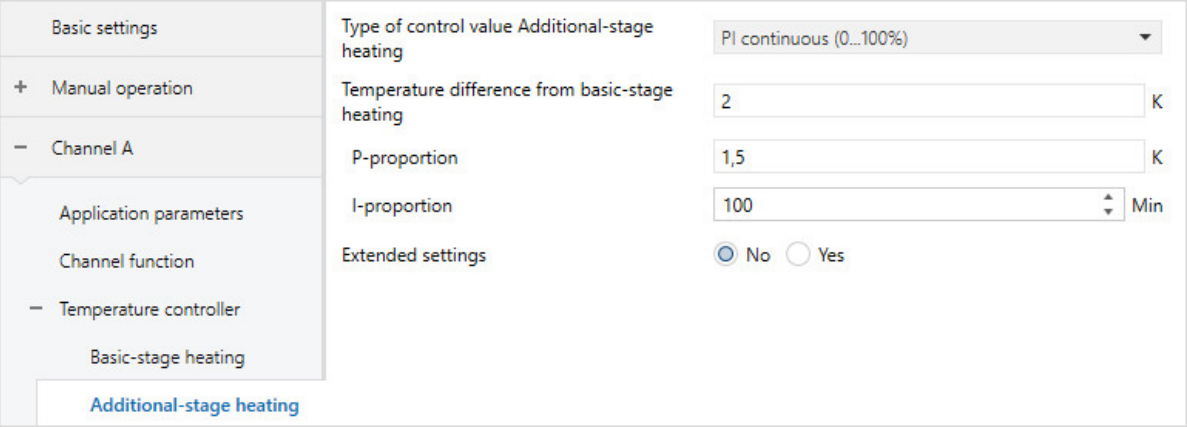

Fig. 15: Additional-stage heating parameter window

This parameter window includes the following parameters:

→ Type of control value Additional-stage heating, Page 64
  → P-proportion, Page 106
  → I-proportion, Page 90
→ Temperature difference from basic-stage heating, Page 127
→ Extended settings, Page 81
  → Control value direction, Page 141
  → Hysteresis, Page 86
  → Control value difference for sending the control value, Page 125
  → Cycle for sending the control value (0 = deactivated), Page 148
  → PWM cycle X, Page 107
  → Maximum control value, Page 100
  → Min. control value (basic load), Page 102
  → Activate temperature limitation, Page 127
    → [Heating] limit temperature, Page 69
    → Limit temperature hysteresis, Page 88
    → I-proportion at temperature limitation, Page 91
    → Input for temperature limit sensor, Page 78

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- The parameter window is in the parameter window *Channel X* \ Parameter window *Temperature controller*.

7.2.3.3.4 Parameter window Additional-stage cooling

The following settings can be made in this parameter window:

- Control type
- Limitation of the control range
- Sending behavior of the control value
- Activation and setting of temperature limitation
- Temperature difference from basic-stage heating

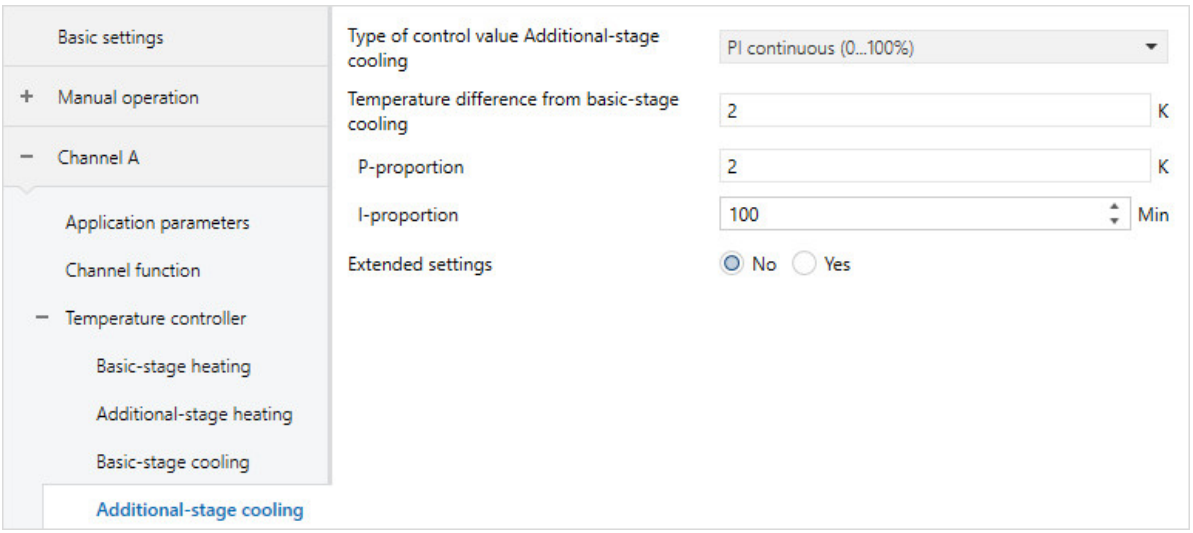

Fig. 16: Additional-stage cooling parameter window

This parameter window includes the following parameters:

→ Type of control value Additional-stage cooling, Page 65
  → P-proportion, Page 106
  → I-proportion, Page 90
→ Temperature difference from basic-stage cooling, Page 128
→ Extended settings, Page 81
  → Control value direction, Page 141
  → Hysteresis, Page 86
  → Control value difference for sending the control value, Page 125
  → Cycle for sending the control value (0 = deactivated), Page 148
  → PWM cycle X, Page 107
  → Maximum control value, Page 100
  → Min. control value (basic load), Page 102
  → Activate temperature limitation, Page 127
    → Limit temperature [cooling], Page 70
    → Limit temperature hysteresis, Page 88
    → I-proportion at temperature limitation, Page 91
    → Input for temperature limit sensor, Page 78

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- The parameter window is in the parameter window *Channel X* \ Parameter window *Temperature controller*.

7.2.3.4 Parameter window Setpoint manager

The following settings can be made in this parameter window:

- Operating mode
- Setpoint specification
- Activating and setting summer compensation

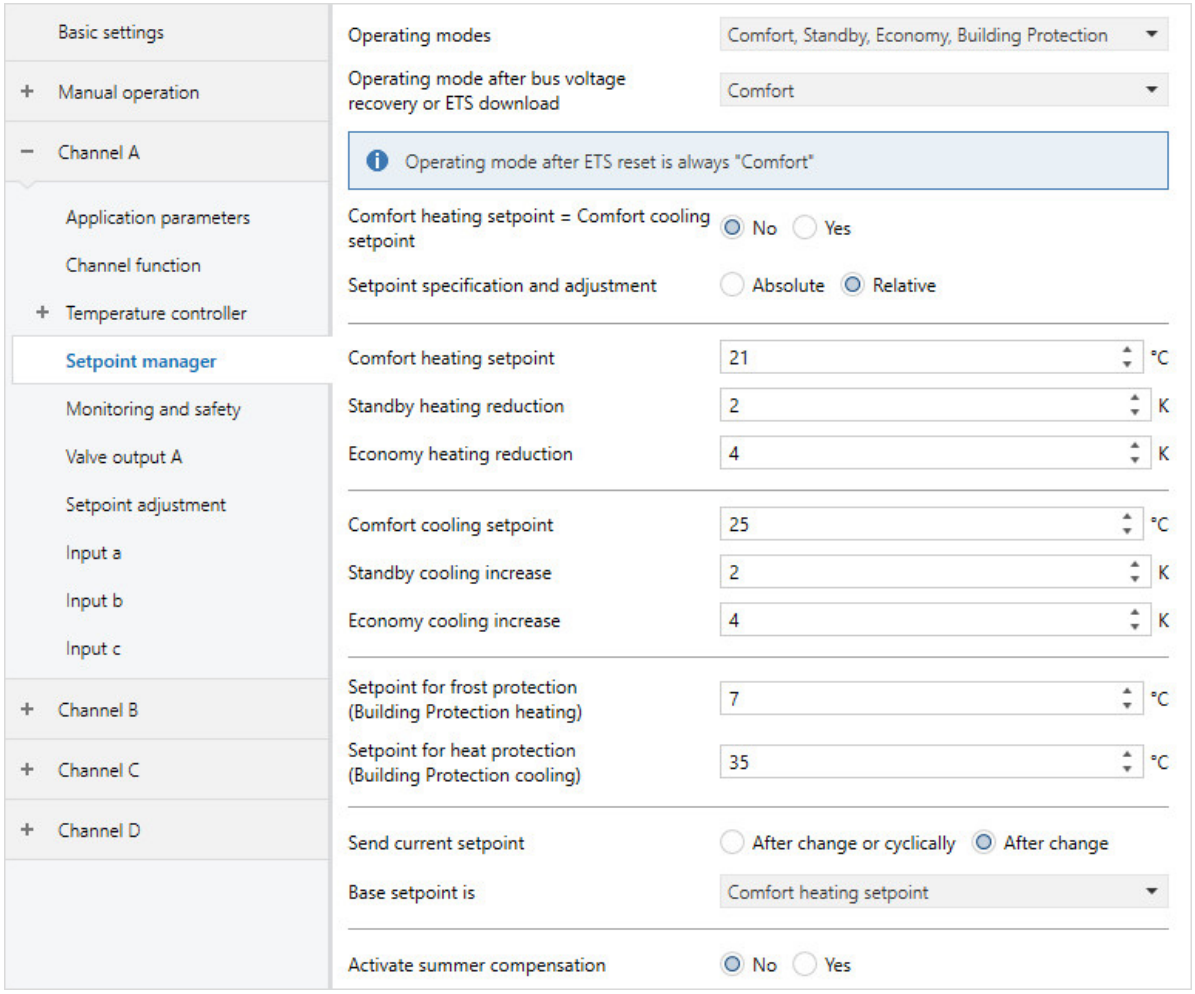

Fig. 17: Setpoint manager parameter window

This parameter window includes the following parameters:

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter window is in the parameter window *Channel X*.

7.2.3.5 Parameter window Monitoring and safety

The following settings can be made in this parameter window:

- Forced operation
- Cyclical monitoring

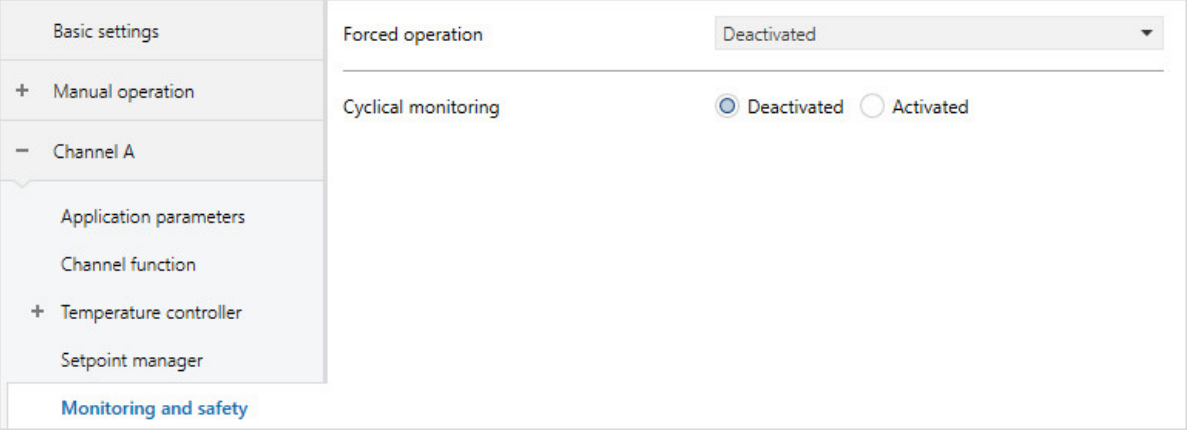

Fig. 18: Monitoring and safety parameter window

This parameter window includes the following parameters:

→ Forced operation, Page 145
→ Control value on forced operation, Page 123
→ Control value on forced operation active "ON", Page 123
→ Control value on forced operation active "OFF", Page 123
→ Cyclical monitoring, Page 146
→ Temperature input monitoring, Page 134
→ Control value on input fault, Page 122
→ Time interval for cyclical monitoring, Page 146
→ Control value after exceeding monitoring time, Page 122
→ Monitor receipt of group object "Operating mode normal (master)", Page 131
→ Operating mode after exceeding monitoring time, Page 73
→ Monitor receipt of group object "Heating/cooling changeover", Page 133
→ Heating/cooling mode when monitoring time exceeded, Page 71
→ Monitor receipt of group object "Window contact", Page 131
→ Monitor receipt of group object "Dew point alarm", Page 132
→ Monitor receipt of group object "Fill level alarm", Page 132
→ Monitor receipt of "Control value heating/cooling" group objects, Page 133
→ Control value after exceeding monitoring time, Page 122

Prerequisites for visibility

- The parameter window is in the parameter window *Channel X*.

7.2.3.6 Parameter window Valve output X

The basic settings of this valve output can be specified in this parameter window.

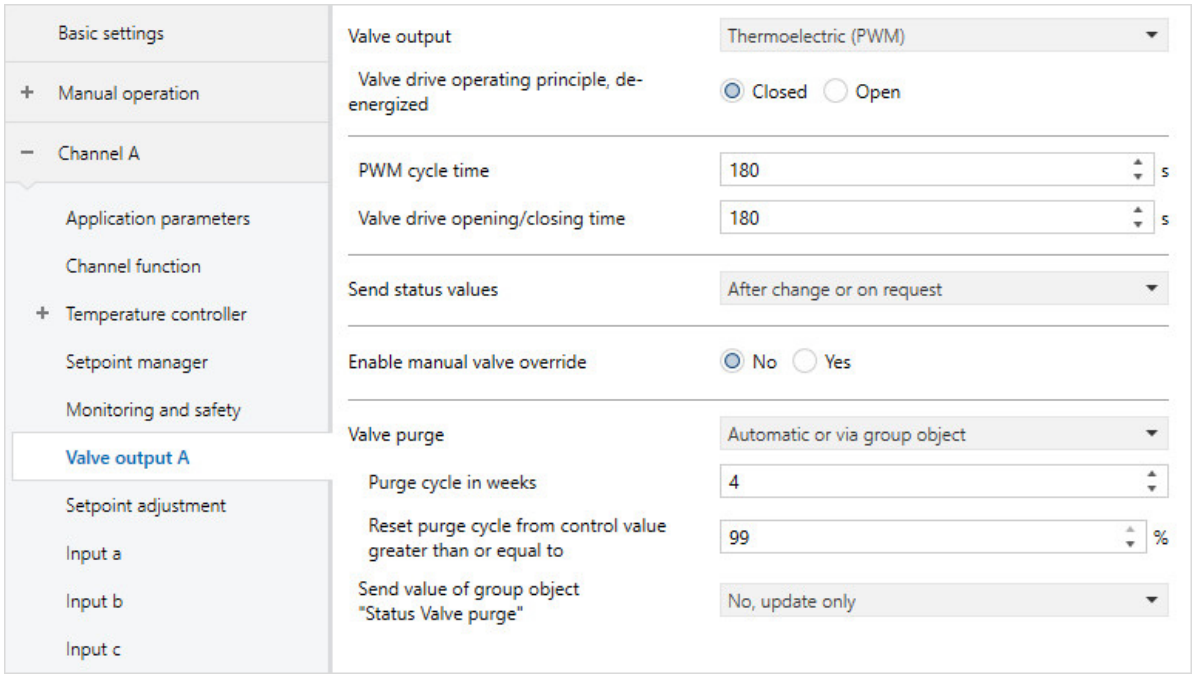

Fig. 19: Parameter window Valve output X

This parameter window includes the following parameters:

→ Valve output, Page 137
- → Valve drive operating principle, de-energized, Page 142
- → PWM cycle time, Page 149
- → Open if control value greater than or equal to, Page 104
- → Valve drive opening/closing time, Page 104
- → Send status values [valve output], Page 121
  - → Send cyclically every, Page 146
- → Enable manual valve override, Page 96
- → Valve purge, Page 138
  - → Purge cycle in weeks, Page 118
  - → Reset purge cycle from control value greater than or equal to, Page 119
  - → Send value of group object "Status valve purge", Page 138

Prerequisites for visibility

- The parameter window is in the parameter window *Channel X*.

7.2.3.7 Parameter window Setpoint adjustment

The following settings can be made in this parameter window:
- Setting setpoint adjustment
- Defining data point types for setpoint adjustment

The depiction of the parameter window and the parameters depends on the setting made in the parameter *Channel function*.

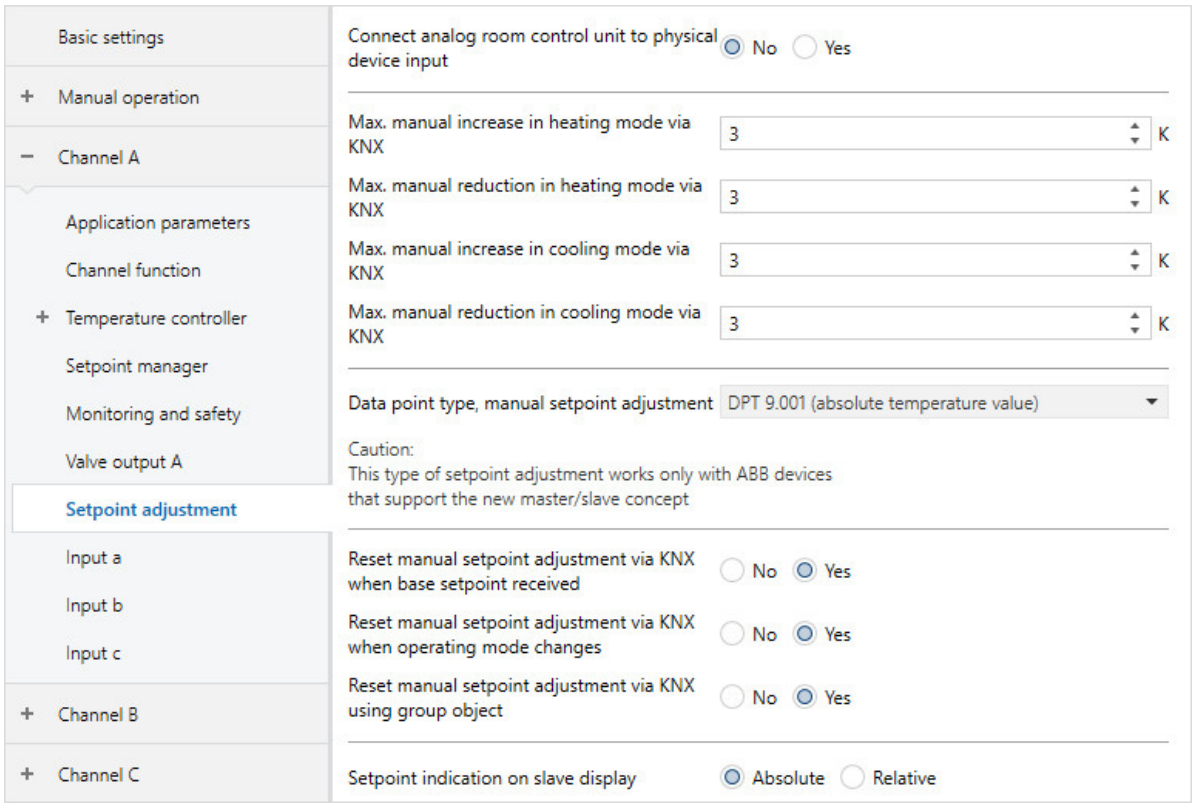

Fig. 20: Parameter window Setpoint adjustment

This parameter window includes the following parameters:

→ Connect analog room control unit to physical device input a, Page 55
→ Max. manual increase in heating mode via KNX, Page 98
→ Max. manual reduction in heating mode via KNX, Page 97
→ Max. manual increase in cooling mode via KNX, Page 98
→ Max. manual reduction in cooling mode via KNX, Page 97
→ Data point type, manual setpoint adjustment, Page 74
→ Reset manual setpoint adjustment when base setpoint received, Page 142
→ Reset manual setpoint adjustment when operating mode changes, Page 143
→ Reset manual setpoint adjustment via group object, Page 144
→ Setpoint indication on slave display, Page 116
→ Maximum setpoint increase, Page 99
→ Maximum setpoint reduction, Page 99

Prerequisites for visibility
- The parameter window is in the parameter window *Channel X*.

7.2.3.8 Parameter window Input x

The following settings can be made in this parameter window:

- Configuring device inputs

> **Note**
> If input a is used to connect an analog room control unit, the input is configured in the parameter window *Setpoint adjustment*.

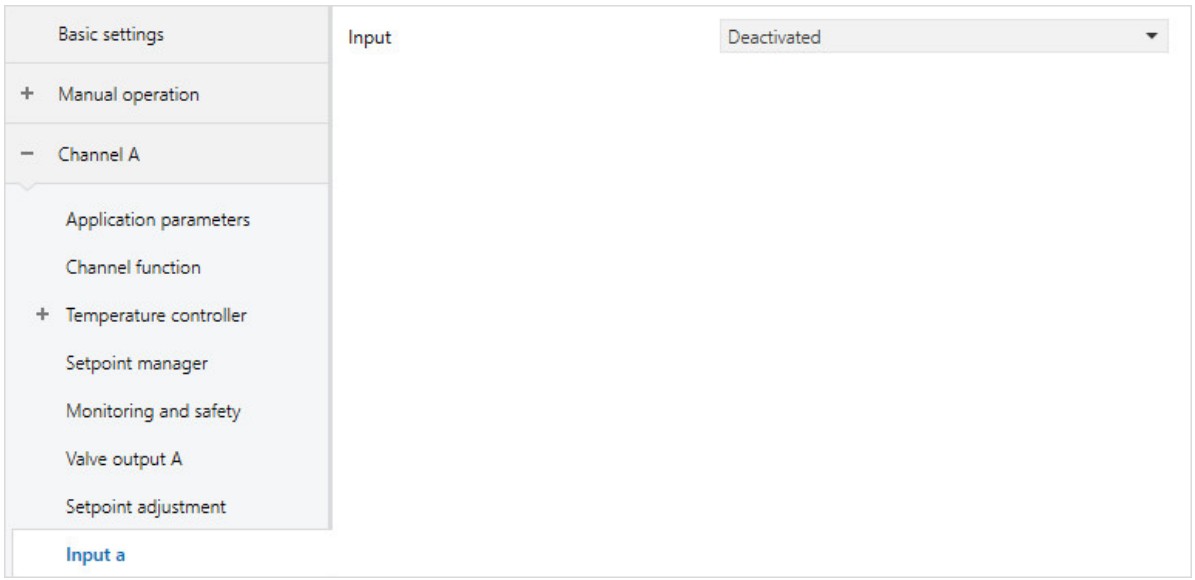

Fig. 21: Parameter window Input x

This parameter window includes the following parameters:

Note

In the following, the possible settings for inputs a … l are explained using input a as an example. The setting options are identical for all inputs.

Prerequisites for visibility

- The parameter window is in the parameter window *Channel X*.

7.3 Overview of parameters

7.4 Parameter descriptions

7.4.1 Economy heating reduction

This parameter is used to define the value by which the temperature is to be reduced in the *Economy heating* operating mode. The value is specified as a difference from the parameter *Comfort heating set-point*.

More information: → Explanation of the operating modes, Page 174.

Note
The controller ensures that the setpoint temperature is not exceeded when the actual temperature increases. The operating mode is not changed.

Option
0 … 4 … 15 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Relative*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.2 Standby heating reduction

This parameter is used to define the value by which the temperature is to be reduced in the *Standby heating* operating mode. The value is specified as a difference from the parameter *Comfort heating set-point*.

More information: → Explanation of the operating modes, Page 174.

Note
The controller ensures that the setpoint temperature is not exceeded when the actual temperature increases. The operating mode is not changed.

Option
0 … 2 … 15 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Options *Comfort, Standby, Economy, Building Protection* / *Comfort, Standby, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Relative*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.3 Send current setpoint

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

Option	
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Cycle for sending the setpoint*
After change	The value is sent if there is a change.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.4 Connect analog room control unit to physical device input a

This parameter is used to define whether an analog room control unit is connected to input a.

Depending on the setting in the parameter *Channel function*, different dependent parameters and group objects are displayed.

For basic information on using an analog room control unit: → Use of an analog room control unit, Page 191.

Note
If an analog room control unit is connected in actuator mode, setpoint adjustment cannot be performed via a KNX room control unit.

Note
Actuators cannot evaluate the values received from the analog room control unit. The group objects for confirmation will be hidden.

Option	
No	An analog room control unit is not connected to input a. The following dependent parameters are shown: • *Max. manual increase in heating mode via KNX* • *Max. manual reduction in heating mode via KNX* • *Max. manual increase in cooling mode via KNX* • *Max. manual reduction in cooling mode via KNX* • *Data point type, manual setpoint adjustment* • *Reset manual setpoint adjustment when base setpoint received* • *Reset manual setpoint adjustment when operating mode changes* • *Reset manual setpoint adjustment via group object* • *Setpoint indication on slave display*
Yes	An analog room control unit is connected to input a. In controller mode, device input a is set to the option *Analog room control unit*. The analog room control unit sends the setpoint adjustment to the internal controller in the device. Setpoint adjustment is performed via the group objects shown in the actuator mode. The following dependent parameters are shown: • *Maximum setpoint increase* • *Maximum setpoint reduction* • *Data point type, manual setpoint adjustment* The following dependent group objects are displayed: • *Error Input* • *Request setpoint adjustment (slave)* (DPT 6.010) • *Request setpoint adjustment (slave)* (DPT 9.002)

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.5 Economy cooling increase

This parameter is used to define the value by which the temperature is to be increased in the *Economy cooling* operating mode. The value is specified as a difference from the parameter *Comfort cooling set-point*.

More information: → Explanation of the operating modes, Page 174.

Note
The controller ensures that the setpoint temperature is not fallen below when the actual temperature decreases. The operating mode is not changed.

Option
0 … 4 … 15 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Relative*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.6 Standby cooling increase

This parameter is used to define the value by which the temperature is to be increased in the *Standby cooling* operating mode. The value is specified as a difference from the parameter *Comfort cooling set-point*.

More information: → Explanation of the operating modes, Page 174.

Note
The controller ensures that the setpoint temperature is not fallen below when the actual temperature decreases. The operating mode is not changed.

Option
0 … 2 … 15 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Options *Comfort, Standby, Economy, Building Protection* / *Comfort, Standby, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Relative*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.7 Activate basic-stage heating via

This parameter is used to define whether the control value for activating basic-stage heating is output via an internal output or a group object.

CAUTION
To ensure that the device functions properly, a reset must be performed each time the assignment of the outputs is changed.

Note
The possible options and the standard option depend on the selection made in the parameter *Basic-stage heating [controller]*.

Option	
Internal channel output (valve)	The control value is output on the internal channel output. In addition, the control value is output via one of the following group objects: • *Status Control value basic-stage heating* (DPT 1.001) • *Status Control value basic-stage heating* (DPT 5.001)
Group object	The control value is output via one of the following group objects: • *Status Control value basic-stage heating* (DPT 1.001) • *Status Control value basic-stage heating* (DPT 5.001)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage heating [actuator]* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.8 Activate basic-stage cooling via

This parameter is used to define whether the control value for activating basic-stage cooling is output via an internal output or a group object.

CAUTION
To ensure that the device functions properly, a reset must be performed each time the assignment of the outputs is changed.

Note
The possible options and the standard option depend on the selection made in the parameter *Activate basic-stage heating via*.

Option	
Internal channel output (valve)	The control value is output on the internal channel output. In addition, the control value is output via one of the following group objects: • *Status Control value basic-stage cooling* (DPT 1.001) • *Status Control value basic-stage cooling* (DPT 5.001)
Group object	The control value is output via one of the following group objects: • *Status Control value basic-stage cooling* (DPT 1.001) • *Status Control value basic-stage cooling* (DPT 5.001)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage cooling [actuator]* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.9 Activate additional-stage heating via

This parameter is used to define whether the control value for activating additional-stage heating is output via an internal output or a group object.

CAUTION
To ensure that the device functions properly, a reset must be performed each time the assignment of the outputs is changed.

