PRODUCT MANUAL

ABB i-bus® KNX

FCC/S 1.X.X.1

Fan Coil 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

ABB AG reserves the right to make changes to the product or modify the contents of this document without prior notice.

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 Fan Coil Controllers FCC/S are intended to control decentralized fan coil units in a KNX environment.

3 Product overview

3.1 Device description

The devices are modular installation devices (MDRC) in 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 comply with the EN 50491 standard and can be used as products of the KNX system.

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

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

The Fan Coil Controllers FCC/S 1.1.X.1, FCC/S 1.2.X.1 and FCC/S 1.4.1.1 feature a mechanical relay in each fan output. These relays are mechanically independent from the other outputs.

All Fan Coil Controllers except the FCC/S 1.4.1.1 variant also have an auxiliary relay for switching an additional heater Switching noises cannot be avoided due to the mechanical nature of the design.

3.2 Product name description

Abbreviation	Description		
F	Fan		
C	Coil		
C	Controller		
/S	MDRC		
X.	1	=	1-fold
X.	1	=	Thermoelectric Valve Drive (PWM); 3-speed fan (relay)
	2	=	Analog valve drive (0 … 10 V); 3-speed fan (relay)
	3	=	Analog valve drive (0 … 10 V); continuous fan (0 … 10 V)
	4	=	Thermoelectric Valve Drive (PWM); 3-speed fan (relay)
	5	=	Thermoelectric Valve Drive (PWM); continuous fan (0 … 10 V)
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	MB	Type	Order no.	Packaging unit [pcs.]	Weight (incl. packaging) [kg]
Fan Coil Controller	6	FCC/S 1.4.1.1	2CDG 110 209 R0011	1	0.215
Fan Coil Controller	6	FCC/S 1.1.1.1	2CDG 110 210 R0011	1	0.230
Fan Coil Controller	6	FCC/S 1.1.2.1	2CDG 110 211 R0011	1	0.235
Fan Coil Controller	6	FCC/S 1.2.1.1	2CDG 110 212 R0011	1	0.230
Fan Coil Controller	6	FCC/S 1.2.2.1	2CDG 110 213 R0011	1	0.235
Fan Coil Controller	6	FCC/S 1.3.1.1	2CDG 110 214 R0011	1	0.210
Fan Coil Controller	6	FCC/S 1.3.2.1	2CDG 110 215 R0011	1	0.215
Fan Coil Controller	6	FCC/S 1.5.1.1	2CDG 110 234 R0011	1	0.210
Fan Coil Controller	6	FCC/S 1.5.2.1	2CDG 110 235 R0011	1	0.215

Tab. 3: Ordering details

3.4 Connections

The devices possess the following connections:

- 4 inputs for sensors or an analog room control unit (SAF/A or SAR/A)
- 2 valve outputs for activating valve drives
- 1 fan output
- 1 relay output
- 1 bus connection

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

Fan output

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Step fan (max. 3 speeds)	1	1	1	1	–	–	1	–	–
Continuous fan (0 … 10 V)	–	–	–	–	1	1	–	1	1

Tab. 4: Fan output

Relay output

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Electric heater	1	1	1	1	1	1	–	1	1

Tab. 5: Relay output

Valve outputs

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Thermoelectric Valve Drive (PWM)	2	2	–	–	–	–	1	2	2
Motor-driven valve drive (3-point)	1	1	–	–	–	–	–	1	1
Solenoid valve (Open/ Close)	2	2	–	–	–	–	1	2	2
Analog valve drive	–	–	2	2	2	2	–	–	–
6-way valve	–	–	1	1	1	1	–	–	–
VAV damper drive	–	–	2	2	2	2	–	–	–

Tab. 6: Valve outputs

Physical inputs

	FCC/S 1.1.1.1	FCC/S 1.1.2.1	FCC/S 1.2.1.1	FCC/S 1.2.2.1	FCC/S 1.3.1.1	FCC/S 1.3.2.1	FCC/S 1.4.1.1	FCC/S 1.5.1.1	FCC/S 1.5.2.1
Analog room control unit	1	1	1	1	1	1	1	1	1
Binary sensor (floating)	4	4	4	4	4	4	4	4	4
Temperature sensor	4	4	4	4	4	4	4	4	4

Tab. 7: Physical inputs

3.4.1 Inputs

Function	a	b	c	d
Analog room control unit	x			
Binary sensor (floating)	x	x	x	x
Temperature sensor				
PT100	x	x	x	x
PT1000	x	x	x	x
KT/KTY	x	x	x	x
KT/KTY user-defined	x	x	x	x
NTC10k	x	x	x	x
NTC20k	x	x	x	x
NI-1000	x	x	x	x
Dew point sensor (floating)	x	x	x	x
Fill level sensor (floating)	x	x	x	x
Window contact (floating)	x	x	x	x

Tab. 8: Function of the inputs

3.4.2 Outputs

3.4.2.1 Valve outputs

FCC/S 1.1.X.1 and FCC/S 1.5.X.1

Function	U	B
Thermoelectric Valve Drive (PWM)	x	x
Solenoid valve (Open/Close)	x	x
Motor-driven valve drive (3-point)	Open	Close
Fault detection		
Overload/short circuit current	x	x

Tab. 9: Valve output function

FCC/S 1.4.1.1

Function	U
Thermoelectric Valve Drive (PWM)	x
Solenoid valve (Open/Close)	x
Fault detection	
Overload/short circuit current	x

Tab. 10: Valve output function

FCC/S 1.2.X.1 and FCC/S 1.3.X.1

Function	U	B
Analog valve drive		
0 … 10 V	x	x
1 … 10 V	x	x
2 … 10 V	x	x
10 … 0 V	x	x
6-way valve drive	x	
VAV damper drive - control signal	x	x
Fault detection		
Overload/short circuit current	x	x

Tab. 11: Valve output function

3.4.2.2 Fan output

FCC/S 1.1.X.1, FCC/S 1.2.X.1 and FCC/S 1.4.1.1

Function	Fan output
Number of fan speeds (5 A)	
1	x
2	x
3	x
Changeover switching	x
Step switching	x

Tab. 12: Function of the fan output

FCC/S 1.3.X.1 and FCC/S 1.5.X.1

Function	Fan output
Continuous fan 0-10 V, freely selectable voltage range	x
Fault detection	
Overload/short circuit	x

Tab. 13: Function of the fan output

3.4.2.3 Relay output

This chapter does not apply to the FCC/S 1.4.X.1.

Function	Relay output
Use by internal controller for electric heater	x
Use as independent switching output	x
Internal connection to a device input	x

Tab. 14: Relay output function

3.5 Fan Coil Controller FCC/S 1.1.1.1, PWM, MDRC

2CDC071019F0017

Fig. 1: Device illustration FCC/S 1.1.1.1

3.5.1 Dimension drawing

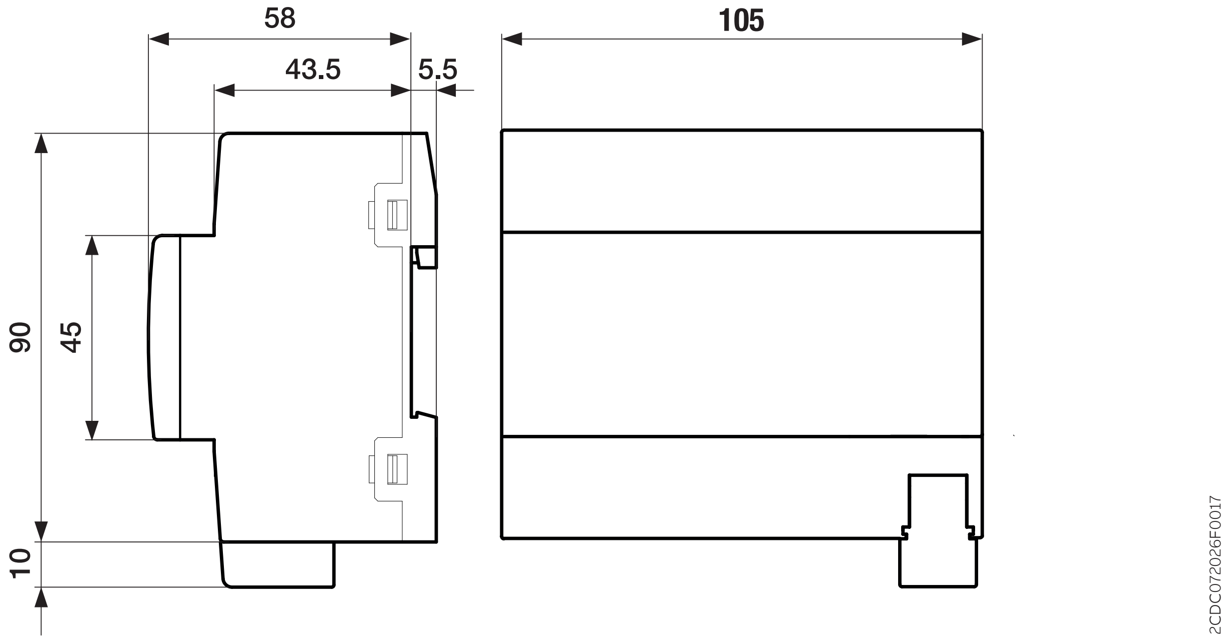


Fig. 2: Dimension drawing

3.5.2 Connection diagram

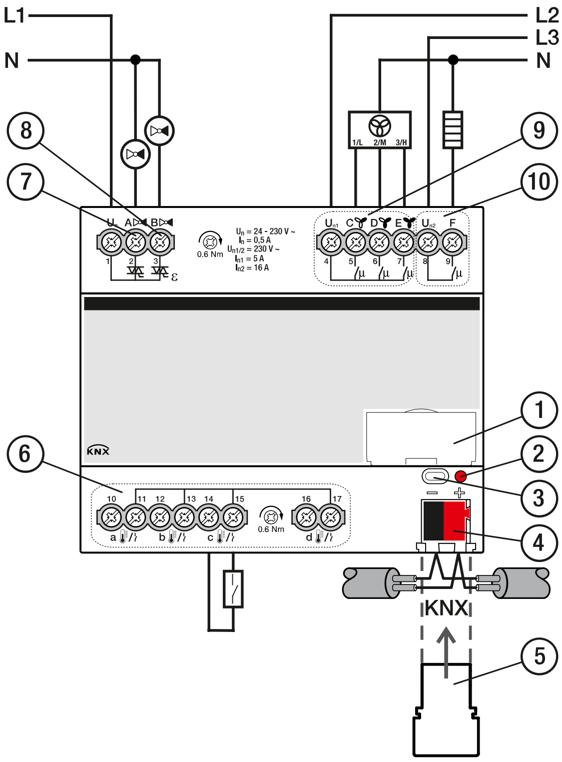


Fig. 3: FCC/S 1.1.1.1

—

Legend

1 Label carriers

2 Programming LED

3 Programming button

4 Bus connection terminal

5 Cover cap

6 Inputs (a, b, c, d)

7 Valve output A

8 Valve output B

9 Fan output

10 Auxiliary relay

3.5.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.

3.5.4 Technical data

3.5.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.23 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, relay 5 A	≤ 0.6 W
	Power loss, electronic outputs	≤ 1.2 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.5.4.2 Valve outputs (thermoelectric, PWM)

Rated values	Number of outputs	2
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	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 T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per PWM output

3.5.4.3 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.5.4.4 Valve outputs (motor-driven, 3-point)

Rated values	Number of outputs	1
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	0.5 A
	Continuous current at T_u up to 20 °C	0.25 A resistive load per channel
	Continuous current at T_u up to 45 °C	0.15 A resistive load per channel
	Inrush current T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per output

3.5.4.5 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3 × 10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.5.4.6 Fan output, rated current 5 A

Rated values	Number of outputs	3
	Rated voltage U_{n1}	230 V AC
	Rated current I_{n1} (per output pair)	5 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 5 A
	Switching current at 24 V DC (resistive load)	≤ 5 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.1 W
	Switching capacity at min. 12 V AC	≥ 0.12 W
	Switching capacity at min. 24 V AC	≥ 0.168 W
Service life	Mechanical service life	> 10^7 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when only one relay switches	≤ 500

3.6 Fan Coil Controller FCC/S 1.1.2.1, PWM, MDRC

2CDC071020F0017

Fig. 4: Device illustration FCC/S 1.1.2.1

3.6.1 Dimension drawing

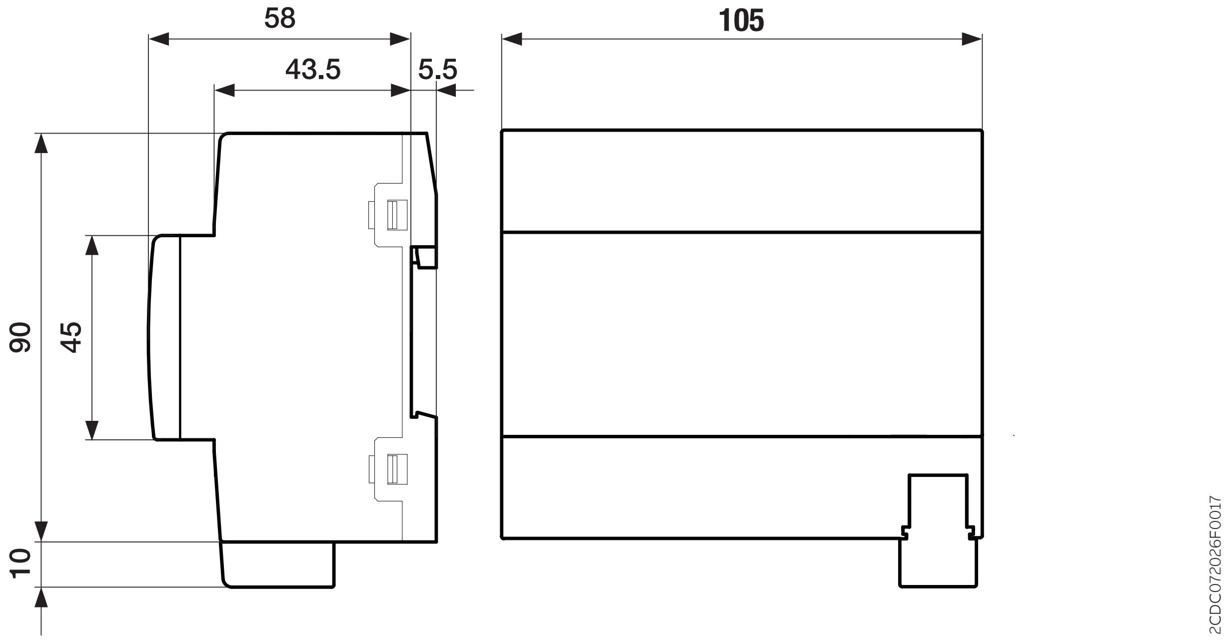


Fig. 5: Dimension drawing

3.6.2 Connection diagram

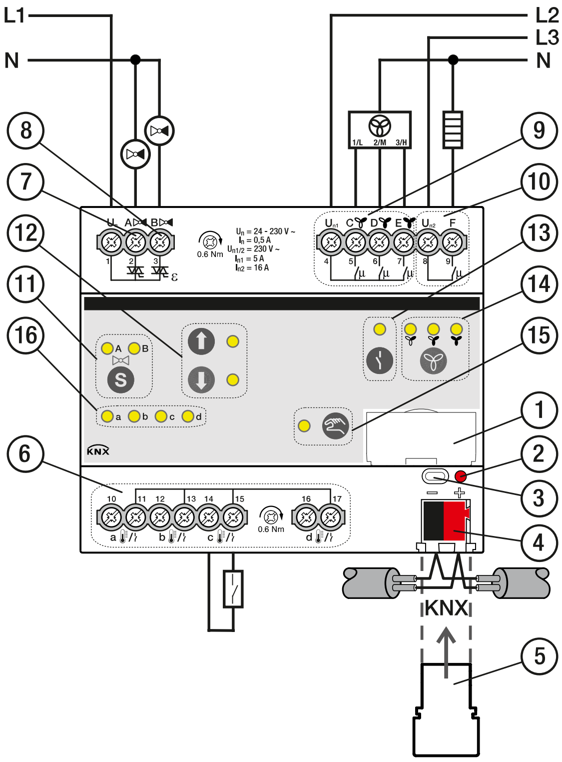


Fig. 6: Connection diagram for FCC/S 1.1.2.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay
11 Valve output changeover button/LED
12 Valve output open/close button/LED
13 Relay output open/close button/LED
14 Fan speed switching button/LED
15 Manual operation button/LED
16 Inputs (a, b, c, d) status indicator LEDs

3.6.3 Operating and display elements

Button/LED	Description/function	LED indicator
Programming	Assignment of the physical address	On: The device is in programming mode.

3.6.3.1 Manual mode

Button/LED	Description/function	LED indicator
A B S Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
Valve output opening	Setting the maximum valve control value (100 %) Reset both outputs with long button push (min. 5 seconds)	On: Valve control value at 100 % Flashing: Fault at output
Valve output closing	Setting the minimum valve control value (0 %)	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
Open/close relay output	Valve switchover	On: Relay closed Off: Relay open
Fan speed	Switches the fan speed in the following sequence: • 0 > 1 > 2 > 3 > 0 > 1… (long button push always switches to 0)	Display of current fan speed with step switching: • 0: all LEDs Off • 1: LED 1 On • 2: LEDs 1 & 2 On • 3: all LEDs On Display of current fan speed with changeover switching: • 0: all LEDs Off • 1: LED 1 On • 2: LED 2 On • 3: LED 3 On
Manual operation	Activates KNX mode with a short button push	On: Device in operating mode *Manual operation* Off: Device in *KNX operation*
a b c d Inputs a...x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.6.3.2 KNX operation

Button/LED	Description/function	LED indicator
A B S Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
Valve output opening	Button without function	On: Valve control value at 100% Flashing: Fault at output
Valve output closing	Button without function	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
Open/close relay output	Button without function	On: Contact closed Off: Contact open
Fan speed	Button without function	Display of current fan speed with step switching: • 0: all LEDs Off • 1: LED 1 On • 2: LEDs 1 & 2 On • 3: all LEDs On Display of current fan speed with changeover switching: • 0: all LEDs Off • 1: LED 1 On • 2: LED 2 On • 3: LED 3 On
Manual operation	Activates manual operation with a long button push (at least 5 seconds)	On: Device in operating mode *Manual operation* Off: Device in *KNX operation* Flashing when button is pushed: Manual operation deactivated via ETS
a b c d Inputs a…x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.6.4 Technical data

3.6.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.24 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, relay 5 A	≤ 0.6 W
	Power loss, electronic outputs	≤ 1.2 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.6.4.2 Valve outputs (thermoelectric, PWM)

Rated values	Number of outputs	2
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	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 T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per PWM output

3.6.4.3 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.6.4.4 Valve outputs (motor-driven, 3-point)

Rated values	Number of outputs	1
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	0.5 A
	Continuous current at T_u up to 20 °C	0.25 A resistive load per channel
	Continuous current at T_u up to 45 °C	0.15 A resistive load per channel
	Inrush current T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per output

3.6.4.5 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3 × 10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.6.4.6 Fan output, rated current 5 A

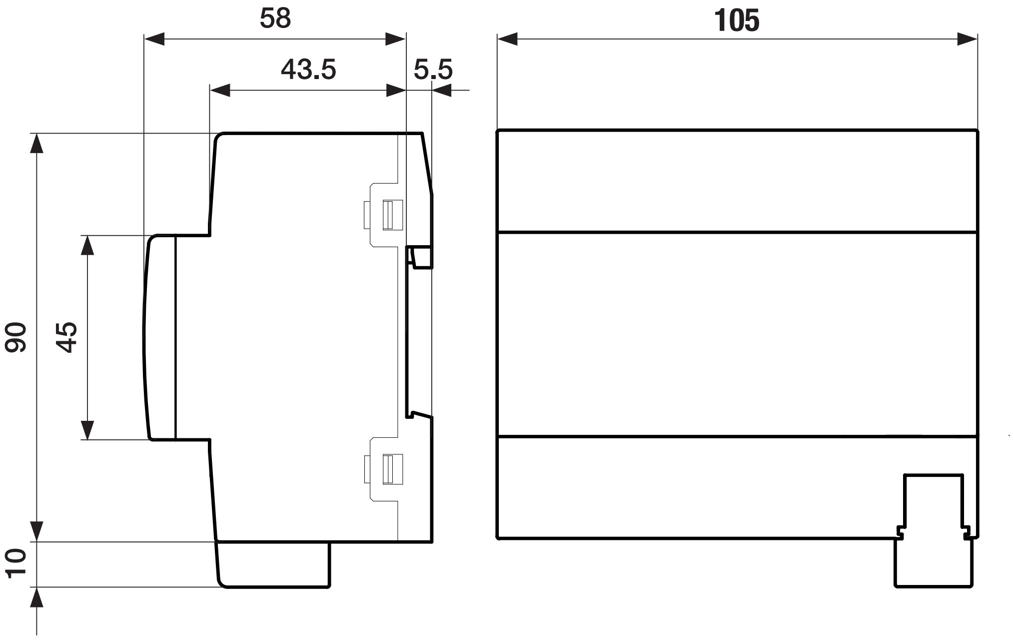
Rated values	Number of outputs	3
	Rated voltage U_{n1}	230 V AC
	Rated current I_{n1} (per output pair)	5 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 5 A
	Switching current at 24 V DC (resistive load)	≤ 5 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.1 W
	Switching capacity at min. 12 V AC	≥ 0.12 W
	Switching capacity at min. 24 V AC	≥ 0.168 W
Service life	Mechanical service life	> 10^7 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when only one relay switches	≤ 500

3.7 Fan Coil Controller FCC/S 1.2.1.1, 0-10V, MDRC

2CDC071021F0017

Fig. 7: Device illustration FCC/S 1.2.1.1

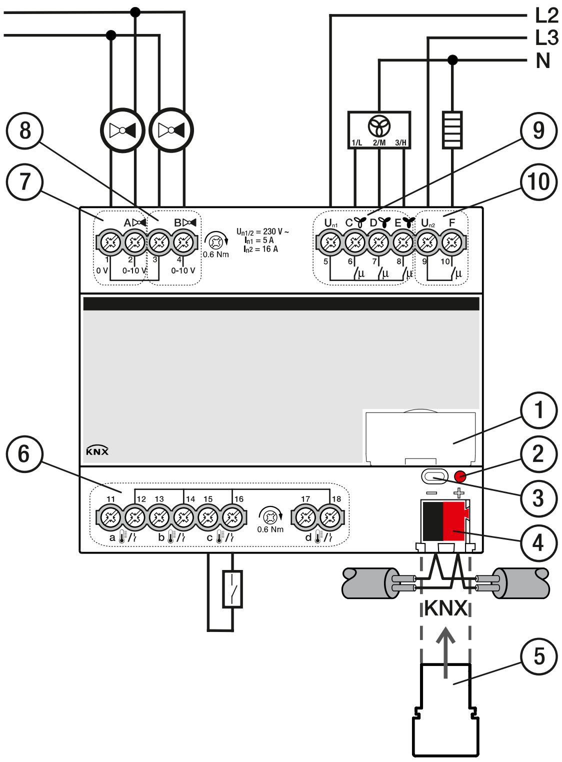
3.7.1 Dimension drawing



2CDC072026F0017

Fig. 8: Dimension drawing

3.7.2 Connection diagram



2CDC072013F0017

Fig. 9: FCC/S 1.2.1.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay

3.7.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.

3.7.4 Technical data

3.7.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.23 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, relay 5 A	≤ 0.6 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.7.4.2 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.7.4.3 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.7.4.4 Valve output (analog)

Rated values	Quantity	2 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.7.4.5 Fan output, rated current 5 A

Rated values	Number of outputs	3
	Rated voltage U_{n1}	230 V AC
	Rated current I_{n1} (per output pair)	5 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 5 A
	Switching current at 24 V DC (resistive load)	≤ 5 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.1 W
	Switching capacity at min. 12 V AC	≥ 0.12 W
	Switching capacity at min. 24 V AC	≥ 0.168 W
Service life	Mechanical service life	> 10^7 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when only one relay switches	≤ 500

3.8 Fan Coil Controller FCC/S 1.2.2.1, 0-10V, MDRC

2CDC071022F0017

Fig. 10: Device illustration FCC/S 1.2.2.1

3.8.1 Dimension drawing

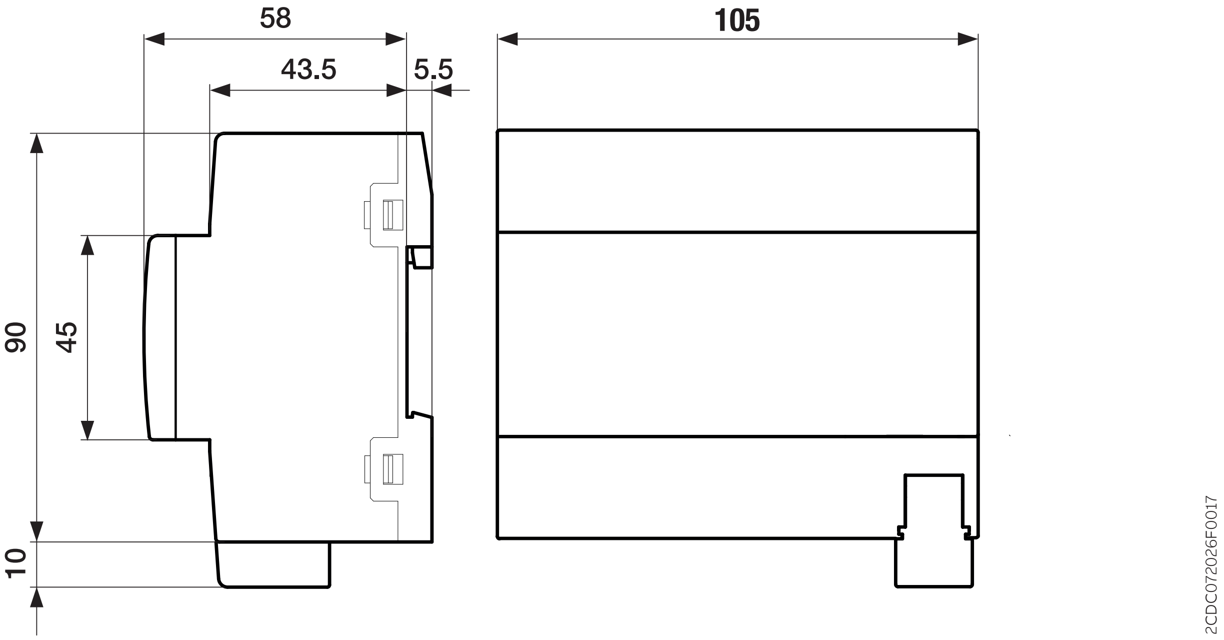


Fig. 11: Dimension drawing

3.8.2 Connection diagram

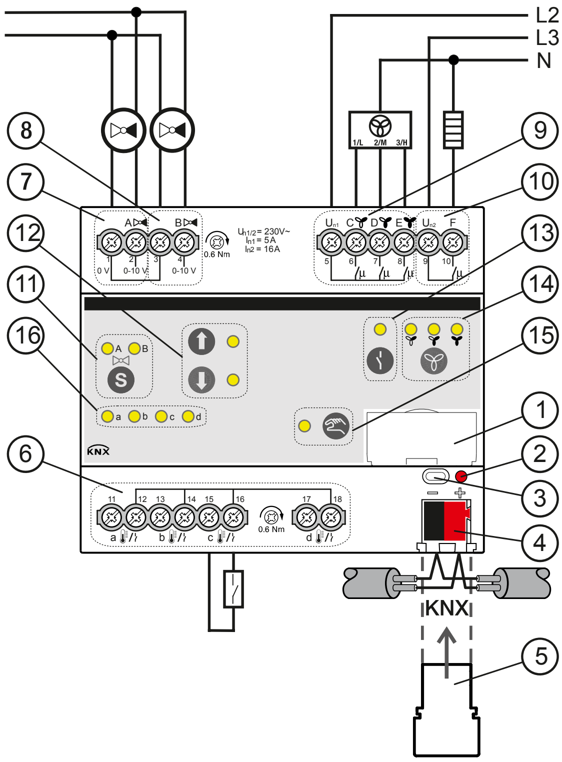


Fig. 12: FCC/S 1.2.2.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay
11 Valve output changeover button/LED
12 Valve output open/close button/LED
13 Relay output open/close button/LED
14 Fan speed switching button/LED
15 Manual operation button/LED
16 Inputs (a, b, c, d) status indicator LEDs

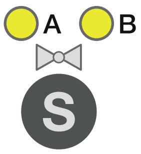
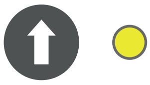
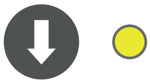
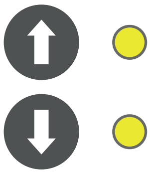
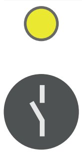
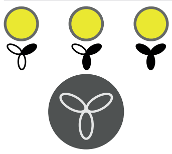
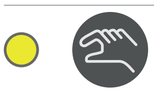
3.8.3 Operating and display elements

Button/LED	Description/function	LED indicator
Programming	Assignment of the physical address	On: The device is in programming mode.

3.8.3.1 Manual mode

Button/LED	Description/function	LED indicator
A B S Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
Valve output opening	Setting the maximum valve control value (100 %) Reset both outputs with long button push (min. 5 seconds)	On: Valve control value at 100 % Flashing: Fault at output
Valve output closing	Setting the minimum valve control value (0 %)	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
Open/close relay output	Valve switchover	On: Relay closed Off: Relay open
Fan speed	Switches the fan speed in the following sequence: • 0 > 1 > 2 > 3 > 0 > 1… (long button push always switches to 0)	Display of current fan speed with step switching: • 0: all LEDs Off • 1: LED 1 On • 2: LEDs 1 & 2 On • 3: all LEDs On Display of current fan speed with changeover switching: • 0: all LEDs Off • 1: LED 1 On • 2: LED 2 On • 3: LED 3 On
Manual operation	Activates KNX mode with a short button push	On: Device in operating mode *Manual operation* Off: Device in *KNX operation*
a b c d Inputs a…x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.8.3.2 KNX operation

Button/LED	Description/function	LED indicator
 Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
 Valve output opening	Button without function	On: Valve control value at 100% Flashing: Fault at output
 Valve output closing	Button without function	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
 Open/close relay output	Button without function	On: Contact closed Off: Contact open
 Fan speed	Button without function	Display of current fan speed with step switching: • 0: all LEDs Off • 1: LED 1 On • 2: LEDs 1 & 2 On • 3: all LEDs On Display of current fan speed with changeover switching: • 0: all LEDs Off • 1: LED 1 On • 2: LED 2 On • 3: LED 3 On
 Manual operation	Activates manual operation with a long button push (at least 5 seconds)	On: Device in operating mode *Manual operation* Off: Device in *KNX operation* Flashing when button is pushed: Manual operation deactivated via ETS
 Inputs a…x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.8.4 Technical data

3.8.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.24 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, relay 5 A	≤ 0.6 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.8.4.2 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.8.4.3 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.8.4.4 Valve output (analog)

Rated values	Quantity	2 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.8.4.5 Fan output, rated current 5 A

Rated values	Number of outputs	3
	Rated voltage U_{n1}	230 V AC
	Rated current I_{n1} (per output pair)	5 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 5 A
	Switching current at 24 V DC (resistive load)	≤ 5 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.1 W
	Switching capacity at min. 12 V AC	≥ 0.12 W
	Switching capacity at min. 24 V AC	≥ 0.168 W
Service life	Mechanical service life	> 10^7 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when only one relay switches	≤ 500

3.9 Fan Coil Controller FCC/S 1.3.1.1, 0-10V, MDRC

2CDC071023F0017

Fig. 13: Device illustration FCC/S 1.3.1.1

3.9.1 Dimension drawing

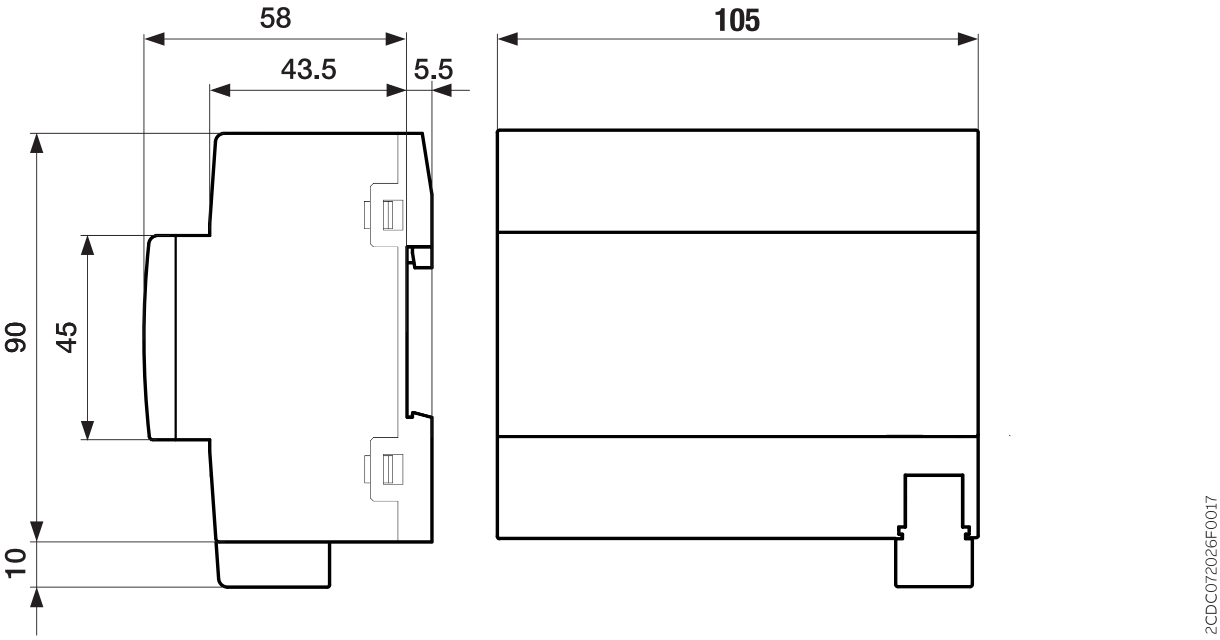


Fig. 14: Dimension drawing

3.9.2 Connection diagram

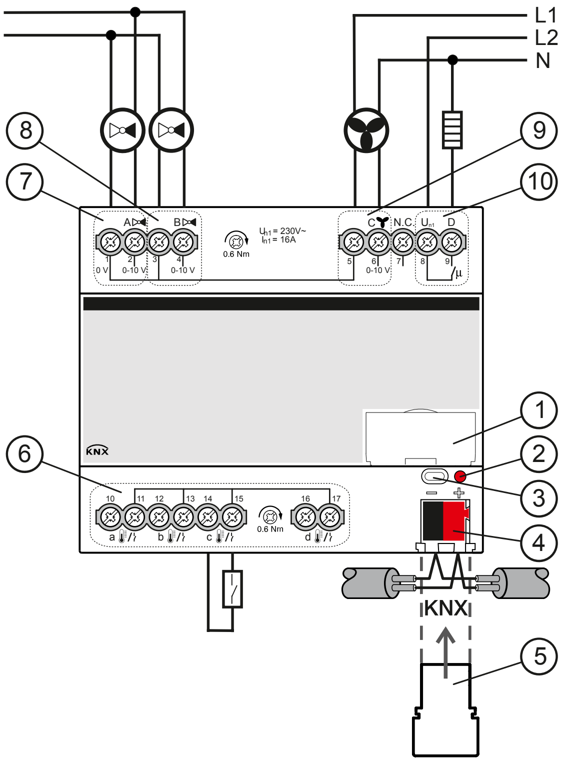


Fig. 15: FCC/S 1.3.1.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay

3.9.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.

3.9.4 Technical data

3.9.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.21 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.9.4.2 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.9.4.3 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.9.4.4 Valve output (analog)

Rated values	Number of outputs	2 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.9.4.5 Fan output (analog)

Rated values	Quantity	1 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.10 Fan Coil Controller FCC/S 1.3.2.1, 0-10V, MDRC

2CDC071024F0017

Fig. 16: Device illustration FCC/S 1.3.2.1

3.10.1 Dimension drawing

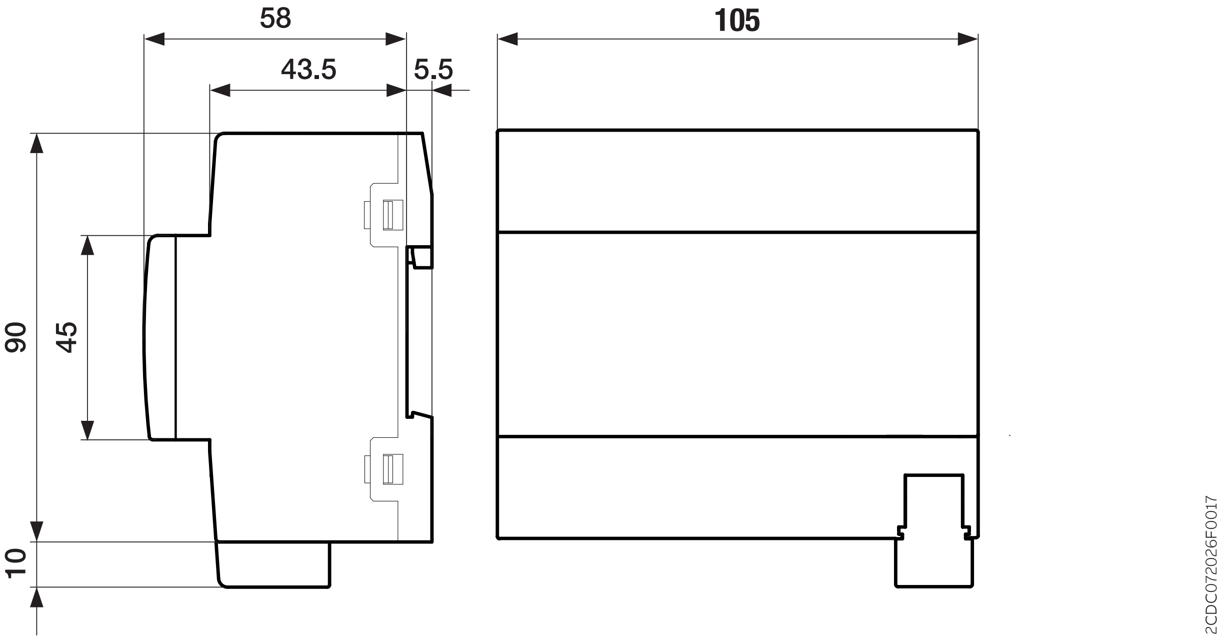


Fig. 17: Dimension drawing

3.10.2 Connection diagram

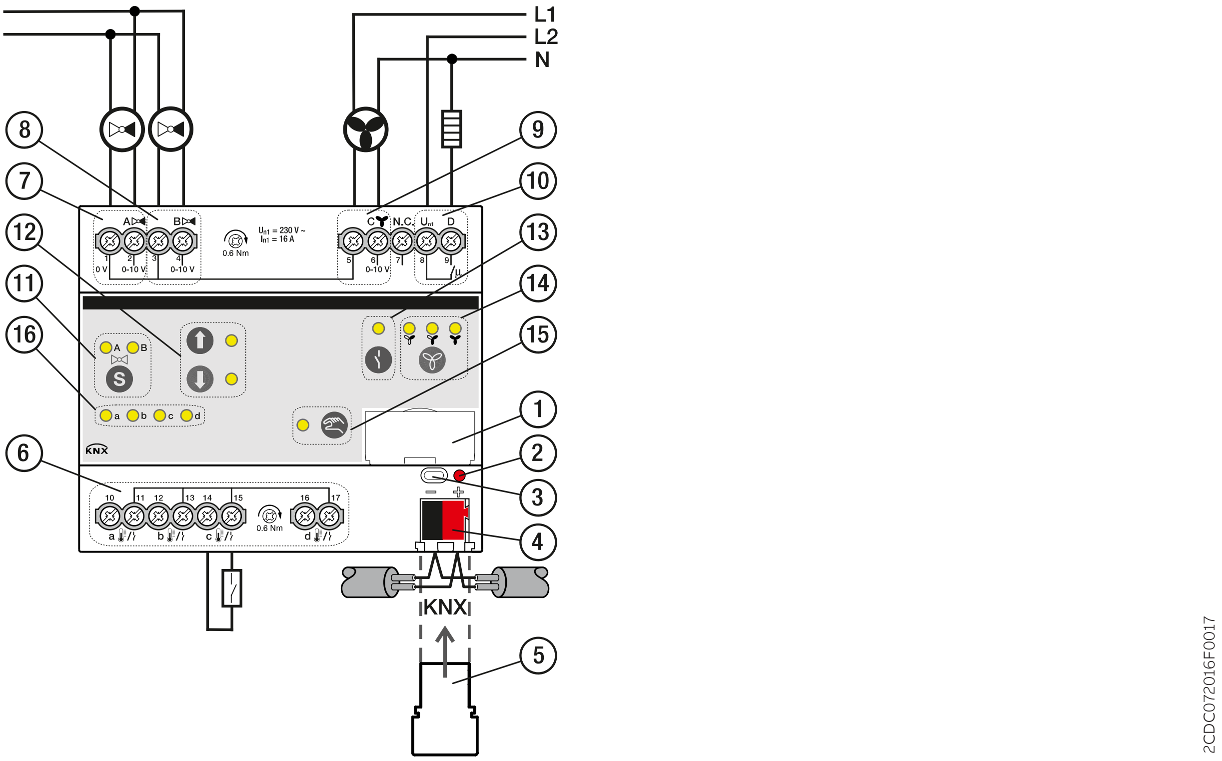


Fig. 18: FCC/S 1.3.2.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay
11 Valve output changeover button/LED
12 Valve output open/close button/LED
13 Relay output open/close button/LED
14 Fan speed switching button/LED
15 Manual operation button/LED
16 Inputs (a, b, c, d) status indicator LEDs

3.10.3 Operating and display elements

Button/LED	Description/function	LED indicator
Programming	Assignment of the physical address	On: The device is in programming mode.

3.10.3.1 Manual mode

Button/LED	Description/function	LED indicator
A B S Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
Valve output opening	Setting the maximum valve control value (100 %) Reset both outputs with long button push (min. 5 seconds)	On: Valve control value at 100 % Flashing: Fault at output
Valve output closing	Setting the minimum valve control value (0 %)	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
Open/close relay output	Valve switchover	On: Relay closed Off: Relay open
Fan speed	Switches the fan speed in the following sequence: • 0 % > 33 % > 66 % > 100 % > 0 % > 33 % … (long button push always switches to 0 %)	Indicates the current fan speed: • 0 %: all LEDs Off • 1 … 33 %: LED 1 On • 34 … 66 %: LEDs 1 & 2 On • 67 … 100 %: all LEDs On All LEDs flashing: Fault at 0-10 V output
Manual operation	Activates KNX mode with a short button push	On: Device in operating mode *Manual operation* Off: Device in *KNX operation*
a b c d Inputs a...x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.10.3.2 KNX operation

Button/LED	Description/function	LED indicator
A B Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
Valve output opening	Button without function	On: Valve control value at 100% Flashing: Fault at output
Valve output closing	Button without function	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
Open/close relay output	Button without function	On: Contact closed Off: Contact open
Fan speed	Button without function	Indicates the current fan speed: • 0 %: all LEDs Off • 1 … 33 %: LED 1 On • 34 … 66 %: LEDs 1 & 2 On • 67 … 100 %: all LEDs On All LEDs flashing: Fault at 0-10 V output
Manual operation	Activates manual operation with a long button push (at least 5 seconds)	On: Device in operating mode *Manual operation* Off: Device in *KNX operation* Flashing when button is pushed: Manual operation deactivated via ETS
a b c d Inputs a...x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.10.4 Technical data

3.10.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.21 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.10.4.2 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.10.4.3 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.10.4.4 Valve output (analog)

Rated values	Quantity	2 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.10.4.5 Fan output (analog)

Rated values	Quantity	1 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.11 Fan Coil Controller FCC/S 1.4.1.1, PWM, MDRC

Fig. 19: Device illustration FCC/S 1.4.1.1

2CDC071018F0017

3.11.1 Dimension drawing

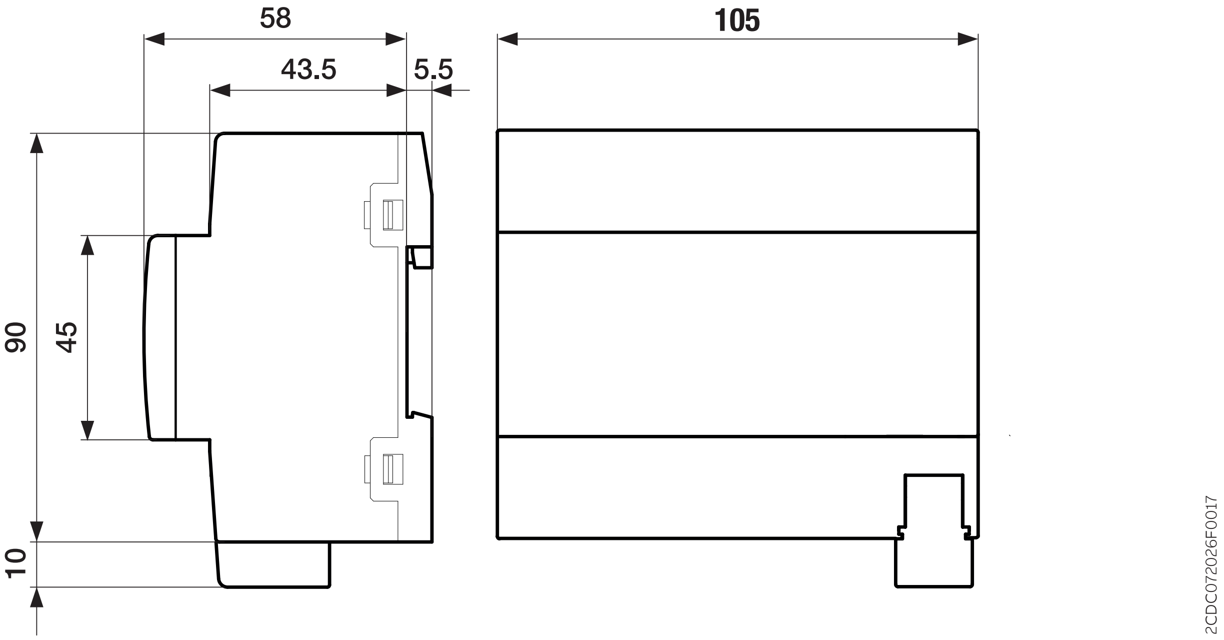
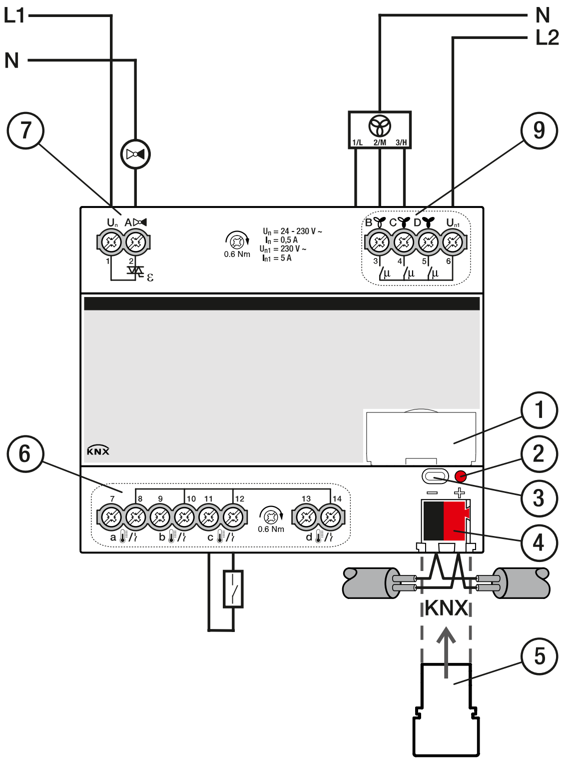


Fig. 20: Dimension drawing

3.11.2 Connection diagram



2CDC072017F0017

Fig. 21: FCC/S 1.4.1.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
9 Fan output

3.11.3 Operating and display elements

Button/LED	Description/function	LED indicator
Programming	Assignment of the physical address	On: The device is in programming mode.

3.11.4 Technical data

3.11.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.22 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, electronic outputs	≤ 1.2 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.11.4.2 Valve outputs (thermoelectric, PWM)

Rated values	Number of outputs	1
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	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 T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per PWM output

3.11.4.3 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.11.4.4 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.12 Fan Coil Controller FCC/S 1.5.1.1, PWM, MDRC

2CDC071025F0017

Fig. 22: Device illustration FCC/S 1.5.1.1

3.12.1 Dimension drawing

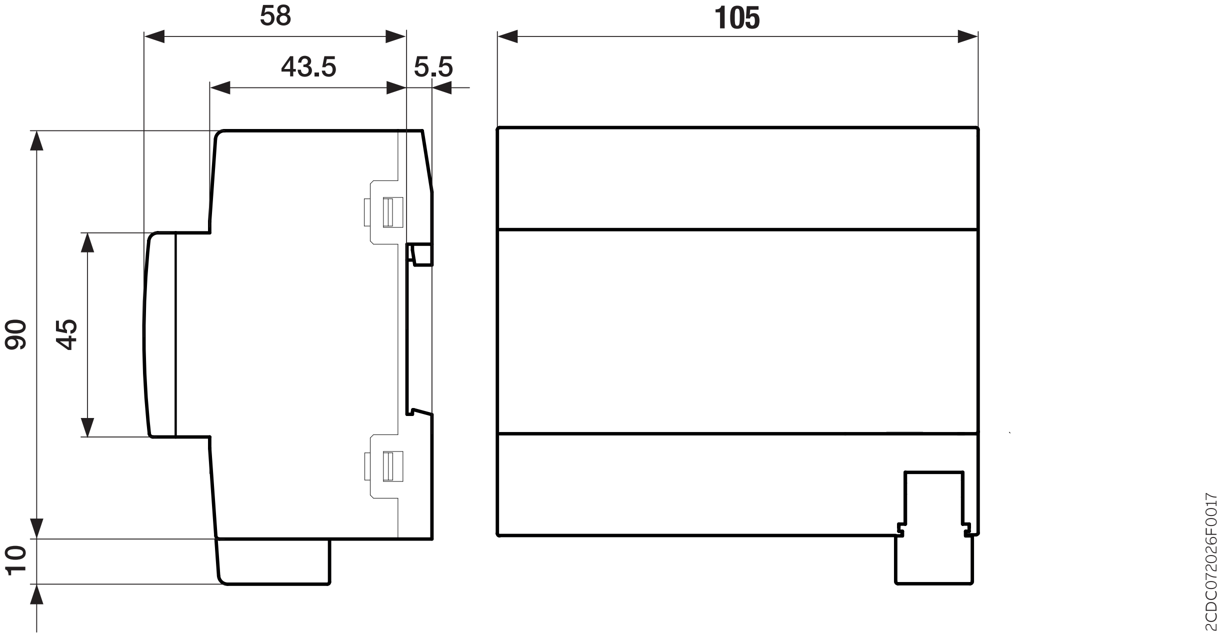


Fig. 23: Dimension drawing

3.12.2 Connection diagram

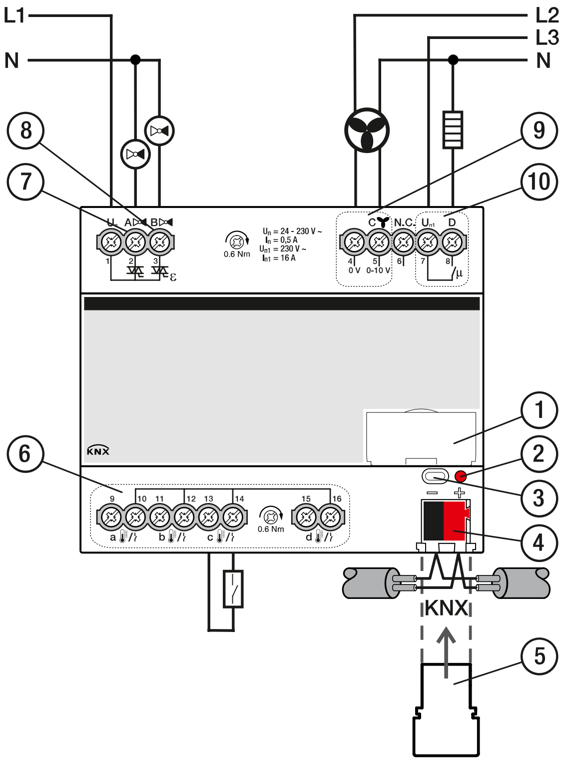


Fig. 24: FCC/S 1.5.1.1

—

Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay

3.12.3 Operating and display elements

Button/LED	Description/function	LED indicator
Programming	Assignment of the physical address	On: The device is in programming mode.

3.12.4 Technical data

3.12.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.21 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, electronic outputs	≤ 1.2 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.12.4.2 Valve outputs (thermoelectric, PWM)

Rated values	Number of outputs	2
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	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 T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per PWM output

3.12.4.3 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.12.4.4 Valve outputs (motor-driven, 3-point)

Rated values	Number of outputs	1
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	0.5 A
	Continuous current at T_u up to 20 °C	0.25 A resistive load per channel
	Continuous current at T_u up to 45 °C	0.15 A resistive load per channel
	Inrush current T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per output

3.12.4.5 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.12.4.6 Fan output (analog)

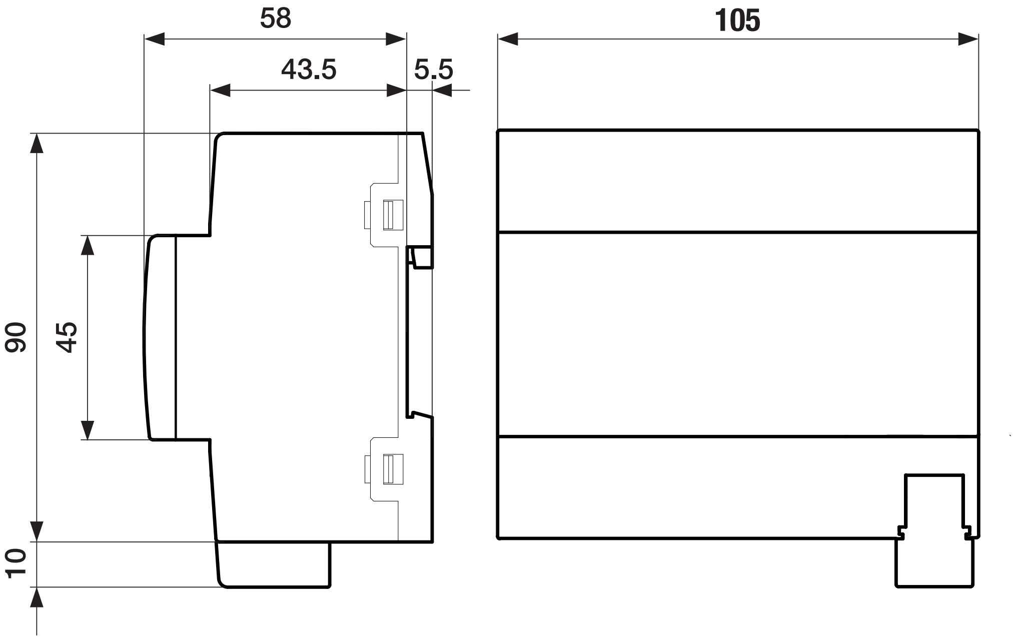
Rated values	Quantity	1 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

3.13 Fan Coil Controller FCC/S 1.5.2.1, PWM, MDRC

Fig. 25: Device illustration FCC/S 1.5.2.1

2CDC071026F0017

3.13.1 Dimension drawing



2CDC072026F0017

Fig. 26: Dimension drawing

3.13.2 Connection diagram

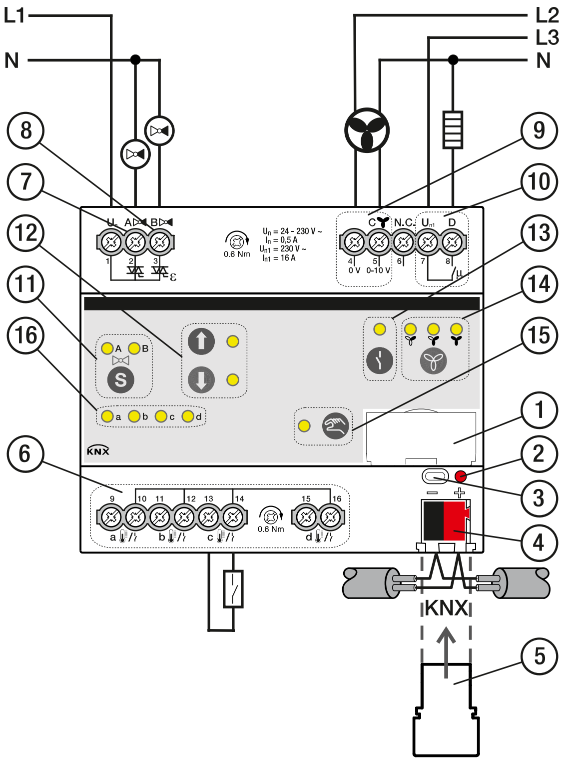


Fig. 27: FCC/S 1.5.2.1

—

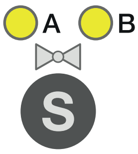
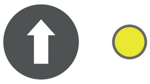
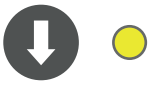
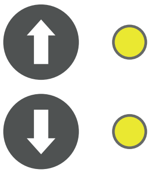
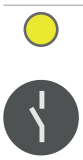
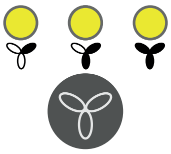
Legend

1 Label carriers
2 Programming LED
3 Programming button
4 Bus connection terminal
5 Cover cap
6 Inputs (a, b, c, d)
7 Valve output A
8 Valve output B
9 Fan output
10 Auxiliary relay
11 Valve output changeover button/LED
12 Valve output open/close button/LED
13 Relay output open/close button/LED
14 Fan speed switching button/LED
15 Manual operation button/LED
16 Inputs (a, b, c, d) status indicator LEDs

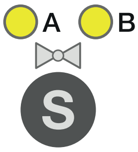
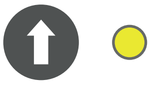
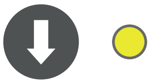
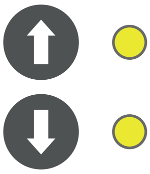
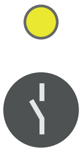
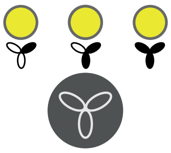
3.13.3 Operating and display elements

Button/LED	Description/function	LED indicator
 Programming	Assignment of the physical address	On: The device is in programming mode.

3.13.3.1 Manual mode

Button/LED	Description/function	LED indicator
 Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
 Valve output opening	Setting the maximum valve control value (100 %) Reset both outputs with long button push (min. 5 seconds)	On: Valve control value at 100 % Flashing: Fault at output
 Valve output closing	Setting the minimum valve control value (0 %)	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
 Open/close relay output	Valve switchover	On: Relay closed Off: Relay open
 Fan speed	Switches the fan speed in the following sequence: • 0 % > 33 % > 66 % > 100 % > 0 % > 33 % … (long button push always switches to 0 %)	Indicates the current fan speed: • 0 %: all LEDs Off • 1 … 33 %: LED 1 On • 34 … 66 %: LEDs 1 & 2 On • 67 … 100 %: all LEDs On All LEDs flashing: Fault at 0-10 V output
 Manual operation	Activates KNX mode with a short button push	On: Device in operating mode *Manual operation* Off: Device in *KNX operation*
 Inputs a...x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.13.3.2 KNX operation

Button/LED	Description/function	LED indicator
 Valve output change	Switches between valve A and valve B. If a valve output is deactivated, the valve cannot be selected.	On: Indicates the selected valve Flashing: Fault at output
 Valve output opening	Button without function	On: Valve control value at 100% Flashing: Fault at output
 Valve output closing	Button without function	On: Valve control value at 0 % Flashing: Fault at output
		Both LEDs On: Valve control value between 1 and 99 % Both LEDs Off: Fault at output
 Open/close relay output	Button without function	On: Contact closed Off: Contact open
 Fan speed	Button without function	Indicates the current fan speed: • 0 %: all LEDs Off • 1 … 33 %: LED 1 On • 34 … 66 %: LEDs 1 & 2 On • 67 … 100 %: all LEDs On All LEDs flashing: Fault at 0-10 V output
 Manual operation	Activates manual operation with a long button push (at least 5 seconds)	On: Device in operating mode *Manual operation* Off: Device in *KNX operation* Flashing when button is pushed: Manual operation deactivated via ETS
 Inputs a...x	Displays the LEDs according to which inputs are in use	Binary sensor: • On: Contact closed • Off: Contact open Temperature sensor: • On: Temperature sensor connected • Flashing: Fault (cable break/short circuit) Analog control panel: • On: Control panel connected • Flashing: Fault (cable break/short circuit)

3.13.4 Technical data

3.13.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H × W × D)
	Weight	0.22 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail (to EN 60715)
	Design	ProM
	Degree of protection	IP 20 (to EN 60529)
	Protection class	II (to EN 61140)
	Overvoltage category	III (to EN 60664-1)
	Pollution degree	II (to EN 60664-1)
	Declaration of conformity	CE
Materials	Housing	Polycarbonate, halogen free
Material note	Fire classification	Flammability V-0 (to UL 94)
Electronics	Rated voltage, bus	29 V DC
	Voltage range, bus	21 … 32 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3.0 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay 16 A	≤ 1.0 W
	Power loss, electronic outputs	≤ 1.2 W
	KNX safety extra low voltage	SELV
Connections	Connection type, bus	Plug-in terminal
	Cable diameter, bus	0.6 … 0.8 mm, single core
	Connection type, load circuit	Screw terminal with universal head (PZ 1)
	Tightening torque, screw terminals	≤ 0.6 Nm
	Conductor cross section, fine stranded	1 × (0.2 … 4 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, single core	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
Conformity	KNX approval	To EN 50491
	Approval	To EN 60669
Ambient conditions	Operation	–5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 93 %
	Condensation allowed	No
	Atmospheric pressure	≤ Atmosphere at 2,000 m

3.13.4.2 Valve outputs (thermoelectric, PWM)

Rated values	Number of outputs	2
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	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 T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per PWM output

3.13.4.3 Inputs

Rated values	Number of inputs	4
	Inputs for analog room controller	1
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
	NTC	20k
Cable length	Between sensor and device input	≤ 100 m, one-way

3.13.4.4 Valve outputs (motor-driven, 3-point)

Rated values	Number of outputs	1
	Non-floating	Yes
	Rated voltage U_n	24 … 230 V AC
	Voltage range	19 … 265 V AC
	Rated frequency	50/60 Hz
	Rated current I_n (per output pair)	0.5 A
	Continuous current at T_u up to 20 °C	0.25 A resistive load per channel
	Continuous current at T_u up to 45 °C	0.15 A resistive load per channel
	Inrush current T_u up to 45 °C	≤ 1.6 A (for 10 s)
	Standard title	T_u = Ambient temperature
	Minimum load	1.2 VA per output

3.13.4.5 Output, rated current 16 A

Rated values	Number of outputs	1
	Rated voltage U_{n2}	230 V AC
	Rated current I_{n2} (per output pair)	16 A
	Rated frequency	50/60 Hz
Switching currents	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	≤ 16 A
	AC-3 operation (cos ϕ = 0.45) to EN 60947-4-1 at 230 V AC	≤ 6 A
	Fluorescent lighting load (to EN 60669-1)	≤ 6 AX
	Switching current at 24 V DC (resistive load)	≤ 16 A
Switching capacity	Switching capacity at min. 5 V AC	≥ 0.5 W
	Switching capacity at min. 12 V AC	≥ 1.2 W
	Switching capacity at min. 24 V AC	≥ 2.4 W
Service life	Mechanical service life	> 3×10^6 switching operations
	AC-1 operation (cos ϕ = 0.8) to EN 60947-4-1 at 230 V AC	> 10^5 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

3.13.4.6 Fan output (analog)

Rated values	Quantity	1 (non-floating, short-circuit proof)
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

4 Function

4.1 Device functions

The following device functions are available for controlling a fan coil unit:
- Controller
- Actuator device

Controller

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

Actuator device

The internal controller is deactivated in the function as an actuator. The control values for activating the outputs are calculated by an external controller and received via the bus.