Note
The possible options and the standard option depend on the selection made in the following parameters:
- *Additional-stage heating*
- *Activate basic-stage heating via*
- *Activate basic-stage cooling via*

Option	
Internal channel output (valve)	The control value is output on the internal channel output. In addition, the control value is output via one of the following group objects: • *Status Control value additional-stage heating* (DPT 1.001) • *Status Control value additional-stage heating* (DPT 5.001)
Group object	The control value is output via one of the following group objects: • *Status Control value additional-stage heating* (DPT 1.001) • *Status Control value additional-stage heating* (DPT 5.001)

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.10 Activate additional-stage cooling via

This parameter is used to define whether the control value for activating additional-stage cooling is output via an internal output or a group object.

CAUTION
To ensure that the device functions properly, a reset must be performed each time the assignment of the outputs is changed.

Note
The possible options and the standard option depend on the selection made in the following parameters:
- *Activate basic-stage heating via*
- *Activate basic-stage cooling via*
- *Activate additional-stage heating via*

Option	
Internal channel output (valve)	The control value is output on the internal channel output. In addition, the control value is output via one of the following group objects: • *Status Control value additional-stage cooling* (DPT 1.001) • *Status Control value additional-stage cooling* (DPT 5.001)
Group object	The control value is output via one of the following group objects: • *Status Control value additional-stage cooling* (DPT 1.001) • *Status Control value additional-stage cooling* (DPT 5.001)

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.11 Number of group objects Actual temperature

This parameter is used to define the number of group objects via which an actual temperature value is received via the bus (ABB i-bus® KNX).

Option	
1	The actual temperature is received via one group object. The following dependent group objects are displayed: • *External temperature 1*
2	The actual temperature is received via two group objects. The received values are weighted. The following dependent parameters are shown: • *Weighting of external measurement 2* The following dependent group objects are displayed: • *External temperature 1* • *External temperature 2*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Actual temperature receipt* \ Options *Via group object* / *Via phys. device input or group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.12 Limit number of telegrams

This parameter is used to define whether the number of telegrams sent by the device will be limited. The fewer telegrams sent, the lower the bus load will be.

More information: → Telegram rate limit, Page 189.

Option	
No	The number of telegrams is not limited.
Yes	The following dependent parameters are shown: • *Maximum number of telegrams* • *In period (0 = deactivated)*

Prerequisites for visibility

- The parameter is in the parameter window *Basic settings*.

7.4.13 Type of control value Basic-stage heating

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

Note
The parameter can be changed only if, in the parameter *Basic-stage heating [controller]*, the option *Free configuration* is selected.

Note
For a detailed description: → Control types, Page 181.

Option	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Status Control value basic-stage heating* (DPT 1.001)
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Status Control value basic-stage heating* (DPT 5.001)
PI continuous (0 … 100 %)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value basic-stage heating* (DPT 5.001)
PI PWM (On/Off)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value basic-stage heating* (DPT 1.001)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

7.4.14 Type of control value Basic-stage cooling

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

Note
The parameter can be changed only if, in the parameter *Basic-stage cooling [controller]*, the option *Free configuration* is selected.

Note
For a detailed description: → Control types, Page 181.

Option	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Status Control value basic-stage cooling* (DPT 1.001)
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Status Control value basic-stage cooling* (DPT 5.001)
PI continuous (0 … 100 %)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value basic-stage cooling* (DPT 5.001)
PI PWM (On/Off)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value basic-stage cooling* (DPT 1.001)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

7.4.15 Type of control value Additional-stage heating

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

Note
The parameter can be changed only if, in the parameter *Additional-stage heating*, the option *Free configuration* is selected.

Note
For a detailed description: → Control types, Page 181.

Option	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Status Control value additional-stage heating* (DPT 1.001)
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Status Control value additional-stage heating* (DPT 5.001)
PI continuous (0 … 100 %)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value additional-stage heating* (DPT 5.001)
PI PWM (On/Off)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value additional-stage heating* (DPT 1.001)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

7.4.16 Type of control value Additional-stage cooling

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

Note
The parameter can be changed only if, in the parameter *Additional-stage cooling*, the option *Free configuration* is selected.

Note
For a detailed description: → Control types, Page 181.

Option	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Status Control value additional-stage cooling* (DPT 1.001)
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Status Control value additional-stage cooling* (DPT 5.001)
PI continuous (0 … 100 %)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value additional-stage cooling* (DPT 5.001)
PI PWM (On/Off)	The following dependent parameters are shown: • *P-proportion* • *I-proportion* The following dependent group objects are displayed: • *Status Control value additional-stage cooling* (DPT 1.001)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.17 Type of heating/cooling system

This parameter is used to define the type of heating/cooling system used. The selection affects the changeover behavior of the device between heating and cooling.

More information: → 2-pipe and 4-pipe systems, Page 173.

Option	
2-pipe	The activated heating and cooling devices are in a 2-pipe system. The parameter *Heating/cooling changeover* is permanently set to the option *Via group object*.
4-pipe	The activated heating and cooling devices are in a 4-pipe system. The parameter *Heating/cooling changeover* is set to the option *Automatic*.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage heating [actuator]* \ Option *Activated*
  - Parameter *Basic-stage cooling [actuator]* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.18 Ending temperature for summer compensation

This parameter is used to define the temperature at which summer compensation is deactivated.

More information: → Summer compensation, Page 187.

Option
10 … 32 … 50 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Activate summer compensation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.19 Time for automatic reset to KNX operation

This parameter is used to define the time after which the device is automatically reset to the operating state *KNX operation*.

After the *Manual operation* button is pressed, the device remains in the operating state *Manual operation* until the button is pressed again or the set time expires.

Option
00:00:30 … 00:05:00 … 18:12:15 hh:mm:ss

Prerequisites for visibility

- Product variant:
  - VC/S 4.2.1
- Parameter window *Manual operation*
  - Parameter *Manual operation* \ Option *Enabled*
  - Parameter *Automatic reset from manual operation to KNX operation* \ Option *Yes*
- The parameter is in the parameter window *Manual operation*.

7.4.20 Automatic reset from manual operation to KNX operation

This parameter is used to define whether the device is reset from the operating state *Manual operation* to the operating state *KNX operation* after an adjustable time.

Option	
No	Automatic reset is deactivated. The operating state can be changed only using the *Manual operation* button.
Yes	The following dependent parameters are shown: • *Time for automatic reset to KNX operation*

Prerequisites for visibility

- Product variant:
  - VC/S 4.2.1
- Parameter window *Manual operation* \ Parameter *Manual operation* \ Option *Enabled*
- The parameter is in the parameter window *Manual operation*.

7.4.21 Base setpoint is

This parameter is used to define which value corresponds to the base setpoint.

More information: → Basic setpoint, Page 174.

> **Note**
> If only the *Heating* operating mode or *Cooling* operating mode is configured, the base setpoint corresponds to the respective *Comfort* setpoint.

Option	
Comfort heating setpoint	The base setpoint corresponds to the setpoint for Comfort heating. If the base setpoint is changed via the group object *Basic setpoint*, the setpoint for Comfort cooling shifts as well. The relative distances between the two Comfort values remain unchanged.
Comfort cooling setpoint	The base setpoint corresponds to the setpoint for Comfort cooling. If the base setpoint is changed via the group object *Basic setpoint*, the setpoint for Comfort heating shifts as well. The relative distances between the two Comfort values remain unchanged.
Mean value between Comfort heating and cooling	A mean value is calculated from the setpoints for Comfort heating and Comfort cooling. This mean value is adopted as the base setpoint.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Relative*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Relative*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.22 [Heating] limit temperature

This parameter is used to define the limit temperature for the *Heating* operating mode. When the temperature reaches the set value, the controller sets the control value to 0.

Setting for receipt of the temperature value → parameter *Input for temperature limit sensor*.

Option
20 … 30 … 50 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

7.4.23 Limit temperature [cooling]

This parameter is used to define the limit temperature for the *Cooling* operating mode. When the temperature reaches the set value, the controller sets the control value to 0.

Setting for receipt of the temperature value → parameter *Input for temperature limit sensor*.

Option
1 … 10 … 30 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.24 On group object value

This parameter is used to define when the value of the group object is sent cyclically.

Option	
0	If the value of the group object is 0, this value is sent cyclically after an adjustable time has elapsed.
1	If the value of the group object is 1, this value is sent cyclically after an adjustable time has elapsed.
0 or 1	The value of the group object is sent cyclically after an adjustable time has elapsed.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Send status values [binary input]* \ Option *After change or cyclically*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.25 When opening the contact

This parameter is used to define how long the contact must be open as a minimum before a reaction is triggered.

Option
0.0 ... 1.0 ... 100.0 s

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Distinction between long and short operation* \ Option *No*
  - Parameter *Activate minimum signal duration* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.26 When closing the contact

This parameter is used to define how long the contact must be closed as a minimum before a reaction is triggered.

Option
0.0 ... 1.0 ... 100.0 s

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Distinction between long and short operation* \ Option *No*
  - Parameter *Activate minimum signal duration* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.27 Heating/cooling mode when monitoring time exceeded

This parameter is used to define which operating mode is activated when the monitoring time is exceeded.

The operating mode remains active until a new value is received on one of the following group objects:

- *Heating/cooling changeover* (Controller mode)
- *Heating/cooling changeover* (Actuator mode)

Option
Unchanged
Heating
Cooling

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Heating/cooling changeover* \ all options except *Automatic*
- Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Heating/cooling changeover"* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.28 Operating mode after bus voltage recovery

This parameter is used to define which operating mode is activated after bus voltage recovery.

Option
As before bus voltage failure
Heating
Cooling

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Channel function*.

7.4.29 Operating mode after ETS download/reset

This parameter is used to define which operating mode is activated after ETS download or reset.

Option
Heating
Cooling

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Channel function*.

7.4.30 Operating modes

This parameter is used to define which operating modes are used.

Note
If the device is requested to change to an unused operating mode via a group object, it changes to *Comfort* mode instead.

For an explanation of the individual operating modes → Explanation of the operating modes, Page 174

Option
Comfort, Standby, Economy, Building Protection
Comfort, Standby, Building Protection
Comfort, Building Protection

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.31 Operating mode after exceeding monitoring time

This parameter is used to define which operating mode is activated if no value is received on group object *Operating mode normal (master)* during the specified period. This operating mode remains active until a new value is received on group object *Operating mode normal (master)*.

Option
Building Protection
Comfort
Standby
Economy

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Operating mode normal (master)"* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.32 Operating mode after bus voltage recovery or ETS download

This parameter is used to define which operating mode is activated after bus voltage recovery or ETS download. The operating mode remains active until a new operating mode is set.

Note
After an ETS reset the *Comfort* operating mode is always set.

Note
The operating mode should be defined during the planning phase. If the operating mode is defined incorrectly, this might reduce comfort or increase energy consumption.

For an explanation of the individual operating modes → Explanation of the operating modes, Page 174.

Option
Comfort
Standby
Economy
Building Protection
As before bus voltage failure/download

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.33 Data point type, manual setpoint adjustment

This parameter is used to define the data point type (DPT) for manual setpoint adjustment.

Note
DPT 6.010 must be selected for existing systems and for older 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 and the adjustment is transmitted incrementally.
With newer devices, DPT 9.001 or 9.002 can be selected and absolute or relative setpoint adjustment can be performed via temperature values.
All ABB devices still support adjustment via DPT 6.010.

Note
If setpoint adjustment is performed using a room control unit, refer to the technical data of the room control unit for the setpoint adjustment format.

Note
Permanent setpoint adjustment can be performed via one of the following group objects:
- *Basic setpoint*
- *Comfort heating setpoint*
- *Comfort cooling setpoint*
- *Setpoint Comfort heating/cooling*

Note
If DPT 6.010 is used, the setpoint adjustment cannot be processed by additionally connected devices (e.g. visualization system).
The current setpoint temperature must be read via the group object *Current setpoint*.

Option	
DPT 6.010 (meter pulses)	Manual setpoint adjustment is performed via DPT 6.010. The following dependent group objects are displayed: • *Request setpoint adjustment (master)* (DPT 6.010) • *Request setpoint adjustment (slave)* (DPT 6.010) • *Confirm setpoint adjustment (master)* (DPT 6.010)
DPT 9.001 (absolute temperature value)	Manual setpoint adjustment is performed via DPT 9.001. This option is only available in the controller mode. The following dependent group objects are displayed: • *Request setpoint adjustment (master)* (DPT 9.001) • *Confirm setpoint adjustment (master)* (DPT 9.001)
DPT 9.002 (relative temperature value)	Manual setpoint adjustment is performed via DPT 9.002. The following dependent group objects are displayed: • *Request setpoint adjustment (master)* (DPT 9.002) • *Request setpoint adjustment (slave)* (DPT 9.002) • *Confirm setpoint adjustment (master)* (DPT 9.002)

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

or
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.34 Input

This parameter is used to define the use of the input.

Note
If, in the parameter *Connect analog room control unit to physical device input a*, the option *Yes* is selected, the option *Analog room control unit* is set for this input and cannot be changed.

Note
The inputs are scanned after bus voltage recovery, download or ETS reset. Scanning takes place once the device functions properly again after download, ETS reset or bus voltage recovery. This can take up to 2 seconds. The current status is sent on the bus (ABB i-bus® KNX) after the end of the sending and switching delay.
For binary inputs, the scanning can be defined in the parameter *Scan input after download, ETS reset or bus voltage recovery*.

Option	
Deactivated	The input is deactivated.
Window contact	A floating window monitoring contact is connected to the input. If, in the parameter *Window status receipt*, the option *Via physical device input* is selected, the window status is included in room temperature control. The following dependent parameters are shown: • *Window open if [input x]* • *Send status values [window contact]* The following dependent group objects are displayed: • *Window contact*
Dew point sensor	A dew point monitoring sensor is connected to the input. If, in the parameter *Dew point status receipt*, the option *Via physical device input* is selected, the dew point status is included in room temperature control. The following dependent parameters are shown: • *Dew point reached if [input x]* • *Send status values [dew point alarm]* The following dependent group objects are displayed: • *Dew point alarm*
Fill level sensor	A sensor for monitoring the fill level in a condensate drain pan is connected to the input. If, in the parameter *Fill level status receipt*, the option *Via physical device input* is selected, the fill level status is included in room temperature control. The following dependent parameters are shown: • *Fill level reached if [input x]* • *Send status values [fill level alarm]* The following dependent group objects are displayed: • *Fill level alarm*
Temperature sensor	A temperature measuring sensor is connected to the input. If, in the parameter *Actual temperature receipt*, the option *Via physical device input* or the option *Via phys. device input or group object* is selected, the temperature value measured is included in room temperature control. If several inputs are parameterized as temperature sensors and the measured values are included as the actual temperature in control, a mean value is determined from the temperature values. The temperature value measured can also be used for the temperature limitation → Parameter *Input for temperature limit sensor*. Two separate temperature sensors must be used to measure the room temperature and the limit temperature. Each temperature sensor must be connected to a separate input. The following dependent parameters are shown: • *Temperature sensor type* • *Temperature offset* • *Cable error compensation* • *Filter* • *Send temperature value* • *Value is sent from a change of* The following dependent group objects are displayed: • *Temperature* • *Error Input*
Binary input	The input is used as the binary input. The following dependent parameters are shown: • *Distinction between long and short operation* • *Activate minimum signal duration* • *Enable group object "Block input"* • *Reaction on event x* • *Send status values [binary input]* • *Scan input after download, ETS reset or bus voltage recovery* The following dependent group objects are displayed: • *Contact position binary input*
Analog room control unit	An analog room control unit is connected to the input. Parameterization is performed in the parameter window *Setpoint adjustment*.

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.35 Scan input after download, ETS reset or bus voltage recovery

This parameter is used to define whether the state of the input is scanned after download, ETS reset or bus voltage recovery.

> **Note**
> Scanning takes place once the device functions properly again after download, ETS reset or bus voltage recovery. This can take up to 2 seconds. The current status is sent on the bus (ABB i-bus® KNX) after the end of the sending and switching delay.

Option
No
Yes

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Binary input*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.36 Input on operation

This parameter is used to define which state the input assumes when a connected contact is operated.

Option
Open
Closed

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Distinction between long and short operation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.37 Starting temperature for summer compensation

This parameter is used to define the temperature from which summer compensation is activated.

More information: → Summer compensation, Page 187.

Option
10 … 21 … 50 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Activate summer compensation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.38 Input for temperature limit sensor

This parameter is used to define how the controller receives the temperature to be limited.

> **Note**
> If a physical device input is selected, a temperature sensor must be connected to this input.
> Two separate temperature sensors must be used to measure the room temperature and the limit temperature. Each temperature sensor must be connected to a separate input.

Option	
Via group object	The temperature is received via a dedicated group object. The following dependent group objects are displayed: • *Basic-stage heating limit temperature* • *Basic-stage cooling limit temperature* • *Additional-stage heating limit temperature* • *Additional-stage cooling limit temperature*
Via physical device input x	The temperature is measured via a connected temperature sensor.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.39 Window status receipt

This parameter is used to define how the controller receives the window status.

> **Note**
> If no input is set as the window contact, the controller interprets the function as being deactivated.
> If several inputs are set as window contacts, they are logically OR-linked. The controller reacts as soon as one of the inputs sends the status "Window open".

Option	
Deactivated	The controller ignores the window status.
Via physical device input	The controller checks which device input is parameterized as a window contact. The status of the connected window contact is included in control. The input is configured in the parameter window *Input x*.
Via group object	The window status is received via group object *Window contact (master/slave)*. The following dependent parameters are shown: • *Window open if [controller]* The following dependent group objects are displayed: • *Window contact (master/slave)*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.40 Fill level status receipt

This parameter is used to define how the controller receives the fill level status of a condensate pan.

> **Note**
> If no input is set as the fill level sensor, the controller interprets the function as being deactivated.
> If several inputs are set as fill level sensors, they are logically OR-linked. The controller reacts as soon as one of the inputs sends the status "Fill level reached".

Option	
Deactivated	The controller ignores the fill level status.
Via physical device input	The controller checks which device input is parameterized as a fill level sensor. The status of the connected fill level sensor is included in control.
Via group object	The fill level status is received via the group object *Fill level alarm*. • *Fill level alarm* The following dependent parameters are shown: • *Fill level reached if [controller]*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.41 Actual temperature receipt

This parameter is used to define how the controller receives the actual temperature.

> **Note**
> If a temperature sensor is not connected to any of the inputs, the controller changes to safety mode. If several inputs are set as temperature sensors, a mean value is formed from the measured values and is used as the actual temperature value.

Option	
Via physical device input	The controller checks which device input is parameterized as a temperature sensor. The measured actual temperature is included in control.
Via group object	The actual temperature is received via max. two group objects. The received values are weighted. The following dependent parameters are shown: • *Number of group objects Actual temperature*
Via phys. device input or group object	The actual temperature can be received via a device input and/or via group objects. The values measured on the inputs and received via the bus (ABB i-bus® KNX) are weighted. The following dependent parameters are shown: • *Number of group objects Actual temperature* • *Weighting of internal measurement* • *Weighting of external measurement 1*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.42 Dew point status receipt

This parameter is used to define how the controller receives the dew point status.

> **Note**
> If no input is set as the dew point sensor, the controller interprets the function as being deactivated. If several inputs are set as dew point sensors, they are logically OR-linked. The controller reacts as soon as one of the inputs sends the status "Dew point reached".

Option	
Deactivated	The controller ignores the dew point status.
Via physical device input	The controller checks which device input is parameterized as a dew point sensor. The status of the connected dew point sensor is included in control.
Via group object	The dew point status is received via the group object *Dew point alarm*. The following dependent parameters are shown: • *Dew point reached if [controller]* The following dependent group objects are displayed: • *Dew point alarm*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.43 Extended settings

This parameter is used to display the extended settings for the parameter window.

Option	
No	The extended settings are not shown. The corresponding parameters are used with the standard values.
Yes	The following dependent parameters are shown: • *Control value direction* • *Control value difference for sending the control value* • *Hysteresis* • *Cycle for sending the control value (0 = deactivated)* • *PWM cycle X* • *Maximum control value* • *Min. control value (basic load)* • *Activate temperature limitation*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.44 Window open if [input x]

This parameter is used to define the sensor contact position that is interpreted as the status "Window open".

Option
Contact open
Contact closed

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Window contact*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.45 Window open if [controller]

This parameter is used to define the value of the group object *Window contact (master/slave)* that is interpreted as the status "Window open".

When the status "Window open" is received, the controller switches to the operating mode *Building Protection* (Building Protection heating = frost protection, Building Protection cooling = heat protection).

Option
Value 0
Value 1

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Window status receipt* \ Option *Via group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.46 Filter

This parameter is used to set a floating mean value filter.

More information: → Floating mean value, Page 178.

Option	
Deactivated	The floating mean value filter is deactivated.
Low (floating mean value over 30 seconds)	The mean value filter is active. The mean value is determined over a time of 30 seconds.
Medium (floating mean value over 60 seconds)	The mean value filter is active. The mean value is determined over a time of 60 seconds.
High (floating mean value over 120 seconds)	The mean value filter is active. The mean value is determined over a time of 120 seconds.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.47 Fill level reached if [input x]

This parameter is used to define the sensor contact position that is interpreted as the status "Fill level alarm".

Option
Contact open
Contact closed

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Fill level sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.48 Fill level reached if [controller]

This parameter is used to define the value of the group object *Fill level alarm* that is interpreted as the status "Fill level alarm".

> **Note**
> When the controller receives the status "Fill level alarm", cooling is interrupted and the operating mode *Building Protection* is activated. Building Protection remains active until the controller receives the status "No fill level alarm".
> The fill level alarm acts only on the *Cooling* operating mode, and the operating mode can therefore be switched to *Heating* (if available) at any time.

Option
Value 0
Value 1

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Fill level status receipt* \ Option *Via group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.49 Weighting of external measurement 1

This parameter is used to define the weighting with which the external measurement is included in the calculation of the actual temperature.

More information: → Weighting of the temperature inputs, Page 177.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Actual temperature receipt* \ Options *Via group object / Via phys. device input or group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.50 Weighting of external measurement 2

This parameter is used to define the weighting with which the external measurement is included in the calculation of the actual temperature.

More information: → Weighting of the temperature inputs, Page 177.

> **Note**
> If only external measurements are included in the calculation and a weighting of 0 % is selected for both measurements, the value received as external temperature 1 is used as the actual temperature.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Actual temperature receipt* \ Options *Via group object / Via phys. device input or group object*
  - Parameter *Number of group objects Actual temperature* \ Option *2*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.51 Weighting of internal measurement

This parameter is used to define the weighting with which the internal measurement is included in the calculation of the actual temperature.

More information: → Weighting of the temperature inputs, Page 177.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Actual temperature receipt* \ Option *Via phys. device input or group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.52 Basic load active when controller off

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

Option
No
Yes

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller*.

7.4.53 Basic-stage heating [actuator]

This parameter is used to define how basic-stage heating is used.

Option	
Deactivated	Basic-stage heating is deactivated.
Activated	The following dependent parameters are shown: • *Type of heating/cooling system* • *Heating/cooling changeover* • *Activate basic-stage heating via* The following dependent group objects are displayed: • *Control value Heating*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.54 Basic-stage heating [controller]

This parameter is used to define how basic-stage heating is used. The controller is preset based on the selected option.

Option	
Deactivated	Basic-stage heating is deactivated.
Convector (e.g. radiator)	Basic-stage heating is set for the use of a convector. The parameter *Type of control value Basic-stage heating* is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameter windows are shown: • *Basic-stage heating* The following dependent parameters are shown: • *Additional-stage heating* • *Activate basic-stage heating via* The following dependent group objects are displayed: • *Status Heating*
Area heating (e.g. floor)	Basic-stage heating is set for the use of area heating. The parameter *Type of control value Basic-stage heating* is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameter windows are shown: • *Basic-stage heating* The following dependent parameters are shown: • *Additional-stage heating* • *Activate basic-stage heating via* The following dependent group objects are displayed: • *Status Heating*
Free configuration	Basic-stage heating can be configured as required. The parameter *Type of control value Basic-stage heating* is preset to the option *PI continuous (0 … 100 %)* but can be changed. The following dependent parameter windows are shown: • *Basic-stage heating* The following dependent parameters are shown: • *Additional-stage heating* • *Activate basic-stage heating via* The following dependent group objects are displayed: • *Status Heating*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.55 Basic-stage cooling [actuator]

This parameter is used to define how basic-stage cooling is used.

Option	
Deactivated	Basic-stage cooling is deactivated.
Activated	The following dependent parameters are shown: • *Type of heating/cooling system* • *Heating/cooling changeover* • *Activate basic-stage cooling via* The following dependent group objects are displayed: • *Control value Cooling*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.56 Basic-stage cooling [controller]

This parameter is used to define how basic-stage cooling is used. The controller is preset based on the selected option.

Option	
Deactivated	Basic-stage cooling is deactivated.
Area cooling (e.g. cooling ceiling)	Basic-stage cooling is set for the use of area cooling. The parameter *Type of control value Basic-stage cooling* is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameter windows are shown: • *Basic-stage cooling* The following dependent parameters are shown: • *Activate basic-stage cooling via* • *Additional-stage cooling* • *Dew point status receipt* • *Fill level status receipt* The following dependent group objects are displayed: • *Status Cooling*
Free configuration	Additional-stage cooling can be configured as required. The parameter *Type of control value Basic-stage cooling* is preset to the option *PI continuous (0 … 100 %)* but can be changed. The following dependent parameter windows are shown: • *Basic-stage cooling* The following dependent parameters are shown: • *Activate basic-stage cooling via* • *Additional-stage cooling* • *Dew point status receipt* • *Fill level status receipt* The following dependent group objects are displayed: • *Status Cooling*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.57 Hysteresis

This parameter is used to define the hysteresis that is to apply above and below the setpoint to prevent continuous switching of the controller.

	Heating	Cooling
Actual temperature > (setpoint + hysteresis/upper switching point)	Controller Off	Controller On
Actual temperature < (setpoint – hysteresis/lower switching point)	Controller On	Controller Off

Tab. 20: Dependency of hysteresis on the operating mode

Option
0.3 … 0.5 … 25.5 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ Options *2-point 1 bit (On/Off)* / *2-point 1 byte (0/100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ Options *2-point 1 bit (On/Off)* / *2-point 1 byte (0/100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ Options *2-point 1 bit (On/Off)* / *2-point 1 byte (0/100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ Options *2-point 1 bit (On/Off)* / *2-point 1 byte (0/100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.58 Limit temperature hysteresis

This parameter is used to define the limit temperature hysteresis. The hysteresis specifies the value by which the limit temperature must be dropped below (*heating*) or exceeded (*cooling*) before the controller becomes active again.

Option
0.5 … 1.0 … 5.0 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.59 Hysteresis for Heating/cooling changeover

This parameter is used to define the hysteresis for changeover between heating and cooling if a common setpoint is used for *Comfort heating* and *Comfort cooling*.

Note
Changeover between heating and cooling only occurs if the option *Automatic* is set in the parameter *Heating/cooling changeover*.

	Operating mode
Actual temperature > (setpoint + hysteresis)	Cooling
Actual temperature < (setpoint – hysteresis)	Heating

Tab. 21: Changing over heating/cooling

Note
Changeover between heating and cooling is possible only in *Comfort* operating mode.

Option
0.5 … 2.0 … 10.0 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Comfort heating setpoint = Comfort cooling setpoint* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.60 I-proportion

This parameter is used to define the I-proportion for the PI control.

More information: → Basics of PI control, Page 178.

Option
0 … 100 … 255 min

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating* \ Parameter *Type of control value Basic-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating* \ Parameter *Type of control value Additional-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling* \ Parameter *Type of control value Basic-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling* \ Parameter *Type of control value Additional-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.61 I-proportion at temperature limitation

This parameter is used to define what happens with the I-proportion when the limit temperature is reached.

More information: → Basics of PI control, Page 178.

Option	
Freeze	The current value of the I-proportion is saved. When the controller becomes active again, the saved value is used for control.
Reset	The I-proportion is reset to 0. When the controller becomes active, the I-proportion starts at 0.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.62 In period (0 = deactivated)

This parameter is used to define the period during which the device sends telegrams. The telegrams are sent as quickly as possible at the start of a period.