4.2 Functional overview

Fan activation

Depending on the product variant, the following fan types can be controlled using the Fan Coil Controller FCC/S:
- Single-phase fans with up to three fan speeds (via step switching or changeover switching)

> **Note**
> If the fan is controlled via changeover switching, it is not possible to switch on two fan speeds simultaneously. The required switchover delay can be set via ETS.

- Continuous fans (via 0-10 V activation)

Valve activation

The following valve types can be activated depending on the product variant:
- FCC/S 1.1.X.1 and FCC/S 1.5.X.1
  - Thermoelectric heating or cooling valves
  - Motor-driven 3-point-drive
- FCC/S 1.4.1.1
  - Thermoelectric heating or cooling valves
- FCC/S 1.2.X.1 and FCC/S 1.3.X.1
  - Analog heating or cooling valves

To prevent simultaneous heating and cooling, the device prevents the heating and cooling valves from opening at the same time.

Manual operation on the device is additionally possible with the following product variants:
- FCC/S 1.1.2.1
- FCC/S 1.2.2.1
- FCC/S 1.3.2.1
- FCC/S 1.5.2.1

4.2.1 Function diagram of fan activation

The following illustration indicates the sequence in which the fan activation functions are processed. Group objects leading to the same box have the same priority and are processed in the sequence in which the telegrams are received.

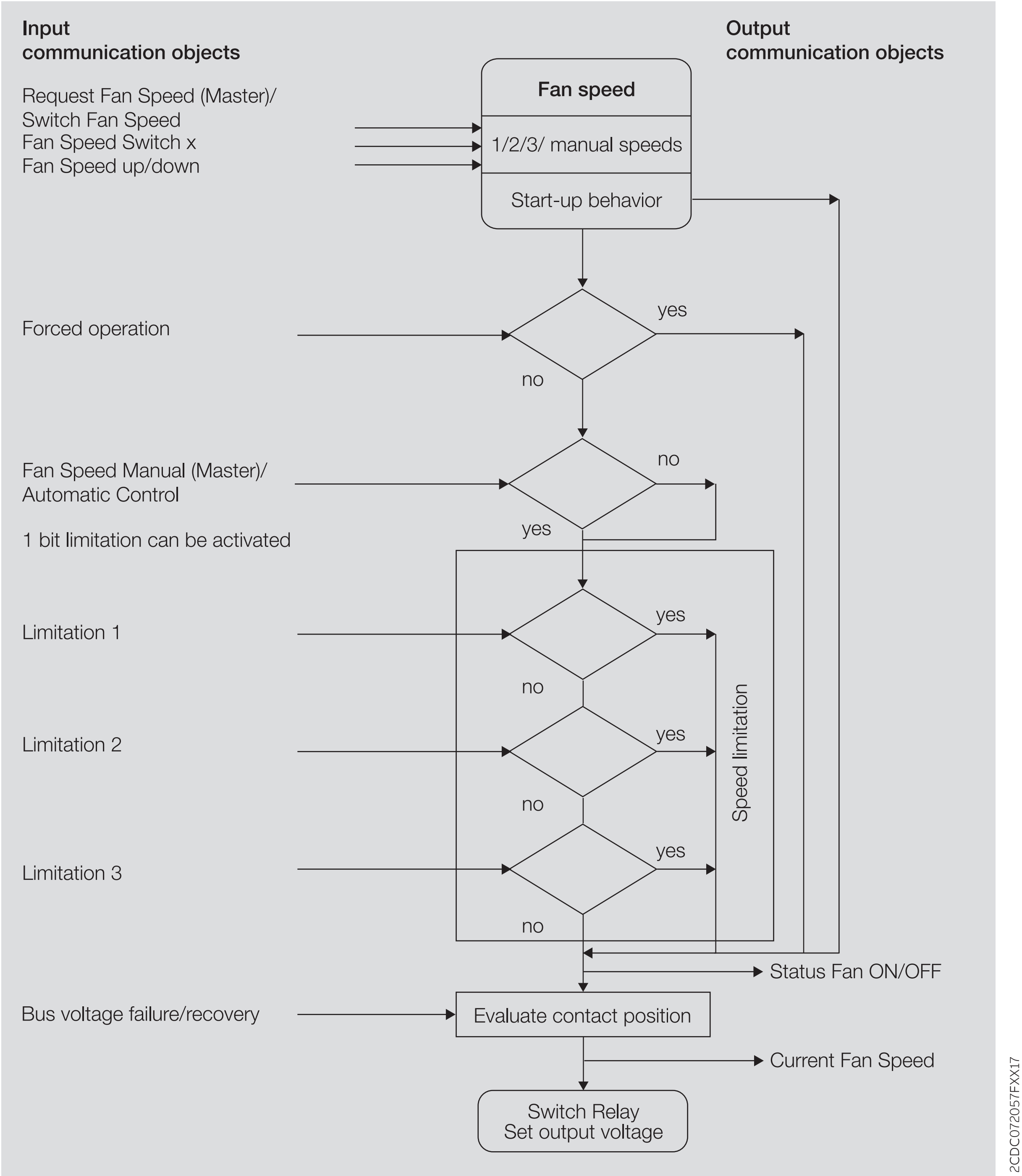


Fig. 28: Function diagram of fan activation

4.3 Limitation of fan speeds

The limitation can be used to limit the fan to one or more fan speeds.

The device features three limitations. The priorities correspond to the order of the individual limitations – limitation 1 has priority 1, limitation 2 has priority 2, etc.

The following properties apply to the limitations:
- The limitations can apply to a fan speed or to a range. If a range of fan speeds is limited, limited control is possible as well.
- The limitation is controlled via receipt of a telegram on group object *Limitation x*.
- If limitation is active, the fan speed closest to the limitation is approached.

Example:
- Limitation to fan speeds 2 and 3
- Control value: Fan speed 1

Fan speed 2 is approached.

- When limitation is active, data are still processed in the device but the outputs are not activated yet. When limitation is deactivated, the fan speed is recalculated and set.

4.4 Safety mode

The control value specified in the parameter Control value after exceeding monitoring time applies when the device is in safety mode.

The device changes to safety mode if one of the following prerequisites is met:
- Controller mode:
  - Error message on group object *Error Input*
  - "Window open" status message on group object *Window contact*
  - Alarm message on group object *Dew point alarm*
  - Alarm message on group object *Fill level alarm*
  - No temperature receipt on group object *External temperature 1*
  - No temperature receipt on group object *External temperature 2*
- Actuator mode:
  - Control value failure on group object *External temperature 1*
  - Control value failure on group object *External temperature 2*

4.5 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.

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

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

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

4.6.1 Bus voltage failure

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

4.6.2 Bus voltage recovery

Bus voltage recovery is the state that exists after 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.

4.6.3 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*.

4.6.4 Download

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 after an interrupted download.
- Download again.

5 Mounting and installation

5.1 Information about mounting

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 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.

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.

5.2 Mounting on mounting rail

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

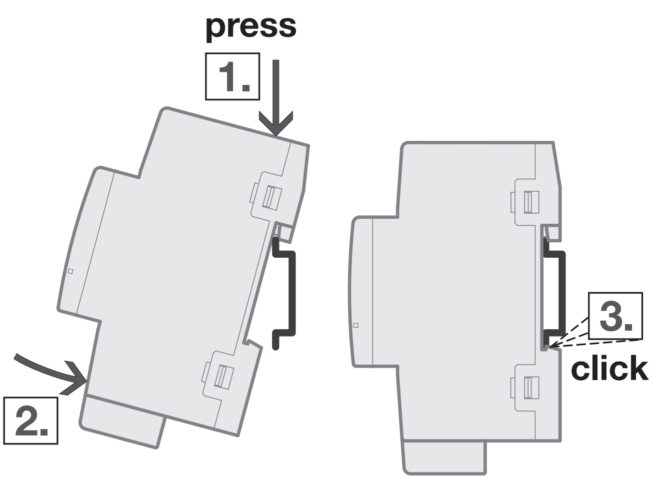


Fig. 29: Mounting on mounting rail

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: NTC 20

6 Commissioning

6.1 Prerequisites for commissioning

Putting the device into operation requires a PC with ETS and a connection to the bus (ABB i-bus® KNX), e.g. via a KNX interface.

- Required ETS version: 3.0 or higher
- Product-specific application: installed

The following, product-specific applications are available for ETS:

- FCC/S 1.1.1.1: *Fan Coil Controller, PWM, 3-speed*
- FCC/S 1.1.2.1: *Fan Coil Controller, PWM, 3-speed, manual operation*
- FCC/S 1.2.1.1: *Fan Coil Controller, 0-10V, 3-speed*
- FCC/S 1.2.2.1: *Fan Coil Controller, 0-10V, 3-speed, manual operation*
- FCC/S 1.3.1.1: *Fan Coil Controller, 0-10V, 0-10V*
- FCC/S 1.3.2.1: *Fan Coil Controller, 0-10V, 0-10V, manual operation*
- FCC/S 1.4.1.1: *Fan Coil Controller, PWM, 3-speed*
- FCC/S 1.5.1.1: *Fan Coil Controller, PWM, 0-10V*
- FCC/S 1.5.2.1: *Fan Coil Controller, PWM, 0-10V, manual operation*

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 reprogrammed 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

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 physical address assignment. 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 *ABBUpdate 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

7 Parameters

7.1 General

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

The following chapters 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' parametrization and function.

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

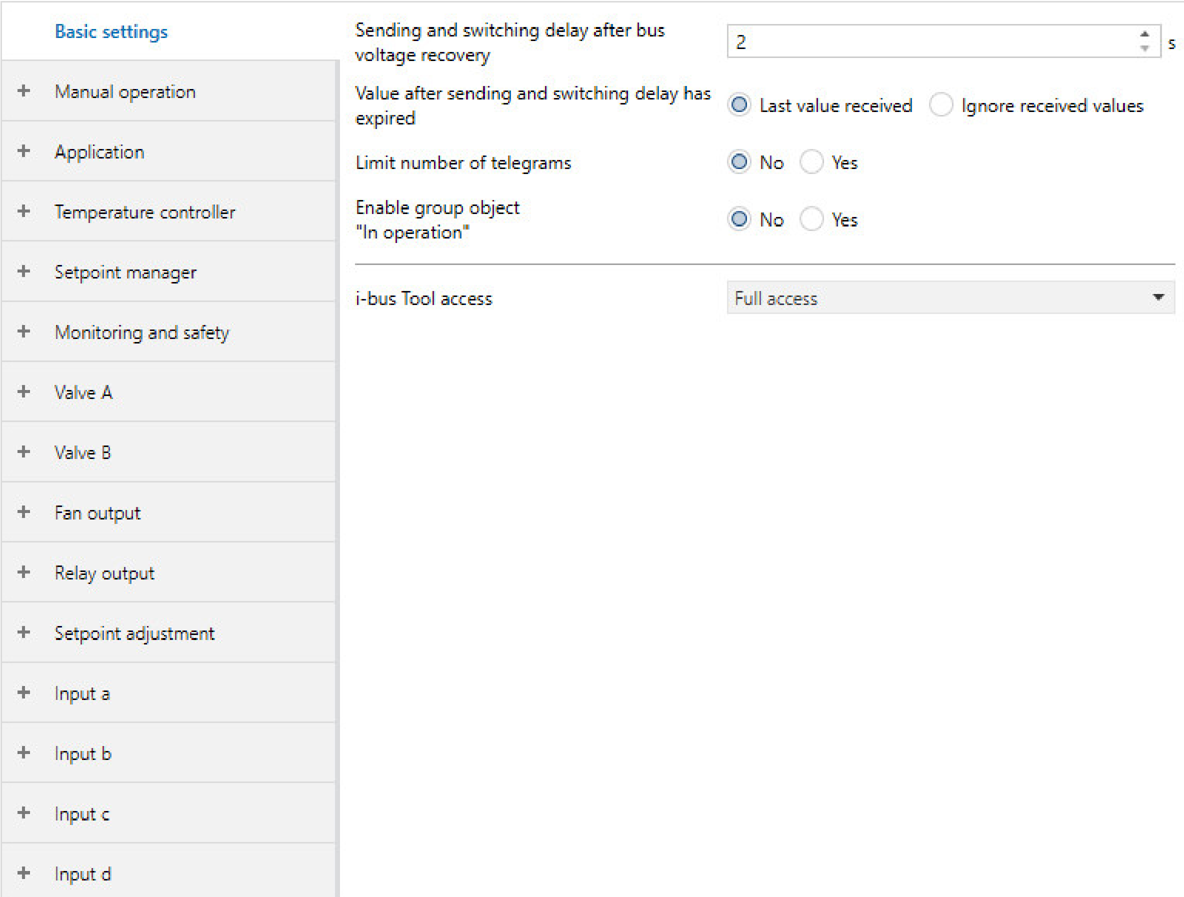
No (checkbox cleared)

Yes (checkbox ticked)

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

7.2 Parameter window Basic settings

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



2CDC078005F0218

Fig. 30: Parameter window General

Parameter

- Sending and switching delay after bus voltage recovery
- Value after sending and switching delay has expired
- Limit number of telegrams
  - Maximum number of telegrams
  - In period
- Enable group object "In operation"
  - Send telegram value
  - Sending cycle time
- i-bus® Tool access

7.2.1 Sending and switching delay after bus voltage recovery

This parameter can be used to set the sending and switching delay after bus voltage recovery.

More information in basic knowledge: → Sending and switching delay, Page 304.

Note
The device draws energy for switching the outputs via the bus (ABB i-bus® KNX). After application of the bus voltage and after bus voltage recovery, it takes about 10 … 30 seconds before sufficient energy is available to switch all relays simultaneously.
The first relay is not switched until the device has stored sufficient energy to switch all outputs to a defined switching state in case of bus voltage failure.

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

Options
2 … 255

7.2.2 Value after sending and switching delay has expired

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

Options	
Last value received	The inputs and outputs send the most recently received value after expiration of the sending and switching delay.
Ignore received values	Values received at the inputs and outputs are ignored during the sending and switching delay. The inputs and outputs react to the first value received after expiration of the sending and switching delay.

7.2.3 Limit number of telegrams

This parameter can be used to limit the number of telegrams sent by the device. The fewer telegrams are sent, the lower the bus load will be.

Note
The device counts the number of telegrams sent within an interval. When the maximum number of telegrams is reached, no more telegrams will be sent within the current interval. The telegram counter is reset after every interval. The telegrams are sent in the order in which they arise (first in – first out). The telegrams are sent as quickly as possible in the first sending interval. The set period is taken into account afterward.

Example:
- Pending telegrams: 20
- Max. number per period: 5
- Period: 5 s

The first five telegrams are sent as quickly as possible. Five telegrams are then sent one after the other within 5 seconds.

Options	
No	The number of sent telegrams is not limited.
Yes	The number of sent telegrams is limited. The following dependent parameters are shown: • Maximum number of telegrams • In period

7.2.3.1

—

DEPENDENT PARAMETER

Maximum number of telegrams

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

Options
1 … 20 … 50

Prerequisites for visibility:
- Parameter Limit number of telegrams \ Option *Yes*

7.2.3.2

—

DEPENDENT PARAMETER

In period

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

The parameter is linked with the parameter Maximum number of telegrams.

Options	
1 s	The device sends the telegrams within 1 second.
2 s	The device sends the telegrams within 2 seconds.
5 s	The device sends the telegrams within 5 seconds.
10 s	The device sends the telegrams within 10 seconds.
30 s	The device sends the telegrams within 30 seconds.
1 min.	The device sends the telegrams within 1 minute.

Prerequisites for visibility:

- Parameter Limit number of telegrams \ Option *Yes*

7.2.4 Enable group object "In operation"

This parameter can be used to enable group object *In operation*.

Options	
No	The group object is not enabled.
Yes	The group object is enabled. The following dependent parameters are shown: • Send telegram value • Sending cycle time

7.2.4.1

—

DEPENDENT PARAMETER

Send telegram value

This parameter can be used to set the value that the group object sends.

Options	
Telegram value 0	The group object is sent on "0".
Telegram value 1	The group object is sent on "1".

Prerequisites for visibility:

- Parameter Enable group object "In operation" \ Option *Yes*

7.2.4.2

—

DEPENDENT PARAMETER

Sending cycle time

This parameter can be used to set the cycle during which group object *In operation* sends a telegram.

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

Options
00:00:01 … 00:01:00 … 18:12:15

Prerequisites for visibility:

- Parameter Enable group object "In operation" \ Option *Yes*

7.2.5 i-bus® Tool access

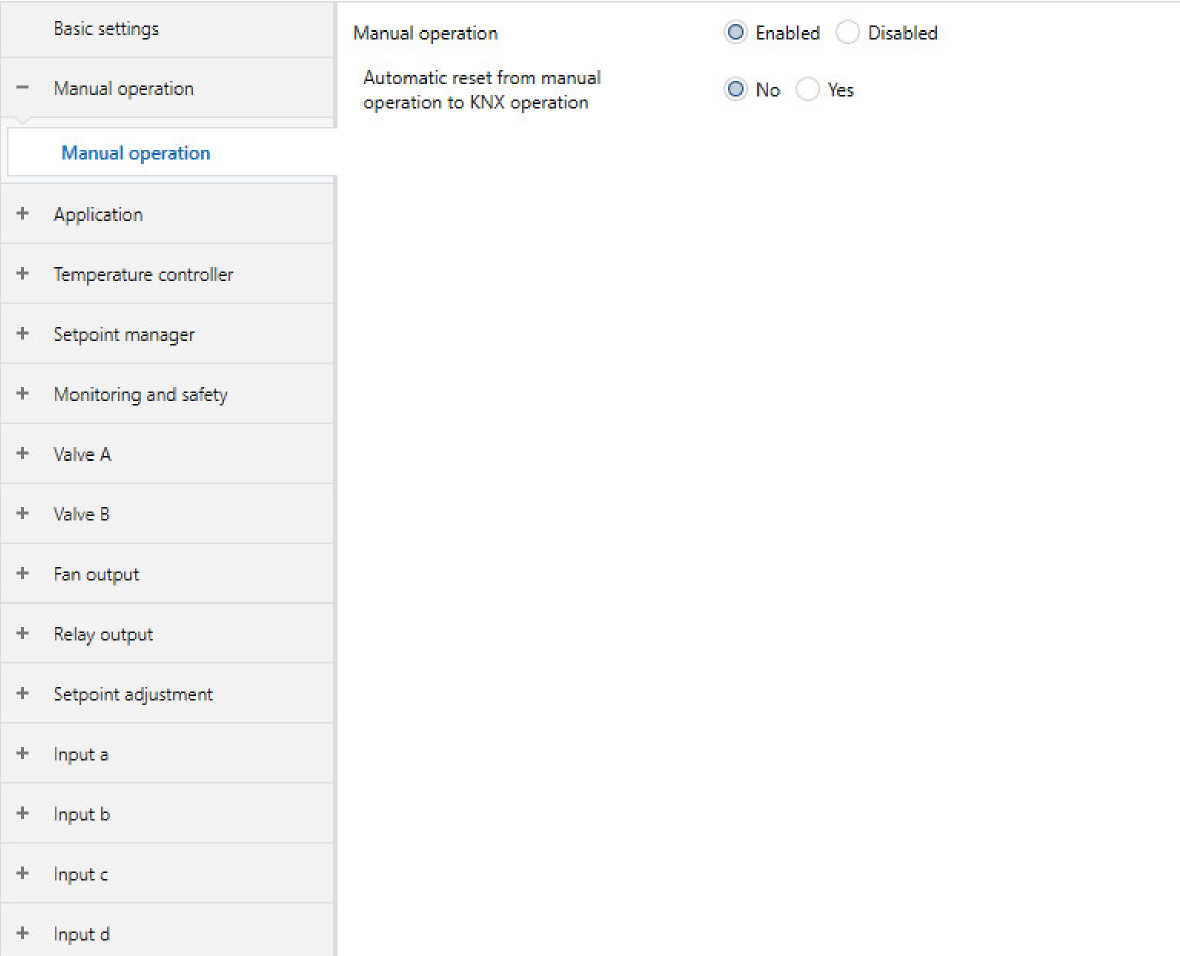
This parameter can be used to limit or completely deactivate i-bus® Tool access. More information: → Integration into i-bus® Tool, Page 76.

Options	
Deactivated	i-bus® Tool access is disabled.
Value display only	Only the status can be displayed via i-bus® Tool.
Full access	Values can be displayed and changed i-bus® Tool.

7.3 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 286.



2CDC078006F0218

Fig. 31: Parameter window Manual operation

Parameter
- Manual operation
  - Automatic reset from manual operation to KNX operation
    - Automatic reset after

7.3.1 Manual operation

This parameter can be used to enable manual operation of the device.

Options	
Enabled	The operating states *Manual operation* and *KNX operation* can be switched via the *Manual operation* button or via group object *Enable/disable manual operation*. The device can be operated using the membrane keypad. The following group objects are enabled: • *Status Manual operation* • *Enable/disable manual operation* The following dependent parameters are shown: • Automatic reset from manual operation to KNX operation
Disabled	Manual operation is disabled. The device cannot be operated using the membrane keypad.

7.3.1.1

—
DEPENDENT PARAMETER

Automatic reset from manual operation to KNX operation

This parameter can be used to define whether the device is automatically reset to the operating state *KNX operation*.

Options	
Disabled	Automatic reset is disabled. The operating state can be changed only using the *Manual operation* button.
Enabled	The device is automatically reset to the operating state *KNX operation* after the set time. The following dependent parameters are shown: • Automatic reset after

Prerequisites for visibility:

- Parameter Manual operation \ Option *Enabled*

7.3.1.1.1

—
DEPENDENT PARAMETER

Automatic reset after

This parameter can be used to set 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.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Automatic reset from manual operation to KNX operation \ Option *Enabled*

7.4 Parameter window Application

7.4.1 Parameter window Application parameters

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

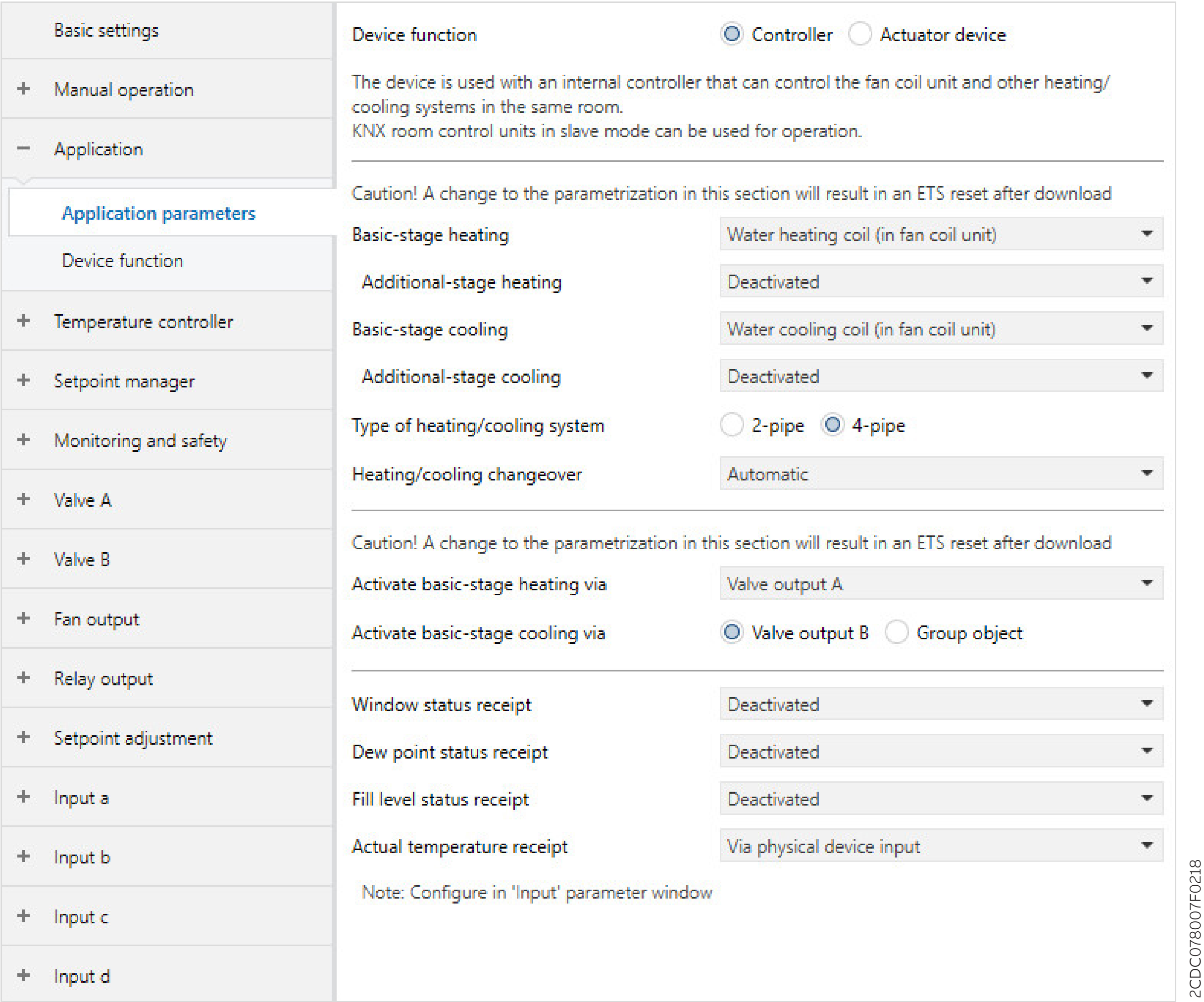


Fig. 32: Parameter window Application parameters

Parameter

- Device function
  - Basic-stage heating
    - Additional-stage heating
      - Activate additional-stage heating via
        - Switch relay output independently of fan speed (including when fan = 0)
          - Automatic reset of manual relay override to controller operation after
    - Type of heating/cooling system
      - Use 6-way valve
    - Heating/cooling changeover
    - Activate basic-stage heating via
      - Switch relay output independently of fan speed (including when fan = 0)
  - Basic-stage cooling
    - Additional-stage cooling
      - Activate additional-stage cooling via
    - Type of heating/cooling system
    - Heating/cooling changeover
    - Activate basic-stage cooling via
  - Window status receipt
    - Window open when
  - Dew point status receipt
    - Dew point reached when
  - Fill level status receipt
    - Fill level reached when
  - Actual temperature receipt
    - Number of group objects Actual temperature
      - Weighting of external measurement 1
      - Weighting of external measurement 2
    - Weighting of internal measurement
    - Weighting of external measurement 1
  - Basic-stage heating
    - Type of heating/cooling system
    - Heating/cooling changeover
    - Activate basic-stage heating via
  - Basic-stage cooling
    - Type of heating/cooling system
    - Heating/cooling changeover
    - Activate basic-stage cooling via

7.4.1.1 Device function

This parameter can be used to define how the device functions.

Options	
Controller	The group objects for master/slave communication are activated. The device acts as the master and can operate KNX room control units acting as slaves. The following dependent parameters are shown: • Basic-stage heating • Basic-stage cooling • Window status receipt • Dew point status receipt • Fill level status receipt • Actual temperature receipt
Actuator device	The device is used only as an actuator and receives its control values from a controller. The unneeded parameter windows and group objects are hidden. The following dependent parameters are shown: • Basic-stage heating • Basic-stage cooling

7.4.1.1.1

DEPENDENT PARAMETER

Basic-stage heating

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

Options	
Deactivated	Basic-stage heating is deactivated. All dependent parameters and parameter windows are hidden.
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 parameters are shown: • Additional-stage heating • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage heating via
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 parameters are shown: • Additional-stage heating • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage heating via
Electric heater (in room)	Basic-stage heating is set for the use of an electric heater in the room. The fan of the device is deactivated. The parameter Type of control value Basic-stage heating is set to the option *2-point 1 bit (On/Off)*. The following dependent parameters are shown: • Additional-stage heating • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage heating via
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 parameters are shown: • Additional-stage heating • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage heating via
Electric heater (in fan coil unit)	Basic-stage heating is set for the use of an electric heater in the fan coil unit. The fan is activated. The parameter Type of control value Basic-stage heating is set to the option *2-point 1 bit (On/Off)*. The following dependent parameters are shown: • Additional-stage heating • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage heating via
Water heating coil (in fan coil unit)	Basic-stage heating is set for the use of a water heating coil in the fan coil unit. 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 parameters are shown: • Additional-stage heating • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage heating via

Prerequisites for visibility:

- Parameter Device function \ Option *Controller*

7.4.1.1.1.1

—

DEPENDENT PARAMETER

Additional-stage heating

This parameter is used to set what is used as/for additional-stage heating. The controller is preset based on the selected option.

Note
If one of the following options is selected, the valve control value is used to activate the fan in automatic mode:
- *Electric heater (in fan coil unit)*
- *Water heating coil (in fan coil unit)*

Options	
Deactivated	Additional-stage heating is deactivated. All dependent parameters and parameter windows are hidden.
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 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 parameters are shown: • Activate additional-stage heating via
Electric heater (in room)	Additional-stage heating is set for the use of an electric heater in the room. The fan is deactivated. The parameter Type of control value Additional-stage heating is set to the option *2-point 1 bit (On/Off)*. The following dependent parameters are shown: • Activate additional-stage heating via
Free configuration	Basic-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 parameters are shown: • Activate additional-stage heating via
Electric heater (in fan coil unit)	Additional-stage heating is set for the use of an electric heater in the fan coil unit. The fan is activated. The parameter Type of control value Additional-stage heating is set to the option *2-point 1 bit (On/Off)*.
Water heating coil (in fan coil unit)	Additional-stage heating is set for the use of a water heating coil in the fan coil unit. 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 parameters are shown: • Activate additional-stage heating via

Prerequisites for visibility:

- Parameter Basic-stage heating \ Option *Convector (e.g. radiator)*

7.4.1.1.1.1.1

—

DEPENDENT PARAMETER

Activate additional-stage heating via

This parameter can be used to set 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

Note
The options *Valve output A* and *Valve output B* are used to activate valve drives.
The option *Relay output* is used to activate an electric heater.

Options	
Valve output A	The control value is output on output A. The control value is additionally output via group object *Control value Additional-stage heating*.
Valve output B	The control value is output on output B. The control value is additionally output via group object *Control value Additional-stage heating*.
Relay output	The control value is output on the relay output. The control value is additionally output via group object *Control value Additional-stage heating*. The following dependent parameters are shown: • Switch relay output independently of fan speed (including when fan = 0)
Group object	The control value is output only via group object *Control value Additional-stage heating*.

Prerequisites for visibility:
- Parameter Additional-stage heating \ Option *Convector (e.g. radiator)*

7.4.1.1.1.1.1.1

—

DEPENDENT PARAMETER

Switch relay output independently of fan speed (including when fan = 0)

This parameter is used to set whether manual switching of the relay output is permissible independently of the fan speed. The relay output is switched via group object *Switch relay*.

CAUTION – Device damage due to great heat
If the relay output may be switched independently of the fan speed, it is possible to switch on the heater even when the fan is switched off. Heated air accumulates in the heater if the fan is not switched on. This can result in device damage or a fire.
- ▸ To avoid overheating the heater, install a temperature monitoring system with mechanical shut-off device.

Options	
No	Relay output switching is deactivated.
Yes	Relay output switching is activated. The relay output can be switched even when the fan is switched off. The following dependent parameters are shown: • Automatic reset of manual relay override to controller operation after

Prerequisites for visibility:
- Parameter Activate additional-stage heating via \ Option *Relay output*

7.4.1.1.1.1.1.1.1

—

DEPENDENT PARAMETER

Automatic reset of manual relay override to controller operation after

This parameter is used to specify the time after which manual switching of the relay output is reset.