More information: → Telegram rate limit, Page 189.

Option
1 s
2 s
5 s
10 s
30 s
1 min

Prerequisites for visibility

- Parameter window *Basic settings* \ Parameter *Limit number of telegrams* \ Option *Yes*
- The parameter is in the parameter window *Basic settings*.

7.4.63 Channel function

The function of the channel is defined using this parameter.

Option	
Controller channel	The internal controller is active and is used for controlling the channel. The channel acts as the master and can control KNX room control units acting as slaves. The following dependent parameter windows are shown: • *Temperature controller* • *Setpoint manager* The following dependent parameters are shown: • *Basic-stage heating [controller]* • *Basic-stage cooling [controller]* • *Window status receipt* • *Actual temperature receipt*
Actuator channel	The channel is used as an actuator and receives its control values from an external controller. The following dependent parameters are shown: • *Basic-stage heating [actuator]* • *Basic-stage cooling [actuator]*

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.64 Enable group object "Block input"

This parameter enables the group object *Block input*.

Option	
No	The group object is not enabled.
Yes	The following dependent group objects are displayed: • *Block input*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Binary input*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.65 Enable group object "In operation"

This parameter enables the group object *In operation*.

Option	
No	The group object is not enabled.
Yes	The following dependent parameters are shown: • *Send value group object "In operation"* • *Sending cycle* The following dependent group objects are displayed: • *In operation*

Prerequisites for visibility

- The parameter is in the parameter window *Basic settings*.

7.4.66 KTY type

This parameter is used to set the KTY subtype.

Note
To ensure trouble-free function of the temperature input, the resistance values in the user-defined entry must increase according to the temperature values.
An incorrect entry results in incorrect output values.

Option	
KTY X	The temperature sensor type KTY X is used. The resistance characteristic is predefined to suit the temperature sensor type selected.
User-defined	The resistance values for the temperature sensor connected can be entered to suit the data sheet for the temperature sensor. The following dependent parameters are shown: • *Resistance in ohms at x °C*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Temperature sensor*
  - Parameter *Temperature sensor type* \ Option *KTY [-15…+110]*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.67 Long operation after

This parameter is used to define the time from which actuation of a connected contact (e.g. button/switch) is interpreted as long operation.

Option
1.0 … 10.0 s

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Distinction between long and short operation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.68 Cable length, single distance

This parameter is used to set the one-way cable length between sensor and device input.

Option
1.0 … 10.0 … 100.0 m

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Temperature sensor*
  - Parameter *Cable error compensation* \ Option *Via cable length*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.69 Cable error compensation

This parameter is used to define how cable errors that occur are compensated.

Note
Cable error compensation based on the cable length is possible only for cables with copper conductors.

Option	
None	Cable error compensation is not used.
Via cable length	The following dependent parameters are shown: • *Cable length, single distance* • *Cross-section of conductor, value* 0.01 mm²*
Via cable resistance	The following dependent parameters are shown: • *Cable resistance (total of fwd and rtn conductor)*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.70 Cable resistance (total of fwd and rtn conductor)

This parameter is used to set the cable resistance of the temperature sensor connected.

Note
To measure the cable resistance correctly, the conductors must be shorted together at the cable end and must not be connected to the input.

Option
0 … 500 … 10,000 mohms

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Temperature sensor*
  - Parameter *Cable error compensation* \ Option *Via cable resistance*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.71 Manual operation

This parameter is used to enable or block manual operation of the device.

Option	
Enabled	The operating states *Manual operation* and *KNX operation* can be switched via the *Manual operation* button or via group object *Enable/block manual operation*. The device can be operated using the membrane keypad. The following dependent parameters are shown: • *Automatic reset from manual operation to KNX operation* The following dependent group objects are displayed: • *Status Manual operation* • *Enable/block manual operation*
Blocked	Manual operation of the device is blocked.

Prerequisites for visibility

- Product variant:
  – VC/S 4.2.1
- The parameter is in the parameter window *Manual operation*.

7.4.72 Enable manual valve override

This parameter is used to define whether manual valve override can be enabled via a group object.

More information: → Manual valve override, Page 180.

Note
The value of group object *Override valve control value X* becomes active only when manual valve override has been enabled via group object *Enable/block manual valve override X*.

Option	
No	Manual valve override cannot be enabled via a group object.
Yes	Manual valve override can be enabled. The following dependent group objects are displayed: • *Enable/block manual valve override X* • *Override valve control value X*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Options *Thermoelectric (PWM)* / *Open/close signal*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.73 Max. manual reduction in heating mode via KNX

This parameter is used to define the value by which the setpoint *Comfort heating* can be reduced as a maximum. The reduction is made via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Request setpoint adjustment (master)* (DPT 6.010)
- *Request setpoint adjustment (master)* (DPT 9.001)
- *Request setpoint adjustment (master)* (DPT 9.002)

The limitation will become active when the device receives a value that is larger than the value set here. If the limitation is active, the maximum reduction is confirmed via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Confirm setpoint adjustment (master)* (DPT 6.010)
- *Confirm setpoint adjustment (master)* (DPT 9.001)
- *Confirm setpoint adjustment (master)* (DPT 9.002)

Option
0 … 3 … 9 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.74 Max. manual reduction in cooling mode via KNX

This parameter is used to define the value by which the setpoint *Comfort cooling* can be reduced as a maximum. The reduction is made via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Request setpoint adjustment (master)* (DPT 6.010)
- *Request setpoint adjustment (master)* (DPT 9.001)
- *Request setpoint adjustment (master)* (DPT 9.002)

The limitation will become active when the device receives a value that is larger than the value set here. If the limitation is active, the maximum reduction is confirmed via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Confirm setpoint adjustment (master)* (DPT 6.010)
- *Confirm setpoint adjustment (master)* (DPT 9.001)
- *Confirm setpoint adjustment (master)* (DPT 9.002)

Option
0 … 3 … 9 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.75 Max. manual increase in heating mode via KNX

This parameter is used to define the value by which the setpoint *Comfort heating* can be increased as a maximum. The increase is made via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Request setpoint adjustment (master)* (DPT 6.010)
- *Request setpoint adjustment (master)* (DPT 9.001)
- *Request setpoint adjustment (master)* (DPT 9.002)

The limitation will become active when the device receives a value that is larger than the value set here. If the limitation is active, the maximum increase is confirmed via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Confirm setpoint adjustment (master)* (DPT 6.010)
- *Confirm setpoint adjustment (master)* (DPT 9.001)
- *Confirm setpoint adjustment (master)* (DPT 9.002)

Option
0 … 3 … 9 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.76 Max. manual increase in cooling mode via KNX

This parameter is used to define the value by which the setpoint *Comfort cooling* can be increased as a maximum. The increase is made via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Request setpoint adjustment (master)* (DPT 6.010)
- *Request setpoint adjustment (master)* (DPT 9.001)
- *Request setpoint adjustment (master)* (DPT 9.002)

The limitation will become active when the device receives a value that is larger than the value set here. If the limitation is active, the maximum increase is confirmed via one of the following group objects, depending on the selection in the parameter *Data point type, manual setpoint adjustment*:

- *Confirm setpoint adjustment (master)* (DPT 6.010)
- *Confirm setpoint adjustment (master)* (DPT 9.001)
- *Confirm setpoint adjustment (master)* (DPT 9.002)

Option
0 … 3 … 9 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.77 Maximum number of telegrams

This parameter is used to define the number of telegrams sent within a period that can be set.

The period is defined in the parameter *In period (0 = deactivated)*.

More information: → Telegram rate limit, Page 189.

Option
1 … 20 … 50

Prerequisites for visibility

- Parameter window *Basic settings* \ Parameter *Limit number of telegrams* \ Option *Yes*
- The parameter is in the parameter window *Basic settings*.

7.4.78 Maximum setpoint increase

This parameter is used to define the permissible value of the maximum setpoint increase via the analog room control unit. The setpoint adjustment only applies to the *Comfort* operating mode.

Note
Beginning from the center position of the rotary knob, the temperature value set is distributed over the range in the clockwise direction. The right stop of the rotary knob corresponds to the maximum value set (e.g. 3 K).

Option
0 … 3 … 5 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.79 Maximum setpoint reduction

This parameter is used to define the permissible value of the maximum setpoint reduction via the analog room control unit. The setpoint adjustment only applies to the *Comfort* operating mode.

Note
Beginning from the center position of the rotary knob, the temperature value set is distributed over the range in the counterclockwise direction. The left stop of the rotary knob corresponds to the maximum value set (e.g. 3 K).

Option
0 … 3 … 5 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.80 Maximum control value

This parameter is used to define the maximum control value. The maximum control value is not allowed to be exceeded by the control, even if the controller calculates a higher control value.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ Options *PI continuous (0 … 100 %) / PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ Options *PI continuous (0 … 100 %) / PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ Options *PI continuous (0 … 100 %) / PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ Options *PI continuous (0 … 100 %) / PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.81 Activate minimum signal duration

This parameter is used to define whether the minimum signal duration is activated.

Note
The minimum signal duration indicates the minimum time a contact (e.g. button/switch) must be operated to trigger a reaction. The minimum signal duration prevents unintentional operation from triggering a reaction.

Option	
No	The minimum signal duration is not activated.
Yes	The following dependent parameters are shown: • *When opening the contact* • *When closing the contact*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Distinction between long and short operation* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.82 Min. control value (basic load)

This parameter is used to define the minimum control value (basic load) for the controller.

More information: → Basic load, Page 178.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.83 Minimum control value for basic load > 0

This parameter is used to define whether the basic load of the heating and cooling stages is always active or whether it is activated via a group object.

More information: → Basic load, Page 178.

Note
The basic load is activated for all stages, but it applies only to the active operating mode (*Heating* or *Cooling*). The basic load remains active during the operating mode change.
The basic load is set individually for each stage in the corresponding parameter windows → Parameter *Min. control value (basic load)*.

Option	
Activate via group object	The basic load can be activated (1) or deactivated (0) via the group object *Activate minimum control value (basic load)*. The following dependent group objects are displayed: • *Activate minimum control value (basic load)*
Always active	The basic load is always active.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller*.

7.4.84 NTC type

This parameter is used to define the NTC type used.

Note
The resistance value of an NTC20 sensor is 20 kohm at 25 °C. The resistance value of NTC10 sensors is 10 kohm at 25 °C. The individual types differ in the further course of the resistance curves.

Option
NTC10-01 [-15…+100°C]
NTC10-02 [-15…+100°C]
NTC10-03 [-15…+100°C]
NTC20 [0…+100°C]

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Temperature sensor*
  - Parameter *Temperature sensor type* \ Option *NTC*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.85 Open if control value greater than or equal to

This parameter is used to define the control value as of which an On signal is sent to the valve drive. If the control value is less than the value set here, an Off signal is sent.

Option
1 ... 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Option *Open/close signal*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.86 Valve drive opening/closing time

This parameter is used to set the time the valve drive requires to open the valve completely (from position 0 % to position 100 %) or close it completely.

Note
The time is listed in the technical data for the valve drive and corresponds to the total run time.

Option
10 ... 180 ... 900 s

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Options *Thermoelectric (PWM)* / *Open/close signal*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.87 Setpoint temperature offset when summer compensation ends

This parameter is used to define the setpoint temperature offset when summer compensation ends.

More information: → Summer compensation, Page 187.

Option
0.0 ... 6.0... 12.7 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Activate summer compensation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.88 Setpoint temperature offset when summer compensation starts

This parameter is used to define the setpoint temperature offset when summer compensation starts.

More information: → Summer compensation, Page 187.

Option
0.0 … 12.7 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Activate summer compensation* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.89 P-proportion

This parameter is used to define the P-proportion for the PI control.

More information: → Basics of PI control, Page 178.

> **Note**
> The default value depends on the operating mode (Heating or Cooling).

Option
1.0 … 1.5 … 10.0 K
1.0 … 2.0 … 10.0 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating* \ Parameter *Type of control value Basic-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating* \ Parameter *Type of control value Additional-stage heating* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling* \ Parameter *Type of control value Basic-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling* \ Parameter *Type of control value Additional-stage cooling* \ Options *PI continuous (0 … 100 %)* / *PI PWM (On/Off)*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.90 PWM cycle X

This parameter is used to define the cycle time (period) of the PWM signal.

The description applies to the following parameters:
- Heating PWM cycle
- Cooling PWM cycle

Depending on the PI control value calculated, the cycle time is subdivided into an On/Off signal (PWM signal).

Example
With a cycle time of 15 minutes and a PI control value of 33 %, the PWM signal is subdivided as follows:
- On signal: 5 minutes
- Off signal: 10 minutes

The PWM signal is output on the following group objects, depending on the operating mode:
- *Status Control value basic-stage heating*
- *Status Control value additional-stage heating*
- *Status Control value basic-stage cooling*
- *Status Control value additional-stage cooling*

For more information, see:

→ Pulse width modulation (PWM), Page 182

→ PI controller (PWM), Page 184

Note
With a PI control value of 0 %, a PWM signal with the value 0 is sent one time. The next PWM signal is sent when the PI control value changes.

Option
0 … 15 … 60 min

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ Option *Free configuration*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ Option *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ Option *Free configuration*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ Option *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ Options *Free configuration*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ Option *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ Option *Free configuration*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ Option *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.91 Cross-section of conductor, value* 0.01 mm²

This parameter is used to define the cross-section of the conductor to which the temperature sensor is connected.

Note
The option *150* corresponds to a conductor cross-section of 1.5 mm².

Option
1 … 100 … 150

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Temperature sensor*
  - Parameter *Cable error compensation* \ Option *Via cable length*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.92 Reaction on event x

This parameter is used to define which value is sent on the group object *Contact position binary input* for event 0 / event 1.

Note
The action that triggers event 0 or event 1 depends on the option in the parameter *Distinction between long and short operation*:

- No
  - Event 0 = Opening the contact
  - Event 1 = Closing the contact
- Yes
  - Event 0 = Short operation
  - Event 1 = Long operation

Note
The option *End cyclic transmission* becomes effective only if, in the parameter *Send status values [binary input]*, the option *After change or cyclically* is selected.

Option	
No edge evaluation	The edge (1 → 0 or 0 → 1 change) is not evaluated. A value is not sent.
On	The value 1 is sent.
Off	The value 0 is sent.
Toggle	If the value 0 was sent last, the value 1 is sent. If the value 1 was sent last, the value 0 is sent.
End cyclic transmission	Cyclical transmission of the status value is ended.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Binary input*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.93 Sending and switching delay after bus voltage recovery

This parameter is used to define the sending and switching delay after bus voltage recovery.

More information: → Sending and switching delay, Page 185.

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

Option
2 … 255 s

Prerequisites for visibility
- The parameter is in the parameter window *Basic settings*.

7.4.94 Sending cycle

This parameter is used to define the cycle in which the group object *In operation* sends a telegram.

Option
00:00:01 … 00:10:00 … 18:12:15 hh:mm:ss

Prerequisites for visibility
- Parameter window *Basic settings* \ Parameter *Enable group object "In operation"* \ Option *Yes*
- The parameter is in the parameter window *Basic settings*.

7.4.95 Setpoint for frost protection (building protection, heating)

This parameter is used to define the setpoint temperature that must not be fallen below in the *Building Protection heating* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be lower than the value in the parameter *Economy heating setpoint*.

If the device is in the *Heating* operating mode, the setpoint is active in the following cases:
- Controller receives the status "Window open"
- The controller is deactivated via group object *Request On/Off (master)*
- Controller is placed in the *Building Protection* operating mode via group objects *Operating mode normal (master)* or *Operating mode override (master)*

Option
5 … 7 … 15 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.96 Economy heating setpoint

This parameter is used to define the setpoint temperature for the *Economy heating* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be lower than the value in the parameter *Standby heating setpoint*. A difference of at least 2 K is recommended.

Note
The controller ensures that the setpoint temperature is not exceeded when the actual temperature increases. The operating mode is not changed.

Option
10 … 17 … 40 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.97 Comfort heating setpoint

This parameter is used to define the setpoint temperature for the *Comfort heating* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be higher than the value in the parameter *Standby heating setpoint*. A difference of at least 2 K is recommended.

Option
10 … 21 … 40 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Comfort heating setpoint = Comfort cooling setpoint* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.98 Standby heating setpoint

This parameter is used to define the setpoint temperature for the *Standby heating* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be lower than the value in the parameters *Comfort heating setpoint* or *Comfort heating and cooling setpoint*. A difference of at least 2 K is recommended.

Note
The controller ensures that the setpoint temperature is not exceeded when the actual temperature increases. The operating mode is not changed.

Option
10 … 19 … 40 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Options *Comfort, Standby, Economy, Building Protection / Comfort, Standby, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.99 Comfort heating and cooling setpoint

This parameter is used to define the setpoint temperature for the *Comfort heating* and *Comfort cooling* operating modes.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be between the values in the parameters *Standby heating setpoint* and *Standby cooling setpoint*. A difference of at least 2 K is recommended.

Option
10 … 21 … 40 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Comfort heating setpoint = Comfort cooling setpoint* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.100 Heat protection setpoint (building protection, cooling)

This parameter is used to define the setpoint temperature that must not be exceeded in the *Building Protection cooling* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be higher than the value in the parameter *Economy cooling setpoint*.

If the device is in the *Cooling* operating mode, the setpoint is active in the following cases:
- Controller receives the status "Window open", "Fill level alarm" or "Dew point alarm"
- The controller is deactivated via group object *Request On/Off (master)*
- Controller is placed in the *Building Protection* operating mode via group objects *Operating mode normal (master)* or *Operating mode override (master)*

Option
27 … 35 … 45 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.101 Economy cooling setpoint

This parameter is used to define the setpoint temperature for the *Economy cooling* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be higher than the value in the parameter *Standby cooling setpoint*. A difference of at least 2 K is recommended.

Note
The controller ensures that the setpoint temperature is not fallen below when the actual temperature decreases. The operating mode is not changed.

Option
10 … 29 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.102 Comfort cooling setpoint

This parameter is used to define the setpoint temperature for the *Comfort cooling* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be lower than the value in the parameter *Standby cooling setpoint*. A difference of at least 2 K is recommended.

Option
10 … 25 … 40 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Comfort heating setpoint = Comfort cooling setpoint* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.103 Standby cooling setpoint

This parameter is used to define the setpoint temperature for the *Standby cooling* operating mode.

More information: → Explanation of the operating modes, Page 174.

Note
The temperature value specified here must be higher than the value in the parameters *Comfort cooling setpoint* or *Comfort heating and cooling setpoint*. A difference of at least 2 K is recommended.

Note
The controller ensures that the setpoint temperature is not fallen below when the actual temperature decreases. The operating mode is not changed.

Option
10 … 27 … 40 °C

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Options *Comfort, Standby, Economy, Building Protection / Comfort, Standby, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.104 Comfort heating setpoint = Comfort cooling setpoint

This parameter is used to define whether a common setpoint temperature is used for *Comfort heating* and *Comfort cooling*.

More information: → Explanation of the operating modes, Page 174.

Option	
No	Two different setpoint temperatures (setpoints) can be set for *Comfort heating* and *Comfort cooling*. The following dependent parameters are shown: • *Comfort heating setpoint* • *Comfort cooling setpoint*
Yes	A common setpoint temperature is used for *Comfort heating* and *Comfort cooling*. The following dependent parameters are shown: • *Hysteresis for Heating/cooling changeover* • *Comfort heating and cooling setpoint*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.105 Setpoint indication on slave display

This parameter is used to define how the setpoint is indicated on the display for a slave.

Option	
Absolute	The setpoint is indicated as an absolute value.
Relative	The setpoint is indicated as a relative value.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.106 Setpoint specification and adjustment

This parameter is used to define whether the setpoints are entered as absolute values or as differences from the respective Comfort values.

Note

To ensure the correct function of the control and to obtain energy savings, there must be a logical relationship between the selected values of the individual operating modes.

- Comfort heating setpoint > Standby heating setpoint > Economy heating setpoint > Frost protection setpoint (Building Protection heating)
- Comfort cooling setpoint < Standby cooling setpoint < Economy cooling setpoint < Heat protection setpoint (Building Protection cooling)

Option	
Absolute	The setpoints for *Standby* and *Economy* modes are entered as absolute values. The setpoints are mutually independent and are not shifted with the base setpoint. The setpoints can be adjusted via the related group objects. The following dependent parameters are shown: • *Standby heating setpoint* • *Economy heating setpoint* • *Standby cooling setpoint* • *Economy cooling setpoint* The following dependent group objects are displayed: • *Comfort heating setpoint* • *Standby heating setpoint* • *Economy heating setpoint* • *Building Protection heating setpoint* • *Comfort cooling setpoint* • *Standby cooling setpoint* • *Economy cooling setpoint* • *Building Protection cooling setpoint*
Relative	The setpoints for *Standby* and *Economy* modes are entered as values relative to the respective Comfort values. The setpoint temperatures are adjusted for all operating modes via the bus (ABB i-bus® KNX) using group object *Basic setpoint*. The values for the *Building Protection* operating mode cannot be changed via the bus (ABB i-bus® KNX). The following dependent parameters are shown: • *Standby heating reduction* • *Economy heating reduction* • *Standby cooling increase* • *Economy cooling increase* • *Base setpoint is* The following dependent group objects are displayed: • *Basic setpoint*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.107 Activate summer compensation

This parameter is used to define whether summer compensation is activated in the device.

More information: → Summer compensation, Page 187.

Option	
No	Summer compensation is not activated.
Yes	The summer compensation is activated. The following dependent parameters are shown: • *Starting temperature for summer compensation* • *Setpoint temperature offset when summer compensation starts* • *Ending temperature for summer compensation* • *Setpoint temperature offset when summer compensation ends* The following dependent group objects are displayed: • *Outside temperature for summer compensation* • *Summer compensation active/inactive*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.108 Purge cycle in weeks

This parameter specifies the cycle for the automatic valve purge.

More information: → Valve purge, Page 190.

The following events reset the purge cycle:

- Valve purge performed
- ETS download
- Bus voltage recovery
- Exceeding the value in the parameter *Reset purge cycle from control value greater than or equal to*

Option
1 … 4 … 12

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X*
  - Parameter *Valve output* \ Options *Thermoelectric (PWM) / Open/close signal*
  - Parameter *Valve purge* \ Option *Automatic or via group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.109 Reset purge cycle from control value greater than or equal to

This parameter is used to define the control value as of which the purge cycle is reset.

More information: → Valve purge, Page 190.

Option
1 … 99 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X*
  - Parameter *Valve output* \ Options *Thermoelectric (PWM) / Open/close signal*
  - Parameter *Valve purge* \ Option *Automatic or via group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.110 Send status values [analog room control unit]

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Error Input*

Note
Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
After change	The value is sent if there is a change.
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.111 Send status values [binary input]

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Contact position binary input*

Option	
After change	The value is sent if there is a change.
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every* • *On group object value*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Binary input*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.112 Send status values [window contact]

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Window contact*

> **Note**
> Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
After change	The value is sent if there is a change.
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Window contact*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.113 Send status values [fill level alarm]

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Fill level alarm*

> **Note**
> Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
After change	The value is sent if there is a change.
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Fill level sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.114 Send status values [dew point alarm]

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Dew point alarm*

Note
Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
After change	The value is sent if there is a change.
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Dew point sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.115 Send status values [valve output]

This parameter is used to define when the values of the following group objects are sent on the bus (ABB i-bus® KNX):

- *Status byte Valve X*
- *Fault Valve output X*
- *Status Control value valve X*

Note
Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
After change	The value is sent if there is a change.
Cyclically	The value is sent cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*
On request	The value is sent on request.
After change or on request	The value is sent after a change or on request.
After change, on request or cyclically	The value is sent after a change, on request or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Options *Thermoelectric (PWM)* / *Open/close signal*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.116 Control value

This parameter is used to define the control value after bus voltage recovery or ETS download. The set control value is valid until a new control value is calculated by the controller in the controller mode or a new control value is received via the bus (ABB i-bus® KNX) in the actuator mode.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Channel function*
  - Parameter *Control value after bus voltage recovery* \ Option *Selection*
    or
  - Parameter *Control value after ETS download* \ Option *Selection*
- The parameter is in the parameter window *Channel X* \ parameter window *Channel function*.

7.4.117 Control value on input fault

This parameter is used to define the control value set if there is an error on the monitored temperature input. The control value applies only to the active operating mode. The control value is valid until the error is corrected.

Option
0 … 25 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Temperature input monitoring* \ Option *On physical device input x*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.118 Control value after exceeding monitoring time

This parameter is used to define the control value set if the monitoring time is exceeded. The control value applies only to the active operating mode.

Option
0 … 25 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Temperature input monitoring* \ Option *On group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.119 Control value on forced operation

This parameter is used to define the control value set if 1-bit forced operation is activated. The control value applies only to the active operating mode. The control value is valid until the forced operation is canceled.

More information: → Forced operation, Page 192.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Options *Activated 1 bit – 1 active* / *Activated 1 bit – 0 active*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.120 Control value on forced operation active "OFF"

This parameter is used to define the control value if 2-bit forced operation "OFF" is activated. The control value applies only to the active operating mode. The control value is valid until the forced operation is canceled.

More information: → Forced operation, Page 192.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 2 bit*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.121 Control value on forced operation active "ON"

This parameter is used to define the control value set if 2-bit forced operation "ON" is activated. The control value applies only to the active operating mode. The control value is valid until the forced operation is canceled.

More information: → Forced operation, Page 192.

Option
0 … 100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 2 bit*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.122 Control value after bus voltage recovery

This parameter is used to define the control value set after bus voltage recovery. The set control value is valid until a new control value is calculated by the controller in the controller mode or a new control value is received via the bus (ABB i-bus® KNX) in the actuator mode.

Note
The reaction set here applies during the sending and switching delay as well.
After bus voltage recovery, it can take up to 2 seconds until the device has started and the outputs can be activated.

Option	
As before bus voltage failure	The last control value before bus voltage failure is applied.
Selection	The control value can be set. The following dependent parameters are shown: • *Control value*

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Channel function*.

7.4.123 Control value after ETS download

This parameter is used to define the control value set after ETS download. The set control value is valid until a new control value is calculated by the controller in the controller mode or a new control value is received via the bus (ABB i-bus® KNX) in the actuator mode.

Option	
Unchanged	The last control value before ETS download is applied.
Selection	The control value can be set. The following dependent parameters are shown: • *Control value*

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Channel function*.

7.4.124 Control value difference for sending the control value

This parameter is used to define the difference for sending the control value. The calculated control value is sent only if it differs by the set difference from the last control value sent.

Option
2 %
5 %
10 %
Only send cyclically

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ Option *PI continuous (0 … 100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ Option *PI continuous (0 … 100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ Option *PI continuous (0 … 100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ Option *PI continuous (0 … 100 %)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.125 Dew point reached if [input x]

This parameter is used to define the sensor contact position that is interpreted as the status "Dew point alarm".

Option
Contact open
Contact closed

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Dew point sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.126 Dew point reached if [controller]

This parameter is used to define the value of group object *Dew point alarm* that is interpreted as the status "Dew point alarm".

Note

When the controller receives the status "Dew point alarm," cooling is interrupted and operating mode *Building Protection* is activated. Building Protection remains active until the controller receives the status "No dew point alarm."
The dew point alarm acts only on the *Cooling* operating mode, and the operating mode can therefore be switched to *Heating* (if available) at any time.

Option
Value 0
Value 1

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Dew point status receipt* \ Option *Via group object*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.127 Temperature change for sending current room temperature

This parameter is used to define the temperature change from which the current value of group object *Actual temperature* is sent on the bus.

Note

Depending on the setting in the parameter *Actual temperature receipt*, the current room temperature can comprise the following values:

- Values measured at the physical device inputs (internal temperature)
- Values received via the group object (*External temperature 1* or *External temperature 2*)

Option
0.1 … 0.5 … 10.0 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller*.

7.4.128 Activate temperature limitation

This parameter is used to define whether the temperature limitation is activated. When the limit temperature set is reached, the controller sets the control value to 0.