The timer starts with receipt of group object *Switch relay*. Controller mode becomes active after the set time expires. The relay switches to the position specified by controller.

Note
Changing from heating mode to cooling mode resets manual valve override.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Switch relay output independently of fan speed (including when fan = 0) \ Option *Yes*

7.4.1.1.1.2

—

DEPENDENT PARAMETER

Type of heating/cooling system

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

Options	
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*. The following dependent parameters are shown: • Use 6-way valve

Prerequisites for visibility:
- Parameter Basic-stage heating \ Option *Convector (e.g. radiator)*

7.4.1.1.1.2.1

—

DEPENDENT PARAMETER

Use 6-way valve

This parameter can be used to set whether a 6-way valve is used.

Options	
No	The following dependent parameters can be set as required: • Activate basic-stage heating via • Activate basic-stage cooling via
Yes	The following dependent parameters are permanently set to the option *Valve output A*: • Activate basic-stage heating via • Activate basic-stage cooling via

Prerequisites for visibility:
- Visible only with the following product variants:
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1
  - FCC/S 1.3.1.1
  - FCC/S 1.3.2.1

7.4.1.1.1.3

—

DEPENDENT PARAMETER

Heating/cooling changeover

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

Note
If the device is used with the parameter *Controller* and the option *2-pipe* or with the parameter *Actuator device*, this parameter is permanently set to the option *Via group object*.

Options	
Automatic	The change between the operating modes takes place depending on the temperature set in the parameter window Setpoint manager.
Via group object	The change between the operating modes takes place via group object *Heating/cooling changeover*.
Via group object or via slave	The change between the operating modes takes place via the following group objects: • *Heating/cooling changeover* • *Request heating/cooling (master)*

Prerequisites for visibility:
- Parameter Basic-stage heating \ Option *Convector (e.g. radiator)*

7.4.1.1.1.4

—

DEPENDENT PARAMETER

Activate basic-stage heating via

This parameter can be used to set 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.

Note
Only FCC/S 1.2.X.1 & 1.3.X.1: If, in the parameter Use 6-way valve, the option *Yes* is selected, this parameter is permanently set to the option *Valve output A*.

Note
The options *Valve output A* and *Valve output B* are used to activate valve drives.
The option *Relay output* is used to activate an electric heater.

Options	
Valve output A	The control value is output on output A. The control value is additionally output via group object *Control value Basic-stage heating*.
Valve output B	The control value is output on output B. The control value is additionally output via group object *Control value Basic-stage heating*.
Relay output	The control value is output on the relay output. The control value is additionally output via group object *Control value Basic-stage heating*. The following dependent parameters are shown: • Switch relay output independently of fan speed (including when fan = 0)
Group object	The control value is output only via group object *Control value Basic-stage heating*.

Prerequisites for visibility:

- Parameter Basic-stage heating \ Option *Convector (e.g. radiator)*

7.4.1.1.1.4.1

—

DEPENDENT PARAMETER

Switch relay output independently of fan speed (including when fan = 0)

This parameter is used to set whether manual switching of the relay output is permissible independently of the fan speed. The relay output is switched via group object *Switch relay*.

CAUTION – Device damage due to great heat
If the relay output may be switched independently of the fan speed, it is possible to switch on the heater even when the fan is switched off. Heated air accumulates in the heater if the fan is not switched on. This can result in device damage or a fire.
- ▶ To avoid overheating the heater, install a temperature monitoring system with mechanical shut-off device.

Options	
No	Relay output switching is deactivated.
Yes	Relay output switching is activated. The relay output can be switched even when the fan is switched off. The following dependent parameters are shown: • Automatic reset of manual relay override to controller operation after

Prerequisites for visibility:
- Parameter Activate basic-stage heating via \ Option *Relay output*

7.4.1.1.1.4.1.1

—

DEPENDENT PARAMETER

Automatic reset of manual relay override to controller operation after

This parameter is used to specify the time after which manual switching of the relay output is reset.

The timer starts with receipt of group object *Switch relay*. Controller mode becomes active after the set time expires. The relay switches to the position specified by controller.

Note
Changing from heating mode to cooling mode resets manual valve override.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Switch relay output independently of fan speed (including when fan = 0) \ Option *Yes*

7.4.1.1.2

—
DEPENDENT PARAMETER

Basic-stage cooling

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

Options	
Deactivated	Basic-stage cooling is deactivated. All dependent parameters and parameter windows are hidden.
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 parameters are shown: • Additional-stage cooling • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage cooling via
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 parameters are shown: • Additional-stage cooling • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage cooling via
Water cooling coil (in fan coil unit)	Basic-stage cooling is set for the use of a water cooling coil in the fan coil unit. The parameter Type of control value Basic-stage cooling is set to the option *PI continuous (0 … 100 %)* for a fan coil unit with the corresponding P- and I-proportions. The following dependent parameters are shown: • Additional-stage cooling • Type of heating/cooling system • Heating/cooling changeover

Prerequisites for visibility:

- Parameter Device function \ all options

7.4.1.1.2.1

—
DEPENDENT PARAMETER

Additional-stage cooling

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

Options	
Deactivated	Additional-stage cooling is deactivated. All dependent parameters and parameter windows are hidden.
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 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 parameters are shown: • Activate additional-stage cooling via
Water cooling coil (in fan coil unit)	Additional-stage cooling is set for the use of a water cooling coil in the fan coil unit. 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 parameters are shown: • Activate additional-stage cooling via

Prerequisites for visibility:

- Parameter Basic-stage cooling \ Option *Area cooling (e.g. cooling ceiling)*

7.4.1.1.2.1.1

—

DEPENDENT PARAMETER

Activate additional-stage cooling via

This parameter can be used to set 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

Options	
Valve output A	The control value is output on output A. The control value is additionally output via group object *Control value Additional-stage cooling*.
Valve output B	The control value is output on output B. The control value is additionally output via group object *Control value Additional-stage cooling*.
Group object	The control value is output only via group object *Control value Additional-stage cooling*.

Prerequisites for visibility:
- Parameter Additional-stage cooling \ Option *Area cooling (e.g. cooling ceiling)*

7.4.1.1.2.2

—

DEPENDENT PARAMETER

Type of heating/cooling system

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

Options	
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*. The following dependent parameters are shown: • Use 6-way valve

Prerequisites for visibility:
- Parameter Basic-stage cooling \ Option *Area cooling (e.g. cooling ceiling)*

7.4.1.1.2.2.1

—

DEPENDENT PARAMETER

Use 6-way valve

This parameter can be used to set whether a 6-way valve is used.

Options	
No	The following dependent parameters can be set as required: • Activate basic-stage heating via • Activate basic-stage cooling via
Yes	The following dependent parameters are permanently set to the option *Valve output A*: • Activate basic-stage heating via • Activate basic-stage cooling via

Prerequisites for visibility:

- Visible only with the following product variants:
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1
  - FCC/S 1.3.1.1
  - FCC/S 1.3.2.1

7.4.1.1.2.3

—

DEPENDENT PARAMETER

Heating/cooling changeover

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

Note
If the device is used with the parameter *Controller* and the option *2-pipe* or with the parameter *Actuator device*, this parameter is permanently set to the option *Via group object*.

Options	
Automatic	The change between the operating modes takes place depending on the temperature set in the parameter window Setpoint manager.
Via group object	The change between the operating modes takes place via group object *Heating/cooling changeover*.
Via group object or via slave	The change between the operating modes takes place via the following group objects: • *Heating/cooling changeover* • *Request heating/cooling (master)*

Prerequisites for visibility:

- Parameter Basic-stage cooling \ Option *Area cooling (e.g. cooling ceiling)*

7.4.1.1.2.4

—

DEPENDENT PARAMETER

Activate basic-stage cooling via

This parameter can be used to set 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.

Note
Only FCC/S 1.2.X.1 & 1.3.X.1: If, in the parameter Use 6-way valve, the option *Yes* is selected, this parameter is permanently set to the option *Valve output A*.

Options	
Valve output A	The control value is output on output A. The control value is additionally output via group object *Control value Basic-stage cooling*.
Valve output B	The control value is output on output B. The control value is additionally output via group object *Control value Basic-stage cooling*.
Group object	The control value is output only via group object *Control value Basic-stage cooling*.

Prerequisites for visibility:

- Parameter Basic-stage cooling \ Option *Area cooling (e.g. cooling ceiling)*

7.4.1.1.3

—

DEPENDENT PARAMETER

Window status receipt

This parameter is used to set 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".

Options	
Deactivated	The controller ignores the window status.
Via physical device input	The controller checks which device inputs are parametrized as window contacts. The status of the connected window contact is included in control.
Via group object	The window status is received via group object *Window contact*. The following dependent parameters are shown: • Window open when

Prerequisites for visibility:

- Parameter Device function \ Option *Controller*

7.4.1.1.3.1

—

DEPENDENT PARAMETER

Window open when

This parameter can be used to set the group object value 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).

Options	
Object value = 0	Value 0 is interpreted as status "Window open".
Object value = 1	Value 1 is interpreted as status "Window open".

Prerequisites for visibility:

- Parameter Window status receipt \ Option *Via group object*

7.4.1.1.4

—

DEPENDENT PARAMETER

Dew point status receipt

This parameter can be used to set 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".

Options	
Deactivated	The controller ignores the dew point status.
Via physical device input	The controller checks which device input is parametrized as a dew point sensor. The status of the connected dew point sensor is included in control.
Via group object	The window status is received via group object *Dew point alarm*. The following dependent parameters are shown: • Dew point reached when

Prerequisites for visibility:

- Parameter Device function \ Option *Controller*

7.4.1.1.4.1

—

DEPENDENT PARAMETER

Dew point reached when

This parameter can be used to set the group object value 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 operating mode *Cooling*, and the operating mode can therefore be switched to *Heating* (if available) at any time.

Options	
Object value = 0	Object value 0 = Status "Dew point alarm" Object value 1 = Status "No dew point alarm"
Object value = 1	Object value 0 = Status "No dew point alarm" Object value 1 = Status "Dew point alarm"

Prerequisites for visibility:

- Parameter Dew point status receipt \ Option *Via group object*

7.4.1.1.5

—

DEPENDENT PARAMETER

Fill level status receipt

This parameter is used to set 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".

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

Prerequisites for visibility:

- Parameter Device function \ Option *Controller*

7.4.1.1.5.1

—
DEPENDENT PARAMETER

Fill level reached when

This parameter can be used to set the group object value that is interpreted as the status "Fill level alarm".

> **Note**
> When the controller receives the status "Fill level alarm", cooling is interrupted and 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 operating mode Cooling, and the operating mode can therefore be switched to Heating (if available) at any time.

Options	
Object value = 0	Object value 0 = Status "Fill level alarm" Object value 1 = Status "No fill level alarm"
Object value = 1	Object value 0 = Status "No fill level alarm" Object value 1 = Status "Fill level alarm"

Prerequisites for visibility:

- Parameter Fill level status receipt \ Option *Via group object*

7.4.1.1.6

—
DEPENDENT PARAMETER

Actual temperature receipt

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

> **Note**
> If a temperature sensor is not connected to any of the inputs, the controller changes to fault 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.

Options	
Via physical device input	The controller checks which device input is parametrized 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 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 Device function \ Option *Controller*

7.4.1.1.6.1

—

DEPENDENT PARAMETER

Number of group objects Actual temperature

This parameter is used to set the number of group objects that can receive a temperature value via the ABB i-bus® KNX

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

Prerequisites for visibility:

- Parameter Actual temperature receipt \ Option *Via group object*

7.4.1.1.6.1.1

—

DEPENDENT PARAMETER

Weighting of external measurement 1

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

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Number of group objects Actual temperature \ Option *2*

7.4.1.1.6.1.2

—

DEPENDENT PARAMETER

Weighting of external measurement 2

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

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.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Number of group objects Actual temperature \ Option *2*

7.4.1.1.6.2

—

DEPENDENT PARAMETER

Weighting of internal measurement

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

Options
0 … <u>100</u> %

Prerequisites for visibility:

- Parameter <u>Actual temperature receipt</u> \ Option *Via phys. device input or group object*

7.4.1.1.6.3

—

DEPENDENT PARAMETER

Weighting of external measurement 1

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

Options
<u>0</u> … 100 %

Prerequisites for visibility:

- Parameter <u>Actual temperature receipt</u> \ Option *Via phys. device input or group object*

7.4.1.1.7

—

DEPENDENT PARAMETER

Basic-stage heating

This parameter can be used to set how basic-stage heating is used.

Options	
Deactivated	Basic-stage heating is deactivated. All dependent parameters and parameter windows are hidden.
<u>Water heating coil (in fan coil unit)</u>	Basic-stage heating is set for the use of a water heating coil in the fan coil unit. The parameter <u>Type of control value Basic-stage heating</u> is set to the option *PI continuous (0 … 100 %)* with the corresponding P- and I-proportions. The following dependent parameters are shown: • <u>Type of heating/cooling system</u> • <u>Heating/cooling changeover</u> • <u>Activate basic-stage heating via</u>

Prerequisites for visibility:

- Parameter <u>Device function</u> \ Option *Actuator device*

7.4.1.1.7.1

—

DEPENDENT PARAMETER

Type of heating/cooling system

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

Options	
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*. The following dependent parameters are shown: • Use 6-way valve

Prerequisites for visibility:

- Parameter Basic-stage heating \ Option *Water heating coil (in fan coil unit)*

7.4.1.1.7.1.1

—

DEPENDENT PARAMETER

Use 6-way valve

This parameter can be used to set whether a 6-way valve is used.

Options	
No	The following dependent parameters can be set as required: • Activate basic-stage heating via • Activate basic-stage cooling via
Yes	The following dependent parameters are permanently set to the option *Valve output A*: • Activate basic-stage heating via • Activate basic-stage cooling via

Prerequisites for visibility:

- Visible only with the following product variants:
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1
  - FCC/S 1.3.1.1
  - FCC/S 1.3.2.1

7.4.1.1.7.2

—

DEPENDENT PARAMETER

Heating/cooling changeover

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

Note

If the device is used with the parameter *Controller* and the option *2-pipe* or with the parameter *Actuator device*, this parameter is permanently set to the option *Via group object*.

Options	
Automatic	The change between the operating modes takes place depending on the temperature set in the parameter window Setpoint manager.
Via group object	The change between the operating modes takes place via group object *Heating/cooling changeover*.
Via group object or via slave	The change between the operating modes takes place via the following group objects: • *Heating/cooling changeover* • *Request heating/cooling (master)*

Prerequisites for visibility:

- Parameter Basic-stage heating \ Option *Water heating coil (in fan coil unit)*

7.4.1.1.7.3

—

DEPENDENT PARAMETER

Activate basic-stage heating via

This parameter can be used to set 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.

Note
Only FCC/S 1.2.X.1 & 1.3.X.1: If, in the parameter Use 6-way valve, the option *Yes* is selected, this parameter is permanently set to the option *Valve output A*.

Note
The options *Valve output A* and *Valve output B* are used to activate valve drives.
The option *Relay output* is used to activate an electric heater.

Options	
Valve output A	The control value is output on output A. The control value is additionally output via group object *Control value Basic-stage heating*.
Valve output B	The control value is output on output B. The control value is additionally output via group object *Control value Basic-stage heating*.
Relay output	The control value is output on the relay output. The control value is additionally output via group object *Control value Basic-stage heating*. The following dependent parameters are shown: • Switch relay output independently of fan speed (including when fan = 0)
Group object	The control value is output only via group object *Control value Basic-stage heating*.

Prerequisites for visibility:
- Parameter Basic-stage heating \ Option *Water heating coil (in fan coil unit)*

7.4.1.1.7.3.1

—

DEPENDENT PARAMETER

Switch relay output independently of fan speed (including when fan = 0)

This parameter is used to set whether manual switching of the relay output is permissible independently of the fan speed. The relay output is switched via group object *Switch relay*.

CAUTION – Device damage due to great heat
If the relay output may be switched independently of the fan speed, it is possible to switch on the heater even when the fan is switched off. Heated air accumulates in the heater if the fan is not switched on. This can result in device damage or a fire.

- ▶ To avoid overheating the heater, install a temperature monitoring system with mechanical shut-off device.

Options	
No	Relay output switching is deactivated.
Yes	Relay output switching is activated. The relay output can be switched even when the fan is switched off. The following dependent parameters are shown: • Automatic reset of manual relay override to controller operation after

Prerequisites for visibility:
- Parameter Activate basic-stage heating via \ Option *Relay output*

7.4.1.1.7.3.1.1

—

DEPENDENT PARAMETER

Automatic reset of manual relay override to controller operation after

This parameter is used to specify the time after which manual switching of the relay output is reset.

The timer starts with receipt of group object *Switch relay*. Controller mode becomes active after the set time expires. The relay switches to the position specified by controller.

Note
Changing from heating mode to cooling mode resets manual valve override.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Switch relay output independently of fan speed (including when fan = 0) \ Option *Yes*

7.4.1.1.8

—

DEPENDENT PARAMETER

Basic-stage cooling

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

Options	
Deactivated	Basic-stage cooling is deactivated. All dependent parameters and parameter windows are hidden.
Water cooling coil (in fan coil unit)	Basic-stage cooling is set for the use of a water cooling coil in the fan coil unit. The parameter Type of control value Basic-stage cooling is set to the option *PI continuous (0 … 100 %)* for a fan coil unit with the corresponding P- and I-proportions. The following dependent parameters are shown: • Type of heating/cooling system • Heating/cooling changeover • Activate basic-stage cooling via

Prerequisites for visibility:
- Parameter Device function \ Option *Actuator device*

7.4.1.1.8.1

—

DEPENDENT PARAMETER

Type of heating/cooling system

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

Options	
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*. The following dependent parameters are shown: • Use 6-way valve

Prerequisites for visibility:
- Parameter Basic-stage cooling \ Option *Water cooling coil (in fan coil unit)*

7.4.1.1.8.1.1

—

DEPENDENT PARAMETER

Use 6-way valve

This parameter can be used to set whether a 6-way valve is used.

Options	
No	The following dependent parameters can be set as required: • Activate basic-stage heating via • Activate basic-stage cooling via
Yes	The following dependent parameters are permanently set to the option *Valve output A*: • Activate basic-stage heating via • Activate basic-stage cooling via

Prerequisites for visibility:
- Visible only with the following product variants:
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1
  - FCC/S 1.3.1.1
  - FCC/S 1.3.2.1

7.4.1.1.8.2

—

DEPENDENT PARAMETER

Heating/cooling changeover

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

Note
If the device is used with the parameter *Controller* and the option *2-pipe* or with the parameter *Actuator device*, this parameter is permanently set to the option *Via group object*.

Options	
Automatic	The change between the operating modes takes place depending on the temperature set in the parameter window Setpoint manager.
Via group object	The change between the operating modes takes place via group object *Heating/cooling changeover*.
Via group object or via slave	The change between the operating modes takes place via the following group objects: • *Heating/cooling changeover* • *Request heating/cooling (master)*

Prerequisites for visibility:
- Parameter Basic-stage cooling \ Option *Water cooling coil (in fan coil unit)*

7.4.1.1.8.3

—

DEPENDENT PARAMETER

Activate basic-stage cooling via

This parameter can be used to set 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.

Note
Only FCC/S 1.2.X.1 & 1.3.X.1: If, in the parameter Use 6-way valve, the option *Yes* is selected, this parameter is permanently set to the option *Valve output A*.

Options	
Valve output A	The control value is output on output A. The control value is additionally output via group object *Control value Basic-stage cooling*.
Valve output B	The control value is output on output B. The control value is additionally output via group object *Control value Basic-stage cooling*.
Group object	The control value is output only via group object *Control value Basic-stage cooling*.

Prerequisites for visibility:
- Parameter Basic-stage cooling \ Option *Water cooling coil (in fan coil unit)*

7.4.2 Parameter window Device function

The following settings can be made in this parameter window:
- Reaction on bus voltage failure
- Reaction after bus voltage recovery
- Reaction after ETS download/reset

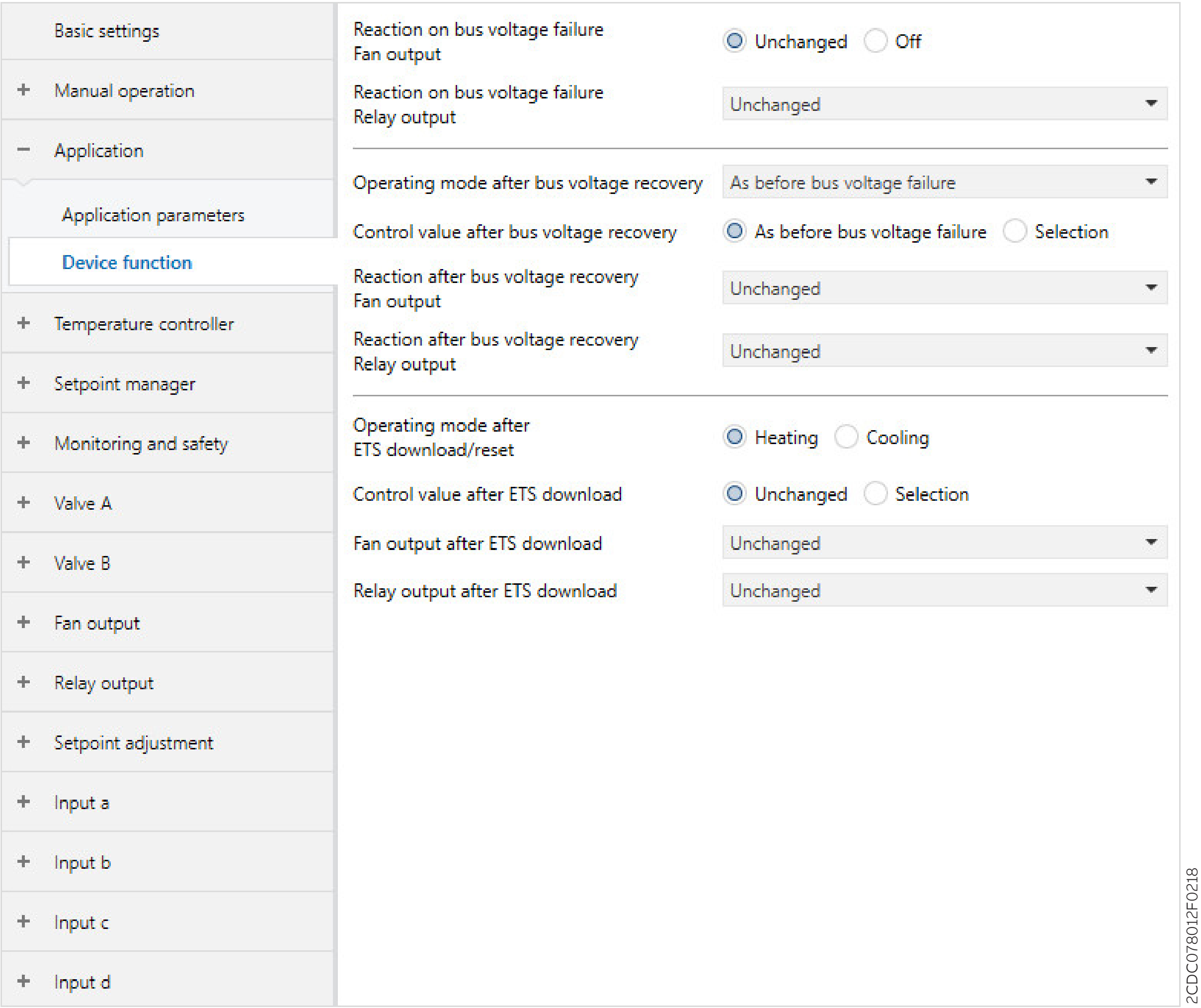


Fig. 33: Parameter window Device function

Parameter
- Reaction on bus voltage failure Fan output
- Reaction on bus voltage failure Relay output
- Operating mode after bus voltage recovery
- Control value after bus voltage recovery
  - Control value
- Reaction after bus voltage recovery – fan output
- Reaction on bus voltage recovery Relay output
- Operating mode after ETS download/reset
- Control value after ETS download
  - Control value
- Fan output after ETS download
- Relay output after ETS download

7.4.2.1 Reaction on bus voltage failure Fan output

This parameter can be used to set how the fan output reacts on bus voltage failure.

Options	
Unchanged	The currently valid fan speed remains active on bus voltage failure.
Off	The fan is switched off on bus voltage failure.

Prerequisites for visibility:

- Product variants:
  - FCC/S 1.1.1.1
  - FCC/S 1.1.2.1
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1
  - FCC/S 1.4.1.1

7.4.2.2 Reaction on bus voltage failure Relay output

This parameter can be used to set how the relay output reacts after bus voltage failure.

Options	
Unchanged	The relay stays in its current position on bus voltage failure.
On	The relay is switched on on bus voltage failure.
Off	The relay is switched off on bus voltage failure.

Prerequisites for visibility:

- Product variants:
  - FCC/S 1.1.1.1
  - FCC/S 1.1.2.1
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1

7.4.2.3 Operating mode after bus voltage recovery

This parameter can be used to set which operating mode (heating or cooling) is activated after bus voltage recovery.

Options	
As before bus voltage failure	The same operating mode as before bus voltage failure is set after bus voltage recovery.
Heating	Heating mode is activated.
Cooling	Cooling mode is activated.

7.4.2.4 Control value after bus voltage recovery

This parameter can be used to set the control value valid after bus voltage recovery. The set control value is valid until the controller has calculated a new control value.

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

Options	
As before bus voltage failure	The same control value as before bus voltage failure is set after bus voltage recovery.
Selection	The control value valid after bus voltage recovery can be set as required. The following dependent parameters are shown: • Control value

7.4.2.4.1

—

DEPENDENT PARAMETER

Control value

This parameter can be used to specify a control value. The set control value is valid until the controller has calculated a new control value.

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Control value after bus voltage recovery \ Option *Selection*

7.4.2.5 Reaction after bus voltage recovery – fan output

This parameter can be used to set the fan speed the controller sets after bus voltage recovery.

Note
The options depend on the FCC/S product version (for continuous fans or 3-speed fans).

Options	
Unchanged	The fan speed remains unchanged in manual mode. The fan speed is set according to the valve control value in automatic mode.
Adopts control value	The fan speed is set based on the valve control value. Automatic mode is active
1	Fan speed 1 is set after bus voltage recovery. Manual mode is active
2	Fan speed 2 is set after bus voltage recovery. Manual mode is active
3	Fan speed 3 is set after bus voltage recovery. Manual mode is active
33 %	Fan speed 33 % is set after bus voltage recovery. Manual mode is active
66 %	Fan speed 66 % is set after bus voltage recovery. Manual mode is active
100 %	Fan speed 100 % is set after bus voltage recovery. Manual mode is active

7.4.2.6 Reaction on bus voltage recovery Relay output

This parameter can be used to set how the relay output reacts after bus voltage recovery.

Options	
Unchanged	The relay stays in its current position after bus voltage recovery.
On	The relay is switched on after bus voltage recovery.
Off	The relay is switched off after bus voltage recovery.

Prerequisites for visibility:
- Product variants:
  - FCC/S 1.1.1.1
  - FCC/S 1.1.2.1
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1

7.4.2.7 Operating mode after ETS download/reset

This parameter can be used to set which operating mode (heating or cooling) is activated after ETS download or reset.

Options	
Heating	Heating mode is activated.
Cooling	Cooling mode is activated.

7.4.2.8 Control value after ETS download

This parameter can be used to set the control value valid after ETS download. The set control value is valid until a new control value is received via the bus.

Options	
Unchanged	The same control value as before ETS download is set after ETS download.
Selection	The control value valid after ETS download can be set as required. The following dependent parameters are shown: • Control value

7.4.2.8.1

—

DEPENDENT PARAMETER

Control value

This parameter can be used to specify a control value. The set control value is valid until the controller has calculated a new control value.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Control value after ETS download \ Option *Selection*

7.4.2.9 Fan output after ETS download

This parameter can be used to set the fan speed set after ETS download.

> **Note**
> The options depend on the FCC/S product version (for continuous fans or 3-speed fans).

> **Note**
> The option *Adopts control value* is available only if, in the parameter , the option *Yes* is selected.

Options	
Unchanged	The set fan speed is not changed by ETS download. The operating mode (manual mode or automatic mode) remains unchanged. The fan speed depends on the valve control value in automatic mode.
Adopts control value	The fan speed depends on the valve control value. Automatic mode is active.
1	The fan runs at speed 1 in manual mode.
2	The fan runs at speed 2 in manual mode.
3	The fan runs at speed 3 in manual mode.
33 %	The fan runs at speed 33 % in manual mode.
66 %	The fan runs at speed 66 % in manual mode.
100 %	The fan runs at speed 100 % in manual mode.

7.4.2.10 Relay output after ETS download

This parameter can be used to set the state the relay assumes after ETS download.

Options	
Unchanged	The same relay position as before ETS download is set after ETS download.
On	The relay is switched on after ETS download.
Off	The relay is switched off after ETS download.

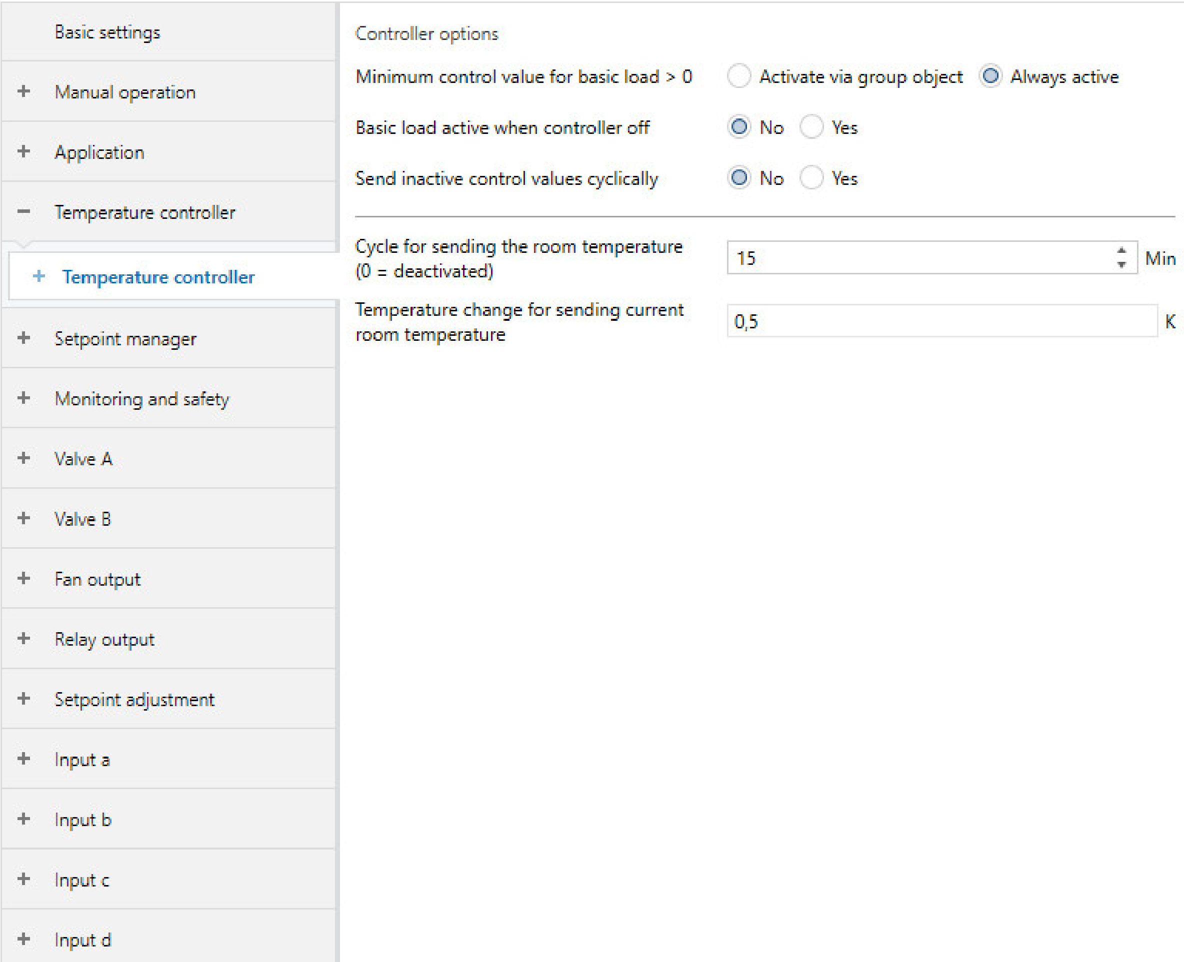
Prerequisites for visibility:
- Product variants:
  - FCC/S 1.1.1.1
  - FCC/S 1.1.2.1
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1

7.5 Parameter window Temperature controller

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.5.1 Parameter window Temperature controller

The following settings can be made in this parameter window:
- Basic load
- Send control values of the inactive operating mode
- Sending behavior of the current room temperature (actual temperature)



2CDC078014FX18

Fig. 34: Parameter window Temperature controller

Parameter
- Min. control value (basic load)
- Basic load active when controller off
- Send inactive control values cyclically
- Cycle for sending the room temperature (0 = deactivated)
- Temperature change for sending current room temperature

7.5.1.1 Min. control value (basic load)

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

Note
The basic load is activated for all stages, but it applies only to the active operating mode (heating or cooling).
The basic load is set individually for each stage in the corresponding parameter windows.

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

7.5.1.2 Basic load active when controller off

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

Options	
No	The basic load is deactivated when the controller is switched off.
Yes	The basic load remains active when the controller is switched off.

7.5.1.3 Send inactive control values cyclically

This parameter can be used to set whether the control value of the inactive operating mode is sent.

Note
On systems with only one control value input for heating and cooling, group objects *Control value Basic-stage heating* and *Control value Basic-stage cooling* must be connected to the same input group object. This causes the control values of the active and inactive operating modes to overwrite each other.

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)).

Options	
No	The control values of the inactive operating mode are not sent.
Yes	All control values are sent according to the set cycle times.

Prerequisites for visibility:
- Parameter window Temperature controller \ Parameter Basic-stage heating \ all options except *Deactivated*
- Parameter window Temperature controller \ Parameter Basic-stage cooling \ all options except *Deactivated*

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

This parameter can be used to set whether the cycle is sent via group object *Actual temperature* for the current room temperature.

The current room temperature corresponds to the value calculated from the individual measured temperature values.

Note
Depending on the selection 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 group object (*External temperature 1* or *External temperature 2*)

Options
0 … 15 … 255 min

7.5.1.5 Temperature change for sending current room temperature

This parameter can be used to set the temperature change as of which the current value of group object *Actual temperature* is sent on the bus.

Note
Depending on the selection 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 group object (*External temperature 1* or *External temperature 2*)

Options
00.1 … 0.5 … 10.0 K

7.5.2 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

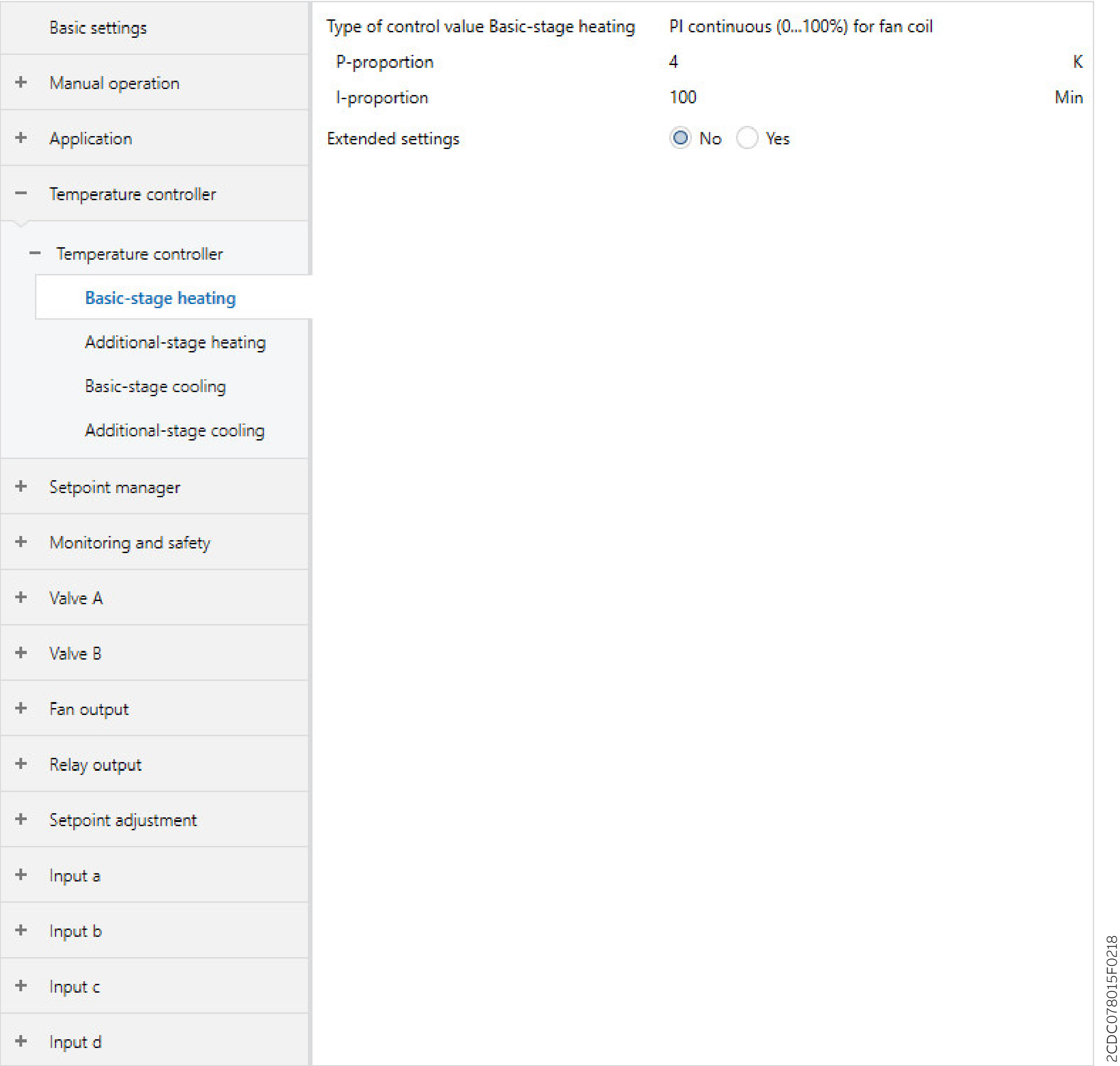


Fig. 35: Basic-stage heating

Prerequisites for visibility:

- Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

Parameter

- Type of control value Basic-stage heating
  - P-proportion
  - I-proportion
- Use control value for fan automatic
- Extended settings
  - Control value direction
  - Hysteresis
  - Control value difference for sending the control value
  - Cycle for sending the control value (0 = deactivated)
  - PWM cycle
  - Max. control value
  - Min. control value (basic load)
  - Activate temperature limitation
    - Limit temperature
    - Limit temperature hysteresis
    - I-proportion on temperature limitation
    - Input for temperature limit sensor

7.5.2.1 Type of control value Basic-stage heating

The control and control-value type for basic-stage heating are indicated in this parameter.

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

Note
For a detailed description: → Control types, Page 299.

Options	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Control value Basic-stage heating*
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Control value Basic-stage heating*
PI continuous (0 … 100 %)	The following dependent group objects are displayed: • *Control value Basic-stage heating* The following dependent parameters are shown: • P-proportion • I-proportion
PI PWM (On/Off)	The following dependent group objects are displayed: • *Control value Basic-stage heating* The following dependent parameters are shown: • P-proportion • I-proportion
PI continuous (0 … 100 %) for fan coil unit	The following dependent group objects are displayed: • *Control value Basic-stage heating* The following dependent parameters are shown: • P-proportion • I-proportion

7.5.2.1.1

—

DEPENDENT PARAMETER

P-proportion

This parameter can be used to set the P-proportion of PI control.

> **Note**
> The standard value depends on the operating mode (heating or cooling).

Options
01.0 … 1.5 … 10.0 K
01.0 … 2 … 10.0 K

Prerequisites for visibility:
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.2.1.2

—

DEPENDENT PARAMETER

I-proportion

This parameter can be used to set the I-proportion of PI control.

Options
0 … 100 … 255 min

Prerequisites for visibility:
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.2.2 Use control value for fan automatic

This parameter can be used to set whether the heating/cooling stage control value is used to activate the fan in automatic mode.

Options	
No	The control value is not used for activating the fan.
Yes	If the fan is in automatic mode, the control value of the heating/cooling stage is used for activating the fan.

Prerequisites for visibility:
- Parameter window Application parameters
  - Parameter Basic-stage heating \ Option *Free configuration*
  - Parameter Basic-stage cooling \ Option *Free configuration*
  - Parameter Additional-stage heating \ Option *Free configuration*
  - Parameter Additional-stage cooling \ Option *Free configuration*

7.5.2.3 Extended settings

This parameter can be used to enable the extended settings of the parameter window.

Options	
No	The extended settings are deactivated.
Yes	The extended settings are active. The following dependent parameters are shown: • Control value direction • Hysteresis • Control value difference for sending the control value • Cycle for sending the control value (0 = deactivated) • PWM cycle • Max. control value • Min. control value (basic load) • Activate temperature limitation

7.5.2.3.1

—

DEPENDENT PARAMETER

Control value direction

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

Options	
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 Extended settings \ Option *Yes*
- Parameter window Application parameters
  - Parameter Basic-stage heating \ all options except Deactivated
  - Parameter Activate basic-stage heating via \ Option *Group object*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
  - Parameter Activate basic-stage cooling via \ Option *Group object*
  - Parameter Additional-stage heating \ all options except *Deactivated*
  - Parameter Activate additional-stage heating via \ Option *Group object*
  - Parameter Additional-stage cooling \ all options except *Deactivated*
  - Parameter Activate additional-stage cooling via \ Option *Group object*

7.5.2.3.2

—

DEPENDENT PARAMETER

Hysteresis

This parameter can be used to define the setpoint hysteresis.

	Heating	Cooling
Switching point + hysteresis	Controller Off	Controller On
Switching point – hysteresis	Controller On	Controller Off

Tab. 15: Dependency of hysteresis on the operating mode

Options
00.3 … 0.5 … 25.5 K

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Basic-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*

7.5.2.3.3

—

DEPENDENT PARAMETER

Control value difference for sending the control value

This parameter can be used to set 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.

Options
2 %
5 %
10 %
Only send cyclically

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.2.3.4

—

DEPENDENT PARAMETER

Cycle for sending the control value (0 = deactivated)

This parameter can be used to set the cycle during which the control value is sent.

Note
To ensure that the actuator (e.g. fan) receives its control value, cyclical sending should not be deactivated (value = 0).
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.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ all options except *PI PWM (On/Off)*

7.5.2.3.5

—

DEPENDENT PARAMETER

PWM cycle

This parameter can be used to set the cycle time (period) of the PWM signal.

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

Depending on the calculated PI control value, the cycle time is subdivided into an On signal and an Off 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

Note
With a PI control value of 0 % a 0 is sent one time. The PWM signal is sent only if the PI control value changes.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ Options *PI PWM (On/Off)*

7.5.2.3.6

—

DEPENDENT PARAMETER

Max. control value

This parameter can be used to set the maximum control value of the controller.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.2.3.7

—

DEPENDENT PARAMETER

Min. control value (basic load)

This parameter can be used to set the minimum control value (basic load) of the controller.

Basic settings for the basic load are made in the parameter window Temperature controller.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.2.3.8

DEPENDENT PARAMETER

Activate temperature limitation

This parameter can be used to activate temperature limitation. When the set limit temperature is reached, the control value of the controller is set to 0.

Options	
No	Temperature limitation is deactivated.
Yes	Temperature limitation is active. The following dependent parameters are shown: • Limit temperature • Limit temperature hysteresis • I-proportion on temperature limitation • Input for temperature limit sensor

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*

7.5.2.3.8.1

DEPENDENT PARAMETER

Limit temperature

This parameter can be used to set the limit temperature that must not be exceeded (heating) or dropped below (cooling).

When the temperature reaches the set value, the controller sets the control value to 0.

For the setting for receipt of the temperature value: → Input for temperature limit sensor, Page 131.

> **Note**
> The value range and the standard value depend on the operating mode (heating or cooling).

Options
20 … 30 … 50 °C
1 … 10 … 30 °C

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.2.3.8.2

DEPENDENT PARAMETER

Limit temperature hysteresis

This parameter can be used to set the hysteresis of the limit temperature.

Options
00.5 … 01.0 … 05.0 K

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.2.3.8.3

—

DEPENDENT PARAMETER

I-proportion on temperature limitation

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

Options	
Freeze	The current value of the I-proportion is saved. When the controller becomes active, 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 Activate temperature limitation \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.2.3.8.4

—

DEPENDENT PARAMETER

Input for temperature limit sensor

This parameter is used to set how the controller receives the measured limit temperature.

> **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.

Options	
Via group object	The temperature value is received via a dedicated group object. The corresponding group object is enabled depending on the heating/cooling stage: • *Basic-stage heating limit temperature* • *Basic-stage cooling limit temperature* • *Additional-stage heating limit temperature* • *Additional-stage cooling limit temperature*
Via physical device input a	The temperature value is measured via a connected temperature sensor.
Via physical device input b	The temperature value is measured via a connected temperature sensor.
Via physical device input c	The temperature value is measured via a connected temperature sensor.
Via physical device input d	The temperature value is measured via a connected temperature sensor.

Prerequisites for visibility:

- Parameter Activate temperature limitation \ Option *Yes*

7.5.3 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

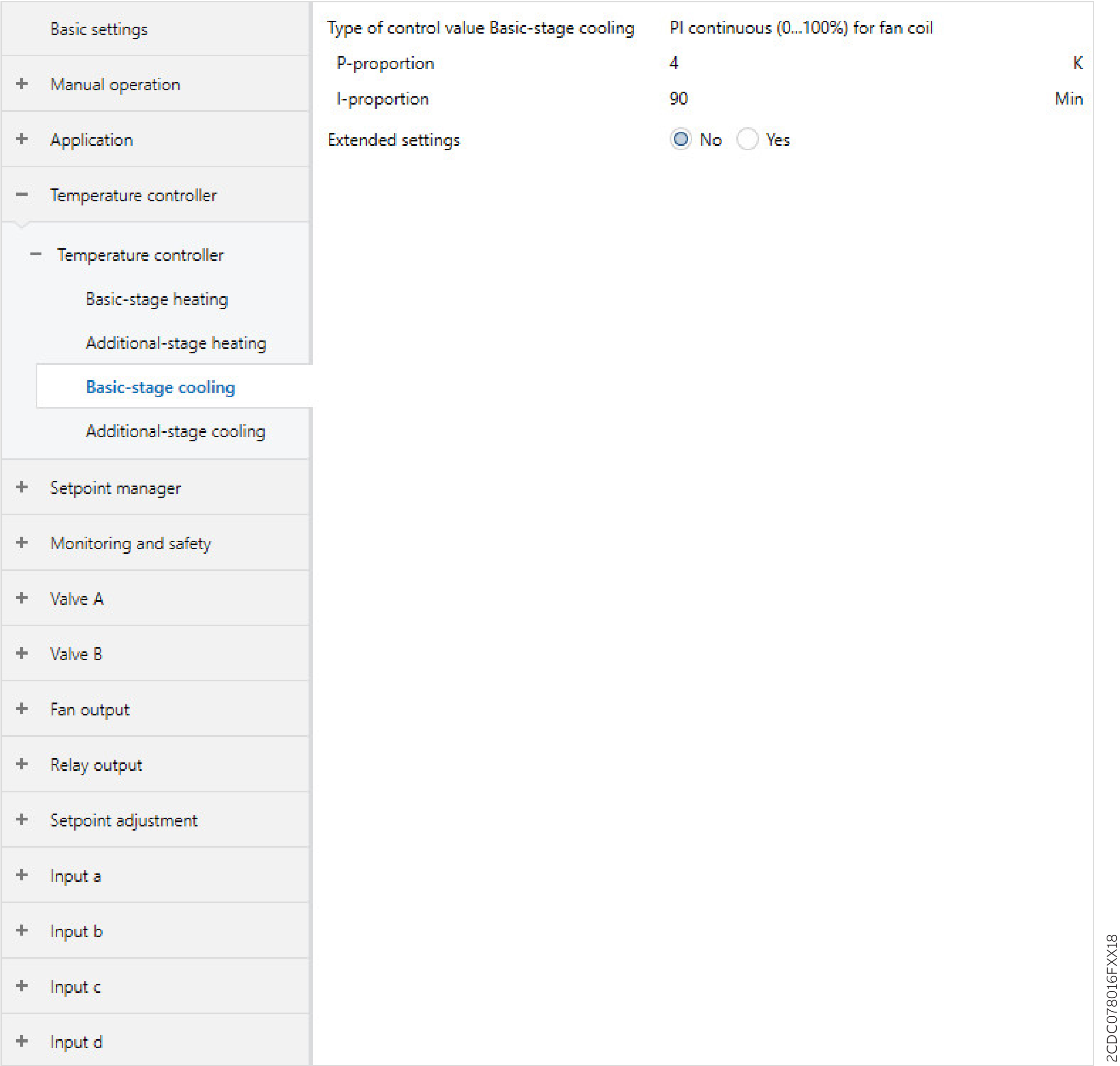


Fig. 36: Basic-stage cooling

Prerequisites for visibility:

- Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

Parameter

- Type of control value Basic-stage cooling
  - P-proportion
  - I-proportion
- Use control value for fan automatic
- Extended settings
  - Control value direction
  - Hysteresis
  - Control value difference for sending the control value
  - Cycle for sending the control value (0 = deactivated)
  - PWM cycle
  - Max. control value
  - Min. control value (basic load)
  - Activate temperature limitation
    - Limit temperature
    - Limit temperature hysteresis
    - I-proportion on temperature limitation
    - Input for temperature limit sensor

7.5.3.1 Type of control value Basic-stage cooling

The control and control-value type for basic-stage cooling are indicated in this parameter.

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

> **Note**
> For a detailed description: → Control types, Page 299.

Options	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Control value Basic-stage cooling*
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Control value Basic-stage cooling*
PI continuous (0 … 100 %)	The following dependent group objects are displayed: • *Control value Basic-stage cooling* The following dependent parameters are shown: • P-proportion • I-proportion
PI PWM (On/Off)	The following dependent group objects are displayed: • *Control value Basic-stage cooling* The following dependent parameters are shown: • P-proportion • I-proportion
PI continuous (0 … 100 %) for fan coil unit	The following dependent group objects are displayed: • *Control value Basic-stage cooling* The following dependent parameters are shown: • P-proportion • I-proportion

7.5.3.1.1

—

DEPENDENT PARAMETER

P-proportion

This parameter can be used to set the P-proportion of PI control.

Note
The standard value depends on the operating mode (heating or cooling).

Options
01.0 … 1.5 … 10.0 K
01.0 … 2 … 10.0 K

Prerequisites for visibility:

- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.3.1.2

—

DEPENDENT PARAMETER

I-proportion

This parameter can be used to set the I-proportion of PI control.

Options
0 … 100 … 255 min

Prerequisites for visibility:

- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.3.2 Use control value for fan automatic

This parameter can be used to set whether the heating/cooling stage control value is used to activate the fan in automatic mode.

Options	
No	The control value is not used for activating the fan.
Yes	If the fan is in automatic mode, the control value of the heating/cooling stage is used for activating the fan.

Prerequisites for visibility:

- Parameter window Application parameters
  - Parameter Basic-stage heating \ Option *Free configuration*
  - Parameter Basic-stage cooling \ Option *Free configuration*
  - Parameter Additional-stage heating \ Option *Free configuration*
  - Parameter Additional-stage cooling \ Option *Free configuration*

7.5.3.3 Extended settings

This parameter can be used to enable the extended settings of the parameter window.

Options	
No	The extended settings are deactivated.
Yes	The extended settings are active. The following dependent parameters are shown: • Control value direction • Hysteresis • Control value difference for sending the control value • Cycle for sending the control value (0 = deactivated) • PWM cycle • Max. control value • Min. control value (basic load) • Activate temperature limitation

7.5.3.3.1

—

DEPENDENT PARAMETER

Control value direction

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

Options	
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 Extended settings \ Option *Yes*
- Parameter window Application parameters
  - Parameter Basic-stage heating \ all options except Deactivated
  - Parameter Activate basic-stage heating via \ Option *Group object*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
  - Parameter Activate basic-stage cooling via \ Option *Group object*
  - Parameter Additional-stage heating \ all options except *Deactivated*
  - Parameter Activate additional-stage heating via \ Option *Group object*
  - Parameter Additional-stage cooling \ all options except *Deactivated*
  - Parameter Activate additional-stage cooling via \ Option *Group object*

7.5.3.3.2

—

DEPENDENT PARAMETER

Hysteresis

This parameter can be used to define the setpoint hysteresis.

	Heating	Cooling
Switching point + hysteresis	Controller Off	Controller On
Switching point – hysteresis	Controller On	Controller Off

Tab. 16: Dependency of hysteresis on the operating mode

Options
00.3 … 0.5 … 25.5 K

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Basic-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*

7.5.3.3.3

—

DEPENDENT PARAMETER

Control value difference for sending the control value

This parameter can be used to set 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.

Options
2 %
5 %
10 %
Only send cyclically

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.3.3.4

—

DEPENDENT PARAMETER

Cycle for sending the control value (0 = deactivated)

This parameter can be used to set the cycle during which the control value is sent.

Note
To ensure that the actuator (e.g. fan) receives its control value, cyclical sending should not be deactivated (value = 0).
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.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ all options except *PI PWM (On/Off)*

7.5.3.3.5

—

DEPENDENT PARAMETER

PWM cycle

This parameter can be used to set the cycle time (period) of the PWM signal.

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

Depending on the calculated PI control value, the cycle time is subdivided into an On signal and an Off 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

Note
With a PI control value of 0 % a 0 is sent one time. The PWM signal is sent only if the PI control value changes.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ Options *PI PWM (On/Off)*

7.5.3.3.6

—

DEPENDENT PARAMETER

Max. control value

This parameter can be used to set the maximum control value of the controller.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.3.3.7

—

DEPENDENT PARAMETER

Min. control value (basic load)

This parameter can be used to set the minimum control value (basic load) of the controller.

Basic settings for the basic load are made in the parameter window Temperature controller.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.3.3.8

—

DEPENDENT PARAMETER

Activate temperature limitation

This parameter can be used to activate temperature limitation. When the set limit temperature is reached, the control value of the controller is set to 0.

Options	
No	Temperature limitation is deactivated.
Yes	Temperature limitation is active. The following dependent parameters are shown: • Limit temperature • Limit temperature hysteresis • I-proportion on temperature limitation • Input for temperature limit sensor

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*

7.5.3.3.8.1

—

DEPENDENT PARAMETER

Limit temperature

This parameter can be used to set the limit temperature that must not be exceeded (heating) or dropped below (cooling).

When the temperature reaches the set value, the controller sets the control value to 0.

For the setting for receipt of the temperature value: → Input for temperature limit sensor, Page 140.

Note
The value range and the standard value depend on the operating mode (heating or cooling).

Options
20 … 30 … 50 °C
1 … 10 … 30 °C

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.3.3.8.2

—

DEPENDENT PARAMETER

Limit temperature hysteresis

This parameter can be used to set the hysteresis of the limit temperature.

Options
00.5 … 01.0 … 05.0 K

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.3.3.8.3

—

DEPENDENT PARAMETER

I-proportion on temperature limitation

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

Options	
Freeze	The current value of the I-proportion is saved. When the controller becomes active, 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 Activate temperature limitation \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.3.3.8.4

—

DEPENDENT PARAMETER

Input for temperature limit sensor

This parameter is used to set how the controller receives the measured limit temperature.

> **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.

Options	
Via group object	The temperature value is received via a dedicated group object. The corresponding group object is enabled depending on the heating/cooling stage: • *Basic-stage heating limit temperature* • *Basic-stage cooling limit temperature* • *Additional-stage heating limit temperature* • *Additional-stage cooling limit temperature*
Via physical device input a	The temperature value is measured via a connected temperature sensor.
Via physical device input b	The temperature value is measured via a connected temperature sensor.
Via physical device input c	The temperature value is measured via a connected temperature sensor.
Via physical device input d	The temperature value is measured via a connected temperature sensor.

Prerequisites for visibility:

- Parameter Activate temperature limitation \ Option *Yes*

7.5.4 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

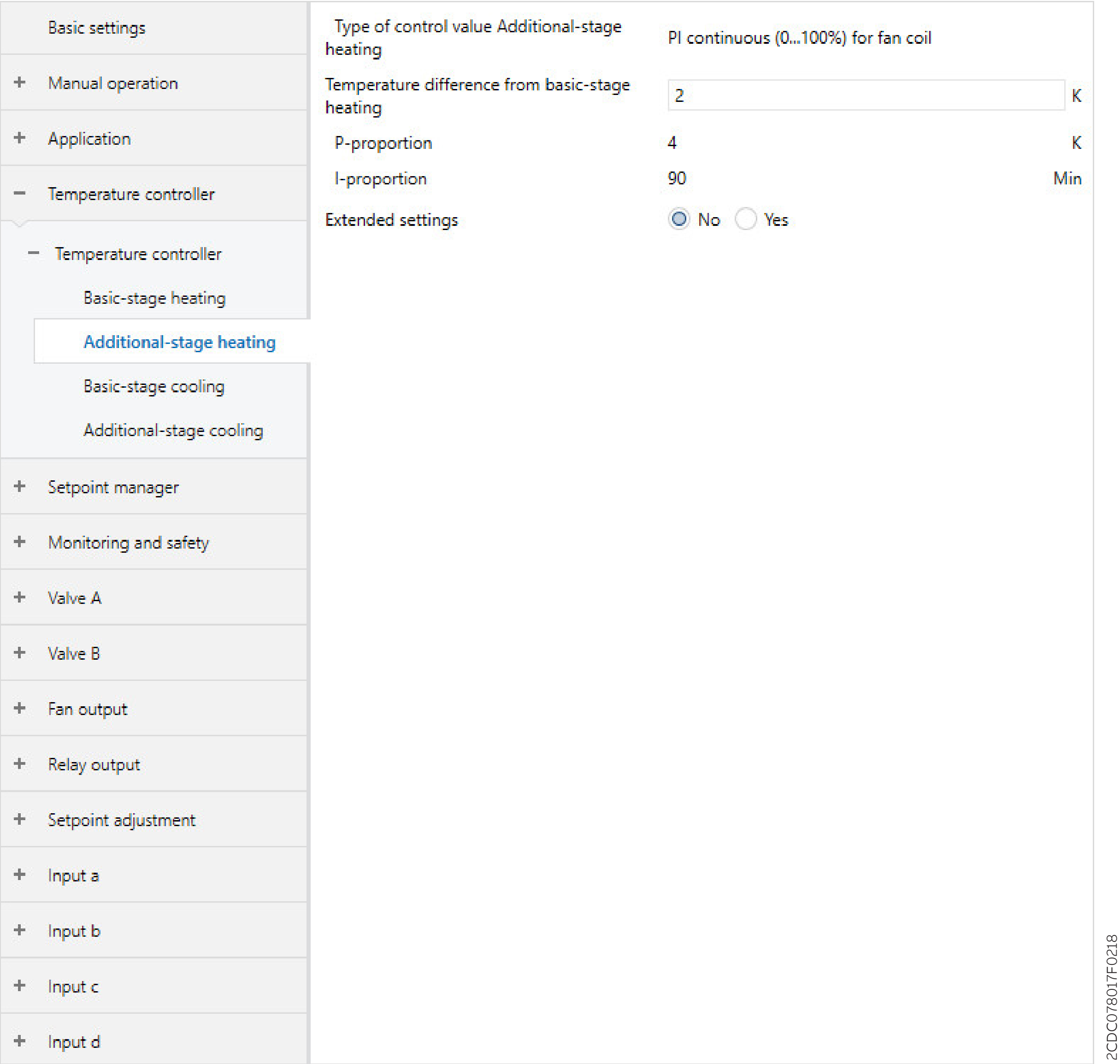


Fig. 37: Additional-stage heating

Prerequisites for visibility:

- Parameter window Application parameters \ Parameter Additional-stage heating \ all options except *Deactivated*

Parameter

- Type of control value Additional-stage heating
  - P-proportion
  - I-proportion
- Temperature difference from basic-stage heating
- Use control value for fan automatic
- Extended settings
  - Control value direction
  - Hysteresis
  - Control value difference for sending the control value
  - Cycle for sending the control value (0 = deactivated)
  - PWM cycle
  - Max. control value
  - Min. control value (basic load)
  - Activate temperature limitation
    - Limit temperature
    - Limit temperature hysteresis
    - I-proportion on temperature limitation
    - Input for temperature limit sensor

7.5.4.1 Type of control value Additional-stage heating

The control and control-value type for additional-stage heating are indicated in this parameter.

> **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 299.

Options	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Control value Additional-stage heating*
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Control value Additional-stage heating*
PI continuous (0 … 100 %)	The following dependent group objects are displayed: • *Control value Additional-stage heating* The following dependent parameters are shown: • P-proportion • I-proportion
PI PWM (On/Off)	The following dependent group objects are displayed: • *Control value Additional-stage heating* The following dependent parameters are shown: • P-proportion • I-proportion
PI continuous (0 … 100 %) for fan coil unit	The following dependent group objects are displayed: • *Control value Additional-stage heating* The following dependent parameters are shown: • P-proportion • I-proportion

7.5.4.1.1

—

DEPENDENT PARAMETER

P-proportion

This parameter can be used to set the P-proportion of PI control.

Note
The standard value depends on the operating mode (heating or cooling).

Options
01.0 … 1.5 … 10.0 K
01.0 … 2 … 10.0 K

Prerequisites for visibility:
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.4.1.2

—

DEPENDENT PARAMETER

I-proportion

This parameter can be used to set the I-proportion of PI control.

Options
0 … 100 … 255 min

Prerequisites for visibility:
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.4.2 Temperature difference from basic-stage heating

This parameter can be used to set 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.

Options
00.0 … 02.0 … 25.5 K

7.5.4.3 Use control value for fan automatic

This parameter can be used to set whether the heating/cooling stage control value is used to activate the fan in automatic mode.

Options	
No	The control value is not used for activating the fan.
Yes	If the fan is in automatic mode, the control value of the heating/cooling stage is used for activating the fan.

Prerequisites for visibility:
- Parameter window Application parameters
  - Parameter Basic-stage heating \ Option *Free configuration*
  - Parameter Basic-stage cooling \ Option *Free configuration*
  - Parameter Additional-stage heating \ Option *Free configuration*
  - Parameter Additional-stage cooling \ Option *Free configuration*

7.5.4.4 Extended settings

This parameter can be used to enable the extended settings of the parameter window.

Options	
No	The extended settings are deactivated.
Yes	The extended settings are active. The following dependent parameters are shown: • Control value direction • Hysteresis • Control value difference for sending the control value • Cycle for sending the control value (0 = deactivated) • PWM cycle • Max. control value • Min. control value (basic load) • Activate temperature limitation

7.5.4.4.1

—

DEPENDENT PARAMETER

Control value direction

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

Options	
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 Extended settings \ Option *Yes*
- Parameter window Application parameters
  - Parameter Basic-stage heating \ all options except Deactivated
  - Parameter Activate basic-stage heating via \ Option *Group object*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
  - Parameter Activate basic-stage cooling via \ Option *Group object*
  - Parameter Additional-stage heating \ all options except *Deactivated*
  - Parameter Activate additional-stage heating via \ Option *Group object*
  - Parameter Additional-stage cooling \ all options except *Deactivated*
  - Parameter Activate additional-stage cooling via \ Option *Group object*

7.5.4.4.2

—

DEPENDENT PARAMETER

Hysteresis

This parameter can be used to define the setpoint hysteresis.