Option	
No	The temperature limitation is not activated.
Yes	The following dependent parameters are shown: • *[Heating] limit temperature* • *Limit temperature [cooling]* • *Limit temperature hysteresis* • *I-proportion at temperature limitation* • *Input for temperature limit sensor*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.129 Temperature difference from basic-stage heating

This parameter is used to define the actual temperature up to which additional-stage heating is active. The temperature value is specified as a difference from the setpoint temperature.

Additional-stage heating is switched on when the difference between the setpoint temperature and actual temperature is greater than or equal to the value set here.

Example

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.

Option
0.0 … 2.0 … 25.5 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

7.4.130 Temperature difference from basic-stage cooling

This parameter is used to define the actual temperature up to which additional-stage cooling is active. The temperature value is specified as a difference from the setpoint temperature.

Additional-stage cooling is switched on when the difference between the setpoint temperature and actual temperature is greater than or equal to the value set here.

Example

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 below 25 °C.

Option
0.0 … 2.0 … 25.5 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.131 Temperature offset

This parameter is used to define the offset for the sensor connected to the temperature input.

Note
The temperature offset can be used to compensate sensor measuring accuracy.

Option
-10.0 … 0.0 … +10.0 K

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.132 Temperature sensor type

This parameter specifies which type of temperature sensor is connected. The sensor measuring range is indicated in brackets.

With sensor types NTC and KTY, the subtype must be set as well.

Option	
PT1000 [-30…+110°C]	The temperature sensor type PT1000 is used.
PT100 [-30…+110°C]	The temperature sensor type PT100 is used.
NTC	The temperature sensor type NTC is used. The following dependent parameters are shown: • *NTC type*
KTY [-15…+110]	The temperature sensor type KTY is used. The following dependent parameters are shown: • *KTY type*
NI1000 - 01 [-30…+110°C]	The temperature sensor type NI1000 - 01 is used.
NI1000 - 02 [-30…+110°C]	The temperature sensor type NI1000 - 02 is used.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.133 Send temperature value

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Temperature*

Note
Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
After change	The value is sent if there is a change. The following dependent parameters are shown: • *Value is sent from a change of*
Cyclically	The value is sent cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Value is sent from a change of* • *Send cyclically every*
On request	The value is sent on request.
After change or on request	The value is sent after a change or on request. The following dependent parameters are shown: • *Value is sent from a change of*
On request or cyclically	The value is sent on request or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*
After change, on request or cyclically	The value is sent after a change, on request or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Value is sent from a change of* • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.134 Monitor receipt of group object "Operating mode normal (master)"

This parameter is used to define whether the monitoring of group object *Operating mode normal (master)* is activated.

Note
If no value is received on group object *Operating mode normal (master)* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Operating mode" receipt* is set to "Error"
- Value in the parameter *Operating mode after exceeding monitoring time* becomes valid

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* • *Operating mode after exceeding monitoring time*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.135 Monitor receipt of group object "Window contact"

This parameter is used to define whether the monitoring of group object *Window contact (master/slave)* is activated.

Note
If no value is received on group object *Window contact (master/slave)* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Window contact" receipt* is set to "Error"
- Until a new value is received on group object *Window contact (master/slave)*, the controller is in *Building Protection* operating mode

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* The following dependent group objects are displayed: • *Error "Window contact" receipt*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Window status receipt* \ Option *Via group object*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.136 Monitor receipt of group object "Fill level alarm"

This parameter is used to define whether the monitoring of group object *Fill level alarm* is activated.

Note
If no value is received on group object *Fill level alarm* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Fill level alarm" receipt* is set to "Error"
- Until a new value is received on group object *Fill level alarm*, the controller sets the control value for cooling to 0

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* The following dependent group objects are displayed: • *Error "Fill level alarm" receipt*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Fill level status receipt* \ Option *Via group object*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.137 Monitor receipt of group object "Dew point alarm"

This parameter is used to define whether the monitoring of group object *Dew point alarm* is activated.

Note
If no value is received on group object *Dew point alarm* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Dew point alarm" receipt* is set to "Error"
- Until a new value is received on group object *Dew point alarm*, the controller is in *Building Protection* operating mode

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* The following dependent group objects are displayed: • *Error "Dew point alarm" receipt*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Dew point status receipt* \ Option *Via group object*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.138 Monitor receipt of group object "Heating/cooling changeover"

This parameter is used to define whether the monitoring of group object *Heating/cooling changeover* is activated.

Note
If no value is received on group object *Heating/cooling changeover* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Heating/cooling changeover" receipt* is set to "Error"
- Value in the parameter *Heating/cooling mode when monitoring time exceeded* becomes valid

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* • *Heating/cooling mode when monitoring time exceeded* The following dependent group objects are displayed: • *Error "Heating/cooling changeover" receipt*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Heating/cooling changeover* \ all options except *Automatic*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.139 Monitor receipt of "Control value heating/cooling" group objects

This parameter is used to define whether the monitoring of the following group objects is activated:
- *Control value Heating*
- *Control value Cooling*

Note
If no value is received on the group object *Control value Heating* or *Control value Cooling* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Control value" receipt* is set to "Error"
- Value in the parameter *Control value after exceeding monitoring time* becomes valid

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* • *Control value after exceeding monitoring time* The following dependent group objects are displayed: • *Error "Control value" receipt*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.140 Temperature input monitoring

This parameter is used to define whether the reception of a temperature value is monitored.

Note

For the monitoring of a physical device input to function, a temperature sensor must be connected and the corresponding input must be set for the connection of a temperature sensor. The following settings must be made:

- Parameter *Input* \ Option *Temperature sensor*
- Parameter *Actual temperature receipt* \ all options except *Via group object*

Option	
Deactivated	Monitoring is deactivated.
On physical device input x	The reception of a temperature value on the physical device input x (x = a, b, c) is monitored. The following actions will be performed if no valid temperature is measured at the input for longer than one minute: • Group object *Fault Actual temperature (master)* is set to "Error" • Value in the parameter *Control value on input fault* becomes valid The following dependent parameters are shown: • *Control value on input fault* The following dependent group objects are displayed: • *Fault Actual temperature (master)*
On group object	The following group objects are monitored: • *External temperature 1* • *External temperature 2* The set time interval applies to both group objects. If a value is received on one of the group objects, only the time interval of the affected group object restarts. If a value is not received on one of the two group objects, the following actions are carried out: • Group object *Fault Actual temperature (master)* is set to "Error" • Value in the parameter *Control value after exceeding monitoring time* becomes valid The following dependent parameters are shown: • *Time interval for cyclical monitoring* • *Control value after exceeding monitoring time* The following dependent group objects are displayed: • *Fault Actual temperature (master)*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.141 Heating/cooling changeover

This parameter is used to define how the change between operating modes takes place.

Note
This parameter is set to the option *Via group object* in the following applications and cannot be changed:
- Actuator mode
- Controller mode and usage of 2-pipe system → parameter *Type of heating/cooling system*

Option	
Automatic	The change between the operating modes takes place automatically depending on the difference between the actual and setpoint temperature. The automatic change between the operating modes is possible only in the Comfort operating mode.
Via group object	The change between the operating modes takes place via the following group objects: • *Heating/cooling changeover* (Controller mode) • *Heating/cooling changeover* (Actuator mode)
Via group object or via slave	The change between the operating modes takes place via the following group objects: • *Heating/cooling changeover* (Controller mode) • *Request heating/cooling (master)*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

or
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage heating [actuator]* \ Option *Activated*
  - Parameter *Basic-stage cooling [actuator]* \ Option *Activated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.142 Distinction between long and short operation

This parameter is used to define whether a distinction is made between short and long operation of the connected contact (e.g. button).

The following figure shows the distinction:

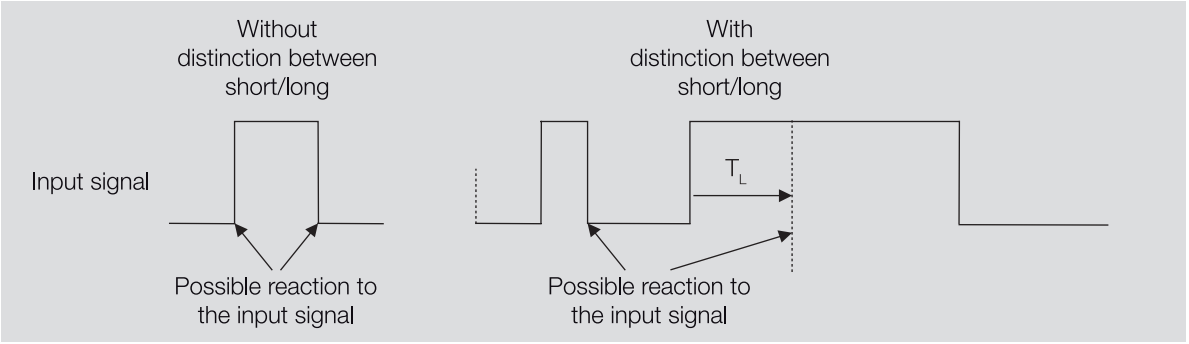

Fig. 22: Distinguishing between short/long operation

Note

T_L is the time from which a long operation is detected.

Option	
No	The following dependent parameters are shown: • *Activate minimum signal duration*
Yes	The following dependent parameters are shown: • *Input on operation* • *Long operation after*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Binary input*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.143 Valve output

This parameter is used to define how the valve output is used.

Depending on the valve drive parameterized, the control values received from the internal controller or via the bus (ABB i-bus® KNX) are converted into the corresponding output signal.

More information: → Valve drives, Page 188.

Option	
Thermoelectric (PWM)	The control value is converted to a PWM signal. The following dependent parameters are shown: • *Valve drive operating principle, de-energized* • *PWM cycle time* • *Valve drive opening/closing time* • *Send status values [valve output]* • *Enable manual valve override* • *Valve purge* The following dependent group objects are displayed: • *Status byte Valve X* • *Status Control value valve X* • *Fault Valve output X* • *Fault Reset valve output X*
Open/close signal	The control value is converted to an On/Off signal. If the value set in the parameter *Open if control value greater than or equal to* is reached, an On signal is output. The following dependent parameters are shown: • *Valve drive operating principle, de-energized* • *Open if control value greater than or equal to* • *Valve drive opening/closing time* • *Send status values [valve output]* • *Enable manual valve override* • *Valve purge* The following dependent group objects are displayed: • *Status byte Valve X* • *Status Control value valve X* • *Fault Valve output X* • *Fault Reset valve output X*
Deactivated	The valve output is deactivated.

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.144 Valve purge

This parameter is used to define how the valve purge is activated.

More information: → Valve purge, Page 190.

Option	
Deactivated	Valve purge is deactivated.
Automatic or via group object	Valve purge takes place automatically in a set cycle. Valve purge can be triggered via a group object as well. The following dependent parameters are shown: • *Purge cycle in weeks* • *Reset purge cycle from control value greater than or equal to* • *Send value of group object "Status valve purge"* The following dependent group objects are displayed: • *Status Valve purge X* • *Activate valve purge X*
Via group object	The valve purge can be triggered via a group object. The following dependent parameters are shown: • *Send value of group object "Status valve purge"* The following dependent group objects are displayed: • *Status Valve purge X* • *Activate valve purge X*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Options *Thermoelectric (PWM)* / *Open/close signal*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.145 Send value group object "In operation"

This parameter is used to define the value that the group object *In operation* sends.

Option
Value 0
Value 1

Prerequisites for visibility

- Parameter window *Basic settings* \ Parameter *Enable group object "In operation"* \ Option *Yes*
- The parameter is in the parameter window *Basic settings*.

7.4.146 Send value of group object "Status valve purge"

This parameter is used to define when the value of the following group object is sent on the bus (ABB i-bus® KNX):

- *Status Valve purge X*

Note

Sending on request can be triggered by the reception of a telegram with the value 0 or 1 on group object *Request status values*.

Option	
No, update only	The value is updated but is not sent.
After change	The value is sent if there is a change.
Cyclically	The value is sent cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*
On request	The value is sent on request.
After change or on request	The value is sent after a change or on request.
After change, on request or cyclically	The value is sent after a change, on request or cyclically. The cycle time can be set. The following dependent parameters are shown: • *Send cyclically every*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X*
  - Parameter *Valve output* \ Options *Thermoelectric (PWM)* / *Open/close signal*
  - Parameter *Valve purge* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.147 Value after sending and switching delay has expired

This parameter is used to define the values that are applicable at the inputs and outputs after expiration of the sending and switching delay.

Option	
Last value received	The inputs and outputs react to the last value received.
Ignore received values	The state of the inputs and outputs remains unchanged until a new value is received after the sending and switching delays have elapsed.

Prerequisites for visibility

- The parameter is in the parameter window *Basic settings*.

7.4.148 Value is sent from a change of

This parameter is used to define the minimum change in the input value for sending the output value on the bus (ABB i-bus® KNX).

Option
0.2 … 1.0 … 10.0 K

Prerequisites for visibility

- The parameter appears at various points in the application. The visibility is dependent on the application and the higher-level parameter.

7.4.149 Resistance in ohms at x °C

These parameters are used to enter the resistance values for the temperature sensor connected. The values entered are used to form a characteristic curve of resistance.

Option
650 … 4,600 ohms

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Temperature sensor*
  - Parameter *Temperature sensor type* \ Option *KTY [-15…+110]*
  - Parameter *KTY type* \ Option *User-defined*
- The parameter is in the parameter window *Channel X* \ parameter window *Input x*.

7.4.150 Control value direction

This parameter is used to define the control value for the heating/cooling stage.

More information: → Control value direction, Page 184.

Option	
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 value Off/0 % • Control value Off/0 % ⇒ Telegram value On/100 %

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ Option *Free configuration*
  - Parameter *Activate basic-stage heating via* \ Option *Group object*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ Option *Free configuration*
  - Parameter *Activate additional-stage heating via* \ Option *Group object*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ Option *Free configuration*
  - Parameter *Activate basic-stage cooling via* \ Option *Group object*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ Option *Free configuration*
  - Parameter *Activate additional-stage cooling via* \ Option *Group object*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling* \ Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.151 Valve drive operating principle, de-energized

This parameter is used to define the operating principle of the valve drive connected.

Option	
Closed	The valve is closed if no current flows through the valve drive. The valve is opened if current flows through the valve drive.
Open	The valve is opened if no current flows through the valve drive. The valve is closed if current flows through the valve drive.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Options *Thermoelectric (PWM)* / *Open/close signal*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

7.4.152 I-bus® Tool access

This parameter is used to define whether the device can be accessed via the i-bus® Tool.

More information: → Integration into i-bus® Tool, Page 27.

Option	
Deactivated	Access via the i-bus® Tool is deactivated.
Value display only	Values can be displayed via the i-bus® Tool.
Full access	Values can be displayed and changed i-bus® Tool.

Prerequisites for visibility

- The parameter is in the parameter window *Basic settings*.

7.4.153 Reset manual setpoint adjustment when base setpoint received

Note
This parameter only has an effect if the option *Relative* is set in the parameter *Setpoint specification and adjustment*.

This parameter is used to define whether manual setpoint adjustment is reset when a new value is received on group object *Basic setpoint*.

Example
- Old base setpoint: 21 °C
- Manual adjustment: 1.5 K
- Old temperature setpoint: 22.5 °C

New value is received via group object *Basic setpoint*:
- New base setpoint: 18 °C
- New temperature setpoint
  - Without manual adjustment reset: 19.5 °C
  - With manual adjustment reset: 18 °C

Option	
No	Manual adjustment is not reset. The new temperature setpoint is calculated from the value in group object *Basic setpoint* and the manual adjustment.
Yes	Manual adjustment is reset. The new temperature setpoint corresponds to the value in group object *Basic setpoint*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.154 Reset manual setpoint adjustment when operating mode changes

This parameter is used to define whether manual setpoint adjustment is reset when the operating mode changes.

Example
- Comfort setpoint: 21 °C
- Manual adjustment: 1.5 K
- Temperature setpoint: 22.5 °C

Change in operating mode (e.g. Economy)

Change the operating mode to comfort
- New temperature setpoint
  - Without manual adjustment reset: 22.5 °C
  - With manual adjustment reset: 21 °C

Option	
No	Manual adjustment is not reset. The new temperature setpoint is calculated from the setpoint set for the operating mode and the manual adjustment.
Yes	Manual adjustment is reset. The new temperature setpoint corresponds to the setpoint of the active operating mode (plus any shift via group object *Basic setpoint*).

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.155 Reset manual setpoint adjustment via group object

This parameter is used to define whether manual setpoint adjustment can be reset via the group object *Reset manual setpoint adjustment*.

Option	
No	Manual setpoint adjustment cannot be reset via a group object.
Yes	The following dependent group objects are displayed: • *Reset manual setpoint adjustment*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *No*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint adjustment*.

7.4.156 Additional-stage heating

This parameter is used to define how the additional-stage heating is used. The controller is preset based on the selected option.

Option	
Deactivated	Additional-stage heating is deactivated.
Convector (e.g. radiator)	Additional-stage heating is set for the use of a convector. The parameter *Type of control value Additional-stage heating* is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameter windows are shown: • *Additional-stage heating* The following dependent parameters are shown: • *Activate additional-stage heating via*
Area heating (e.g. floor)	Additional-stage heating is set for the use of area heating. The parameter *Type of control value Additional-stage heating* is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameter windows are shown: • *Additional-stage heating* The following dependent parameters are shown: • *Activate additional-stage heating via*
Free configuration	The additional-stage heating can be configured as required. The parameter *Type of control value Additional-stage heating* is preset to the option *PI continuous (0 … 100 %)* but can be changed. The following dependent parameter windows are shown: • *Additional-stage heating* The following dependent parameters are shown: • *Activate additional-stage heating via*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.157 Additional-stage cooling

This parameter is used to define how the additional-stage cooling is used. The controller is preset based on the selected option.

Option	
Deactivated	Additional-stage cooling is deactivated.
Area cooling (e.g. cooling ceiling)	Additional-stage cooling is set for the use of area cooling. The parameter *Type of control value Additional-stage cooling* is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameter windows are shown: • *Additional-stage cooling* The following dependent parameters are shown: • *Activate additional-stage cooling via*
Free configuration	Additional-stage cooling can be configured as required. The parameter *Type of control value Additional-stage cooling* is preset to the option *PI continuous (0 … 100 %)* but can be changed. The following dependent parameter windows are shown: • *Additional-stage cooling* The following dependent parameters are shown: • *Activate additional-stage cooling via*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Application parameters*.

7.4.158 Forced operation

This parameter is used to activate/deactivate 1-bit or 2-bit forced operation.

More information: → Forced operation, Page 192.

> **Note**
> If forced operation is active, operation via group objects, manual operation and i-bus® Tool is blocked. Higher-priority functions continue to run → Priorities, Page 173.

Option	
Deactivated	Forced operation is deactivated.
Activated 1 bit – 1 active	Forced operation is activated by the reception of a telegram with the value 1. The following dependent parameters are shown: • *Control value on forced operation* The following dependent group objects are displayed: • *Forced operation, 1-bit*
Activated 1 bit – 0 active	Forced operation is activated by the reception of a telegram with the value 0. The following dependent parameters are shown: • *Control value on forced operation* The following dependent group objects are displayed: • *Forced operation, 1-bit*
Activated 2 bit	2-bit forced operation is used. The following dependent parameters are shown: • *Control value on forced operation active "ON"* • *Control value on forced operation active "OFF"* The following dependent group objects are displayed: • *Forced operation, 2-bit*

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.159 Send cyclically every

This parameter is used to define the cycle in which the value of the group object is sent.

> **Note**
> The possible options and default values depend on the higher-level parameter.

Option
00:00:30 … 00:05:00 … 18:12:15 hh:mm:ss
00:00:30 … 00:01:00 … 18:12:15 hh:mm:ss

Prerequisites for visibility

- The parameter appears at various points in the application. The visibility is dependent on the application and the higher-level parameter.

7.4.160 Cyclical monitoring

The cyclical monitoring is activated/deactivated with this parameter.

More information: → Cyclical monitoring, Page 193.

Option	
Deactivated	The cyclical monitoring is deactivated.
Activated	The following dependent parameters are shown: • *Temperature input monitoring* • *Monitor receipt of group object "Operating mode normal (master)"* • *Monitor receipt of group object "Heating/cooling changeover"* • *Monitor receipt of group object "Window contact"* • *Monitor receipt of group object "Dew point alarm"* • *Monitor receipt of group object "Fill level alarm"* • *Monitor receipt of "Control value heating/cooling" group objects*

Prerequisites for visibility

- The parameter is in the parameter window *Channel X* \ parameter window *Monitoring and safety*.

7.4.161 Time interval for cyclical monitoring

This parameter is used to define the time interval during which a value must be received on the monitored group object.

More information: → Cyclical monitoring, Page 193.

> **Note**
> The monitoring cycle in the device should be at least quadruple the cyclical sending time of the sending device. As a result, the reactions set will not be triggered immediately if a signal is missing, e.g. due to high bus load.

Option
00:00:30 … 01:00:00 … 18:12:15 hh:mm:ss

Prerequisites for visibility

- The parameter appears at various points in the application. The visibility is dependent on the application and the higher-level parameter.

7.4.162 Send inactive control values cyclically

This parameter is used to define whether the control value for the inactive operating mode is sent cyclically.

Note
On systems with only one control value input for heating and cooling, the group objects *Status Control value basic-stage heating* and *Status Control value basic-stage cooling* must be connected to the same input group object. If the *Yes* option is selected in this parameter, the control values for the active and inactive operating mode overwrite each other.

Example
Active type of operation: *Heating*
Control value Heating: 50 %
Control value Cooling: 0 %
Sending cycle: 5 minutes (for both types of operation)
Valve drive actuator: 2-pipe system for *Heating* and *Cooling* (only one control value input)
Send control value *Heating* ⇒ control value received: 50 %
⇒ Valve drive actuator output control value: 50 %
Send control value *Cooling* ⇒ control value received: 0 %
⇒ Valve drive actuator output control value: 0 %

Note
The cycle times can be set in the parameter window of the respective heating/cooling stage → parameter *Cycle for sending the control value (0 = deactivated)*.

Option
No
Yes

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller*.

7.4.163 Cycle for sending the room temperature (0 = deactivated)

This parameter is used to define the cycle in which the current room temperature is to be sent via group object *Actual temperature*.

Note
Depending on the setting in the parameter *Actual temperature receipt*, the current room temperature can comprise the following values:
- Values measured at the physical device inputs (internal temperature)
- Values received via the group object (*External temperature 1* or *External temperature 2*)

Option
0 … 15 … 255 min

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller*.

7.4.164 Cycle for sending the control value (0 = deactivated)

This parameter is used to define the cycle for sending the control value.

Note
Sending cyclically should not be deactivated to ensure that the actuator receives its control value.
If, in the parameter *Control value difference for sending the control value*, the option *Only send cyclically* is selected, a value > 0 must be selected.

Option
0 … 15 … 60 min

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Type of control value Basic-stage heating* \ all options except *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Type of control value Additional-stage heating* \ all options except *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage heating*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Type of control value Basic-stage cooling* \ all options except *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Basic-stage cooling*.

or

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Type of control value Additional-stage cooling* \ all options except *PI PWM (On/Off)*
  - Parameter *Extended settings* \ Option *Yes*
- The parameter is in the parameter window *Channel X* \ parameter window *Temperature controller* \ parameter window *Additional-stage cooling*.

7.4.165 Cycle for sending the setpoint

This parameter is used to define the cycle in which the group object *Current setpoint* sends the setpoint.

Option
5 … 15 … 240 min

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Send current setpoint* \ Option *After change or cyclically*
- The parameter is in the parameter window *Channel X* \ parameter window *Setpoint manager*.

7.4.166 PWM cycle time

This parameter is used to define the cycle time for the pulse width modulation on the valve output.

Option
10 … 180 … 900 s

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ Option *Thermoelectric (PWM)*
- The parameter is in the parameter window *Channel X* \ parameter window *Valve output X*.

8 Group objects

8.1 Overview of group objects

Function	Group object name	Data point type	Length	Flags
Activate minimum control value (basic load)	Channel X – Controller	DPT 1.003	1 bit	C W
Activate valve purge X	Channel X – Valve X	DPT 1.017	1 bit	C W
Actual temperature	Channel X – Controller	DPT 9.001	2 bytes	C R T
Additional-stage cooling limit temperature	Channel X – Controller	DPT 9.001	2 bytes	C W T U
Additional-stage heating limit temperature	Channel X – Controller	DPT 9.001	2 bytes	C W T U
Basic setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Basic-stage cooling limit temperature	Channel X – Controller	DPT 9.001	2 bytes	C W T U
Basic-stage heating limit temperature	Channel X – Controller	DPT 9.001	2 bytes	C W T U
Block input	Channel X – Input x	DPT 1.003	1 bit	C W
Building Protection cooling setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Building Protection heating setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Comfort heating setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Comfort setpoint reached	Channel X – Controller	DPT 1.002	1 bit	C R T
Comfort cooling setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Confirm On/Off (master)	Channel X – Controller	DPT 1.001	1 bit	C R T
Confirm setpoint adjustment (master)	Channel X – Controller	DPT 9.001	2 bytes	C R T
Confirm setpoint adjustment (master)	Channel X – Controller	DPT 6.010	1 byte	C R T
Confirm setpoint adjustment (master)	Channel X – Controller	DPT 9.002	2 bytes	C R T
Contact position binary input	Channel X – Input x	DPT 1.001	1 bit	C R T
Control value Cooling	Channel X – Actuator	DPT 5.001	1 byte	C W T U
Control value Heating	Channel X – Actuator	DPT 5.001	1 byte	C W T U
Controller Status HVAC (master)	Channel X – Controller	DPT 5.001	1 byte	C R T
Current HVAC operating mode	Channel X – Controller	DPT 20.102	1 byte	C R T
Current setpoint	Channel X – Controller	DPT 9.001	2 bytes	C R T
Dew point alarm	Channel X – Controller	DPT 1.005	1 bit	C W T U
Dew point alarm	Channel X – Input x	DPT 1.005	1 bit	C R T
Economy cooling setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Economy heating setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Enable/block manual operation	General	DPT 1.003	1 bit	C W
Enable/block manual valve override X	Channel X – Valve X	DPT 1.003	1 bit	C W
Error "Control value" receipt	Channel X – General	DPT 1.005	1 bit	C R T
Error "Dew point alarm" receipt	Channel X – General	DPT 1.005	1 bit	C R T
Error "Fill level alarm" receipt	Channel X – General	DPT 1.005	1 bit	C R T
Error "Heating/cooling changeover" receipt	Channel X – General	DPT 1.005	1 bit	C R T
Error "Operating mode" receipt	Channel X – General	DPT 1.005	1 bit	C R T
Error "Window contact" receipt	Channel X – General	DPT 1.005	1 bit	C R T
Error Input	Channel X – Input x	DPT 1.005	1 bit	C R T
External temperature 1	Channel X – Controller	DPT 9.001	2 bytes	C W T U
External temperature 2	Channel X – Controller	DPT 9.001	2 bytes	C W T U
Fault Actual temperature (master)	Channel X – Controller	DPT 1.005	1 bit	C R T
Fault Reset valve output X	Channel X – Valve X	DPT 1.015	1 bit	C W
Fault Valve output X	Channel X – Valve X	DPT 1.005	1 bit	C R T
Fill level alarm	Channel X – Controller	DPT 1.005	1 bit	C W T U
Fill level alarm	Channel X – Input x	DPT 1.005	1 bit	C R T
Forced operation, 1-bit	Channel X – General	DPT 1.002	1 bit	C W
Forced operation, 2-bit	Channel X – General	DPT 2.001	2 bit	C W
Heating/cooling changeover	Channel X – Actuator	DPT 1.100	1 bit	C W T U
Heating/cooling changeover	Channel X – Controller	DPT 1.100	1 bit	C W T U
In operation	General	DPT 1.002	1 bit	C R T
Operating mode normal (master)	Channel X – Controller	DPT 20.102	1 byte	C W T U
Operating mode override (master)	Channel X – Controller	DPT 20.102	1 byte	C W T U
Outside temperature for summer compensation	Channel X – Controller	DPT 9.001	2 bytes	C W
Override valve control value X	Channel X – Valve X	DPT 5.001	1 byte	C W
Presence detector (master/slave)	Channel X – Controller	DPT 1.018	1 bit	C W
Request heating/cooling (master)	Channel X – Controller	DPT 1.100	1 bit	C W
Request On/Off (master)	Channel X – Controller	DPT 1.001	1 bit	C W
Request setpoint adjustment (master)	Channel X – Controller	DPT 9.001	2 bytes	C W
Request setpoint adjustment (master)	Channel X – Controller	DPT 9.002	2 bytes	C W
Request setpoint adjustment (master)	Channel X – Controller	DPT 6.010	1 byte	C W
Request setpoint adjustment (slave)	Channel X – Actuator	DPT 9.002	2 bytes	C R T
Request setpoint adjustment (slave)	Channel X – Actuator	DPT 6.010	1 byte	C R T

Function	Group object name	Data point type	Length	Flags
Request status values	General	DPT 1.017	1 bit	C W
Reset manual setpoint adjustment	Channel X – Controller	DPT 1.017	1 bit	C W
Setpoint Comfort heating/cooling	Channel X – Controller	DPT 9.001	2 bytes	C W
Setpoint display (master)	Channel X – Controller	DPT 9.002	2 bytes	C R T
Standby cooling setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Standby heating setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W
Status byte channel	Channel X - General	Non DPT	1 byte	C R T
Status byte Valve X	Channel X – Valve X	Non DPT	1 byte	C R T
Status Control value additional-stage cooling	Channel X – Controller	DPT 5.001	1 byte	C R T
Status Control value additional-stage cooling	Channel X – Controller	DPT 1.001	1 bit	C R T
Status Control value additional-stage heating	Channel X – Controller	DPT 5.001	1 byte	C R T
Status Control value additional-stage heating	Channel X – Controller	DPT 1.001	1 bit	C R T
Status Control value basic-stage cooling	Channel X – Controller	DPT 5.001	1 byte	C R T
Status Control value basic-stage cooling	Channel X – Controller	DPT 1.001	1 bit	C R T
Status Control value basic-stage heating	Channel X – Controller	DPT 5.001	1 byte	C R T
Status Control value basic-stage heating	Channel X – Controller	DPT 1.001	1 bit	C R T
Status Control value valve X	Channel X – Valve X	DPT 5.001	1 byte	C R T
Status Controller RHCC	Channel X – Controller	DPT 22.101	2 bytes	C R T
Status Heating/cooling	Channel X – Controller	DPT 1.100	1 bit	C R T
Status Manual operation	General	DPT 1.011	1 bit	C R T
Status Cooling	Channel X – Controller	DPT 1.001	1 bit	C R T
Status Heating	Channel X – Controller	DPT 1.001	1 bit	C R T
Status Valve purge X	Channel X – Valve X	DPT 1.011	1 bit	C R T
Summer compensation active/inactive	Channel X – Controller	DPT 1.002	1 bit	C R T
Temperature	Channel X – Input x	DPT 9.001	2 bytes	C R T
Window contact (master/slave)	Channel X – Controller	DPT 1.019	1 bit	C W
Window contact	Channel X – Input x	DPT 1.005	1 bit	C R T

8.2 Group objects, general

Function	Group object name	Data point type	Length	Flags
In operation	**General**	**DPT 1.002**	**1 bit**	**C R T**

This group object cyclically sends an In operation telegram on the bus (ABB i-bus® KNX). The sending cycle is set in parameter *Sending cycle*.
The telegram value depends on the setting in the parameter *Send value group object "In operation"*.
Telegram value:
- 1 = Device in operation
- 0 = Device in operation

Note
Readiness can be monitored by another KNX device using this group object. If a telegram is not received, the sending device could be faulty or the bus cable to the transmitting device could be interrupted.

Prerequisites for visibility
- Parameter window *Basic settings* \ Parameter *Enable group object "In operation"* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Request status values	**General**	**DPT 1.017**	**1 bit**	**C W**

If a telegram is received on this group object, the values of the status group objects are sent on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Send status values
- 0 = Send status values

Note
The values of the status group objects are sent only if sending on request is set in the related parameters.

Prerequisites for visibility
- This group object is always visible.

Function	Group object name	Data point type	Length	Flags
Enable/block manual operation	**General**	**DPT 1.003**	**1 bit**	**C W**

The *Manual operation* mode is enabled/blocked using this group object.
If *Manual operation* mode is active, it will be ended and blocked with telegram value 0.
Telegram value:
- 1 = Enable manual operation
- 0 = End manual operation and block

Prerequisites for visibility
- Parameter window *Manual operation* \ Parameter *Manual operation* \ Option *Enabled*

Function	Group object name	Data point type	Length	Flags
Status Manual operation	**General**	**DPT 1.011**	**1 bit**	**C R T**

This group object sends the status of the *Manual operation* mode on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Manual operation active
- 0 = Manual operation inactive

Prerequisites for visibility
- Parameter window *Manual operation* \ Parameter *Manual operation* \ Option *Enabled*

8.3 Group objects, Channel x - General

Function	Group object name	Data point type	Length	Flags
Forced operation, 2-bit	**Channel X – General**	**DPT 2.001**	**2 bit**	**C W**

This group object is used to activate/deactivate 2-bit forced operation via the bus (ABB i-bus® KNX),
Forced operation is activated/deactivated with bit 1. Bit 0 is used to toggle between the states *Forced operation active "ON"* and *Forced operation active "OFF"*.
If forced operation is active, the control value cannot be controlled via KNX commands.
Telegram value (bit 1 | bit 0):

- 0 | 0 = Forced operation inactive
- 0 | 1 = Forced operation inactive
- 1 | 0 = Forced operation active "OFF"
- 1 | 1 = Forced operation active "ON"

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 2 bit*

Forced operation, 1-bit	Channel X – General	DPT 1.002	1 bit	C W

This group object is used to activate/deactivate 1-bit forced operation via the bus (ABB i-bus® KNX).
If forced operation is active, the control value cannot be controlled via KNX commands.
Telegram value:

- Depends on the setting in the parameter *Forced operation*

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 1 bit – 0 active* / *Activated 1 bit – 1 active*

Error "Heating/cooling changeover" receipt	Channel X – General	DPT 1.005	1 bit	C R T

The group object sends the error status for the cyclical monitoring of the following group objects on the bus (ABB i-bus® KNX):

- *Heating/cooling changeover*
- *Heating/cooling changeover*

The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:

- 1 = Error
- 0 = No error

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Heating/cooling changeover* \ Option *Via group object* / *Via group object or via slave*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Heating/cooling changeover"* \ Option *Activated*

Error "Window contact" receipt	Channel X – General	DPT 1.005	1 bit	C R T

The group object sends the error status for the cyclical monitoring of the group object Window contact on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:

- 1 = Error
- 0 = No error

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Window status receipt* \ Option *Via group object*
- Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Window contact"* \ Option *Activated*

Error "Dew point alarm" receipt	Channel X – General	DPT 1.005	1 bit	C R T

The group object sends the error status for the cyclical monitoring of the group object Dew point alarm [input x] on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:

- 1 = Error
- 0 = No error

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Dew point status receipt* \ Option *Via group object*
- Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Dew point alarm"* \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Error "Fill level alarm" receipt	**Channel X – General**	**DPT 1.005**	**1 bit**	**C R T**

The group object sends the error status for the cyclical monitoring of the group object Fill level alarm [input x] on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Fill level status receipt* \ Option *Via group object*
- Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Fill level alarm"* \ Option *Activated*

Error "Operating mode" receipt	Channel X – General	DPT 1.005	1 bit	C R T

The group object sends the error status for the cyclical monitoring of the group object *Operating mode normal (master)* on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of group object "Operating mode normal (master)"* \ Option *Activated*

Status byte channel	Channel X - General	Non DPT	1 byte	C R T

This group object sends the following status information on the bus (ABB i-bus® KNX):
- Bit 7: Unused
- Bit 6: Unused
- Bit 5: Safety mode (→ Safety mode, Page 25)
  - 1 = Active
  - 0 = Inactive
- Bit 4: Manual operation
  - 1 = Active
  - 0 = Inactive
- Bit 3: Manual valve override
  - 1 = Active
  - 0 = Inactive
- Bit 2: Forced operation
  - 1 = Active
  - 0 = Inactive
- Bit 1: Building Protection (→ Explanation of the operating modes, Page 174)
  This bit is always 0 for an actuator channel (Device function).
  - 1 = Active
  - 0 = Inactive
- Bit 0: Operating mode override
  This bit is always 0 for an actuator channel (Device function).
  - 1 = Active
  - 0 = Inactive

Note
The device is in safety mode after starting, because the controller has not yet received a valid temperature value.

Prerequisites for visibility
- This group object is always visible.

Error "Control value" receipt	Channel X – General	DPT 1.005	1 bit	C R T

The group object sends the error status for the cyclical monitoring of the following group objects on the bus (ABB i-bus® KNX):
- *Control value Heating*
- *Control value Cooling*

The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- Parameter window *Channel X* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of "Control value heating/cooling" group objects* \ Option *Activated*

8.4 Group objects, Channel X - Valve X

Function	Group object name	Data point type	Length	Flags
Status byte Valve X	**Channel X – Valve X**	**Non DPT**	**1 byte**	**C R T**

This group object sends the following status information on the bus (ABB i-bus® KNX):
- Bit 7: Unused
- Bit 6: Unused
- Bit 5: Unused
- Bit 4: Unused
- Bit 3: Valve purge
  - 1 = Active
  - 0 = Inactive
- Bit 2: Forced operation
  - 1 = Active
  - 0 = Inactive
- Bit 1: Fault Valve output
  - 1 = Fault
  - 0 = No fault
- Bit 0: Setpoint/control value
  - 1 = Setpoint/control value not received
  - 0 = Setpoint/control value received

Note
If the *Deactivated* option is selected for one of the following parameters, bit 0 always has the value 0:
- *Monitor receipt of group object "Operating mode normal (master)"*
- *Monitor receipt of "Control value heating/cooling" group objects*

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ all options except *Deactivated*

Status Control value valve X	**Channel X – Valve X**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends the valve status (active valve control value) on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [valve output]*.
Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (e.g. 0x0001) or by changing to a different DPT (e.g. DPT 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ all options except *Deactivated*

Fault Valve output X	**Channel X – Valve X**	**DPT 1.005**	**1 bit**	**C R T**

This group object sends a fault messages of the valve output on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [valve output]*.
It there is a fault, the output is switched off. The fault can be reset only via group object *Fault Reset valve output X*.
Telegram value:
- 1 = Fault
- 0 = No fault

Note
If there is a fault on the valve output, on devices with manual operation via membrane keypad the following LEDs flash:
- *Switch valve output*
- *Open valve output* (if channel selected)

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ all options except *Deactivated*

Status Valve purge X	**Channel X – Valve X**	**DPT 1.011**	**1 bit**	**C R T**

This group object sends the valve purge status on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send value of group object "Status valve purge"*.
Telegram value:
- 1 = Valve purge active
- 0 = Valve purge inactive

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ all options except *Deactivated*

Activate valve purge X	**Channel X – Valve X**	**DPT 1.017**	**1 bit**	**C W**

This group object is used to trigger a valve purge.
More information: → Valve purge, Page 190.
Telegram value:
- 1 = Trigger valve purge
- 0 = Trigger valve purge

Note
If the valve purge is not performed due to a higher-priority function, the valve purge must be triggered again.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Enable/block manual valve override X	**Channel X – Valve X**	**DPT 1.003**	**1 bit**	**C W**

This group object is used to enable/block manual valve override via the bus (ABB i-bus® KNX).
If manual valve override is enabled, the active valve control value is overridden with the value of group object Override valve control value X.
If manual valve override is blocked, the following active valve control value applies.
Telegram value:
- 1 = Manual valve override enabled
- 0 = Manual valve override blocked

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X*
  - Parameter *Valve output* \ all options except *Deactivated*
  - Parameter *Enable manual valve override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Override valve control value X	**Channel X – Valve X**	**DPT 5.001**	**1 byte**	**C W**

This group object is used to receive the setpoint for the manual valve override via the bus (ABB i-bus® KNX).
The value in this group object becomes active only if the override has been enabled by the Enable/block manual valve override X group object.
Telegram value:
- 0 … 100 %

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X*
  - Parameter *Valve output* \ all options except *Deactivated*
  - Parameter *Enable manual valve override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Fault Reset valve output X	**Channel X – Valve X**	**DPT 1.015**	**1 bit**	**C W**

This group object is used to reset a fault on the valve output via the bus (ABB i-bus® KNX) (reset). Resetting is successful only if the fault has been rectified.
Telegram value:
- 1 = Reset fault
- 0 = No reaction

Note
A fault can be reset by restarting the device or by means of ETS reset as well.

Note
On devices with manual operation, a successful reset is indicated on the membrane keypad.
More information → operating and display elements, corresponding sub-chapter of the individual product variant.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Valve output X* \ Parameter *Valve output* \ all options except *Deactivated*

8.5 Group objects, Channel X - Input x

Function	Group object name	Data point type	Length	Flags
Temperature	**Channel X – Input x**	**DPT 9.001**	**2 bytes**	**C R T**

This group object sends the temperature value measured at the input on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send temperature value*.
Telegram value:
- -30 … 110 °C

Note
If an analog room control unit is connected to device input a, this group object is not available for device input a, → *Connect analog room control unit to physical device input a*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*

Function	Group object name	Data point type	Length	Flags
Block input	**Channel X – Input x**	**DPT 1.003**	**1 bit**	**C W**

This group object is used to block the physical input x.
Telegram value:
- 1 = Block input
- 0 = Enable input

Note
The block on the input is canceled after ETS reset, bus voltage recovery or download.

Note
If an analog room control unit is connected to device input a, this group object is not available for device input a, → *Connect analog room control unit to physical device input a*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Enable group object "Block input"* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Error Input	**Channel X – Input x**	**DPT 1.005**	**1 bit**	**C R T**

This group object monitors receipt of a temperature value at the input and sends a message on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment* \ Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
  or
- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Temperature sensor*

Function	Group object name	Data point type	Length	Flags
Window contact	**Channel X – Input x**	**DPT 1.005**	**1 bit**	**C R T**

This group object sends the contact position of the connected sensor on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [window contact]*.
Telegram value:
- Depends on the setting in the parameter *Window open if [input x]*

Note
If an analog room control unit is connected to device input a, this group object is not available for device input a, → *Connect analog room control unit to physical device input a*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Window contact*

Function	Group object name	Data point type	Length	Flags
Fill level alarm	**Channel X – Input x**	**DPT 1.005**	**1 bit**	**C R T**

This group object sends the contact position of the connected sensor on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [fill level alarm]*.
Telegram value:
- Depends on the setting in the parameter *Fill level reached if [input x]*

Note
If an analog room control unit is connected to device input a, this group object is not available for device input a, → *Connect analog room control unit to physical device input a*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Fill level sensor*

Function	Group object name	Data point type	Length	Flags
Contact position binary input	**Channel X – Input x**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the contact position of the sensor connected to the binary input on the bus (ABB i-bus® KNX).
Telegram value:
- Depends on the setting in the following parameters:
  - *Distinction between long and short operation*
  - *Input on operation*

Note
If an analog room control unit is connected to device input a, this group object is not available for device input a, → *Connect analog room control unit to physical device input a*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Binary input*

Function	Group object name	Data point type	Length	Flags
Dew point alarm	**Channel X – Input x**	**DPT 1.005**	**1 bit**	**C R T**

This group object sends the contact position of the connected sensor on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [dew point alarm]*.
Telegram value:
- Depends on the setting in the parameter *Dew point reached if [input x]*

Note
If an analog room control unit is connected to device input a, this group object is not available for device input a, → *Connect analog room control unit to physical device input a*.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Input x* \ Parameter *Input* \ Option *Dew point sensor*

8.6 Group objects Channel X – Controller

Function	Group object name	Data point type	Length	Flags
Status Heating/cooling	**Channel X – Controller**	**DPT 1.100**	**1 bit**	**C R T**

This group object sends the status *Heating/cooling* on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Heating
- 0 = Cooling

Note
If the channel is operated as a controller (master) and controls an actuator (slave), the actuator (slave) is switched between *Heating* and *Cooling* is this group object.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Type of heating/cooling system* \ Option *4-pipe*
  - Parameter *Heating/cooling changeover* \ Options *Automatic* / *Via group object or via slave*

Function	Group object name	Data point type	Length	Flags
Status Control value basic-stage heating	**Channel X – Controller**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends the control value for basic-stage heating on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Basic-stage heating [controller]* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-byte value (DPT 5.001) with the following control types:
- 2-point 1 byte (0/100 %)
- PI continuous (0 … 100 %)
- PI continuous (0 … 100 %) for fan coil

Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (e.g. 0x0001) or by changing to a different DPT (e.g. DPT 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ Options *Convector (e.g. radiator)/ Area heating (e.g. floor) / Free configuration*

Function	Group object name	Data point type	Length	Flags
Status Control value basic-stage heating	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the control value for basic-stage heating on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Basic-stage heating [controller]* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-bit value (DPT 1.001) for the following control types:
- 2-point 1 bit (On/Off)
- PI PWM (On/Off)

Telegram value:
- 1 = On
- 0 = Off

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window → Application parameters, Page 36
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ Option *Free configuration*

Function	Group object name	Data point type	Length	Flags
Status Control value additional-stage heating	**Channel X – Controller**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends the control value for additional-stage heating on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Additional-stage heating* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-byte value (DPT 5.001) with the following control types:
- 2-point 1 byte (0/100 %)
- PI continuous (0 … 100 %)
- PI continuous (0 … 100 %) for fan coil

Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (e.g. 0x0001) or by changing to a different DPT (e.g. DPT 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ Options *Convector (e.g. radiator) / Area heating (e.g. floor) / Free configuration*

Function	Group object name	Data point type	Length	Flags
Status Control value additional-stage heating	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the control value for additional-stage heating on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Additional-stage heating* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-bit value (DPT 1.001) for the following control types:
- 2-point 1 bit (On/Off)
- PI PWM (On/Off)

Telegram value:
- 1 = On
- 0 = Off

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ Option *Free configuration*

Status Control value basic-stage cooling	Channel X – Controller	DPT 5.001	1 byte	C R T

This group object sends the control value for basic-stage cooling on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Basic-stage cooling [controller]* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-byte value (DPT 5.001) with the following control types:
- 2-point 1 byte (0/100 %)
- PI continuous (0 … 100 %)
- PI continuous (0 … 100 %) for fan coil

Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (e.g. 0x0001) or by changing to a different DPT (e.g. DPT 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ Options *Area cooling (e.g. cooling ceiling) / Free configuration*

Status Control value basic-stage cooling	Channel X – Controller	DPT 1.001	1 bit	C R T

This group object sends the control value for basic-stage cooling on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Basic-stage cooling [controller]* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-bit value (DPT 1.001) for the following control types:
- 2-point 1 bit (On/Off)
- PI PWM (On/Off)

Telegram value:
- 1 = On
- 0 = Off

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ Option *Free configuration*

Status Control value additional-stage cooling	Channel X – Controller	DPT 5.001	1 byte	C R T

This group object sends the control value for additional-stage cooling on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Additional-stage cooling* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-byte value (DPT 5.001) with the following control types:
- 2-point 1 byte (0/100 %)
- PI continuous (0 … 100 %)
- PI continuous (0 … 100 %) for fan coil

Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (e.g. 0x0001) or by changing to a different DPT (e.g. DPT 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ Options *Area cooling (e.g. cooling ceiling) / Free configuration*

Function	Group object name	Data point type	Length	Flags
Status Control value additional-stage cooling	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the control value for additional-stage cooling on the bus (ABB i-bus® KNX).
The data point type depends on the option selected in the parameter *Additional-stage cooling* and the associated control type. A control type is preset depending on the option. Any control type can be selected if the option *Free configuration* is selected.
Output is via a 1-bit value (DPT 1.001) for the following control types:
- 2-point 1 bit (On/Off)
- PI PWM (On/Off)

Telegram value:
- 1 = On
- 0 = Off

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ Option *Free configuration*

Actual temperature	Channel X – Controller	DPT 9.001	2 bytes	C R T

This group object sends the actual temperature value of the controller on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Cycle for sending the room temperature (0 = deactivated)*.
The actual temperature value is determined from the following values:
- Average of the values measured over the physical device inputs
- Values received on the group objects External temperature 1 and External temperature 2. These values can be weighted with the parameters *Weighting of external measurement 1* and *Weighting of external measurement 2*.

Telegram value:
- -30 … 110 °C

Note
This group object can also be used for display on control units and visual display systems.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

External temperature 1	Channel X – Controller	DPT 9.001	2 bytes	C W T U

This group object is used to receive a temperature value via the bus (ABB i-bus® KNX). This value is included in the determination of the actual temperature (room temperature).
Telegram value:
- -273 … 670760 °C

Note
The value of this group object is evaluated each time the device is restarted.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Actual temperature receipt* \ Option *Via group object / Via phys. device input or group object*

External temperature 2	Channel X – Controller	DPT 9.001	2 bytes	C W T U

This group object is used to receive a temperature value via the bus (ABB i-bus® KNX). This value is included in the determination of the actual temperature (room temperature).
Telegram value:
- -273 … 670760 °C

Note
The value of this group object is evaluated each time the device is restarted.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Actual temperature receipt* \ Option *Via group object / Via phys. device input or group object*
  - Parameter *Number of group objects Actual temperature* \ Option *2*

Fault Actual temperature (master)	Channel X – Controller	DPT 1.005	1 bit	C R T

This group object sends the error status of the cyclical monitoring of the temperature input (physical device input or group object) on the bus (ABB i-bus® KNX).
The telegram with the current status is sent after every change.
Telegram value:
- 1 = Error
- 0 = No error

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Temperature input monitoring* \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Current setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C R T**

This group object sends the current setpoint temperature for the active operating mode (*heating/cooling*) on the bus (ABB i-bus® KNX).
The setpoint temperature value consists of the following values:
- Current operating mode
- Manual setpoint adjustment

The following settings influence this group object:
- Manual setpoint adjustment
- Operating mode changes
- Basic setpoint temperature change
- Change of the setpoint temperature of the operating modes

Telegram value:
- 5 … 45 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Operating mode normal (master)	Channel X – Controller	DPT 20.102	1 byte	C W T U

This group object is used to receive the operating mode to be set via the bus (ABB i-bus® KNX).
More information: → Explanation of the operating modes, Page 174
Telegram value:
- 1 = Comfort
- 2 = Standby
- 3 = Economy
- 4 = Building Protection

Note
The controller's setpoint temperature value is influenced by the following factors (listed in descending order of priority):
- Manual setpoint adjustment
- Overriding of basic setpoint
- Overriding of operating mode
- Fill level alarm
- Dew point alarm
- Window contact
- Control On/Off
- Presence detector
- Operating mode

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Operating mode override (master)	Channel X – Controller	DPT 20.102	1 byte	C W T U

This group object is used to receive the override of the operating mode via the bus(ABB i-bus® KNX). All other priorities, except for the reaction on bus voltage failure, are overridden as well.
Telegram value:
- 0 = Automatic/no override
- 1 = Comfort
- 2 = Standby
- 3 = Economy
- 4 = Building Protection

Note
This group object can be used to override a malfunction in the connected sensor (e.g. faulty window contact) that would cause the operating mode to change.

Note
For the device to react to adjustment by the user, this group object must be set to telegram value 0 (Automatic/no override).

Note
The controller's setpoint temperature value is influenced by the following factors (listed in descending order of priority):
- Manual setpoint adjustment
- Overriding of basic setpoint
- Overriding of operating mode
- Fill level alarm
- Dew point alarm
- Window contact
- Control On/Off
- Presence detector
- Operating mode

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Window contact (master/slave)	**Channel X – Controller**	**DPT 1.019**	**1 bit**	**C W**

This group object is used to receive the window status via the bus (ABB i-bus® KNX). Operating mode *Building Protection* is activated when telegram value 1 is received. A higher-priority group object can override the operating mode.
Telegram value:
- 1 = Window open
- 0 = Window closed

Note
The controller's setpoint temperature value is influenced by the following factors (listed in descending order of priority):
- Manual setpoint adjustment
- Overriding of basic setpoint
- Overriding of operating mode
- Fill level alarm
- Dew point alarm
- Window contact
- Control On/Off
- Presence detector
- Operating mode

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Window status receipt* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Presence detector (master/slave)	**Channel X – Controller**	**DPT 1.018**	**1 bit**	**C W**

This group object is used to receive the presence status (person in the room) via the bus (ABB i-bus® KNX).
Operating mode *Comfort* is activated when telegram value 1 is received. The operating mode set via group object Operating mode normal (master) is activated when telegram value 0 is received. A higher-priority group object can override the operating mode.
Telegram value:
- 1 = Room occupied
- 0 = Room vacant

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Status Heating	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the status of the control value Heating on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Control value Heating > 0
- 0 = Control value Heating = 0

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Status Cooling	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the status of the control value Cooling on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Control value Cooling > 0
- 0 = Control value Cooling = 0

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Activate minimum control value (basic load)	**Channel X – Controller**	**DPT 1.003**	**1 bit**	**C W**

This group object is used to receive the activation of the basic load via the bus (ABB i-bus® KNX).
The basic load is defined in the parameter *Min. control value (basic load)* and it can be parametrized individually for each heating and cooling stage if the control value for the respective control type is output as a percentage.
The basic load is always activated jointly for all stages, but it is applicable only to the active operating mode *Heating* or *Cooling*.
Telegram value:
- 1 = Basic load active
- 0 = Basic load inactive

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Temperature controller* \ Parameter *Minimum control value for basic load > 0* \ Option *Activate via group object*

Function	Group object name	Data point type	Length	Flags
Heating/cooling changeover	**Channel X – Controller**	**DPT 1.100**	**1 bit**	**C W T U**

This group object is used to switch the operating mode (*heating/cooling)* via the bus (ABB i-bus® KNX).
If, in the parameter *Heating/cooling changeover*, the option *Via group object or via slave* is set, switching can be performed via this group object or via a slave.
Telegram value:
- 1 = Heating
- 0 = Cooling

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Heating/cooling changeover* \ Option *Via group object / Via group object or via slave*

Basic setpoint	Channel X – Controller	DPT 9.001	2 bytes	C W

This group object is used to receive the adjustment of the basic setpoint via the bus (ABB i-bus® KNX).
The basic setpoint is defined in the parameter *Base setpoint is*, and it can be overridden by a temperature value received on this group object. This temperature value is limited to the valid value range (10 … 40 °C).
More information: → Basic setpoint, Page 174.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Relative*

Reset manual setpoint adjustment	Channel X – Controller	DPT 1.017	1 bit	C W

This group object is used to reset manual setpoint adjustment via the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Reset manual setpoint adjustment
- 0 = Reset manual setpoint adjustment

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Reset manual setpoint adjustment via group object* \ Option *Yes*

Dew point alarm	Channel X – Controller	DPT 1.005	1 bit	C W T U

This group object is used to receive the dew point status via the bus (ABB i-bus® KNX). Operating mode *Building Protection* is activated when telegram value 1 is received.
Telegram value:
- 1 = Dew point alarm active
- 0 = Dew point alarm inactive

Note
The alarm is valid as long as the device is in *Cooling* mode or until the alarm is canceled by reception of the value 0.
The operating mode is recalculated upon the change to *Heating* operating mode.
A higher-priority group object can override the operating mode.
The controller's setpoint temperature value is influenced by the following factors (listed in descending order of priority):
- Manual setpoint adjustment
- Overriding of basic setpoint
- Overriding of operating mode
- Fill level alarm
- Dew point alarm
- Window contact
- Control On/Off
- Presence detector
- Operating mode

Note
If a slave is used:
To determine the operating mode on a slave, this group object must be connected to the corresponding group object of the slave.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Dew point status receipt* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Fill level alarm	**Channel X – Controller**	**DPT 1.005**	**1 bit**	**C W T U**

This group object is used to receive the fill level status via the bus (ABB i-bus® KNX). Operating mode *Building Protection* is activated when telegram value 1 is received.
Telegram value:
- 1 = Fill level alarm active
- 0 = Fill level alarm inactive