	Heating	**Cooling**
Switching point + hysteresis	Controller Off	Controller On
Switching point – hysteresis	Controller On	Controller Off

Tab. 17: Dependency of hysteresis on the operating mode

Options
00.3 … 0.5 … 25.5 K

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Basic-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*

7.5.4.4.3

—

DEPENDENT PARAMETER

Control value difference for sending the control value

This parameter can be used to set 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.

Options
2 %
5 %
10 %
Only send cyclically

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.4.4.4

—

DEPENDENT PARAMETER

Cycle for sending the control value (0 = deactivated)

This parameter can be used to set the cycle during which the control value is sent.

Note
To ensure that the actuator (e.g. fan) receives its control value, cyclical sending should not be deactivated (value = 0).
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.

Options
0 … 15 … 60 min

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ all options except *PI PWM (On/Off)*

7.5.4.4.5

—

DEPENDENT PARAMETER

PWM cycle

This parameter can be used to set the cycle time (period) of the PWM signal.

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

Depending on the calculated PI control value, the cycle time is subdivided into an On signal and an Off 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

Note
With a PI control value of 0 % a 0 is sent one time. The PWM signal is sent only if the PI control value changes.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ Options *PI PWM (On/Off)*

7.5.4.4.6

—

DEPENDENT PARAMETER

Max. control value

This parameter can be used to set the maximum control value of the controller.

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.4.4.7

—

DEPENDENT PARAMETER

Min. control value (basic load)

This parameter can be used to set the minimum control value (basic load) of the controller.

Basic settings for the basic load are made in the parameter window Temperature controller.

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.4.4.8

—

DEPENDENT PARAMETER

Activate temperature limitation

This parameter can be used to activate temperature limitation. When the set limit temperature is reached, the control value of the controller is set to 0.

Options	
No	Temperature limitation is deactivated.
Yes	Temperature limitation is active. The following dependent parameters are shown: • Limit temperature • Limit temperature hysteresis • I-proportion on temperature limitation • Input for temperature limit sensor

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*

7.5.4.4.8.1

—

DEPENDENT PARAMETER

Limit temperature

This parameter can be used to set the limit temperature that must not be exceeded (heating) or dropped below (cooling).

When the temperature reaches the set value, the controller sets the control value to 0.

For the setting for receipt of the temperature value: → Input for temperature limit sensor, Page 150.

> **Note**
> The value range and the standard value depend on the operating mode (heating or cooling).

Options
20 … 30 … 50 °C
1 … 10 … 30 °C

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.4.4.8.2

—

DEPENDENT PARAMETER

Limit temperature hysteresis

This parameter can be used to set the hysteresis of the limit temperature.

Options
00.5 … 01.0 … 05.0 K

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.4.4.8.3

—

DEPENDENT PARAMETER

I-proportion on temperature limitation

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

Options	
Freeze	The current value of the I-proportion is saved. When the controller becomes active, 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 Activate temperature limitation \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.4.4.8.4

—

DEPENDENT PARAMETER

Input for temperature limit sensor

This parameter is used to set how the controller receives the measured limit temperature.

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.

Options	
Via group object	The temperature value is received via a dedicated group object. The corresponding group object is enabled depending on the heating/cooling stage: • *Basic-stage heating limit temperature* • *Basic-stage cooling limit temperature* • *Additional-stage heating limit temperature* • *Additional-stage cooling limit temperature*
Via physical device input a	The temperature value is measured via a connected temperature sensor.
Via physical device input b	The temperature value is measured via a connected temperature sensor.
Via physical device input c	The temperature value is measured via a connected temperature sensor.
Via physical device input d	The temperature value is measured via a connected temperature sensor.

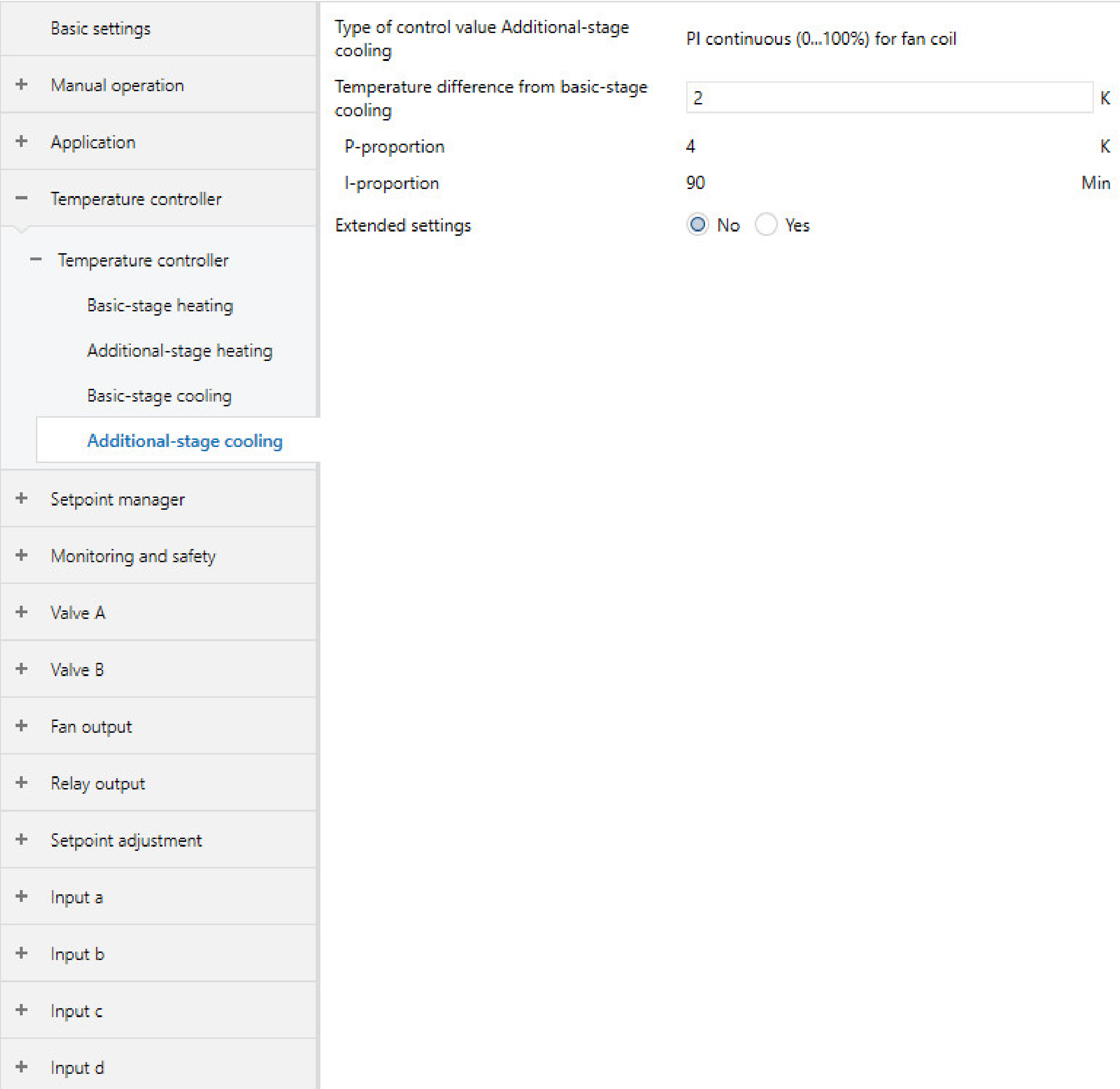
Prerequisites for visibility:

- Parameter Activate temperature limitation \ Option *Yes*

7.5.5 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



2CDC078018F0218

Fig. 38: Additional-stage cooling

Prerequisites for visibility:

- Parameter window Application parameters \ Parameter Additional-stage cooling \ all options except *Deactivated*

Parameter

- Type of control value Additional-stage cooling
  - P-proportion
  - I-proportion
- Temperature difference from basic-stage cooling
- Use control value for fan automatic
- Extended settings
  - Control value direction
  - Hysteresis
  - Control value difference for sending the control value
  - Cycle for sending the control value (0 = deactivated)
  - PWM cycle
  - Max. control value
  - Min. control value (basic load)
  - Activate temperature limitation
    - Limit temperature
    - Limit temperature hysteresis
    - I-proportion on temperature limitation
    - Input for temperature limit sensor

7.5.5.1 Type of control value Additional-stage cooling

The control and control-value type for additional-stage cooling are indicated in this parameter.

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 299.

Options	
2-point 1 bit (On/Off)	The following dependent group objects are displayed: • *Control value Additional-stage cooling*
2-point 1 byte (0/100 %)	The following dependent group objects are displayed: • *Control value Additional-stage cooling*
PI continuous (0 … 100 %)	The following dependent group objects are displayed: • *Control value Additional-stage cooling* The following dependent parameters are shown: • P-proportion • I-proportion
PI PWM (On/Off)	The following dependent group objects are displayed: • *Control value Additional-stage cooling* The following dependent parameters are shown: • P-proportion • I-proportion
PI continuous (0 … 100 %) for fan coil unit	The following dependent group objects are displayed: • *Control value Additional-stage cooling* The following dependent parameters are shown: • P-proportion • I-proportion

7.5.5.1.1

—

DEPENDENT PARAMETER

P-proportion

This parameter can be used to set the P-proportion of PI control.

> **Note**
> The standard value depends on the operating mode (heating or cooling).

Options
01.0 … 1.5 … 10.0 K
01.0 … 2 … 10.0 K

Prerequisites for visibility:

- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.5.1.2

—

DEPENDENT PARAMETER

I-proportion

This parameter can be used to set the I-proportion of PI control.

Options
0 … 100 … 255 min

Prerequisites for visibility:

- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.5.2 Temperature difference from basic-stage cooling

This parameter can be used to set 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.

Options
00.0 … 02.0 … 25.5 K

7.5.5.3 Use control value for fan automatic

This parameter can be used to set whether the heating/cooling stage control value is used to activate the fan in automatic mode.

Options	
No	The control value is not used for activating the fan.
Yes	If the fan is in automatic mode, the control value of the heating/cooling stage is used for activating the fan.

Prerequisites for visibility:

- Parameter window Application parameters
  - Parameter Basic-stage heating \ Option *Free configuration*
  - Parameter Basic-stage cooling \ Option *Free configuration*
  - Parameter Additional-stage heating \ Option *Free configuration*
  - Parameter Additional-stage cooling \ Option *Free configuration*

7.5.5.4 Extended settings

This parameter can be used to enable the extended settings of the parameter window.

Options	
No	The extended settings are deactivated.
Yes	The extended settings are active. The following dependent parameters are shown: • Control value direction • Hysteresis • Control value difference for sending the control value • Cycle for sending the control value (0 = deactivated) • PWM cycle • Max. control value • Min. control value (basic load) • Activate temperature limitation

7.5.5.4.1

DEPENDENT PARAMETER

Control value direction

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

Options	
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 Extended settings \ Option *Yes*
- Parameter window Application parameters
  - Parameter Basic-stage heating \ all options except Deactivated
  - Parameter Activate basic-stage heating via \ Option *Group object*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
  - Parameter Activate basic-stage cooling via \ Option *Group object*
  - Parameter Additional-stage heating \ all options except *Deactivated*
  - Parameter Activate additional-stage heating via \ Option *Group object*
  - Parameter Additional-stage cooling \ all options except *Deactivated*
  - Parameter Activate additional-stage cooling via \ Option *Group object*

7.5.5.4.2

DEPENDENT PARAMETER

Hysteresis

This parameter can be used to define the setpoint hysteresis.

	Heating	Cooling
Switching point + hysteresis	Controller Off	Controller On
Switching point – hysteresis	Controller On	Controller Off

Tab. 18: Dependency of hysteresis on the operating mode

Options
00.3 … 0.5 … 25.5 K

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Basic-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage heating
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*
- Parameter Type of control value Additional-stage cooling
  - Option *2-point 1 bit (On/Off)*
  - Option *2-point 1 byte (0/100 %)*

7.5.5.4.3

—

DEPENDENT PARAMETER

Control value difference for sending the control value

This parameter can be used to set 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.

Options
2 %
5 %
10 %
Only send cyclically

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.5.4.4

—

DEPENDENT PARAMETER

Cycle for sending the control value (0 = deactivated)

This parameter can be used to set the cycle during which the control value is sent.

Note
To ensure that the actuator (e.g. fan) receives its control value, cyclical sending should not be deactivated (value = 0).
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.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ all options except *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ all options except *PI PWM (On/Off)*

7.5.5.4.5

—

DEPENDENT PARAMETER

PWM cycle

This parameter can be used to set the cycle time (period) of the PWM signal.

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

Depending on the calculated PI control value, the cycle time is subdivided into an On signal and an Off 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

Note
With a PI control value of 0 % a 0 is sent one time. The PWM signal is sent only if the PI control value changes.

Options
0 … 15 … 60 min

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Basic-stage cooling \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage heating \ Options *PI PWM (On/Off)*
- Parameter Type of control value Additional-stage cooling \ Options *PI PWM (On/Off)*

7.5.5.4.6

—

DEPENDENT PARAMETER

Max. control value

This parameter can be used to set the maximum control value of the controller.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.5.4.7

—

DEPENDENT PARAMETER

Min. control value (basic load)

This parameter can be used to set the minimum control value (basic load) of the controller.

Basic settings for the basic load are made in the parameter window Temperature controller.

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Extended settings \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.5.4.8

DEPENDENT PARAMETER

Activate temperature limitation

This parameter can be used to activate temperature limitation. When the set limit temperature is reached, the control value of the controller is set to 0.

Options	
No	Temperature limitation is deactivated.
Yes	Temperature limitation is active. The following dependent parameters are shown: • Limit temperature • Limit temperature hysteresis • I-proportion on temperature limitation • Input for temperature limit sensor

Prerequisites for visibility:
- Parameter Extended settings \ Option *Yes*

7.5.5.4.8.1

DEPENDENT PARAMETER

Limit temperature

This parameter can be used to set the limit temperature that must not be exceeded (heating) or dropped below (cooling).

When the temperature reaches the set value, the controller sets the control value to 0.

For the setting for receipt of the temperature value: → Input for temperature limit sensor, Page 160.

> **Note**
> The value range and the standard value depend on the operating mode (heating or cooling).

Options
20 … 30 … 50 °C
1 … 10 … 30 °C

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.5.4.8.2

DEPENDENT PARAMETER

Limit temperature hysteresis

This parameter can be used to set the hysteresis of the limit temperature.

Options
00.5 … 01.0 … 05.0 K

Prerequisites for visibility:
- Parameter Activate temperature limitation \ Option *Yes*

7.5.5.4.8.3

DEPENDENT PARAMETER

I-proportion on temperature limitation

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

Options	
Freeze	The current value of the I-proportion is saved. When the controller becomes active, 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 Activate temperature limitation \ Option *Yes*
- Parameter Type of control value Basic-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Basic-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage heating
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*
- Parameter Type of control value Additional-stage cooling
  - Option *PI continuous (0 … 100 %)*
  - Option *PI PWM (On/Off)*
  - Option *PI continuous (0 … 100 %) for fan coil unit*

7.5.5.4.8.4

DEPENDENT PARAMETER

Input for temperature limit sensor

This parameter is used to set how the controller receives the measured limit temperature.

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.

Options	
Via group object	The temperature value is received via a dedicated group object. The corresponding group object is enabled depending on the heating/cooling stage: • *Basic-stage heating limit temperature* • *Basic-stage cooling limit temperature* • *Additional-stage heating limit temperature* • *Additional-stage cooling limit temperature*
Via physical device input a	The temperature value is measured via a connected temperature sensor.
Via physical device input b	The temperature value is measured via a connected temperature sensor.
Via physical device input c	The temperature value is measured via a connected temperature sensor.
Via physical device input d	The temperature value is measured via a connected temperature sensor.

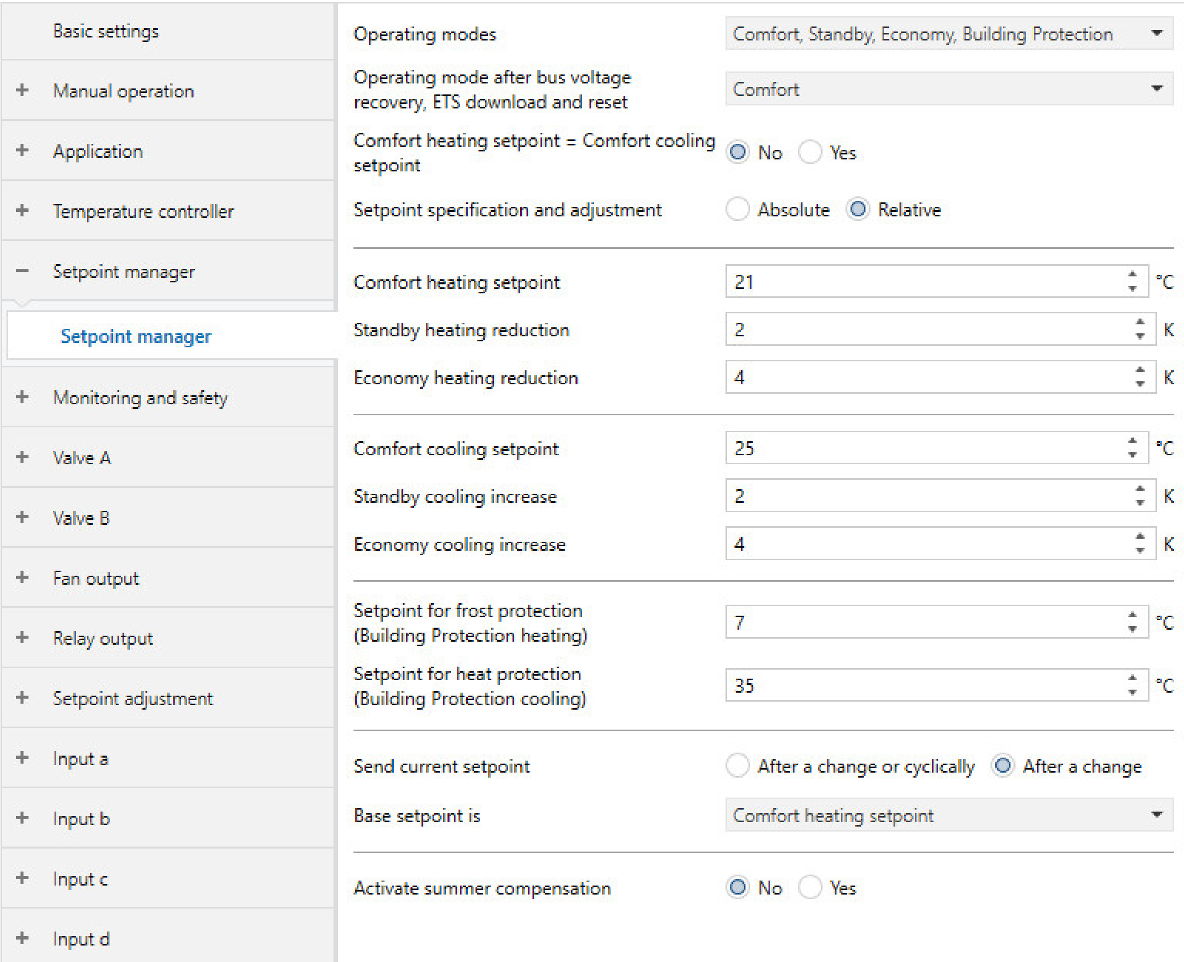
Prerequisites for visibility:

- Parameter Activate temperature limitation \ Option *Yes*

7.6 Parameter window Setpoint manager

The following settings can be made in this parameter window:

- Operating mode
- Setpoint specification
- Activate summer compensation



2CDC078019FX18

Fig. 39: Setpoint manager parameter window

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Parameter

- Operating modes
- Operating mode after bus voltage recovery, ETS download and reset
- Comfort heating setpoint = Comfort cooling setpoint
  - Comfort heating setpoint
  - Comfort cooling setpoint
  - Hysteresis for Heating/cooling changeover
  - Comfort heating and cooling setpoint
- Setpoint specification and adjustment
  - Standby heating setpoint
  - Economy heating setpoint
  - Standby cooling setpoint
  - Economy cooling setpoint
  - Standby heating reduction
  - Economy heating reduction
  - Standby cooling increase
  - Economy cooling increase
  - Base setpoint is
- Setpoint for frost protection (building protection, heating)
- Heat protection setpoint (building protection, cooling)
- Send current setpoint
  - Cycle for sending the setpoint
- Activate summer compensation
  - Starting temperature for summer compensation
  - Setpoint temperature offset when summer compensation starts
  - Ending temperature for summer compensation
  - Setpoint temperature offset when summer compensation ends

7.6.1 Operating modes

This parameter can be used to set which operating modes are used.

For an explanation of the individual operating modes → Explanation of the operating modes, Page 291

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

Options	
Comfort, Standby, Economy, Building Protection	The operating modes *Comfort, Standby, Economy, Building Protection* are used.
Comfort, Standby, Building Protection	The operating modes *Comfort, Standby, Building Protection* are used.
Comfort, Building Protection	The operating modes *Comfort, Building Protection* are used.

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

This parameter can be used to set the operating mode set after bus voltage recovery, ETS download or reset. The operating mode remains active until a new operating mode is set (e.g. via group object *Operating mode normal (master)*).

For an explanation of the individual operating modes → Explanation of the operating modes, Page 291

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.

Options	
Comfort	Comfort mode is activated.
Standby	Standby mode is activated.
Economy	Economy mode is activated.
Building Protection	Building Protection mode is activated.

7.6.3 Comfort heating setpoint = Comfort cooling setpoint

This parameter can be used to set whether the setpoints for Comfort heating and Comfort cooling are identical.

Options	
No	Two different setpoints can be set for Comfort heating and Comfort cooling. The change between the operating modes is set in the parameter Heating/cooling changeover. The following dependent parameters are shown: • Comfort heating setpoint • Comfort cooling setpoint
Yes	The setpoint for Comfort heating and Comfort cooling is identical. Cooling mode is activated if the setpoint plus hysteresis is exceeded. Heating mode is activated if the setpoint minus hysteresis is dropped below. The following dependent parameters are shown: • Hysteresis for Heating/cooling changeover • Comfort heating and cooling setpoint

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.3.1

—

DEPENDENT PARAMETER

Comfort heating setpoint

This parameter can be used to set the setpoint temperature for *Comfort heating* mode.

Options
10 … 21 … 40 °C

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

7.6.3.2

—

DEPENDENT PARAMETER

Comfort cooling setpoint

This parameter can be used to set the setpoint temperature for *Comfort cooling* mode.

Options
10 … 25 … 40 °C

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.3.3

—

DEPENDENT PARAMETER

Hysteresis for Heating/cooling changeover

This parameter can be used to set the hysteresis for changeover between heating and cooling.

> **Note**
> Automatic changeover between heating and cooling is possible only in *Comfort* mode.

Options
00.5 … 2 … 10.0 °C

Prerequisites for visibility:

- Parameter Comfort heating setpoint = Comfort cooling setpoint \ Option *Yes*

7.6.3.4

—

DEPENDENT PARAMETER

Comfort heating and cooling setpoint

This parameter can be used to set a setpoint temperature for *Comfort heating* and *Comfort cooling* modes.

Options
10 … 21 … 40 °C

Prerequisites for visibility:

- Parameter Comfort heating setpoint = Comfort cooling setpoint \ Option *Yes*

7.6.4 Setpoint specification and adjustment

This parameter can be used to set whether the setpoints are entered as absolute values or as differences from the respective Comfort values.

Note
In order to save energy, there must be a logical relationship between the selected values of the individual operating modes.

- Comfort heating setpoint > Standby heating setpoint > Economy heating setpoint > Setpoint for frost protection (Building Protection heating)
- Comfort cooling setpoint < Standby cooling setpoint < Economy cooling setpoint < Heat protection setpoint (Building Protection cooling)

Options	
Absolute	The setpoints for Standby and Economy modes are entered as absolute values. The setpoints are mutually independent and are not shifted based on the base setpoint. The setpoints can be adjusted via the related group objects as well. 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* The following dependent parameters are shown: • Standby heating setpoint • Economy heating setpoint • Standby cooling setpoint • Economy 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 simultaneously for all operating modes via KNX using group object *Basic setpoint*. The values for Building Protection mode cannot be changed via KNX. The following dependent group objects are displayed: • *Basic setpoint* The following dependent parameters are shown: • Standby heating reduction • Economy heating reduction • Standby cooling increase • Economy cooling increase • Base setpoint is

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

7.6.4.1

—

DEPENDENT PARAMETER

Standby heating setpoint

This parameter can be used to set the setpoint temperature for *Standby heating* mode.

Note
The temperature value specified here must be lower than the value in the parameter 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.

Options
10 … 19 … 40 °C

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

7.6.4.2

—

DEPENDENT PARAMETER

Economy heating setpoint

This parameter can be used to set the setpoint temperature for *Economy heating* mode.

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.

Options
10 … 17 … 40 °C

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

7.6.4.3

—

DEPENDENT PARAMETER

Standby cooling setpoint

This parameter can be used to set the setpoint temperature for *Standby cooling* mode.

> **Note**
> The temperature value specified here must be higher than the value in the parameter 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.

Options
10 … 27 … 40 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.4.4

—

DEPENDENT PARAMETER

Economy cooling setpoint

This parameter can be used to set the setpoint temperature for *Economy cooling* mode.

> **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.

Options
10 … 29 … 40 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.4.5

—

DEPENDENT PARAMETER

Standby heating reduction

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

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

Options
0 … 2 … 15 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

7.6.4.6

—

DEPENDENT PARAMETER

Economy heating reduction

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

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

Options
0 … 4 … 15 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage heating \ all options except *Deactivated*

7.6.4.7

—

DEPENDENT PARAMETER

Standby cooling increase

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

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

Options
0 … 2 … 15 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.4.8

—

DEPENDENT PARAMETER

Economy cooling increase

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

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

Options
0 … 4 … 15 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.4.9

DEPENDENT PARAMETER

Base setpoint is

This parameter can be used to set which value corresponds to the base setpoint.

Note
If the FCC/S is configured only for heating mode or cooling mode, the base setpoint automatically corresponds to the respective Comfort setpoint.

Options	
Comfort heating setpoint	The base setpoint corresponds to the setpoint for Comfort heating. If the base setpoint is changed via group object *Comfort heating setpoint*, the setpoint for Comfort cooling shifts as well – the difference between the two Comfort values is retained.
Comfort cooling setpoint	The base setpoint corresponds to the setpoint for Comfort cooling. If the base setpoint is changed via group object *Comfort cooling setpoint*, the setpoint for Comfort heating shifts as well – the difference between the two Comfort values is retained.
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 Setpoint specification and adjustment \ Option *Relative*

7.6.5 Setpoint for frost protection (building protection, heating)

This parameter can be used to set the temperature (setpoint) that must not be fallen below in *Building Protection heating* mode.

The setpoint becomes active in the following cases:
- Controller receives the status "Window open"
- The controller is deactivated via group object *Request On/Off (master)*

Options
5 … 7 … 15 °C

7.6.6 Heat protection setpoint (building protection, cooling)

This parameter can be used to set the temperature (setpoint) that must not be exceeded in *Building Protection cooling* mode.

The setpoint becomes 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)*

Options
27 … 35 … 45 °C

7.6.7 Send current setpoint

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

Options	
After a change or cyclically	The setpoint is sent after a change or cyclically. The following dependent parameters are shown: • Cycle for sending the setpoint
After a change	The setpoint is sent only after a change.

7.6.7.1

DEPENDENT PARAMETER

Cycle for sending the setpoint

This parameter can be used to set the sending cycle for the current setpoint.

Options
5 … 15 … 240 min

Prerequisites for visibility:

- Parameter Send current setpoint \ Option *After a change or cyclically*

7.6.8 Activate summer compensation

The summer compensation in the device can be activated using this parameter.

Information about the summer compensation function: → Summer compensation, Page 292

Options	
No	Summer compensation is deactivated.
Yes	Summer compensation is activated. The following dependent group objects are displayed: • *Outside temperature for summer compensation* • *Summer compensation active/inactive* 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

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Basic-stage cooling \ all options except *Deactivated*

7.6.8.1

DEPENDENT PARAMETER

Starting temperature for summer compensation

This parameter can be used to set the temperature at which summer compensation is activated.

Options
10 … 21 … 50 °C

Prerequisites for visibility:

- Parameter Activate summer compensation \ Option *Yes*

7.6.8.2

—

DEPENDENT PARAMETER

Setpoint temperature offset when summer compensation starts

This parameter can be used to set the setpoint temperature offset when summer compensation starts.

Options
0 … 12.7 °C

Prerequisites for visibility:

- Parameter Activate summer compensation \ Option *Yes*

7.6.8.3

—

DEPENDENT PARAMETER

Ending temperature for summer compensation

This parameter can be used to set the temperature at which summer compensation is deactivated.

Options
10 … 32 … 50 °C

Prerequisites for visibility:

- Parameter Activate summer compensation \ Option *Yes*

7.6.8.4

—

DEPENDENT PARAMETER

Setpoint temperature offset when summer compensation ends

This parameter can be used to set the setpoint temperature offset when summer compensation ends.

Options
00.0 … 6… 12.7 °C

Prerequisites for visibility:

- Parameter Activate summer compensation \ Option *Yes*

7.7 Parameter window Monitoring and safety

The following settings can be made in this parameter window:
- Forced operation
- Cyclical monitoring

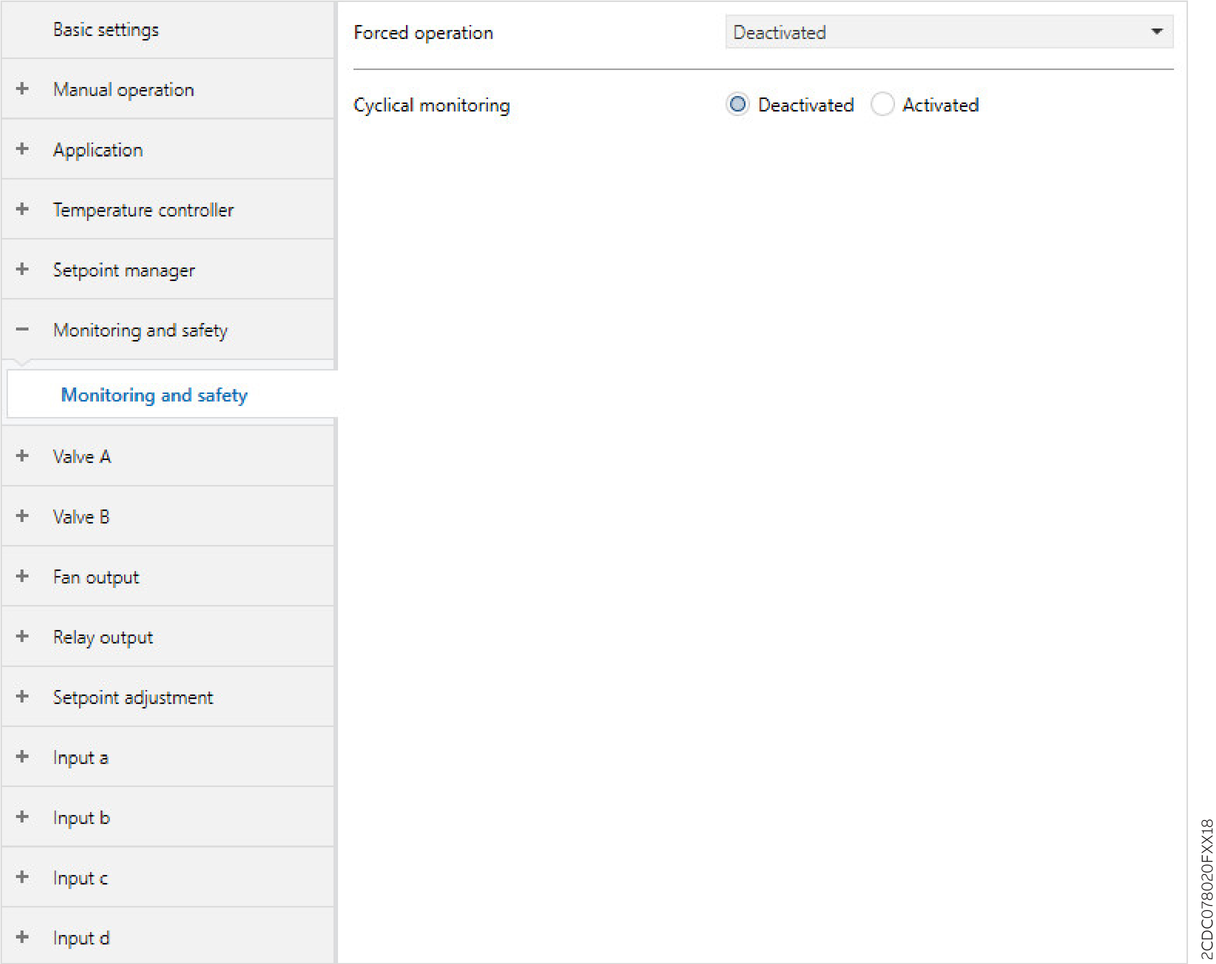


Fig. 40: Monitoring and safety parameter window

Parameter

- Forced operation
  - Control value
  - Fan output
  - Relay output
  - Forced operation active "ON" control value
  - Forced operation active "ON" fan output
  - Forced operation active "ON" relay output
  - Forced operation active "OFF" control value
  - Forced operation active "OFF" fan output
  - Forced operation active "OFF" relay output
- Cyclical monitoring
  - Temperature input monitoring
    - Control value on input fault
    - Time interval for cyclical monitoring
    - Control value after exceeding monitoring time
  - Monitor receipt of group object "Operating mode"
    - Time interval for cyclical monitoring
    - Operating mode after exceeding monitoring time
  - Monitor receipt of group object "Window contact"
    - Time interval for cyclical monitoring
  - Monitor receipt of group object "Dew point alarm"
    - Time interval for cyclical monitoring
  - Monitor receipt of group object "Fill level alarm"
    - Time interval for cyclical monitoring
  - Monitor receipt of group object "Heating/cooling changeover"
    - Time interval for cyclical monitoring
    - Heating/cooling mode when monitoring time exceeded
  - Monitor receipt of group object "Control value"
    - Time interval for cyclical monitoring
    - Control value after exceeding monitoring time

7.7.1 Forced operation

This parameter can be used to set the type of forced operation.