Note
The alarm is valid as long as the device is in *Cooling* mode or until the alarm is canceled by reception of the value 0.
The operating mode is recalculated upon the change to *Heating* operating mode.
A higher-priority group object can override the operating mode.
The controller's setpoint temperature value is influenced by the following factors (listed in descending order of priority):
- Manual setpoint adjustment
- Overriding of basic setpoint
- Overriding of operating mode
- Fill level alarm
- Dew point alarm
- Window contact
- Control On/Off
- Presence detector
- Operating mode

Note
If a slave is used:
To determine the operating mode on a slave, this group object must be connected to the corresponding group object of the slave.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Fill level status receipt* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Outside temperature for summer compensation	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive the outside temperature via the bus (ABB i-bus® KNX) in order to calculate and activate summer compensation.
More information: → Summer compensation, Page 187.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Setpoint manager* \ Parameter *Activate summer compensation* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Summer compensation active/inactive	**Channel X – Controller**	**DPT 1.002**	**1 bit**	**C R T**

This group object sends the status of summer compensation on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Summer compensation active
- 0 = Summer compensation inactive

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Setpoint manager* \ Parameter *Activate summer compensation* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Comfort setpoint reached	**Channel X – Controller**	**DPT 1.002**	**1 bit**	**C R T**

This group object sends the status of the setpoint Comfort on the bus (ABB i-bus® KNX).
This group object sends a telegram when Comfort operating mode is activated. This group object sends telegram value 0 when the operating mode is changed or a new setpoint is set.
Telegram value:
- 1 = Comfort setpoint reached
- 0 = Comfort setpoint not reached

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Request On/Off (master)	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to activate/deactivate control via the bus (ABB i-bus® KNX).
The controller changes to operating mode *Building Protection* when telegram value 0 is received. If the setpoints for *Building Protection* have not yet been reached, the control is shut down. All control values are set to 0.
Control is activated when the setpoints for *Building Protection* are reached or when telegram value 1 is received.
In master/slave mode, the slave can send the request to switch off control to the controller (master) via this group object. Confirmation is provided via the group object Confirm On/Off (master).
Telegram value:
- 1 = Activate control (On)
- 0 = Deactivate control (Off)

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Confirm On/Off (master)	**Channel X – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the control status on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Control active (On)
- 0 = Control inactive (Off)

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Setpoint display (master)	**Channel X – Controller**	**DPT 9.002**	**2 bytes**	**C R T**

This group object sends the current setpoint on the bus (ABB i-bus® KNX).
This group object can be used for synchronization between the controller (master) and the slave as well.
Telegram value:
- -273 … 670760 K

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (master)	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive a setpoint adjustment via the bus (ABB i-bus® KNX).
The setpoint adjustment must lie withing the permitted setpoint range; see following parameters:
- *Max. manual increase in heating mode via KNX*
- *Max. manual reduction in heating mode via KNX*
- *Max. manual increase in cooling mode via KNX*
- *Max. manual reduction in cooling mode via KNX*

If the required temperature is outside the permitted setpoint range, the maximum/minimum possible value is set. The master device checks the value received and returns the set value via group object Confirm setpoint adjustment (master) [DPT 9.001].
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:
- 10 … 40 °C

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 9.001 (absolute temperature value)*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (master)	**Channel X – Controller**	**DPT 9.002**	**2 bytes**	**C W**

This group object is used to receive a setpoint adjustment via the bus (ABB i-bus® KNX).
The setpoint adjustment must lie withing the permitted setpoint range; see following parameters:
- *Max. manual increase in heating mode via KNX*
- *Max. manual reduction in heating mode via KNX*
- *Max. manual increase in cooling mode via KNX*
- *Max. manual reduction in cooling mode via KNX*

If the required temperature is outside the permitted setpoint range, the maximum/minimum possible value is set. The master device checks the value received and returns the set value via group object Confirm setpoint adjustment (master) [DPT 9.002].
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:
- -9 … 9 K

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 9.002 (relative temperature value)*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (master)	**Channel X – Controller**	**DPT 6.010**	**1 byte**	**C W**

This group object is used to receive a setpoint adjustment via the bus (ABB i-bus® KNX).
The setpoint adjustment must lie withing the permitted setpoint range; see following parameters:

- *Max. manual increase in heating mode via KNX*
- *Max. manual reduction in heating mode via KNX*
- *Max. manual increase in cooling mode via KNX*
- *Max. manual reduction in cooling mode via KNX*

If the required temperature is outside the permitted setpoint range, the maximum/minimum possible value is set. The master device checks the value received and returns the set value via group object Confirm setpoint adjustment (master) [DPT 6.010].
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:

- -128 … 127

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 6.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Confirm setpoint adjustment (master)	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C R T**

This group object sends the confirmation of the setpoint adjustment on the bus (ABB i-bus® KNX) as was requested via group object Request setpoint adjustment (master) [DPT 9.001].
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:

- 10 … 40 °C

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 9.001 (absolute temperature value)*

Function	Group object name	Data point type	Length	Flags
Confirm setpoint adjustment (master)	**Channel X – Controller**	**DPT 6.010**	**1 byte**	**C R T**

This group object sends the confirmation of the setpoint adjustment on the bus (ABB i-bus® KNX) as was requested via group object Request setpoint adjustment (master) [DPT 6.010].
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:

- -128 … 127

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 6.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Request heating/cooling (master)	**Channel X – Controller**	**DPT 1.100**	**1 bit**	**C W**

This group object is used to receive the heating/cooling status via the bus (ABB i-bus® KNX) and to synchronize the controller (master) with the slave.
Telegram value:

- 1 = Heating
- 0 = Cooling

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Heating/cooling changeover* \ Option *Via group object or via slave*

Function	Group object name	Data point type	Length	Flags
Status Controller RHCC	**Channel X – Controller**	**DPT 22.101**	**2 bytes**	**C R T**

This group object sends the following items of status information (according to the specification for the RHCC status) on the bus (ABB i-bus® KNX):

- Operating mode *Heating/cooling*
- Operation *active/inactive*
- Status *Building Protection*
- Fault (failure of actual-temperature measurement)

Prerequisites for visibility

- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Controller Status HVAC (master)	**Channel X – Controller**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends the following status information on the bus (ABB i-bus® KNX):
- Operating mode *Heating/cooling*
- Operation *active/inactive*
- Status Frost and dew point alarm
- Operating mode

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Current HVAC operating mode	**Channel X – Controller**	**DPT 20.102**	**1 byte**	**C R T**

This group object sends the HVAC operating mode on the bus (ABB i-bus® KNX) after evaluation of all priorities and influences.
Telegram value:
- 1 = Comfort
- 2 = Standby
- 3 = Economy
- 4 = Building Protection

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*

Function	Group object name	Data point type	Length	Flags
Comfort heating setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive a setpoint adjustment for the operating mode *Comfort heating* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Comfort heating setpoint*. The overridden setpoint is limited to the valid value range (10 … 40 °C).
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags
Setpoint Comfort heating/cooling	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive a setpoint adjustment for the operating mode *Comfort heating/cooling* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Comfort heating and cooling setpoint*. The overridden setpoint is limited to the valid value range (10 … 40 °C).
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Comfort heating setpoint = Comfort cooling setpoint* \ Option *Yes*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags
Comfort cooling setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive a setpoint adjustment for the operating mode *Comfort cooling* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Comfort cooling setpoint*. The overridden setpoint is limited to the valid value range (10 … 40 °C).
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags
Economy heating setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive a setpoint adjustment for the operating mode *Economy heating* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Economy heating setpoint*. The overridden setpoint is limited to the valid value range (10…40 °C) and limited by the value *Comfort heating*.
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags	
Economy cooling setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C**	**W**

This group object is used to receive a setpoint adjustment for the operating mode *Economy cooling* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Economy cooling setpoint*. The overridden setpoint is limited to the valid value range (10…40 °C) and limited by the value *Comfort cooling*.
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags	
Standby heating setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C**	**W**

This group object is used to receive a setpoint adjustment for the operating mode *Standby heating* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Standby heating setpoint*. The overridden setpoint is limited to the valid value range (10…40 °C) and limited by the value *Comfort heating*.
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection / Comfort, Standby, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags	
Standby cooling setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C**	**W**

This group object is used to receive a setpoint adjustment for the operating mode *Standby cooling* via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Standby cooling setpoint*. The overridden setpoint is limited to the valid value range (10…40 °C) and limited by the value *Comfort cooling*.
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 10 … 40 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager*
  - Parameter *Operating modes* \ Option *Comfort, Standby, Economy, Building Protection / Comfort, Standby, Building Protection*
  - Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags	
Building Protection heating setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C**	**W**

This group object is used to receive a setpoint adjustment for the operating mode *Building Protection heating* (frost protection) via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Setpoint for frost protection (building protection, heating)*. The overridden setpoint is limited to the valid value range (5…15 °C) and limited by the value *Comfort heating*.
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 5 … 15 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags	
Building Protection cooling setpoint	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C**	**W**

This group object is used to receive a setpoint adjustment for the operating mode *Building Protection cooling* (heat protection) via the bus (ABB i-bus® KNX).
This group object overrides the value set in the parameter *Heat protection setpoint (building protection, cooling)*. The overridden setpoint is limited to the valid value range (27 … 45 °C) and limited by the value *Comfort cooling*.
Manual setpoint adjustment acts on the overridden setpoint.
Telegram value:
- 27 … 45 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Setpoint manager* \ Parameter *Setpoint specification and adjustment* \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags
Basic-stage heating limit temperature	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W T U**

This group object is used to receive the limit temperature for basic-stage heating via the bus (ABB i-bus® KNX).
The limitation is activated when the received temperature value exceeds the temperature set in the parameter *[Heating] limit temperature*.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
  - Parameter *Input for temperature limit sensor* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Basic-stage cooling limit temperature	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W T U**

This group object is used to receive the limit temperature for basic-stage cooling via the bus (ABB i-bus® KNX).
The limitation is activated when the received temperature value falls below the temperature set in the parameter *Limit temperature [cooling]*.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Basic-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
  - Parameter *Input for temperature limit sensor* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Additional-stage heating limit temperature	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W T U**

This group object is used to receive the limit temperature for additional-stage heating via the bus (ABB i-bus® KNX).
The limitation is activated when the received temperature value exceeds the temperature set in the parameter *[Heating] limit temperature*.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage heating [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage heating* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage heating*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
  - Parameter *Input for temperature limit sensor* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Additional-stage cooling limit temperature	**Channel X – Controller**	**DPT 9.001**	**2 bytes**	**C W T U**

This group object is used to receive the limit temperature for additional-stage cooling via the bus (ABB i-bus® KNX).
The limitation is activated when the received temperature value falls below the temperature set in the parameter *Limit temperature [cooling]*.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Controller channel*
  - Parameter *Basic-stage cooling [controller]* \ all options except *Deactivated*
  - Parameter *Additional-stage cooling* \ all options except *Deactivated*
- Parameter window *Channel X* \ Parameter window *Temperature controller* \ Parameter window *Additional-stage cooling*
  - Parameter *Extended settings* \ Option *Yes*
  - Parameter *Activate temperature limitation* \ Option *Yes*
  - Parameter *Input for temperature limit sensor* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Confirm setpoint adjustment (master)	**Channel X – Controller**	**DPT 9.002**	**2 bytes**	**C R T**

This group object sends the confirmation of the setpoint adjustment on the bus (ABB i-bus® KNX) as was requested via group object Request setpoint adjustment (master) [DPT 9.002].
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:
- -9 … 9 K

Note
If a slave is used:
This group object must be connected to the corresponding group object of the slave to ensure the functionality of master/slave operation.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Controller channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *No*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 9.002 (relative temperature value)*

8.7 Group objects Channel X – Actuator

Function	Group object name	Data point type	Length	Flags
Control value Heating	**Channel X – Actuator**	**DPT 5.001**	**1 byte**	**C W T U**

This group object is used to receive the control value Heating via the bus (ABB i-bus® KNX). This control value is output via the selected output in operating mode *Heating*.
Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (this is then e.g. 0x0001) or by changing to a different DPT (e.g. 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage heating [actuator]* \ Option *Activated*

Heating/cooling changeover	**Channel X – Actuator**	**DPT 1.100**	**1 bit**	**C W T U**

This group object is used to receive the change of the operating mode (*heating/cooling*) via the bus (ABB i-bus® KNX).
The operating mode is switched in actuator mode exclusively via this group object.
Telegram value:
- 1 = Heating
- 0 = Cooling

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage heating [actuator]* \ Option *Activated*
  - Parameter *Basic-stage cooling [actuator]* \ Option *Activated*

Request setpoint adjustment (slave)	**Channel X – Actuator**	**DPT 9.002**	**2 bytes**	**C R T**

This group object sends a setpoint adjustment on the bus (ABB i-bus® KNX).
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:
- -9 … 9 K

Note
This group object must be connected to the corresponding group object of the controller (master) to ensure master/slave operation functionality.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 9.002 (relative temperature value)*

Request setpoint adjustment (slave)	**Channel X – Actuator**	**DPT 6.010**	**1 byte**	**C R T**

This group object sends a setpoint adjustment on the bus (ABB i-bus® KNX).
The data point type of the group object depends on the setting in the parameter *Data point type, manual setpoint adjustment*.
Telegram value:
- -128 … 127 °C

Note
This group object must be connected to the corresponding group object of the controller (master) to ensure master/slave operation functionality.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters* \ Parameter *Channel function* \ Option *Actuator channel*
- Parameter window *Channel X* \ Parameter window *Setpoint adjustment*
  - Parameter *Connect analog room control unit to physical device input a* \ Option *Yes*
  - Parameter *Data point type, manual setpoint adjustment* \ Option *DPT 6.010 (meter pulses)*

Control value Cooling	**Channel X – Actuator**	**DPT 5.001**	**1 byte**	**C W T U**

This group object is used to receive the control value Cooling via the bus (ABB i-bus® KNX). This control value is output via the selected output in operating mode *Cooling*.
Telegram value:
- 0 … 100 %

Note
If DPT 5.001 (percentage) is used for the activation, the value displayed for the group object may vary from the actual value due to rounding differences. The actual value of the group object can be seen by viewing the hexadecimal value (this is then e.g. 0x0001) or by changing to a different DPT (e.g. 5.005) in the ETS.

Prerequisites for visibility
- Parameter window *Channel X* \ Parameter window *Application parameters*
  - Parameter *Channel function* \ Option *Actuator channel*
  - Parameter *Basic-stage cooling [actuator]* \ Option *Activated*

9 Operation

Note
The device cannot be operated manually.

9.1 Manual operation

Note
Bear the following points in mind for manual operation:
- Values calculated by the controller or received via the bus (ABB i-bus® KNX) will be overridden.
- Forced operation and safety priorities of the device cannot be overridden.
- Override of the individual function becomes active only after the function has been changed for the first time using the associated button.

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.

The group object *Status Manual operation* indicates whether manual operation is enabled/blocked.

The device is in *KNX operation* after connection to the bus, bus voltage recovery, ETS download or ETS reset. The LED is off.

Complete overview of the control elements → Product overview, Page 10.

9.1.1 Activating manual operation

▸ Press and hold the *Manual operation* button for 5 seconds.
⇨ The yellow LED is lit.

9.1.2 Blocking manual operation

The *Manual operation* mode can be blocked in various ways:
- Via the parameter *Manual operation*.
- Via the group object *Enable/block manual operation*.

9.1.3 Ending manual operation

▸ Briefly press the *Manual operation* button.
⇨ The yellow LED is off.

All changes will become invalid when manual operation is deactivated.

10 Maintenance and cleaning

10.1 Maintenance

The device is maintenance-free if used properly. In the event of damage, e.g. during transport and/or storage, repairs are not allowed to be made.

10.2 Cleaning

1. Disconnect the device from the electrical power supply before cleaning.
2. Clean dirty devices using a dry cloth or a slightly damp cloth.

11 Removal and disposal

11.1 Removal

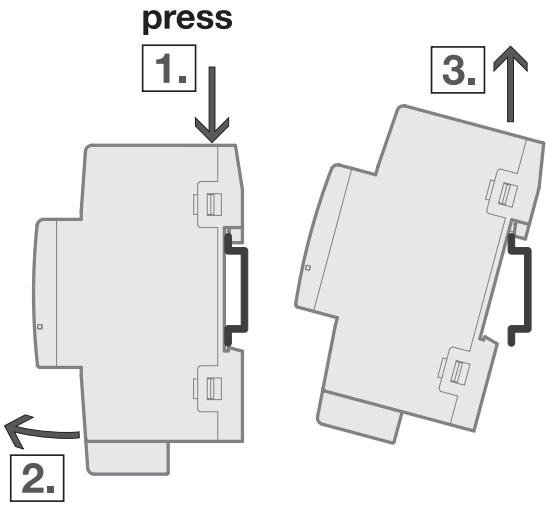

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Fig. 23: Removing from the mounting rail

1. Press on the top of the device.
2. Release the bottom of the device from the mounting rail.
3. Lift the device up and off the mounting rail.

11.2 Environment

Consider environmental protection.

Electrical and electronic devices must not be disposed of as domestic waste.

The device contains valuable resources that can be recycled. Therefore, please take 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)

12 Planning and application

12.1 Priorities

12.1.1 Priorities for controller mode

Valve

a) Bus voltage failure
b) Operating mode overridden
c) Safety mode → Safety mode, Page 25
d) Forced operation
e) i-bus® Tool
f) Operating mode *Manual operation* (only VC/S 4.2.1)
g) Manual valve override
h) Controller mode via group object *Operating mode normal (master)* (optional: *Presence detector (master/slave)*)
i) Bus voltage recovery

12.1.2 Priorities for actuator mode

Valve

a) Bus voltage failure
b) Forced operation
c) i-bus® Tool
d) Operating mode *Manual operation* (only VC/S 4.2.1)
e) Manual valve override
f) Actuator mode via group objects
g) Bus voltage recovery

12.2 Basic knowledge

12.2.1 2-pipe and 4-pipe systems

2-pipe system

In a 2-pipe system, one pipe is used to supply the heating/cooling devices with warm or cold water. Only one operating mode (*Heating*/*Cooling*) can be active in the complete system. Switching between *Heating* and *Cooling* is performed centrally in this system. The device receives information about the current operating mode via the bus (ABB i-bus® KNX).

4-pipe system

In a 4-pipe system, two separate pipes are used to supply the heating/cooling devices with warm or cold water. The separate pipes permit switching between heating mode and cooling mode. Switching between *Heating* and *Cooling* is performed centrally via the bus (ABB i-bus® KNX) or is controlled by the controller.

12.2.2 Basic setpoint

The basic setpoint can be used to change the operating modes *Comfort*, *Standby* and *Economy* via the bus (ABB i-bus® KNX).

The base setpoint shifts the setpoint for the *Comfort* operating mode. The value to which the base setpoint corresponds (*Comfort heating* or *Comfort cooling*) is defined in the parameter *Base setpoint is*.

By changing the base setpoint, the setpoints assigned to the *Standby* and *Economy* operating modes are also shifted. The relative distances between the setpoints remain unchanged. The setpoints for the *Building Protection* operating modes are not influenced.

The change to the base setpoint applies to both operating modes (*Heating*/ *Cooling*).

Note
If only the *Heating* operating mode or *Cooling* operating mode is configured, the base setpoint corresponds to the respective *Comfort* setpoint.

12.2.3 Explanation of the operating modes

The operating modes are used to adjust the setpoint temperatures to the actual room or building utilization. Switchover between the operating modes usually takes place via a central schedule or via Intelligent Building Control. The settings for the operating modes and the setpoints assigned are made in the parameter window *Setpoint manager*.

The change between the operating modes takes place via group object *Operating mode normal (master)*.

Comfort

The operating mode *Comfort* is used if the room is actively utilized (e.g. people in the room). In operating mode *Comfort*, the controller attempts to reach the specified room temperature by heating or cooling.

If a presence detector is used, the change from the current operating mode to *Comfort* can additionally be performed via group object *Presence detector (master/slave)*.

Standby

The operating mode *Standby* is used to prepare for active room utilization (e.g. before the start of lessons in schools). If the room is not utilized briefly (e.g. if the room is left or during breaks), the operating mode *Standby* can also be used. In operating mode *Standby*, the actual temperature may deviate by a set value from the Comfort temperature. This deviation is usually 2 … 3 K. Heating or cooling is activated if the deviation is exceeded or fallen below.

Note
The operating mode *Standby* can be used as an intermediate stage during the change from *Economy* to *Comfort*.

Example
The operating mode *Economy* is used for automatic nighttime reduction. If it can be anticipated when the Comfort temperature must be reached, the operating mode *Standby* can be used as an intermediate stage. With the intermediate stage, the Comfort temperature is reached sooner at the required time.

Economy

In the operating mode *Economy*, the actual temperature may deviate by a set value from the Comfort temperature. This deviation is usually 5 … 6 K. Heating or cooling is activated if the deviation is exceeded or fallen below.

Unlike the operating mode *Standby*, the operating mode *Economy* is used only if there is no utilization for an extended time (e.g. on weekends).

Building Protection

The operating mode *Building Protection* is activated to save energy and nevertheless prevent damage to the building due to cooling/heating if the building is not used for an extended period. Similarly as in the operating modes *Standby* and *Economy*, the temperature may decrease/increase to a value that can be parameterized.

The operating mode *Building Protection* can be activated via the following group objects:

- *Dew point alarm*
- *Fill level alarm*
- *Window contact (master/slave)*
- *Operating mode normal (master)*

A difference of at least 2 K is recommended for the setpoint temperature levels for *Comfort*, *Standby* and *Economy*. The difference in relation to the setpoint temperatures for *Building Protection* should be greater.

Example

Operating mode	Setpoint temperature (standard values)
Heat Protection (Building Protection cooling)	35 °C
Economy Cooling	29 °C
Standby Cooling	27 °C
Comfort Cooling	25 °C
Comfort Heating	21 °C
Standby Heating	19 °C
Economy Heating	17 °C
Frost Protection (Building Protection heating)	7 °C

Tab. 22: Setpoint temperatures for the operating modes

12.2.3.1 Operating modes and influencing factors

The following diagram shows the relationship between the specified operating mode and the priorities of the influencing factors in the room that can override the operating mode set.

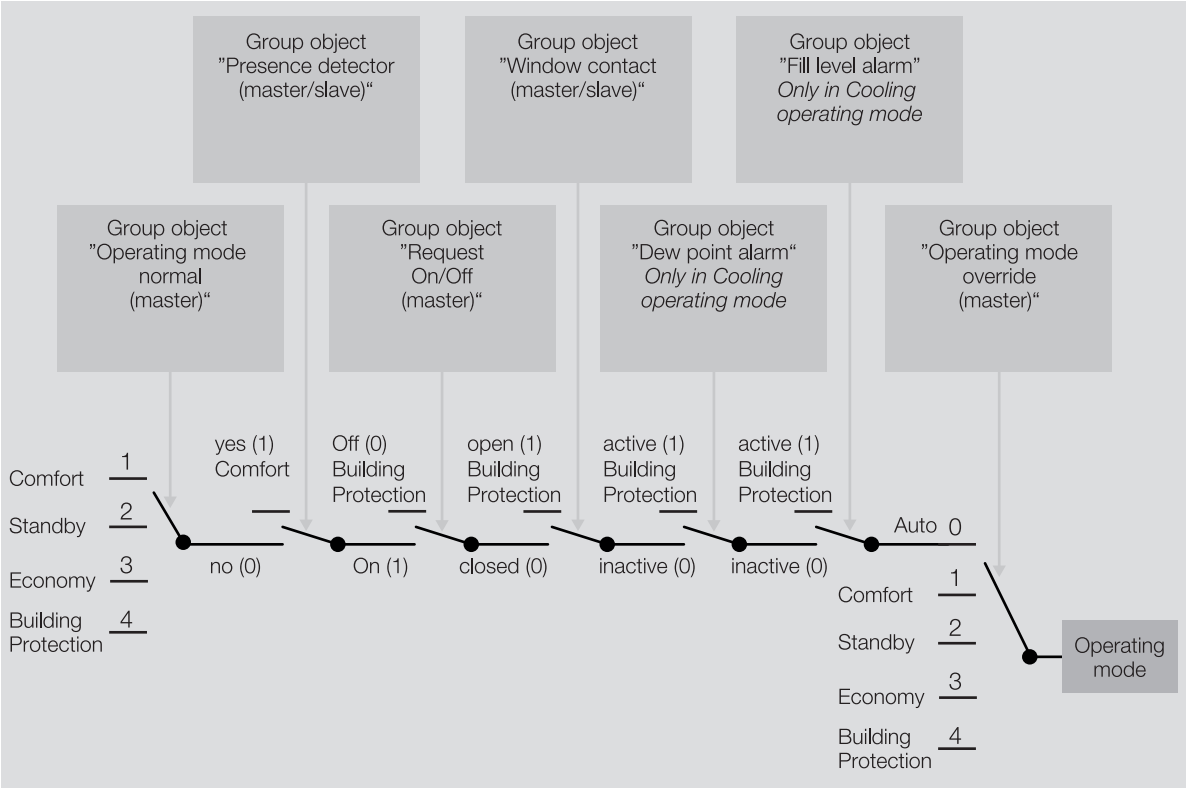

Fig. 24: Operating modes and priorities of the influencing factors

Example

The operating mode Comfort is specified in the group object *Operating mode normal (master)*.

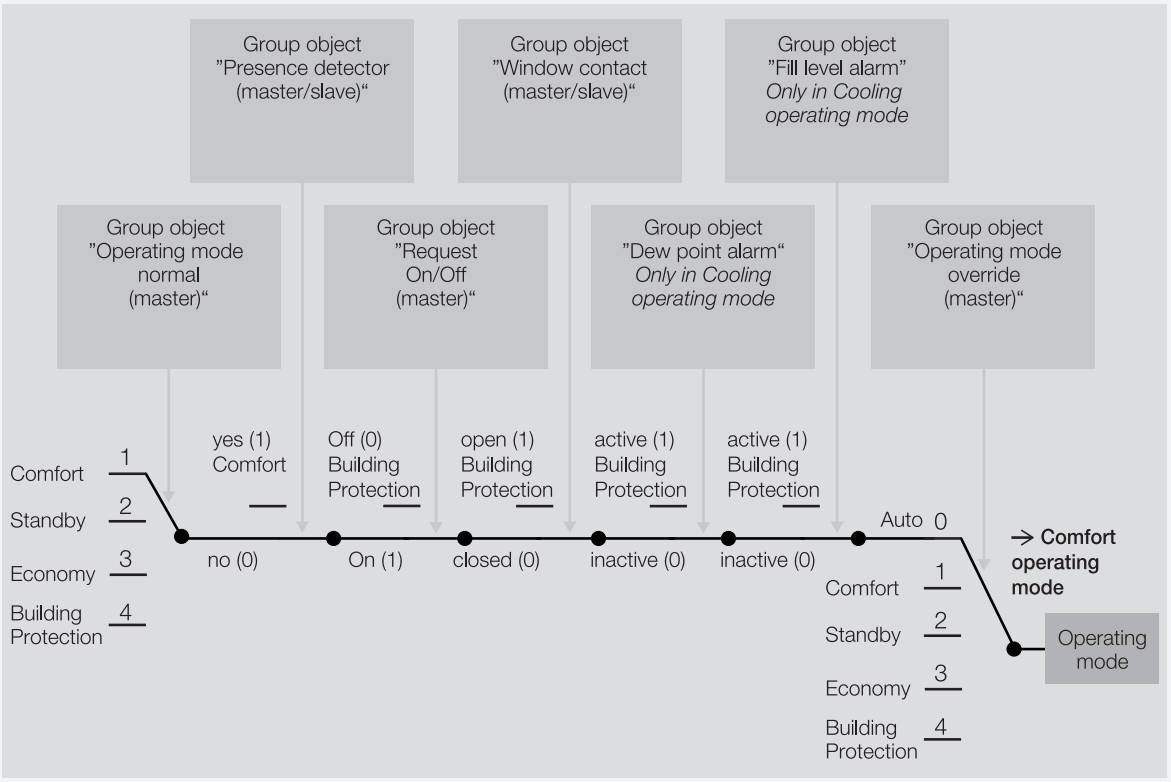

Fig. 25: Operating mode Comfort

Example
The operating mode Building Protection is set by overriding the operating mode specified via the group object *Window contact (master/slave)*.