More information: → Forced operation, Page 306.

Options	
Deactivated	Forced operation is deactivated.
Activated 1-bit – 1 active	Forced operation is activated if telegram value 1 is received on group object *Forced operation, 1-bit*. The following dependent parameters are shown: • Control value • Fan output • Relay output
Activated 1-bit – 0 active	Forced operation is activated if telegram value 0 is received on group object *Forced operation, 1-bit*. The following dependent parameters are shown: • Control value • Fan output • Relay output
Activated 2-bit	Forced operation is controlled via group object *Forced operation, 2-bit*. The following dependent parameters are shown: • Forced operation active "ON" control value • Forced operation active "ON" fan output • Forced operation active "ON" relay output • Forced operation active "OFF" control value • Forced operation active "OFF" fan output • Forced operation active "OFF" relay output

7.7.1.1

—

DEPENDENT PARAMETER

Control value

This parameter can be used to set the applicable control value for activated 1-bit forced operation. The control value refers only to the valve for the active operating mode (heating or cooling).

Note
If basic stage and additional stage are output via the valve outputs in controller mode, the control value for forced operation is a mean value of the control values for basic stage and additional stage. Only the basic stage is activated up to a control value of 50 %. With a control value higher than 50 %, the basic stage is 100 % activated and the additional stage is activated as well.

Example:

Control value Forced operation	Control value Basic stage	Control value Additional stage
0 %	0 %	0 %
1 %	2 %	0 %
25 %	50 %	0 %
50 %	100 %	0 %
51 %	100 %	2 %
75 %	100 %	50 %
100 %	100 %	100 %

Tab. 19: Control values

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Forced operation \ Option *Activated 1-bit – 1 active*

7.7.1.2

—

DEPENDENT PARAMETER

Fan output

This parameter can be used to set the fan speed set for activated forced operation.

Note
The options depend on the FCC/S product version (for continuous fans or 3-speed fans).

Note
The option *Adopts control value* is available only if, in the parameter , the option *Yes* is selected.

Options	
Unchanged	The fan speed does not change when forced operation is activated.
Adopts control value	The fan speed depends on the valve control value. Automatic mode is active.
1	The fan runs at speed 1.
2	The fan runs at speed 2.
3	The fan runs at speed 3.
33	The ran runs at speed 33 %.
66	The ran runs at speed 66 %.
100	The ran runs at speed 100 %.

Prerequisites for visibility:
- Parameter Forced operation \ Option *Activated 1-bit – 1 active*

7.7.1.3

—

DEPENDENT PARAMETER

Relay output

This parameter is used to set the state the relay assumes for activated 1-bit forced operation.

> **Note**
> This parameter is not available for product variant FCC/S 1.4.1.1.

> **Note**
> During forced operation, the FCC/S continues to receive telegrams via the ABB i-bus® KNX:
> - Group objects with a lower priority than that of forced operation are ignored.
> - Group objects with a higher priority cancel forced operation.
>
> The fan changes to automatic mode after forced operation is canceled. The control values calculated by the controller are valid.

Options	
Unchanged	The relay stays in its current position with activated forced operation.
On	The relay is switched on with activated forced operation.
Off	The relay is switched off with activated forced operation.

Prerequisites for visibility:
- Parameter Forced operation \ Option *Activated 1-bit – 1 active*

7.7.1.4

—

DEPENDENT PARAMETER

Forced operation active "ON" control value

This parameter can be used to set the applicable control value for activated 2-bit forced operation "ON". The control value refers only to the valve for the active operating mode (heating or cooling).

> **Note**
> If basic stage and additional stage are output via the valve outputs in controller mode, the control value for forced operation is a mean value of the control values for basic stage and additional stage. Only the basic stage is activated up to a control value of 50 %. With a control value higher than 50 %, the basic stage is 100 % activated and the additional stage is activated as well.
>
> **Example:**

Control value Forced operation	Control value Basic stage	Control value Additional stage
0 %	0 %	0 %
1 %	2 %	0 %
25 %	50 %	0 %
50 %	100 %	0 %
51 %	100 %	2 %
75 %	100 %	50 %
100 %	100 %	100 %

Tab. 21: Control values

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Forced operation \ Option *Activated 2-bit*

7.7.1.5

—

DEPENDENT PARAMETER

Forced operation active "ON" fan output

This parameter can be used to set the fan speed set for activated 2-bit forced operation "ON".

> **Note**
> The options depend on the FCC/S product version (for continuous fans or 3-speed fans).

> **Note**
> The option *Adopts control value* is available only if, in the parameter , the option *Yes* is selected.

Options	
Unchanged	The fan speed does not change when forced operation is activated.
Adopts control value	The fan speed depends on the valve control value. Automatic mode is active.
1	The fan runs at speed 1.
2	The fan runs at speed 2.
3	The fan runs at speed 3.
33	The ran runs at speed 33 %.
66	The ran runs at speed 66 %.
100	The ran runs at speed 100 %.

Prerequisites for visibility:

- Parameter Forced operation \ Option *Activated 2-bit*

7.7.1.6

—

DEPENDENT PARAMETER

Forced operation active "ON" relay output

This parameter is used to set the state the relay assumes for activated 2-bit forced operation "ON".

> **Note**
> This parameter is not available for product variant FCC/S 1.4.1.1.

> **Note**
> During forced operation, the FCC/S continues to receive telegrams via the ABB i-bus® KNX:
> - Group objects with a lower priority than that of forced operation are ignored.
> - Group objects with a higher priority cancel forced operation.
>
> The fan changes to automatic mode after forced operation is canceled. The control values calculated by the controller are valid.

Options	
Unchanged	The relay stays in its current position with activated forced operation.
On	The relay is switched on with activated forced operation.
Off	The relay is switched off with activated forced operation.

Prerequisites for visibility:

- Parameter Forced operation \ Option *Activated 2-bit*

7.7.1.7

—

DEPENDENT PARAMETER

Forced operation active "OFF" control value

This parameter can be used to set the applicable control value for activated 2-bit forced operation "OFF". The control value refers only to the valve for the active operating mode (heating or cooling).

Note
If basic stage and additional stage are output via the valve outputs in controller mode, the control value for forced operation is a mean value of the control values for basic stage and additional stage. Only the basic stage is activated up to a control value of 50 %. With a control value higher than 50 %, the basic stage is 100 % activated and the additional stage is activated as well.

Example:

Control value Forced operation	Control value Basic stage	Control value Additional stage
0 %	0 %	0 %
1 %	2 %	0 %
25 %	50 %	0 %
50 %	100 %	0 %
51 %	100 %	2 %
75 %	100 %	50 %
100 %	100 %	100 %

Tab. 22: Control values

Options
0 … 100 %

Prerequisites for visibility:

- Parameter Forced operation \ Option *Activated 2-bit*

7.7.1.8

—

DEPENDENT PARAMETER

Forced operation active "OFF" fan output

This parameter can be used to set the fan speed set for activated 2-bit forced operation "OFF".

Note
The options depend on the FCC/S product version (for continuous fans or 3-speed fans).

Note
The option *Adopts control value* is available only if, in the parameter , the option *Yes* is selected.

Options	
Unchanged	The fan speed does not change when forced operation is activated.
Adopts control value	The fan speed depends on the valve control value. Automatic mode is active.
1	The fan runs at speed 1.
2	The fan runs at speed 2.
3	The fan runs at speed 3.
33	The ran runs at speed 33 %.
66	The ran runs at speed 66 %.
100	The ran runs at speed 100 %.

Prerequisites for visibility:

- Parameter Forced operation \ Option *Activated 2-bit*

7.7.1.9

—

DEPENDENT PARAMETER

Forced operation active "OFF" relay output

This parameter can be used to set the state the relay assumes for activated 2-bit forced operation "OFF".

> **Note**
> This parameter is not available for product variant FCC/S 1.4.1.1.

> **Note**
> During forced operation, the FCC/S continues to receive telegrams via the ABB i-bus® KNX:
> - Group objects with a lower priority than that of forced operation are ignored.
> - Group objects with a higher priority cancel forced operation.
>
> The fan changes to automatic mode after forced operation is canceled. The control values calculated by the controller are valid.

Options	
Unchanged	The relay stays in its current position with activated forced operation.
On	The relay is switched on with activated forced operation.
Off	The relay is switched off with activated forced operation.

Prerequisites for visibility:

- Parameter Forced operation \ Option *Activated 2-bit*

7.7.2 Cyclical monitoring

This parameter can be used to activate cyclical monitoring of the group objects.

Options	
Deactivated	The cyclical monitoring is deactivated.
Activated	Cyclical monitoring of the group objects is active. For each group object, it is possible to decide separately whether it is to be monitored. The following dependent parameters are shown: • Temperature input monitoring • Monitor receipt of group object "Operating mode" • 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 group object "Heating/cooling changeover" • Monitor receipt of group object "Control value"

7.7.2.1

—

DEPENDENT PARAMETER

Temperature input monitoring

The reception of a temperature value can be monitored using this parameter.

> **Note**
> For the monitoring of a physical device input to function, the corresponding input must be set for the connection of a temperature sensor. The following settings must be made:
> - Parameter window Input x \ Parameter Input \ Option *Temperature sensor*
> - Parameter window Application \ Parameter window Application parameters \ Parameter Actual temperature receipt \ all options except *Via group object*

Options	
Deactivated	Monitoring is deactivated.
On physical device input a	If the input does not send a valid temperature value after more than one minute, the value in the parameter Control value on input fault becomes valid. The following dependent group objects are displayed: • *Fault Actual temperature (master)* The following dependent parameters are shown: • Control value on input fault
On physical device input b	If the input does not send a valid temperature value after more than one minute, the value in the parameter Control value on input fault becomes valid. The following dependent group objects are displayed: • *Fault Actual temperature (master)* The following dependent parameters are shown: • Control value on input fault
On physical device input c	If the input does not send a valid temperature value after more than one minute, the value in the parameter Control value on input fault becomes valid. The following dependent group objects are displayed: • *Fault Actual temperature (master)* The following dependent parameters are shown: • Control value on input fault
On physical device input d	If the input does not send a valid temperature value after more than one minute, the value in the parameter Control value on input fault becomes valid. The following dependent group objects are displayed: • *Fault Actual temperature (master)* The following dependent parameters are shown: • Control value on input fault
On group object	Group objects *External temperature 1* and *External temperature 2* (only if activated) are monitored. 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: • Cyclical monitoring is ended. • Group object *Fault Actual temperature (master)* is set to Alarm • Value in the parameter Control value after exceeding monitoring time becomes valid The following dependent group objects are displayed: • *Fault Actual temperature (master)* The following dependent parameters are shown: • Time interval for cyclical monitoring • Control value after exceeding monitoring time

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.7.2.1.1

—

DEPENDENT PARAMETER

Control value on input fault

This parameter can be used to specify a control value to be set in case of an error on the monitored device input. The control value applies only to the active operating mode. *Building Protection* mode is active.

The set control value is valid until the error is corrected or a new control value is received via the bus.

Options
0 … 25 … 100 %

Prerequisites for visibility:

- Parameter Temperature input monitoring \ Option *On physical device input a*

7.7.2.1.2

—

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Temperature input monitoring \ Option *On group object*

7.7.2.1.3

—

DEPENDENT PARAMETER

Control value after exceeding monitoring time

This parameter can be used to specify a control value to be set in case the monitoring time is exceeded. The set control value is valid until a new control value is received via the bus.

Note
The standard value depends on the higher-level parameter.

Options
0 … 25 … 100 %

Prerequisites for visibility:

- Parameter Temperature input monitoring \ Option *On group object*

7.7.2.2

—

DEPENDENT PARAMETER

Monitor receipt of group object "Operating mode"

This parameter can be used to activate monitoring of group object *Operating mode normal (master)*.

Note
If no value is received on group object *Operating mode normal (master)* during the set time interval, the following actions are carried out:
- Group object Group object 000001 is set to Alarm
- Value in the parameter Operating mode after exceeding monitoring time becomes valid

Options	
Deactivated	Monitoring of group object *Operating mode normal (master)* is deactivated.
Activated	Group object *Operating mode normal (master)* is monitored. The following dependent group objects are displayed: • Group object 000001 The following dependent parameters are shown: • Time interval for cyclical monitoring • Operating mode after exceeding monitoring time

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.7.2.2.1

—

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Operating mode" \ Option *Activated*

7.7.2.2.2

DEPENDENT PARAMETER

Operating mode after exceeding monitoring time

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

Options	
Building Protection	Building Protection mode is activated.
Comfort	Comfort mode is activated.
Standby	Standby mode is activated.
Economy	Economy mode is activated.

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Operating mode" \ Option *Activated*

7.7.2.3

DEPENDENT PARAMETER

Monitor receipt of group object "Window contact"

This parameter can be used to activate monitoring of group object *Window contact*.

Note
If no value is received on group object *Window contact* during the set time interval, the following actions are carried out:
- Group object *Error "Window contact" receipt* is set to Alarm
- Until a new value is received on group object *Window contact*, the controller is in *Building Protection* mode

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

Prerequisites for visibility:
- Parameter window Application \ Parameter Device function \ Option *Controller* \ Parameter Window status receipt \ Option *Via group object*

7.7.2.3.1

—

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Window contact" \ Option *Activated*

7.7.2.4

—

DEPENDENT PARAMETER

Monitor receipt of group object "Dew point alarm"

This parameter can be used to activate monitoring of group object *Dew point alarm*.

Note
If no value is received on group object *Dew point alarm* during the set time interval, the following actions are carried out:
- Group object *Error "Dew point alarm" receipt* is set to Alarm.
- Until a new value is received on group object *Dew point alarm*, the controller is in *Building Protection* mode.

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

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller* \ Parameter Dew point status receipt \ Option *Via group object*

7.7.2.4.1

—

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Monitor receipt of group object "Dew point alarm" \ Option *Activated*

7.7.2.5

—

DEPENDENT PARAMETER

Monitor receipt of group object "Fill level alarm"

This parameter can be used to activate monitoring of group object *Fill level alarm*.

Note
If no value is received on group object *Fill level alarm* during the set time interval, the following actions are carried out:

- Group object *Error "Fill level alarm" receipt* is set to Alarm.
- Until a new value is received on group object *Fill level alarm*, the controller sets the control value for cooling to 0.

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

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller* \ Parameter *Fill level sensor* \ Option *Via group object*

7.7.2.5.1

—

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Fill level alarm" \ Option *Activated*

7.7.2.6

—

DEPENDENT PARAMETER

Monitor receipt of group object "Heating/cooling changeover"

This parameter can be used to activate monitoring of group object *Heating/cooling changeover*.

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

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

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Heating/cooling changeover \ all options except *Automatic*

7.7.2.6.1

—

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Heating/cooling changeover" \ Option *Activated*

7.7.2.6.2

—

DEPENDENT PARAMETER

Heating/cooling mode when monitoring time exceeded

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

The operating mode remains active until a new value is received on group object *Heating/cooling changeover*.

Options	
Unchanged	The most recently set operating mode remains active.
Heating	*Heating* mode is activated.
Cooling	*Cooling* mode is activated.

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Heating/cooling changeover" \ Option *Activated*

7.7.2.7

DEPENDENT PARAMETER

Monitor receipt of group object "Control value"

This parameter can be used to activate monitoring of the following group objects:
- *Control value Heating*
- *Control value Cooling*

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

Options	
Deactivated	Monitoring of the following group objects is deactivated: • *Control value Heating* • *Control value Cooling*
Activated	The following group objects are monitored: • *Control value Heating* • *Control value Cooling* The following dependent parameters are shown: • Time interval for cyclical monitoring • Control value after exceeding monitoring time

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Actuator device*

7.7.2.7.1

DEPENDENT PARAMETER

Time interval for cyclical monitoring

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

CAUTION
If the monitoring time is too short, this can lead to a high bus load and cause errors. The monitoring time and the sending cycle must be set accordingly.
Recommendation: Time interval for cyclical monitoring ≥ 2 × sending cycle time

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Monitor receipt of group object "Control value" \ Option *Activated*

7.7.2.7.2

DEPENDENT PARAMETER

Control value after exceeding monitoring time

This parameter can be used to specify a control value to be set in case the monitoring time is exceeded. The set control value is valid until a new control value is received via the bus.

Note
The standard value depends on the higher-level parameter.

Options
0 … 25 … 100 %

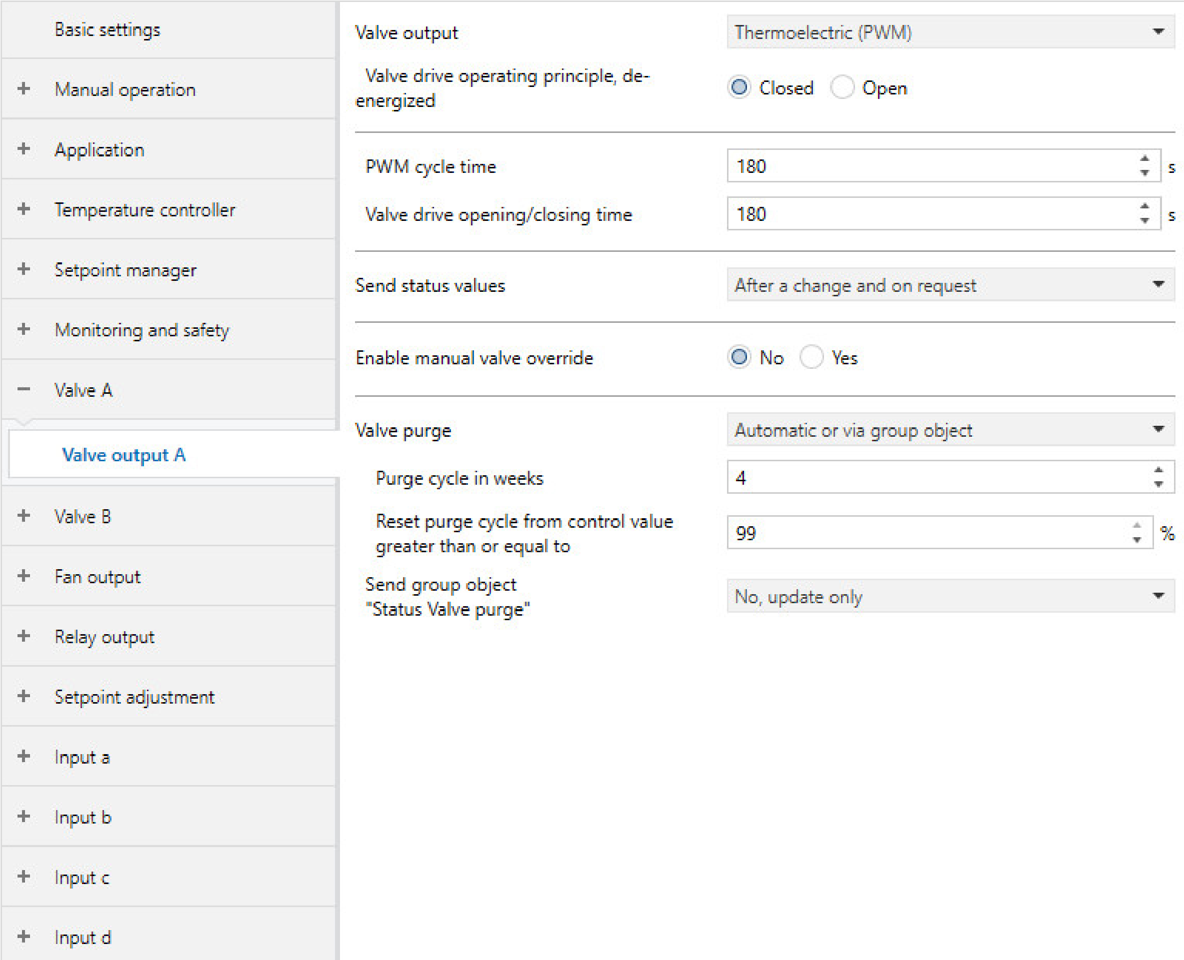
Prerequisites for visibility:

- Parameter Monitor receipt of group object "Control value" \ Option *Activated*

7.8 Parameter window Valve A

7.8.1 Parameter window Valve output A

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



2CDC078021F0218

Fig. 41: Valve output A

Prerequisites for visibility:

- Visible only with the following product variants:
  - FCC/S 1.1.1.1
  - FCC/S 1.1.2.1
  - FCC/S 1.4.1.1
  - FCC/S 1.5.1.1
  - FCC/S 1.5.2.1

Parameter

- Valve output
  - Valve drive operating principle, de-energized
  - PWM cycle time
  - Valve drive opening/closing time
  - Send status values
    - Every
  - Enable manual valve override
  - Valve purge
    - Purge cycle in weeks
    - Reset purge cycle from control value greater than or equal to
    - Send group object "Status Valve purge"
      - Every
  - Reversing time
  - Switch-on time for valve drive from 0 to 100 %
  - Automatic adjustment of valve drive
    - Number of changes until adjustment
  - Open if control value greater than or equal to

7.8.1.1 Valve output

This parameter can be used to set how the valve output is used.

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

Note
The controller control value to be output on the respective valve output is specified in the parameter window Application parameters.

Options	
Thermoelectric (PWM)	The received control value is converted to a PWM signal. The following dependent group objects are displayed: • *Status byte Valve A* • *Status Valve control value A* • *Fault Valve output A* The following dependent parameters are shown: • Valve drive operating principle, de-energized • PWM cycle time • Valve drive opening/closing time • Send status values • Enable manual valve override • Valve purge
Motor-driven (3-point)	Valve outputs A and B are interconnected for activation of the valve drive. Valve A outputs the opening signal and valve B the closing signal. The following dependent group objects are displayed: • *Status byte Valve A* • *Status Valve control value A* • *Fault Valve output A* The following dependent parameters are shown: • Reversing time • Switch-on time for valve drive from 0 to 100 % • Automatic adjustment of valve drive • Send status values • Enable manual valve override • Valve purge
Open/close signal	When the set threshold is reached, the continuous control value is converted to an On signal. The following dependent group objects are displayed: • *Status byte Valve A* • *Status Valve control value A* • *Fault Valve output A* 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 • Enable manual valve override • Valve purge
Deactivated	The output is deactivated.

7.8.1.1.1

—
DEPENDENT PARAMETER

Valve drive operating principle, de-energized

This parameter can be used to set the operating principle of the connected valve drive.

Options	
Closed	The valve is closed if no current flows through the valve drive. The valve is open if current flows through the valve drive.
Open	The valve is open if no current flows through the valve drive. The valve is closed if current flows through the valve drive.

Prerequisites for visibility:

• Parameter Valve output \ Option *Thermoelectric (PWM)*

7.8.1.1.2

—

DEPENDENT PARAMETER

PWM cycle time

This parameter can be used to set the cycle time for pulse width modulation.

Options
10 … 180 … 900 s

Prerequisites for visibility:

- Parameter Valve output \ Option *Thermoelectric (PWM)*

7.8.1.1.3

—

DEPENDENT PARAMETER

Valve drive opening/closing time

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

> **Note**
> The time is listed in the technical data for the valve and corresponds to the total runtime.

Options
10 … 180 … 900 s

Prerequisites for visibility:

- Parameter Valve output \ Option *Thermoelectric (PWM)*

7.8.1.1.4

—

DEPENDENT PARAMETER

Send status values

This parameter can be used to set when the values of the following group objects are sent:

- *Status byte Valve A*
- *Fault Valve output A*
- *Status Valve control value A*

Options	
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change	The status values are sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
After a change or on request	The status values are sent after a change or on request.
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

Prerequisites for visibility:

- Parameter Valve output \ Option *Thermoelectric (PWM)*

7.8.1.1.4.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

ⓘ **Note**
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Send status values \ Option *Cyclically*

7.8.1.1.5

—

DEPENDENT PARAMETER

Enable manual valve override

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

ⓘ **Note**
The value in group object *Override valve control value A* is sent only if manual valve override is enabled via group object *Enable/disable manual valve override A*.

Options	
No	Manual valve override is not enabled.
Yes	Manual override is enabled. The following group objects are displayed: • *Enable/disable manual valve override A* • *Override valve control value A*

Prerequisites for visibility:

- Parameter Valve output \ Option *Thermoelectric (PWM)*

7.8.1.1.6

—

DEPENDENT PARAMETER

Valve purge

This parameter can be used to activate valve purge.

Options	
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 group objects are displayed: • *Status Valve purge A* • *Activate valve purge A* The following dependent parameters are shown: • Purge cycle in weeks • Reset purge cycle from control value greater than or equal to • Send group object "Status Valve purge"
Via group object	The valve purge can be triggered via a group object. The following dependent group objects are displayed: • *Status Valve purge A* • *Activate valve purge A* The following dependent parameters are shown: • Send group object "Status Valve purge"

Prerequisites for visibility:

- Parameter Valve output \ Option *Thermoelectric (PWM)*

7.8.1.1.6.1

—

DEPENDENT PARAMETER

Purge cycle in weeks

This parameter can be used to set the automatic valve purge cycle.

The following events reset the counter for the purge cycle:

- Valve purge performed
- Device commissioning
- Download
- Bus voltage recovery
- Exceeding the value in the parameter Reset purge cycle from control value greater than or equal to

Note
If the purge cycle is triggered for two valves simultaneously, the purges will take place one after the other.

Options
1 … 4 … 12

Prerequisites for visibility:

- Parameter Valve purge \ Option *Automatic or via group object*

7.8.1.1.6.2

—
DEPENDENT PARAMETER

Reset purge cycle from control value greater than or equal to

This parameter can be used to set the control value as of which the purge cycle is reset.

Options
1 … 99 %

Prerequisites for visibility:
- Parameter Valve purge \ Option *Automatic or via group object*

7.8.1.1.6.3

—
DEPENDENT PARAMETER

Send group object "Status Valve purge"

This parameter can be used to set when the telegram value of group object *Status Valve purge A* is sent.

Options	
No, update only	The status value of group object *Status Valve purge A* is updated but is not sent on the bus (ABB i-bus® KNX).
After a change	The status value is sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change or on request	The status values are sent after a change or on request.
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

Prerequisites for visibility:
- Parameter Valve purge \ Option *Automatic or via group object*

7.8.1.1.6.3.1

—
DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

Note
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send group object "Status Valve purge" \ Option *Cyclically*

7.8.1.1.7

—

DEPENDENT PARAMETER

Reversing time

This parameter can be used to set reversing time of the valve drive.

> **Note**
> Observe the technical data for the valve drive.

Options
50 … 500 … 1,000 ms

Prerequisites for visibility:

- Parameter Valve output \ Option *Motor-driven (3-point)*

7.8.1.1.8

—

DEPENDENT PARAMETER

Switch-on time for valve drive from 0 to 100 %

This parameter can be used to set the time the valve drive requires to open the valve completely (from position 0 % to position 100 %). The output must be switched on for this time.

> **Note**
> The time is listed in the technical data for the valve and corresponds to the total runtime.

Options
10 … 120 … 6000 s

Prerequisites for visibility:

- Parameter Valve output \ Option *Motor-driven (3-point)*

7.8.1.1.9

—

DEPENDENT PARAMETER

Automatic adjustment of valve drive

This parameter can be used to activate automatic adjustment.

Options	
No	Automatic adjustment is deactivated.
Yes	Automatic adjustment is activated. The following dependent parameters are shown: • Number of changes until adjustment

Prerequisites for visibility:

- Parameter Valve output \ Option *Motor-driven (3-point)*

7.8.1.1.9.1

—

DEPENDENT PARAMETER

Number of changes until adjustment

This parameter can be used to set the number of changes after which automatic adjustment is performed.

The adjustment counter is incremented by 1 after every change.

Note

The following events trigger an additional adjustment:

- Bus voltage recovery
- ETS reset
- Download
- Reset of a corrected fault (via the *Reset* button or via group object *Fault Reset valve output A*)

Options
30 … 500 … 65,535

Prerequisites for visibility:

- Parameter Automatic adjustment of valve drive \ Option *Yes*

7.8.1.1.10

—

DEPENDENT PARAMETER

Open if control value greater than or equal to

This parameter can be used to set 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.