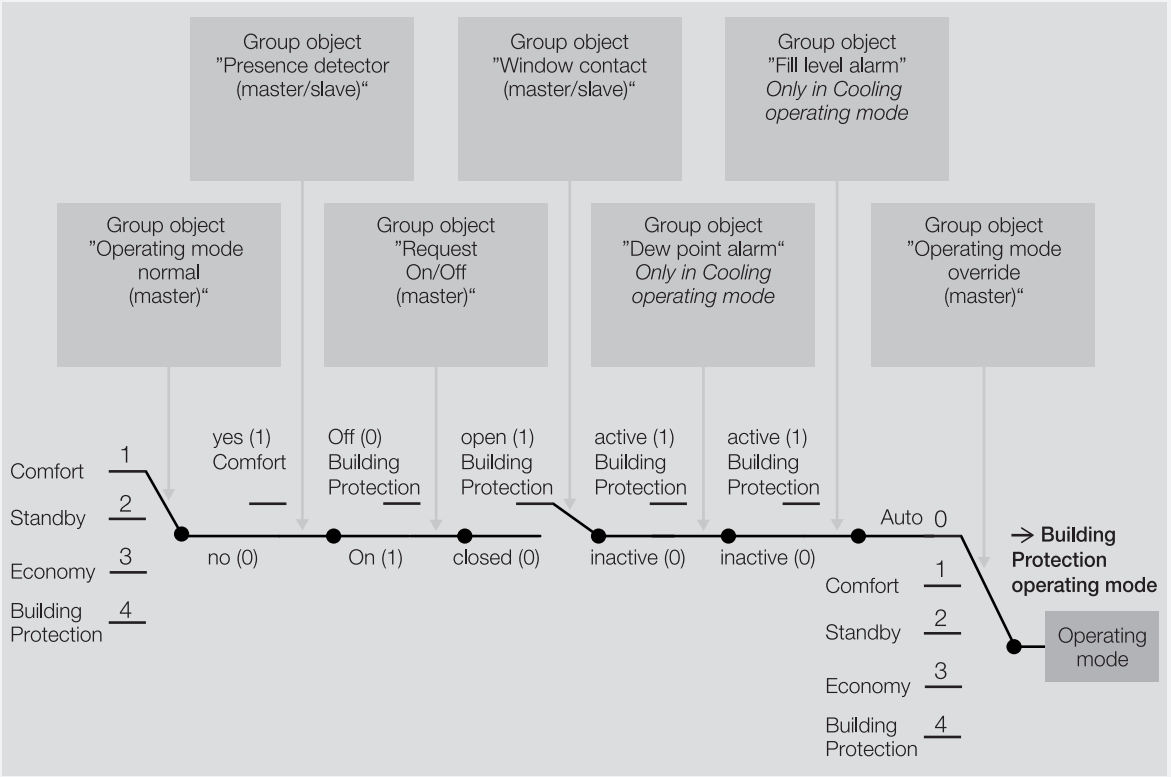

Fig. 26: Operating mode Building Protection

12.2.4 Weighting of the temperature inputs

If the actual temperature is acquired via several temperature inputs, the values acquired can have different weightings. The weighting can be set in the following parameters:

- *Weighting of internal measurement*
- *Weighting of external measurement 1*
- *Weighting of external measurement 2*

If several internal measured values are acquired (multiple temperature sensors connected to physical device inputs), the measured values are averaged automatically.

Case 1: All measured values are weighted equally.

If all measured values are weighted equally, a mean value is determined from the received temperature values. The mean value is then used as the actual temperature.

Case 2: The measured values are weighted differently – the total is 100 %

The measured values are included in the calculation of the actual temperature based on their weighting.

Example
Value 1: 21 °C; weighting 60 %
Value 2: 24 °C; weighting 40 %
(21 °C × 0.6) + (24 °C × 0.4) = 22.2 °C

Case 3: The measured values are weighted differently – the total is greater than 100 %

The ratio of the measured values is formed based on their weighting. The result is then used as the actual temperature.

Example
Value 1: 21 °C; weighting 80 %
Value 2: 24 °C; weighting 40 %
((21 °C × 0.8) + (24 °C × 0.4)) / (0.8 + 0.4) = 22 °C

12.2.5 Floating mean value

With a floating mean value filter, the output value is calculated as a mean value over a specified time interval (smoothing). The higher the degree of filtering, the smoother the result.

Example
If a time interval of 60 seconds is selected for the floating mean value filter, a mean value is formed from the values from the last 60 seconds. Temperature fluctuations are smoothed, continuous temperature changes become apparent with a delay.

12.2.6 Basics of PI control

P-proportion / xP-proportion

The P-proportion / xP-proportion stands for the proportional range of control. The proportional range fluctuates around the setpoint, and in PI control is used to change the speed of control. The smaller the value set, the faster the control reacts. If the value is too small, there is a risk of overshooting.

I-proportion

The I-proportion (also readjustment time) represents the integral control proportion. The I-proportion causes the room temperature to reach the setpoint. In principle the following applies: the more sluggish the overall system, the larger the integral time is.

12.2.7 Basic load

The basic load is used to specify a minimum control value. The basic load is not allowed to be dropped below by the control, even if the controller calculates a lower control value.

Example
Floor heating is to be operated with the minimum control value (basic load) 5 % to protect the installation and to prevent cooling of the floor.

The parameter *Minimum control value for basic load > 0* is used to define whether the basic load is always active or can be activated via a group object.

The control value can decrease to 0 % when the basic load is inactive.

The basic load is defined in the parameter *Min. control value (basic load)* and can be parameterized individually for each heating/cooling stage if the control value for the respective control type is output as a percentage.

Note
The basic load is activated for all stages, but it applies only to the active operating mode (*Heating* or *Cooling*). The basic load remains active during the operating mode change.
The basic load is set individually for each stage in the corresponding parameter windows → Parameter *Min. control value (basic load)*.

12.2.8 Heating/cooling circuit

A heating/cooling circuit is used to supply the rooms connected with warm or cold water for heating or cooling. The temperature in the heating/cooling circuit (supply flow temperature) can be adjusted depending on the requirements in the rooms.

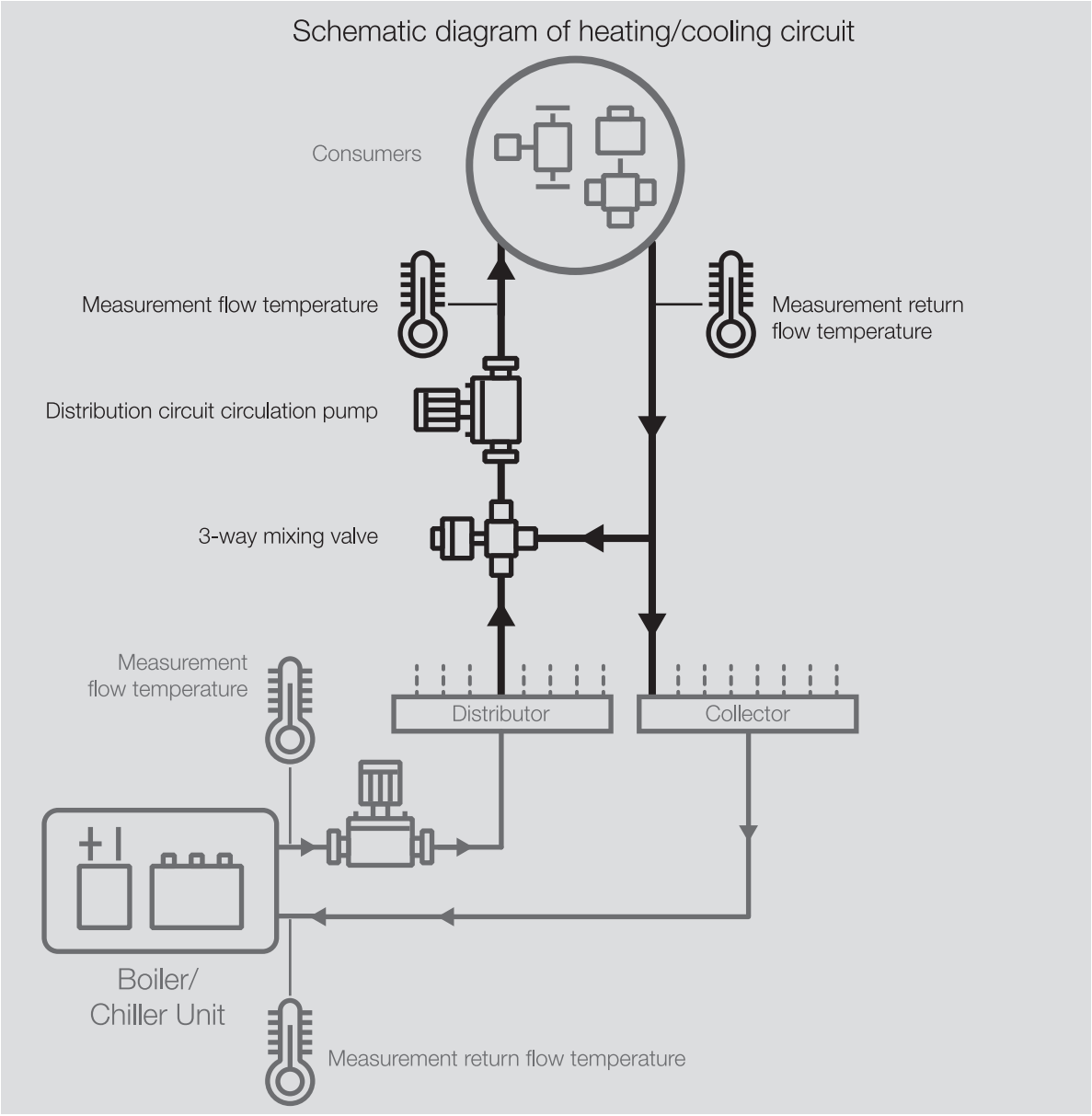

Fig. 27: Heating/cooling circuit

A heating/cooling circuit consists of the following components:
- Supply flow (from the distributor to the load)
- Loads (e.g. radiators in the room)
- Return flow (from the load to the manifold)

The supply and return flow are normally connected together by a 3-way mixing valve. The water from the supply flow is mixed with the water from the return flow to achieve the required supply flow temperature. A circulating pump ensures that the water circulates in the heating/cooling circuit.

12.2.9 Hysteresis

The hysteresis indicates the difference by which a value must change before a control operation is performed. Hysteresis prevents switching in response to minimal changes.

12.2.10 Manual valve override

During manual valve override, the active valve control value is overridden. The active valve control value is the valve control value calculated by the controller (controller mode) or received via the bus (ABB i-bus® KNX) (actuator mode).

If manual valve override is enabled (→ parameter *Enable manual valve override*), the active valve control value is overridden with the value of group object *Override valve control value X*.

If manual valve override is disabled, the active valve control value cannot be overridden.

Possible applications:
- System function test
- Specific override of the active valve control value

12.2.11 Master/slave operation

In master/slave operation, a central master takes over the control of the slaves. In master/slave operation, there can be several slaves but only one master.

Slaves send requests to the master via a "Request" telegram (e.g. manual temperature adjustments). The master checks whether the request is within the valid parameterized range, implements the request and sends the value back to the slave via a "Confirm" telegram.

12.2.12 Refreshed KNX state

If an input or an output is blocked by device-specific functions (e.g. manual operation, alarms, block, forced operation, switching delay), it will not react to telegrams received via the bus (ABB i-bus® KNX) while the block is active.

While a block is active, the device processes the telegrams received in the background. Active functions (e.g. staircase lighting, logic, position, brightness value) are executed in the background, but the results are not sent. The actual value is sent to the input or output when the block is canceled.

If the input or output has not received any telegrams via the bus (ABB i-bus® KNX) while a block is active, the input or output will assume the state it was in before the block.

12.2.13 Control types

The following control types are commonly used for activating valves in heating, ventilation and air conditioning technology.

- Continuous control
- Pulse width modulation (PWM)
- 2-point control

12.2.13.1 Overview of control and control-value types

2-point 1 bit (On/Off)

The 2-point controller switches only when the set operating points are reached. The switch-on and switch-off commands are sent as 1-bit values on the bus (ABB i-bus® KNX). The 2-point controller switches as follows:
- Switch-on at setpoint – hysteresis
- Switch-off at setpoint + hysteresis

2-point 1 byte (0/100 %)

Unlike 2-point 1 bit (On/Off), the switch-on and switch-off commands are sent as 1-byte values (0 %/100 %) on the bus (ABB i-bus® KNX).

PI continuous (0 ... 100 %)

The PI controller (continuous) adapts its output value to the difference between the actual value and the setpoint. This adaptation permits exact correction of the room temperature to the setpoint. The control value is sent as a 1-byte value (0 … 100 %) on the bus (ABB i-bus® KNX). To reduce the bus load, the control value is sent only if it has changed by a previously specified value.

PI PWM (On/Off)

The PI controller (PWM) converts the calculated control value to a pulse-to-pause ratio. The control value is sent as a 1-bit value on the bus (ABB i-bus® KNX).

12.2.13.2 2-point controller

A two-point controller has two output states (On/Off) that change based on the actual value:
- If the actual value is higher than the parameterized setpoint, the associated control value is 0.
- If the actual value is lower than the parameterized setpoint, the associated control value is 1.

As the 2-point controller switches only between the On and Off states, the following applications are possible:
- Activation of a thermoelectric valve connected to a Switch Actuator or a valve drive actuator
- Activation of an electric heater via a relay output

CAUTION
Each change of the control value causes the relay to switch.
▸ Observe the maximum number of operating cycles (service life).

Example
If the control value changes 10 times per day, this corresponds to 3,650 operating cycles per year.
If the control value changes 50 times per day, this corresponds to 18,250 operating cycles per year.

Using hysteresis

A 2-point controller can quickly correct large control deviations in the command variable (setpoint temperature). As correction is a continuous process, overshooting of the system can occur (exceeding the setpoint temperature). Each 2-point controller features built-in hysteresis to avoid overshooting.

Hysteresis ensures that the control value must change by a certain value before the controller has the outputs adjusted. Hysteresis reduces the number of control value changes. Reducing the number of changes leads to smoother control and fewer relay switching operations.

Example
In heating mode, the setpoint is 21 °C and the hysteresis is 1.0 K.
The controller switches on when the temperature falls below 20.5 °C and off when it exceeds 21.5 °C.

The following factors should be considered when setting the hysteresis:
- How quickly can the heater heat the room?
- How quickly can the cooler cool the room?
- How does a person in the room perceive temperatures?

Note
If the selected hysteresis is too small, a switching valve drive will be opened and closed constantly.
If the selected hysteresis is too large, this will lead to excessive temperature fluctuations in the room.

12.2.13.2.1 Pulse width modulation (PWM)

With pulse width modulation, the valve is operated exclusively in the completely open and completely closed positions. In contrast to 2-point control, the position is not controlled via limit values. Control is based on a calculated control value – similar to continuous control.

To calculate the control value, the input signal (1-byte control value 0 … 100 %) is converted to a 2-point signal (On/Off signal) with a parameterized cycle time. Based on this PWM calculation, valve actuation is performed via a variable pulse-to-pause ratio.

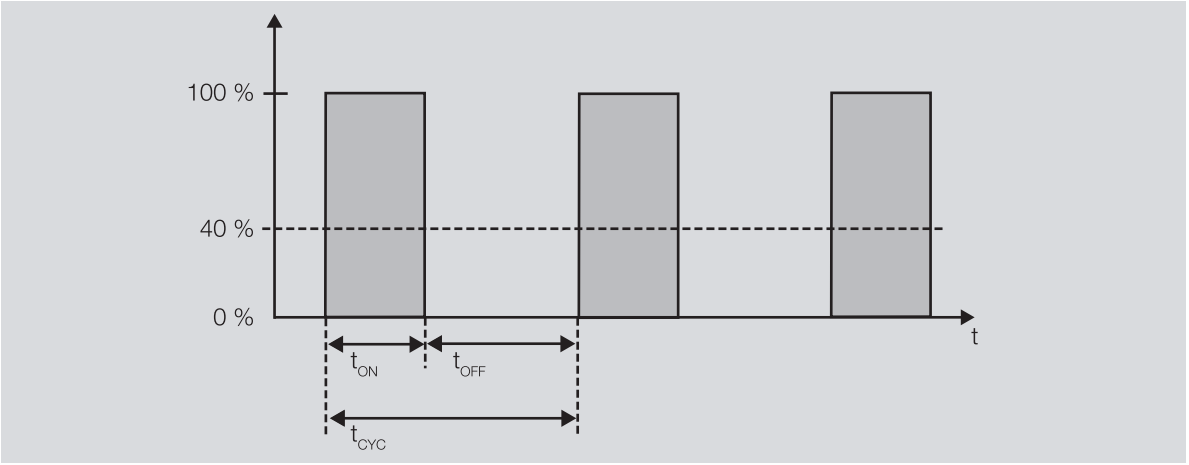

Fig. 28: Activation via a variable pulse-pause ratio

During the time t_{ON} the valve is opened. During the time t_{OFF} the valve is closed. t_{CYC} is the PWM cycle time for continuous control.

With pulse width modulation, the setpoint temperature can be set relatively accurately without pronounced overshooting of the system. However, pulse width modulation leads to frequent positioning operations of the valve drive.

Electromotor or Thermoelectric Valve Drives can be connected to the device when pulse width modulation is used.

Example
- Control value: 20 %
- Cycle time: 15 minutes

The valve is opened for 3 minutes (0.2 × 15) and closed for 12 minutes.

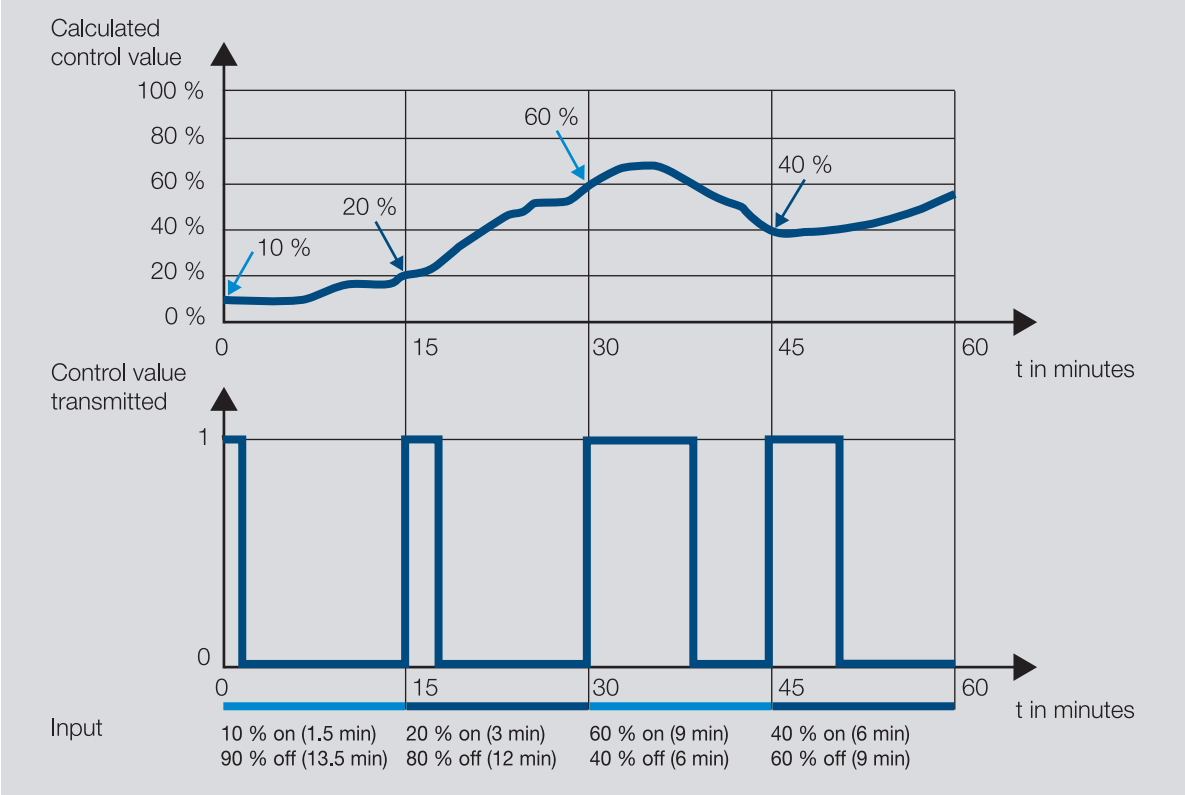

Fig. 29: Pulse width modulation – example

12.2.13.3 Continuous control

Continuous control is the most accurate type of temperature control. At the same time, the positioning frequency of the valve drive can be kept low. Continuous control can be implemented with 3-point electromotor valve drives via 1-byte activation.

Note
With 1-byte activation, the room thermostat specifies a value of 0 … 255 (corresponding to 0 … 100 %). The valve is closed at 0 % and fully opened at 100 %.

With continuous control, the actual and setpoint temperatures are used to calculate a control value to set the ideal temperature. The valve is moved to a position corresponding to the calculated control value. The valve can be fully opened, fully closed or put in any intermediate position.

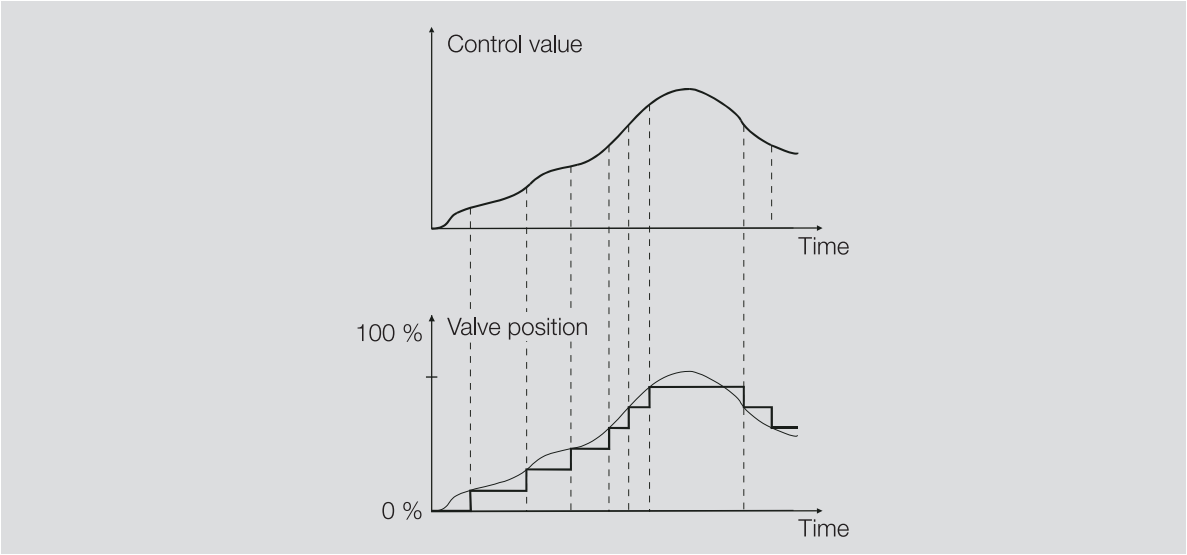

Fig. 30: Continuous control

12.2.13.4 PI controller (PWM)

The PI controller (PWM) works like a PI controller (continuous) in principle. Unlike the procedure for a continuous controller, the control value is converted to a 1-bit PWM switch-on/switch-off ratio prior to output for a PI controller (PWM).

Example
With a control value of 70 % and a cycle time of 10 minutes, the switch-on time is 7 minutes and the switch-off time is 3 minutes.

Using the PI controller (PWM) the advantages offered by continuous control (precise attainment of the setpoint temperature) can be obtained with drives that are designed only for switch-on/switch-off signals (e.g. thermoelectric drives).

The cycle time of the PWM control value can be set to optimize the control properties of the heating/cooling system. The type of heating/cooling and the valve drive used must be considered when setting the cycle time. The following cycle times are recommended:

- Thermoelectric Valve Drive: 15 minutes
  It takes approx. 2 … 3 minutes to open a control valve fully with a thermoelectric drive (depending on the manufacturer). Other times must be correspondingly adapted to the heating/cooling system.
- Floor heating: 20 minutes
  The time constant of a floor heater is very large (sluggish).
- Water heating: 15 minutes
  A cycle time of 15 minutes produces very good control results.
- Electric convector heater: 10 … 15 minutes
  The cycle time depends on the type of electric heater and the room situation.

12.2.13.5 Control value direction

If the control value is only output via a group object, the output value can be inverted. The inversion of the output value can be necessary to actuate NC (normally closed) or NO (normally opened) valve drives correctly.

Example
- 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 value Off 0 %
  - Control value Off 0 % => Telegram value On 100 %

If the control value is output via the physical device outputs, the actuation range is set in the related heating/cooling stage. The inversion of the control value in the control is not necessary in this case.

12.2.14 Sending and switching delay

No telegrams are sent on the bus during the sending and switching delay (ABB i-bus® KNX).

Telegrams received (e.g. requests from a visualization system) are sent to the outputs after the sending and switching delay expires. The state of the outputs is set according to the settings in the ETS application or the telegram values of the group objects.

Time sequences (e.g. staircase lighting time) are started immediately during the sending and switching delay. If, at the time of reception, the staircase lighting time is smaller than the remaining sending and switching delay, the staircase lighting time elapses during the sending and switching delay. After the sending and switching delay has elapsed there is no switching command, the staircase lighting is not switched on.

Note
The sending and switching delay includes the device initialization time.

12.2.15 Temperature sensor types

PT100

This sensor type is precise and interchangeable, however it is susceptible to cable errors (e.g. cable resistance or heating of the cable). A terminal resistance as low as 200 milliohms causes a temperature error of 0.5 °C.

PT1000/NI

These sensor types respond just like the PT100, but the influences of cable errors are lower by a factor of 10. These sensor types should be preferred.

KT/KTY/NTC

These sensor types have a low level of accuracy, are interchangeable only under certain circumstances and can be used only for very simple applications.

Characteristic resistances of the most common temperature sensors

Temperature [°C]	PT100 Resistance [Ω]	PT1000 Resistance [Ω]	NTC10-01 Resistance [Ω]	NTC10-02 Resistance [Ω]	NTC10-03 Resistance [Ω]	NTC20 Resistance [Ω]	NI1000-01 Resistance [Ω]	NI1000-02 Resistance [Ω]
110	142.3	1423	511	758	624	818	1557	1688
100	138.5	1385	679	973	817	1114	1500	1618
90	134.7	1347	916	1266	1084	1541	1444	1549
80	130.9	1309	1255	1668	1457	2166	1390	1483
70	127.1	1271	1752	2228	1990	3098	1337	1417
65	125.2	1252	2083	2588	2338	3732	1311	1385
60	123.2	1232	2488	3020	2760	4518	1285	1353
55	121.3	1213	2986	3536	3270	5494	1260	1322
50	119.4	1194	3602	4160	3893	6718	1235	1291
45	117.5	1175	4368	4911	4655	8260	1210	1260
40	115.5	1155	5324	5827	5594	10212	1186	1230
35	113.6	1136	6532	6940	6754	12698	1162	1200
30	111.7	1117	8055	8313	8196	15886	1138	1171
29	111.3	1113	8406	8622	8525	16627	1132	1165
28	111.0	1110	8779	8944	8869	17407	1128	1159
27	110.5	1105	9165	9281	9229	18227	1123	1153
26	110.1	1101	9574	9632	9606	19090	1119	1147
25	109.7	1097	10000	10000	10000	20000	1114	1141
24	109.3	1093	10448	10380	10413	20958	1109	1136
23	109.0	1090	10924	10780	10845	21968	1105	1130
22	108.6	1086	11421	11200	11298	23033	1100	1124
21	108.2	1082	11940	11630	11773	24156	1095	1118
20	107.8	1078	12491	12090	12270	25340	1091	1112
19	107.4	1074	13073	12560	12791	26491	1086	1107
18	107.0	1070	13681	13060	13337	27912	1081	1101
17	106.6	1066	14325	13580	13910	29307	1077	1095
16	106.2	1062	15000	14120	14510	30782	1072	1089
15	105.9	1059	15710	14690	15140	32340	1068	1084
14	105.5	1055	16461	15280	15801	33982	1063	1078
13	105.1	1051	17256	15900	16494	35716	1058	1072
12	104.7	1047	18091	16560	17222	37550	1054	1067
11	104.3	1043	18970	17240	17987	39489	1049	1061
10	103.9	1039	19902	17960	18790	41540	1045	1056
9	103.5	1035	20884	18700	19633	43715	1040	1050
8	103.1	1031	21918	19480	20519	46018	1036	1044
7	102.7	1027	23015	20300	21451	48457	1031	1039
6	102.3	1023	24170	21150	22430	51041	1027	1033
5	101.9	1019	25391	22050	23460	53780	1022	1028
4	101.6	1016	26683	23000	24545	56678	1018	1022
3	101.2	1012	28051	23990	25687	59751	1013	1016
2	100.8	1008	29498	25030	26890	63011	1009	1011
1	100.4	1004	31030	26130	28156	66469	1004	1005
0	100.0	1000	32650	27280	29490	70140	1000	1000
-5	98.0	980	42327	33900	37310	92220	978	973
-10	96.1	961	55329	42470	47540	122260	956	946
-15	94.1	941	72957	53410	61020	163480	935	919
-20	92.2	922	97083	67770	78910	220600	914	893
-25	90.2	902	130422	86430	102900	300400	893	867
-30	88.2	882	176976	111300	135200	413400	872	842

Tab. 23: Characteristic resistances of the most common temperature sensors

Tolerance classes

The tolerance classes for sensor versions PT100 and PT1000 differ. The following table illustrates the individual classes to the standard IEC 60751 (status: 2008):

Designation	Tolerance
Class AA	0.10 °C + (0.0017 x t)
Class A	0.15 °C + (0.002 x t)
Class B	0.30 °C + (0.005 x t)
Class C	0.60 °C + (0.01 x t)
t = Temperature	

Tab. 24: Tolerance classes

Example
Class B:
Measured-value deviations of ± 0.8 °C at 100 °C are permissible.

12.2.16 Summer compensation

12.2.16.1 Summer compensation – background and use

"To save energy and to keep the temperature difference within comfortable limits when an air-conditioned building is entered, the room temperature should be increased based on the outdoor temperature during the summer. This is known as summer compensation." (DIN 1946)

Summer compensation increases the setpoint for the operating mode *Comfort cooling*.

Increasing the setpoint prevents the difference between the outdoor temperature and room temperature from becoming too large. Cooling is reduced or stopped entirely to reach the setpoint.

Summer compensation requires an outdoor temperature sensor. The room thermostat evaluates the measured temperature value.

12.2.16.2 Summer compensation – technical implementation

The following parameters must be set for summer compensation:
- *Starting temperature for summer compensation*
- *Ending temperature for summer compensation*
- *Setpoint temperature offset when summer compensation starts*
- *Setpoint temperature offset when summer compensation ends*

The starting temperature and ending temperature define the range in which dynamic setpoint correction occurs. Incremental adaptation within the range can additionally be adjusted by the offset values. Above the ending temperature, the difference between room temperature and outdoor temperature corresponds to the offset configured when summer compensation ends.

When summer compensation is active, dynamic adaptation begins when the starting temperature is exceeded.

Example

The following example shows dynamic adaptation of the setpoint as the outdoor temperature increases:
- Setpoint temperature: 21 °C
- Starting temperature for summer compensation: 21 °C
- Setpoint temperature offset when summer compensation starts: 00.0 °C
- Ending temperature for summer compensation: 32.0 °C
- Setpoint temperature offset when summer compensation ends: see figure

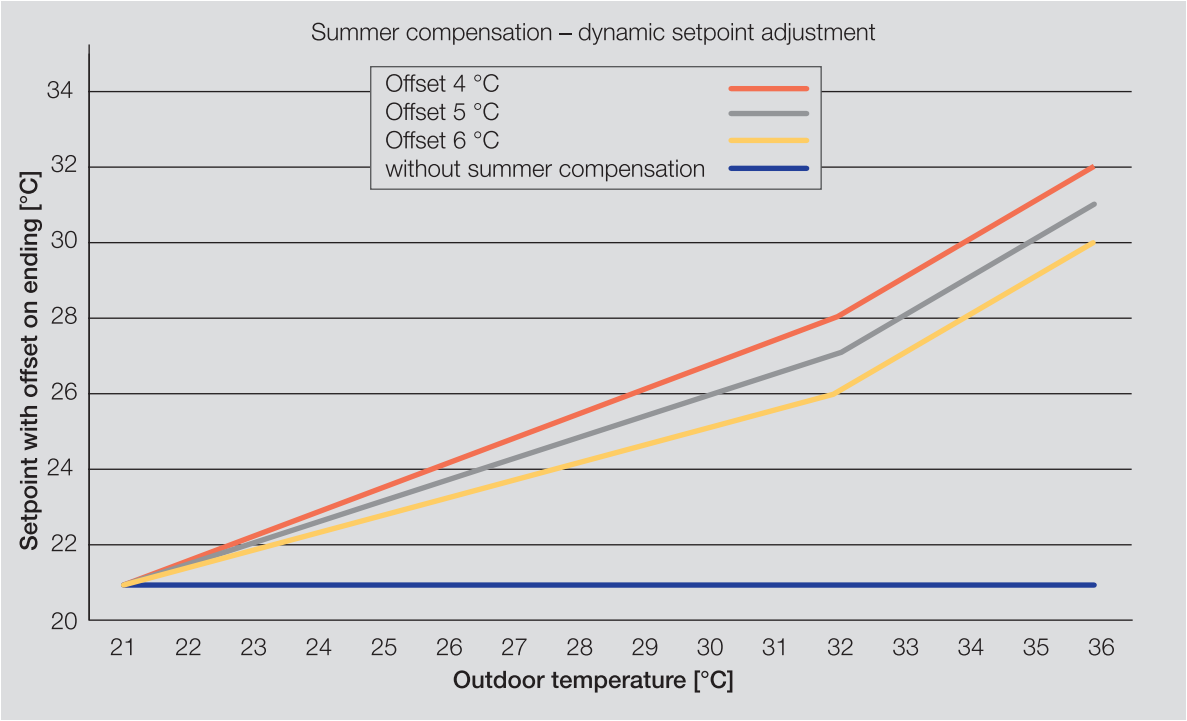

Fig. 31: Dynamic setpoint adjustment

Above the starting temperature, the setpoint temperature is increased according to the selected values until the selected ending temperature is reached. When the ending temperature is reached, the difference between room temperature and outdoor temperature corresponds to the selected offset when summer compensation ends. If the outdoor temperature continues to increase, the setpoint temperature is increased uniformly.

12.2.17 Valve drives

Magnetic/Thermoelectric 2-point Valve Drives

The valve can only be completely opened (100 %) or completely closed (0 %) with 2-point valve drives. The valve position is activated via 2-point control (open-close signal) for a magnetic valve drive or pulse width modulation (PWM) for a Thermoelectric Valve Drive.

Thermoelectric 2-point Valve Drives are adjusted by the thermal expansion of a material caused by a flow of electric current.

2-point valve drives are available in the following variants:

- Normally closed: The valve is closed if no current flows through the valve drive. The valve is opened if current flows through the valve drive.
- Normally open: The valve is opened if no current flows through the valve drive. The valve is closed if current flows through the valve drive.

Motor-driven 3-point valve drives

The valve positions between 0 % and 100 % are adopted using a motor in 3-point valve drives. A 3-point valve drive is connected to both device valve outputs. The open signal is output on valve output A, the close signal on valve output B. The valve position is activated directly based on the control value, usually in the form of continuous control.

Analog (proportional) valve drives

The valve positions between 0 % and 100 % are adopted using a motor in analog (proportional) valve drives. Analog (proportional) valve drives are controlled via a 0-10 V signal. The power for the valve drive is normally supplied via 230 V AC or 24 V AC/DC.

Due to aging processes or mechanical inaccuracies in the valve, the valve may not shut completely despite the control value 0 %. To prevent this situation arising, there are valve drives that can be activated via a 0-10 V signal or a 2-10 V signal → parameter Voltage range valve control value. With this activation, the output signal is restricted to the corresponding voltage range. To make sure that the valve is always closed completely, the 0 V signal is nevertheless output for the control value 0 %. If the control value is greater than 0 %, the lower limit (1 V or 2 V) is used directly for the activation.

Activation via 1-10 V signal:
- Control value 0 % = 0 V
- Control value 1 % = 1 V
- Control value 100 % = 10 V

Activation via 2-10 V signal:
- Control value 0 % = 0 V
- Control value 1 % = 2 V
- Control value 100 % = 10 V

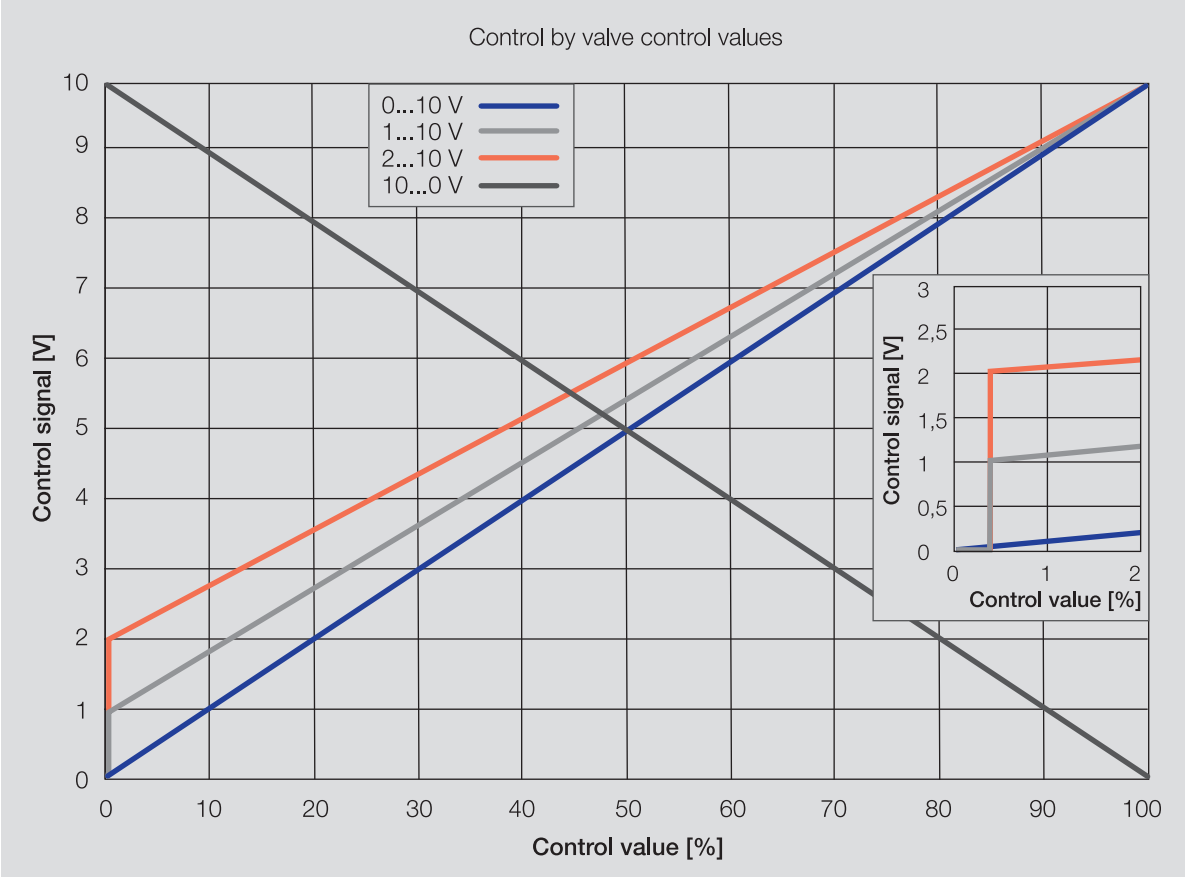

Fig. 32: Control by valve control values

12.2.18 Telegram rate limit

The bus load generated by the device can be limited using the telegram rate limit. This limit relates to all telegrams sent by the device.

The device counts the number of telegrams sent within the parameterized period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the bus (ABB i-bus® KNX) until the end of the period. A new period commences automatically at the end of the previous period. The telegram counter is reset to zero. Telegrams can be sent again. The group object always sends the current telegram value.

The first period (break time) is not precisely predefined. The break time can be anywhere between 0 seconds and the parameterized period. The subsequent periods correspond to the parameterized time → parameter *In period (0 = deactivated)*.

Example
- Number of telegrams = 20
- Maximum number of telegrams per period = 5
- Period = 5 s

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 the bus (ABB i-bus® KNX) every 5 seconds.

12.2.19 Valve purge

To prevent the valve from sticking during an extended idle period, the valve is completely opened and closed one time during the valve purge.

The purge cycle time is restarted after starting the device if automatic valve purge has been activated.

The purging cycle time will be restarted at the end of the actual purging period. The parameterized duration for the valve purge is included here.

The purging cycle with an active automatic valve purge is reset and restarted if:
- A manual valve purge is triggered.
- The parameterized value (in Reset purge cycle from...) is exceeded. The purging cycle is only restarted once the parameterized value is reached or dropped below.

After bus voltage recovery and ETS download, the automatic purge cycle is restarted. The time before bus voltage failure is not considered. If the purge cycle is triggered simultaneously for two valves, purging will take place one after the other.

12.2.20 Use of 6-way valve

If a 6-way valve is used, both operating modes (*Heating/ Cooling*) in a 4-pipe system are activated together on one valve output. Despite the joint activation, both operating modes can be used independent of each other.

A 6-way valve can be used only if the following prerequisites are met:
- Basic-stage heating is used for a water heating type
- Basic-stage cooling is active

The valve drive for the 6-way valve is connected to valve output A, and the control values for *heating* and *cooling* are issued at this output. The control signal for the drive is given by the two control values and is divided into a range for *heating* and a range for *cooling*. Between the two ranges there is a dead zone in which the valve is closed.

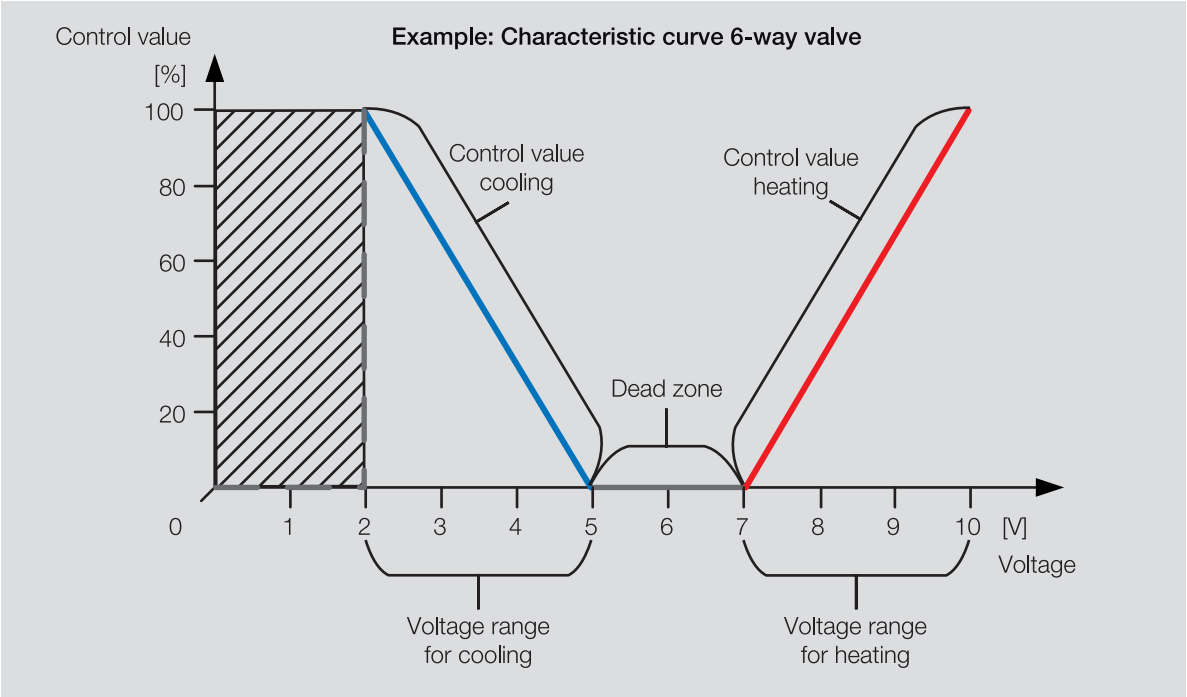

Fig. 33: 6-way valve activation

If the control value is in the voltage range for *heating*, the flow for *heating* is opened to suit the control value and the flow for *cooling* blocked.

If the control value is in the voltage range for *cooling*, the flow for *cooling* is opened to suit the control value and the flow for *heating* blocked.

If the control value is 0 %, the middle of the dead zone is activated. The flow for *heating* and *cooling* is blocked.

12.2.21 Use of an analog room control unit

CAUTION
Connecting several analog room control units will cause malfunctions when the device is operated.

The following functions can be implemented with analog room control units:
- Manual adjustment of the temperature setpoint and (depending on the analog room control unit) the fan speed
- Measurement of the room temperature with a temperature sensor

A separate output is available for each function, → Connecting analog room control unit, Page 30.

The following analog room control units can be connected:
- SAR/A 1.0.1-24 Room Temperature Control Panel

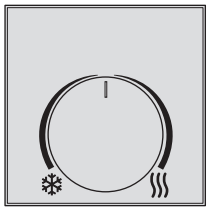

Fig. 34: SAR/A 1.0.1-24

- SAF/A 1.0.1-24 Room Temperature and Fan Coil Control Panel

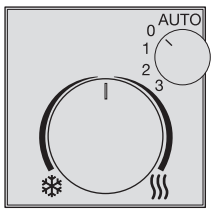

Fig. 35: SAF/A 1.0.1-24

If the SAF/A room temperature and fan coil control unit is used, the following reaction applies to the settings for the fan speed:

- Automatic: The controller takes over the control of the fan speed corresponding to the control value (fan automatic).
- Fan speed 0: If, in the active operating mode (*Heating/ Cooling*), the basic stage or additional stage is used to activate a fan coil unit, the fan is overridden and switched off. All valves assigned to the fan coil unit are also overridden and control value set to 0 %. The fan and valve override has no effect on the control value output by the controller to activate the basic stage or additional stage via group objects. If the controller is in the Building Protection operating mode, there is no override. If the controller changes to the Building Protection operating mode during the override, the override is withdrawn.
- Fan speed 1 ... 3 (for continuous fans: 33 %, 66 %, 100 %): If, in the active operating mode (*Heating/ Cooling*), the basic stage or additional stage is used to activate a fan coil unit, the fan is overridden to suit the speed set. The override has no effect on the control value.

12.2.21.1 Connecting an analog room control unit in actuator mode

An actuator cannot evaluate the values for setpoint adjustment, and therefore a KNX room control unit with integrated controller must be used in addition to the analog room control unit. The actuator forwards the setpoint adjustment of the analog room control unit to the KNX room control unit, which returns the control value and the fan speed.

The value that the actuator sends to the fan can deviate from the values in the analog room control unit. This deviation is due to the following control panel properties:

- Setpoint adjustments can be made mutually independently in the analog room control unit and in the KNX room control unit.
- The analog room control unit and the KNX room control unit do not communicate with each other.

Example
Hotel guests can control the fan in their room using an analog room control unit.
Hotel employees can use an additional KNX room control unit per hotel room to control all fans centrally, e.g. to implement nighttime reduction after a certain time.

12.2.22 Forced operation

The function *Forced operation* can be used to set the device outputs to a defined state and block them. Forced operation is triggered by the switching of a 1- or 2-bit group object.

The controller continues to send the control values on the bus (ABB i-bus® KNX) during forced operation.

Master/slave communication occurs despite active forced operation.

Note
If forced operation is active, operation via group objects, manual operation and i-bus® Tool is blocked. Higher-priority functions continue to run → Priorities, Page 173.

Note
The same forced operation state as for bus voltage failure applies after bus voltage recovery. Forced operation is deactivated on an ETS reset.

Forced operation, 1-bit

A state that is set if forced operation is activated can be parameterized with 1-bit forced operation. It can additionally be defined whether activation is to take place via the value 1 or 0.

Control values and the state of the outputs can be defined in the device-specific parameters → parameter *Forced operation*.

Forced operation, 2-bit

With 2-bit forced operation, two states are specified that are set if forced operation is activated. The states are activated via the 2-bit group object. The first bit indicates whether forced operation is active (bit 1 (High) = 1) or inactive (bit 1 (High) = 0). The second bit determines the state *Forced operation active "OFF"* (bit 0 (Low) = 0) or *Forced operation active "ON"* (bit 0 (Low) = 1).

State	Bit 1	Bit 0	Value
Inactive	0	0	0
Inactive	0	1	1
Active "OFF"	1	0	2
Active "ON"	1	1	3

Tab. 25: Forced operation states

Control values and the state of the outputs can be defined in the device-specific parameters → parameter *Forced operation*.

12.2.23 Cyclical monitoring

The reception of a telegram on a group object can be monitored using the cyclical monitoring. If a telegram is not received on the group object within a parameterizable time (monitoring cycle), the sending device may be faulty or the bus cable to the sending device may be interrupted. The reaction to the loss of a telegram can be set in the application-specific parameters for the device.

After the receipt of a telegram, ETS download or bus voltage recovery, the monitoring cycle is restarted.

Note
The monitoring cycle in the device should be at least quadruple the cyclical sending time of the sending device. As a result, the reactions set will not be triggered immediately if a signal is missing, e.g. due to high bus load.

13 Appendix

13.1 Scope of delivery

The device is supplied together with the following components:

- 1 x valve drive controller
- 1 x installation and operating instructions
- 1 x bus connection terminal (red/black)
- 1x KNX connection cover cap

13.2 Status byte channel

x = value 1, applicable
Empty = value 0, not applicable

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building Protection	Operating mode override
0	0								
1	1								x
2	2							x	
3	3							x	x
4	4						x		
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	
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building Protection	Operating mode override
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
86	56		x		x		x	x	
87	57		x		x		x	x	x
88	58		x		x	x			
89	59		x		x	x			x
90	5A		x		x	x		x	
91	5B		x		x	x		x	x
92	5C		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	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	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	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	x
128	80	x							
129	81	x							x
130	82	x						x	
131	83	x						x	x

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building Protection	Operating mode override
132	84	x					x		
133	85	x					x		x
134	86	x					x	x	
135	87	x					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		
141	8D	x				x	x		x
142	8E	x				x	x	x	
143	8F	x				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		
149	95	x			x		x		x
150	96	x			x		x	x	
151	97	x			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	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	x
160	A0	x		x					
161	A1	x		x					x
162	A2	x		x				x	
163	A3	x		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	x
168	A8	x		x		x			
169	A9	x		x		x			x
170	AA	x		x		x		x	
171	AB	x		x		x		x	x
172	AC	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	x
176	B0	x		x	x				
177	B1	x		x	x				x
178	B2	x		x	x			x	
179	B3	x		x	x			x	x
180	B4	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	x
192	C0	x	x						
193	C1	x	x						x

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building Protection	Operating mode override
194	C2	x	x					x	
195	C3	x	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	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	x
208	D0	x	x		x				
209	D1	x	x		x				x
210	D2	x	x		x			x	
211	D3	x	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	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	x
220	DC	x	x		x	x	x		
221	DD	x	x		x	x	x		x
222	DE	x	x		x	x	x	x	
223	DF	x	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	x
228	E4	x	x	x			x		
229	E5	x	x	x			x		x
230	E6	x	x	x			x	x	
231	E7	x	x	x			x	x	x
232	E8	x	x	x		x			
233	E9	x	x	x		x			x
234	EA	x	x	x		x		x	
235	EB	x	x	x		x		x	x
236	EC	x	x	x		x	x		
237	ED	x	x	x		x	x		x
238	EE	x	x	x		x	x	x	
239	EF	x	x	x		x	x	x	x
240	F0	x	x	x	x				
241	F1	x	x	x	x				x
242	F2	x	x	x	x			x	
243	F3	x	x	x	x			x	x
244	F4	x	x	x	x		x		
245	F5	x	x	x	x		x		x
246	F6	x	x	x	x		x	x	
247	F7	x	x	x	x		x	x	x
248	F8	x	x	x	x	x			
249	F9	x	x	x	x	x			x
250	FA	x	x	x	x	x		x	
251	FB	x	x	x	x	x		x	x
252	FC	x	x	x	x	x	x		
253	FD	x	x	x	x	x	x		x
254	FE	x	x	x	x	x	x	x	
255	FF	x	x	x	x	x	x	x	x

Tab. 26: Status byte channel

13.3 Status byte Valve

x = Value 1, applicable
Empty = Value 0, not applicable

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Unused	Unused	Valve purge	Forced operation	Fault Valve output	Setpoint/ control value received
0	0								
1	1								x
2	2							x	
3	3							x	x
4	4						x		
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	
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Unused	Unused	Valve purge	Forced operation	Fault Valve output	Setpoint/ control value received
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
86	56		x		x		x	x	
87	57		x		x		x	x	x
88	58		x		x	x			
89	59		x		x	x			x
90	5A		x		x	x		x	
91	5B		x		x	x		x	x
92	5C		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	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	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	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	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	x

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Unused	Unused	Valve purge	Forced operation	Fault Valve output	Setpoint/ control value received
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		
141	8D	x				x	x		x
142	8E	x				x	x	x	
143	8F	x				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		
149	95	x			x		x		x
150	96	x			x		x	x	
151	97	x			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	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	x
160	A0	x		x					
161	A1	x		x					x
162	A2	x		x				x	
163	A3	x		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	x
168	A8	x		x		x			
169	A9	x		x		x			x
170	AA	x		x		x		x	
171	AB	x		x		x		x	x
172	AC	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	x
176	B0	x		x	x				
177	B1	x		x	x				x
178	B2	x		x	x			x	
179	B3	x		x	x			x	x
180	B4	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	x
192	C0	x	x						
193	C1	x	x						x
194	C2	x	x					x	
195	C3	x	x					x	x

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Unused	Unused	Valve purge	Forced operation	Fault Valve output	Setpoint/ control value received
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	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	x
208	D0	x	x		x				
209	D1	x	x		x				x
210	D2	x	x		x			x	
211	D3	x	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	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	x
220	DC	x	x		x	x	x		
221	DD	x	x		x	x	x		x
222	DE	x	x		x	x	x	x	
223	DF	x	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	x
228	E4	x	x	x			x		
229	E5	x	x	x			x		x
230	E6	x	x	x			x	x	
231	E7	x	x	x			x	x	x
232	E8	x	x	x		x			
233	E9	x	x	x		x			x
234	EA	x	x	x		x		x	
235	EB	x	x	x		x		x	x
236	EC	x	x	x		x	x		
237	ED	x	x	x		x	x		x
238	EE	x	x	x		x	x	x	
239	EF	x	x	x		x	x	x	x
240	F0	x	x	x	x				
241	F1	x	x	x	x				x
242	F2	x	x	x	x			x	
243	F3	x	x	x	x			x	x
244	F4	x	x	x	x		x		
245	F5	x	x	x	x		x		x
246	F6	x	x	x	x		x	x	
247	F7	x	x	x	x		x	x	x
248	F8	x	x	x	x	x			
249	F9	x	x	x	x	x			x
250	FA	x	x	x	x	x		x	
251	FB	x	x	x	x	x		x	x
252	FC	x	x	x	x	x	x		
253	FD	x	x	x	x	x	x		x
254	FE	x	x	x	x	x	x	x	
255	FF	x	x	x	x	x	x	x	x

Tab. 27: Status byte Valve

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