Options
1 … 100 %

Prerequisites for visibility:

- Parameter Valve output \ Option *Open/close signal*

7.8.2 Parameter window Valve output A (0 ... 10 V)

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

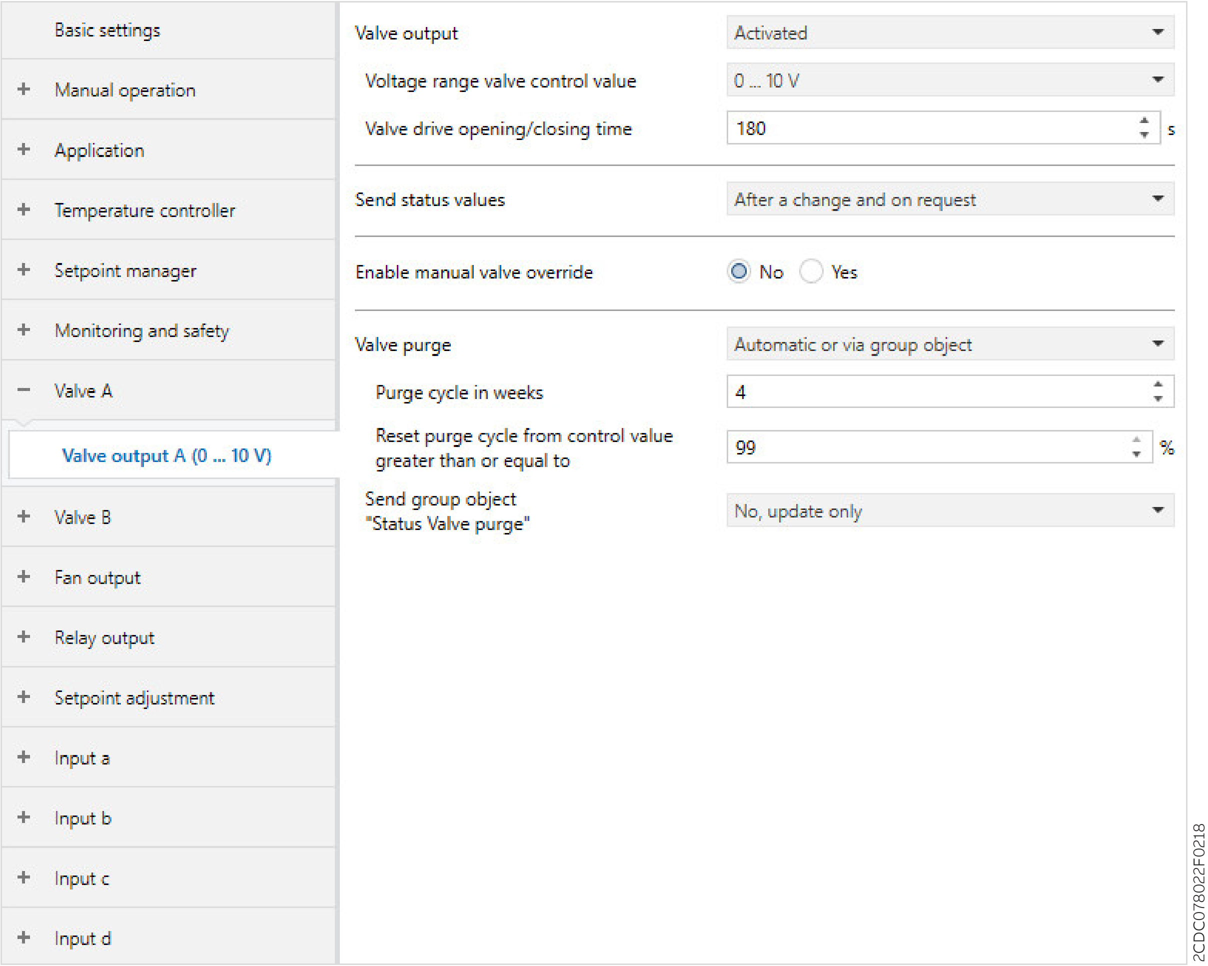


Fig. 42: Valve output A (0 ... 10 V)

Prerequisites for visibility:

- Visible only with the following product variants:
  - FCC/S 1.2.1.1
  - FCC/S 1.2.2.1
  - FCC/S 1.3.1.1
  - FCC/S 1.3.2.1

Parameter

- Valve output
  - Voltage range valve control value
  - Valve drive opening/closing time
  - Send status values
    - Every
  - Enable manual valve override
  - Valve purge
    - Purge cycle in weeks
    - Reset purge cycle from control value greater than or equal to
    - Send group object "Status Valve purge"
      - Every
  - Voltage range for VAV damper control value
  - Reaction after bus voltage recovery, ETS download and ETS reset
    - Control value
  - Send status values
    - Every

7.8.2.1 Valve output

This parameter can be used to set how the valve output is used.

Options	
Activated	The output is used as a control-value output for a 0-10 V valve. The following dependent group objects are displayed: • *Status byte Valve A* • *Status Valve control value A* • *Fault Valve output A* • *Fault Reset valve output A* The following dependent parameters are shown: • Voltage range valve control value • Valve drive opening/closing time • Send status values • Enable manual valve override • Valve purge
Deactivated	The output is deactivated. Control values assigned in the parameter window Application parameters are not output.
Use as VAV damper output	The output is used to activate a damper drive. The control value received via the bus (ABB i-bus® KNX) is output without influence by the controller on the selected voltage range. The following dependent group objects are displayed: • *Control value VAV damper control A* • *Status Valve control value A* The following dependent parameters are shown: • Voltage range for VAV damper control value • Reaction after bus voltage recovery, ETS download and ETS reset • Send status values

7.8.2.1.1

—

DEPENDENT PARAMETER

Voltage range valve control value

This parameter is used to set the voltage range for the valve control value. The control value calculated by the controller is converted to a voltage value according to the selected option.

> **Note**
> Observe the technical data for the valve drive.

Options	
0 … 10 V	The voltage range is 0 … 10 V.
1 … 10 V	The voltage range is 1 … 10 V.
2 … 10 V	The voltage range is 2 … 10 V.
10 … 0 V	The voltage range is 10 … 0 V.

Prerequisites for visibility:
- Parameter Valve output \ Option *Activated*

7.8.2.1.2

—

DEPENDENT PARAMETER

Valve drive opening/closing time

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

> **Note**
> The time is listed in the technical data for the valve and corresponds to the total runtime.

Options
10 … 180 … 900 s

Prerequisites for visibility:
- Parameter Valve output \ Option *Activated*

7.8.2.1.3

—

DEPENDENT PARAMETER

Send status values

This parameter can be used to set when the values of the following group objects are sent:
- *Status byte Valve A*
- *Fault Valve output A*
- *Status Valve control value A*

Options	
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change	The status values are sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
After a change or on request	The status values are sent after a change or on request.
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

Prerequisites for visibility:
- Parameter Valve output \ Option *Activated*

7.8.2.1.3.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

Note
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send status values \ Option *Cyclically*

7.8.2.1.4

—

DEPENDENT PARAMETER

Enable manual valve override

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

> **Note**
> The value in group object *Override valve control value A* is sent only if manual valve override is enabled via group object *Enable/disable manual valve override A*.

Options	
No	Manual valve override is not enabled.
Yes	Manual override is enabled. The following group objects are displayed: • *Enable/disable manual valve override A* • *Override valve control value A*

Prerequisites for visibility:
- Parameter Valve output \ Option *Activated*

7.8.2.1.5

—

DEPENDENT PARAMETER

Valve purge

This parameter can be used to activate valve purge.

Options	
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 group objects are displayed: • *Status Valve purge A* • *Activate valve purge A* The following dependent parameters are shown: • Purge cycle in weeks • Reset purge cycle from control value greater than or equal to • Send group object "Status Valve purge"
Via group object	The valve purge can be triggered via a group object. The following dependent group objects are displayed: • *Status Valve purge A* • *Activate valve purge A* The following dependent parameters are shown: • Send group object "Status Valve purge"

Prerequisites for visibility:
- Parameter Valve output \ Option *Activated*

7.8.2.1.5.1

—

DEPENDENT PARAMETER

Purge cycle in weeks

This parameter can be used to set the automatic valve purge cycle.

The following events reset the counter for the purge cycle:
- Valve purge performed
- Device commissioning
- Download
- Bus voltage recovery
- Exceeding the value in the parameter Reset purge cycle from control value greater than or equal to

> **Note**
> If the purge cycle is triggered for two valves simultaneously, the purges will take place one after the other.

Options
1 … 4 … 12

Prerequisites for visibility:
- Parameter Valve purge \ Option *Automatic or via group object*

7.8.2.1.5.2

—

DEPENDENT PARAMETER

Reset purge cycle from control value greater than or equal to

This parameter can be used to set the control value as of which the purge cycle is reset.

Options
1 … 99 %

Prerequisites for visibility:
- Parameter Valve purge \ Option *Automatic or via group object*

7.8.2.1.5.3

—

DEPENDENT PARAMETER

Send group object "Status Valve purge"

This parameter can be used to set when the telegram value of group object *Status Valve purge A* is sent.

Options	
No, update only	The status value of group object *Status Valve purge A* is updated but is not sent on the bus (ABB i-bus® KNX).
After a change	The status value is sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change or on request	The status values are sent after a change or on request.
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

Prerequisites for visibility:
- Parameter Valve purge \ Option *Automatic or via group object*

7.8.2.1.5.3.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

Note
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send group object "Status Valve purge" \ Option *Cyclically*

7.8.2.1.6

—

DEPENDENT PARAMETER

Voltage range for VAV damper control value

This parameter is used to set the voltage range for the VAV damper control value. The control value calculated by the controller is converted to a voltage value according to the selected option.

Options	
0 … 10 V	The voltage range is 0 … 10 V.
1 … 10 V	The voltage range is 1 … 10 V.
2 … 10 V	The voltage range is 2 … 10 V.
10 … 0 V	The voltage range is 10 … 0 V.

Prerequisites for visibility:
- Parameter Valve output \ Option *Use as VAV damper output*

7.8.2.1.7

—

DEPENDENT PARAMETER

Reaction after bus voltage recovery, ETS download and ETS reset

This parameter can be used to define the reaction of the VAV damper output after bus voltage recovery, ETS download and ETS reset.

Options	
Unchanged	The output outputs the same voltage value after bus voltage recovery, ETS download and ETS reset as before the event.
Selection	The output voltage value after bus voltage recovery, ETS download and ETS reset can be set. The following dependent parameters are shown: • Control value

Prerequisites for visibility:
- Parameter Valve output \ Option *Use as VAV damper output*

7.8.2.1.7.1

—

DEPENDENT PARAMETER

Control value

This parameter can be used to specify a control value. The set control value is valid until the controller has calculated a new control value.

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Reaction after bus voltage recovery, ETS download and ETS reset \ Option *Selection*

7.8.2.1.8

—

DEPENDENT PARAMETER

Send status values

This parameter can be used to set when the values of the following group objects are sent:
- *Status Valve control value A*

Options	
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change	The status values are sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
After a change or on request	The status values are sent after a change or on request.
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

Prerequisites for visibility:
- Parameter Valve output \ Option *Use as VAV damper output*

7.8.2.1.8.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

> **Note**
> The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Send status values \ Option *Cyclically*

7.9 Parameter window Valve B

7.9.1 Parameter window Valve output B

> **Note**
> The parameters for valve output B are the same as for valve output A.

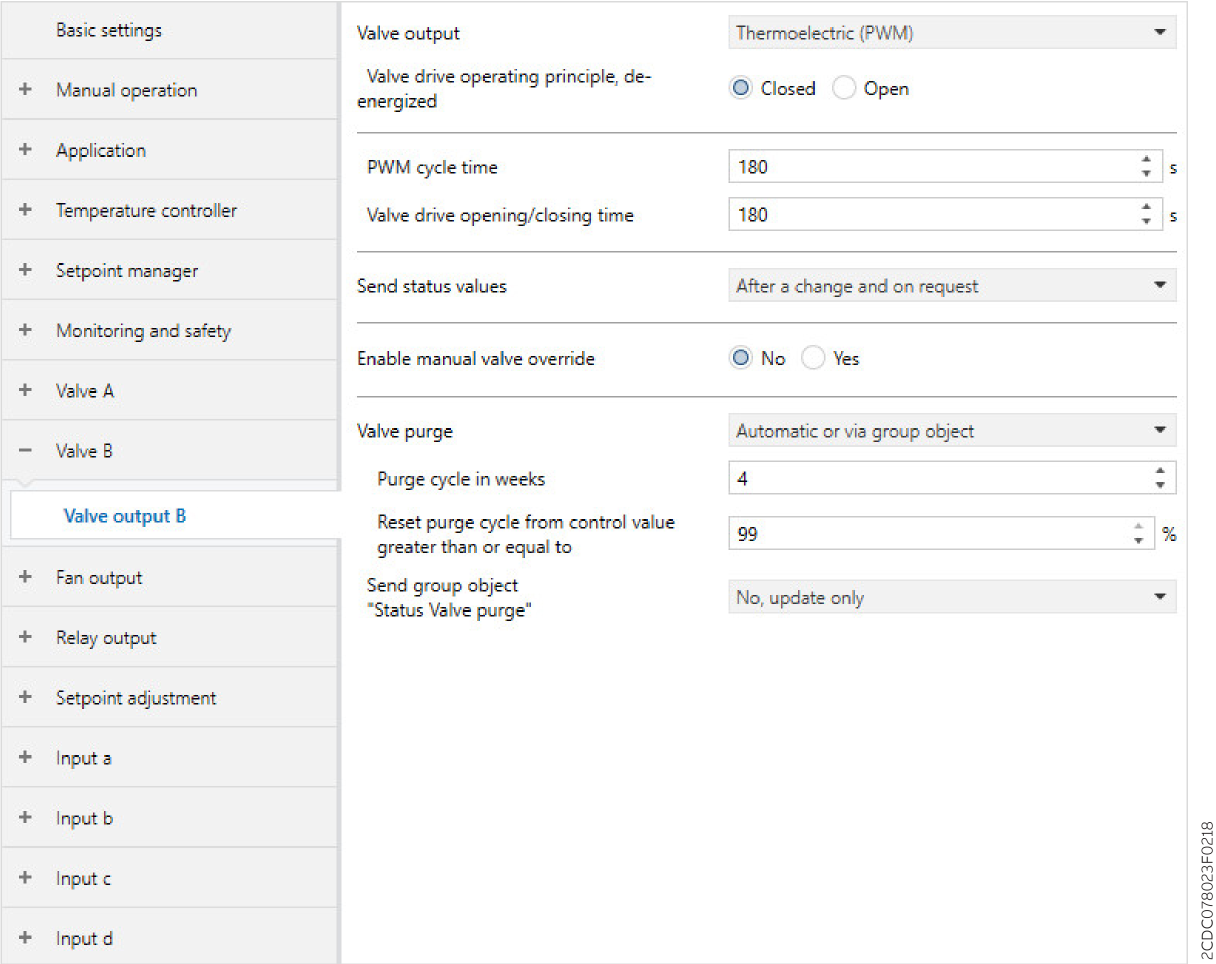
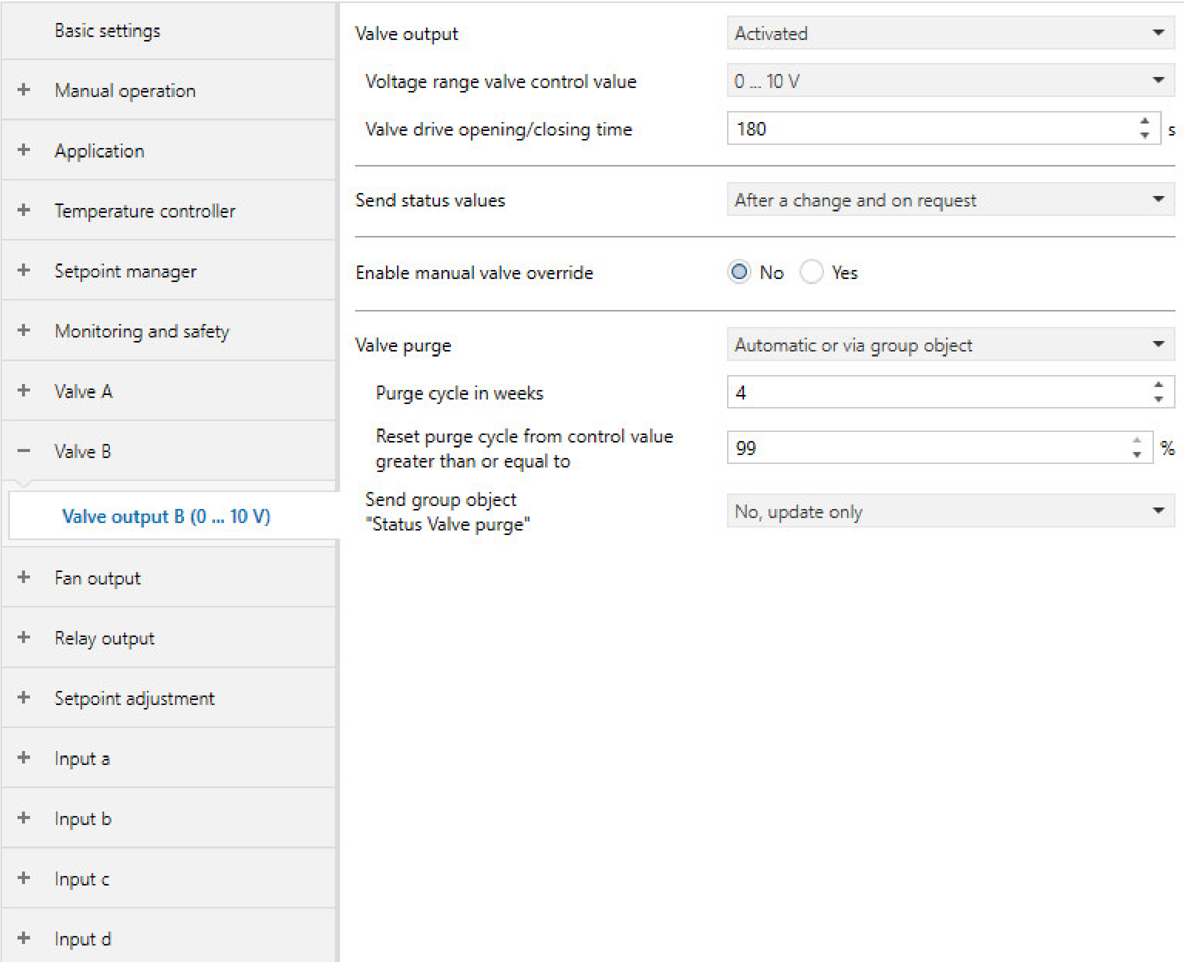


Fig. 43: Parameter window Valve output B

7.9.2 Parameter window Valve output B (0 … 10 V)

> **Note**
> The parameters for valve output B are the same as for valve output A.



2CDC078024F0218

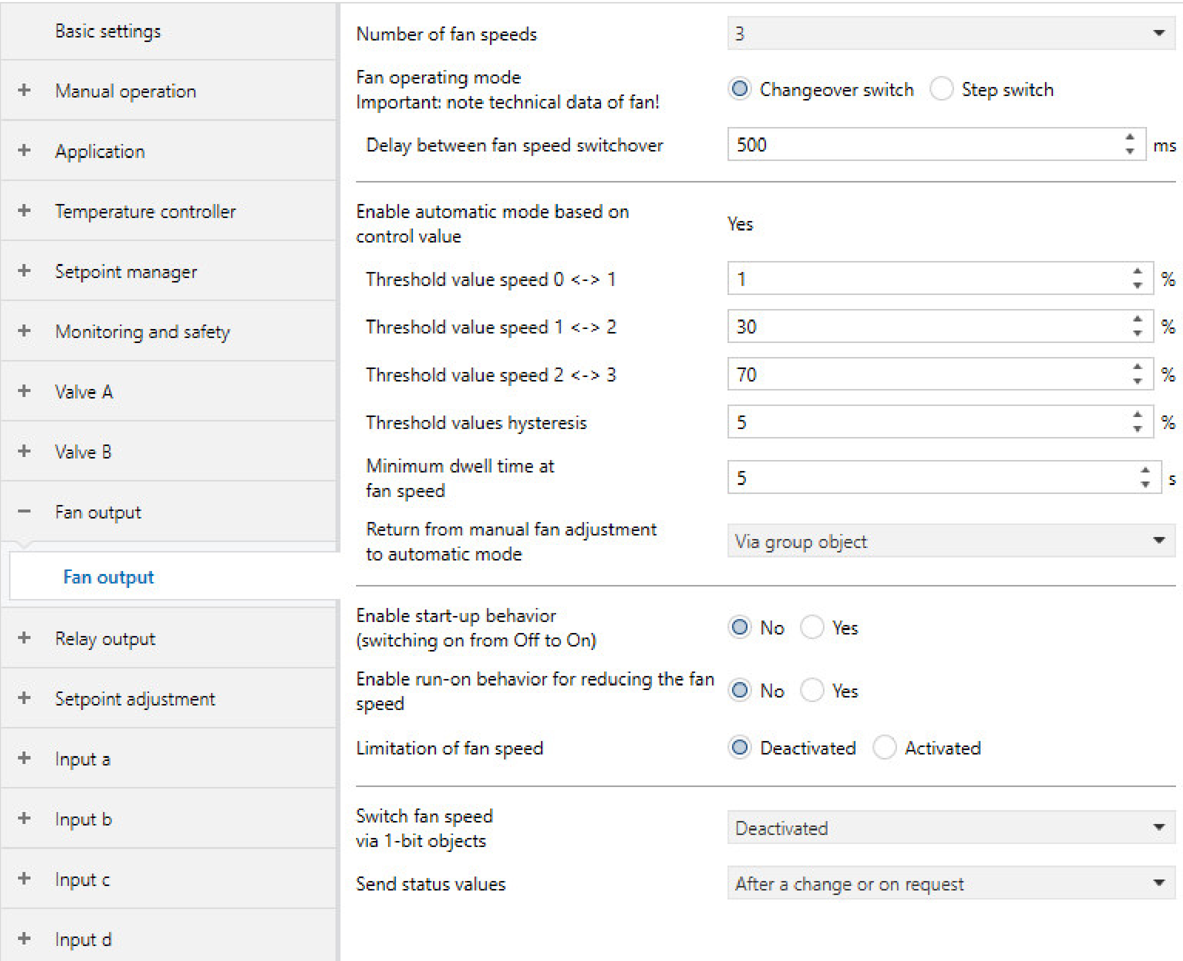
Fig. 44: Parameter window Valve output B

7.10 Parameter window Fan output

7.10.1 Parameter window Fan output

The following settings can be made in this parameter window:

- Fan settings and operating mode
- Thresholds
- Limitation of fan speeds
- Fan speed switching reaction
- Status value sending reaction



2CDC078025F0218

Fig. 45: Parameter window Fan output

Prerequisites for visibility:

Visible for the following product variants:

- FCC/S 1.1.X.1
- FCC/S 1.2.X.1
- FCC/S 1.4.1.1

Parameter

- Number of fan speeds
- Fan mode – important: Observe the technical data for the fan!
  - Delay between fan speed switchover
- Enable automatic mode based on control value
  - Threshold value speed 0 <-> 1
  - Threshold value speed 1 <-> 2
  - Threshold value speed 2 <-> 3
  - Threshold value hysteresis
  - Minimum dwell time at fan speed
  - Return from manual fan adjustment to automatic mode
    - Reset time
- Enable start-up behavior (switch on from Off to On)
  - Switch on at fan speed
  - Minimum dwell time at switch-on speed
- Enable run-on behavior for reducing the fan speed
  - Run-on speed x
- Limitation of fan speed
  - Limitation x
- Switch fan speed via 1-bit group objects
- Send status values
  - Every

7.10.1.1 Number of fan speeds

This parameter can be used to set the number of fan speeds of the activated fan. Accordingly, only the required relay outputs are used to output the control value.

Options	
1	The fan has one speed.
2	The fan has two speeds.
3	The fan has three speeds.

7.10.1.2 Fan mode – important: Observe the technical data for the fan!

This parameter is used to set the fan operating mode. Refer to the technical data of the fan for the operating mode.

Options	
Changeover switch	The fan is parametrized as a changeover switch. The following dependent parameters are shown: • Delay between fan speed switchover
Step switch	The fan is parametrized as a step switch.

7.10.1.2.1 —

DEPENDENT PARAMETER

Delay between fan speed switchover

This parameter can be used to set a delay for switching the fan speeds. The delay time is a fan-specific value and is always taken into account.

Options
50 … 500 … 5,000 ms

Prerequisites for visibility:

- Parameter Fan mode – important: Observe the technical data for the fan! \ Option *Changeover switch*

7.10.1.3 Enable automatic mode based on control value

This parameter can be used to enable automatic fan operation based on the control value.

Note
In order to ensure correct functioning of the FCC/S, automatic mode cannot be deactivated in actuator mode.

Note
If the basic and additional stages are operated in a fan coil unit in actuator mode, only the control values of the basic stage will be processed.
In order to be able to process the additional-stage control values, the additional stage must be operated with a separate fan coil unit. Automatic mode must be activated in the control unit of this fan coil unit.

Options	
Yes	Automatic mode is activated. The following dependent group objects are displayed: • *Activate/deactivate fan automatic* • *Status Fan automatic* The following dependent parameters are shown: • Threshold value speed 0 <-> 1 • Threshold value speed 1 <-> 2 • Threshold value speed 2 <-> 3 • Threshold value hysteresis • Minimum dwell time at fan speed • Return from manual fan adjustment to automatic mode
No	Automatic mode is deactivated. The fan reacts only to control via the fan objects.

7.10.1.3.1

—

DEPENDENT PARAMETER

Threshold value speed 0 <-> 1

This parameter can be used to set the threshold from which fan speed 1 is switched on.

Fan speed 1 is switched on if the heating/cooling stage control value is greater than or equal to the set threshold.

If the threshold 0 % is set, the fan will be switched off only when the control value for activating the heating/cooling stages is 0 %.

Note
Heating/cooling without active fan is not very efficient. This is why the threshold for switching on fan speed 1 is limited to max. 10 %.

Options
0 … 1 … 10 %

Prerequisites for visibility:
- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.1.3.2

—

DEPENDENT PARAMETER

Threshold value speed 1 <-> 2

This parameter can be used to set the threshold from which fan speed 2 is switched on.

Fan speed 2 is switched on if the heating/cooling stage control value is greater than or equal to the set threshold.

Options
1 … 30 … 100 %

Prerequisites for visibility:

- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.1.3.3

—

DEPENDENT PARAMETER

Threshold value speed 2 <-> 3

This parameter can be used to set the threshold from which fan speed 3 is switched on.

Fan speed 3 is switched on if the heating/cooling stage control value is greater than or equal to the set threshold.

Options
1 … 70 … 100 %

Prerequisites for visibility:

- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.1.3.4

—

DEPENDENT PARAMETER

Threshold value hysteresis

This parameter can be used to set the threshold value hysteresis.

Note
The hysteresis does not apply to the threshold value for switching between fan speeds 0 and 1.

Options
0 … 5 … 20 %

Prerequisites for visibility:

- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.1.3.5

—

DEPENDENT PARAMETER

Minimum dwell time at fan speed

This parameter can be used to set the minimum time that the fan dwells at each fan speed.

The dwell time is taken into account only in automatic operation.

When the value 0 is set, the minimum dwell time will be deactivated.

> **Note**
> Refer to the technical data for the minimum relay switching times.

Options
0 … 5 … 600 s

Prerequisites for visibility:

- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.1.3.6

—

DEPENDENT PARAMETER

Return from manual fan adjustment to automatic mode

This parameter can be used to set what is triggered upon return to automatic mode from manual fan adjustment.

Options	
Via group object	Return to automatic mode takes place only via group object *Activate/deactivate fan automatic*.
Automatic (time)	Return to automatic mode takes place automatically after a set time. The following dependent parameters are shown: • Reset time
Via group object or automatically (time)	Return to automatic mode takes place via group object *Activate/deactivate fan automatic* or after the set time. The following dependent parameters are shown: • Reset time

Prerequisites for visibility:

- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.1.3.6.1

—

DEPENDENT PARAMETER

Reset time

This parameter can be used to set the time after which the fan changes from manual adjustment to automatic mode.

The time restarts after each manual fan adjustment.

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

Prerequisites for visibility:

- Parameter Return from manual fan adjustment to automatic mode \ Option *Automatic (time)*

7.10.1.4 Enable start-up behavior (switch on from Off to On)

This parameter can be used to set whether the fan starts at a preset fan speed from the OFF state.

Note
The start-up behavior is a technical property of the fan, and it is prioritized over a limitation or forced operation.
Forced operation remains valid and is taken into account.
The fan will switch off when an OFF command is received during the start-up time.

Options	
No	The preset start-up behavior is not enabled.
Yes	The preset start-up behavior is enabled. The following dependent parameters are shown: • Switch on at fan speed • Minimum dwell time at switch-on speed

7.10.1.4.1

—

DEPENDENT PARAMETER

Switch on at fan speed

This parameter can be used to set the start-up speed for the fans.

Note
High torque is required to ensure that the fan starts up. To ensure high torque, the fan must be started with a high fan speed.

Note
The preset fan speed is set directly with a changeover switch. The fan speeds are set one by one with a step switch.

Note
The dwell time at a fan speed is taken into account only after the start-up phase.

Note
Depending on the product variant, not all options are available.

Options
1
2
3
0 … 30 … 100 %

Prerequisites for visibility:
- Parameter Enable start-up behavior (switch on from Off to On) \ Option *Yes*

7.10.1.4.2

—
DEPENDENT PARAMETER

Minimum dwell time at switch-on speed

This parameter can be used to set the minimum time that the fan dwells at the switch-on speed.

Options
0 … 5 … 600 s

Prerequisites for visibility:
- Parameter Enable start-up behavior (switch on from Off to On) \ Option *Yes*

7.10.1.5 Enable run-on behavior for reducing the fan speed

This parameter can be used to set the fan run-on time when the fan speed is reduced.

Note
When several fan speeds are changed, all run-on times are passed through one by one. The run-on times are added.

Note
Run-on occurs independently of how the the fan speed was changed (automatic operation, direct operation, manual specification, fan switch-off).

Options	
No	The fan run-on behavior is deactivated.
Yes	The fan run-on behavior is active. If the fan is changed to a lower fan speed, it will remain at the previous speed for the set time. Only afterward will it slow down by one speed. The following dependent parameters are shown: • Run-on speed x

7.10.1.5.1

—
DEPENDENT PARAMETER

Run-on speed x

This parameter can be used to set the run-on time of the individual fan speeds.

The description applies to the following parameters:
- Run-on speed 1
- Run-on speed 2
- Run-on speed 3

Note
A run-on time of 0 seconds means that run-on is deactivated.

Options
0 … 20 … 600 s

Prerequisites for visibility:
- Parameter Enable run-on behavior for reducing the fan speed \ Option *Yes*

7.10.1.6 Limitation of fan speed

This parameter can be used to activate limitation of the fan speed.

Options	
Deactivated	Fan speed limitation is deactivated.
Activated	Fan speed limitation is activated. The following dependent parameters are shown: • Limitation x

7.10.1.6.1

DEPENDENT PARAMETER

Limitation x

This parameter can be used to set the selectable fan speeds when limitation is active. The limitations apply in manual and automatic modes.

The description applies to the following parameters:
- Limitation 1
- Limitation 2
- Limitation 3

The limitation priorities correspond to the listed order. In other words, limitation 1 has the highest priority and limitation 3 the lowest.

The following points apply to all limitations:
- If a fan speed range is limited, limited control is additionally possible.
- Limitation will be activated when a telegram with the value 1 is received on group object *Limitation x*. Limitation remains active until a telegram with the value 0 is received.
- When limitation is active, the fan will run at the fan speed set in this parameter, irrespective of the control value. When the speed is limited to a range, the fan will run at the fan speed closest to the control value.
- After deactivation of limitation, the control value will be recalculated and the corresponding fan speed will be set.

Note
The fan start-up behavior takes priority over limitation of fan speed. Despite active limitation, the fan speed set in the parameter Switch on at fan speed is set at first.
Example:
- Start-up behavior: Fan speed 3
- Limitation: Fan speed 2
- Control value: Fan speed 1

When the fan is switched on, fan speed 3 is set at first. Fan speed 2 is set after the minimum dwell time expires. The requested fan speed 1 will not be set due to the limitation.

Options	
Unchanged	If limitation is activated, the fan speed will not be changed.
Off	The fan is switched off. The fan cannot be switched on while limitation is active.
Off, 1	The fan will be limited to fan speed 1 and the OFF state.
Off, 1, 2	The fan will be limited to the fan speeds 1, 2 and the OFF state.
Off, 1, 2, 3	If limitation is active, all fan speeds can still be set.
1	The fan is limited to fan speed 1.
1, 2	The fan is limited to fan speeds 1 and 2.
1, 2, 3	The fan will be limited to the fan speeds 1, 2 and 3.
2	The fan is limited to fan speed 2.
2, 3	The fan is limited to fan speeds 2 and 3.
3	The fan is limited to fan speed 3.

Prerequisites for visibility:
- Parameter Limitation of fan speed \ Option *Activated*

7.10.1.7 Switch fan speed via 1-bit group objects

This parameter can be used to set whether the fan speeds are switched via 1-bit group objects.

Only the group objects of the fan speeds used will be enabled (→ Number of fan speeds, Page 211).

Note
If the group objects are sent cyclically or simultaneously, the option *Switch off to any 1-bit fan speed using "0"* can lead to the fan switching on only briefly or not at all.

Options	
Deactivated	Switching the fan speeds via group objects is deactivated.
Switch off to active 1-bit fan speed using "0"	When this option is selected, the fan will be switched off only if the fan speed is active. The following group objects are displayed: • *Switch fan speed 1* • *Switch fan speed 2* • *Switch fan speed 3* • *Status Fan speed 1* • *Status Fan speed 2* • *Status Fan speed 3*
Switch off to any 1-bit fan speed using "0"	When this option is selected, the fan will be switched off independently of the active fan speed. The following group objects are displayed: • *Switch fan speed 1* • *Switch fan speed 2* • *Switch fan speed 3* • *Status Fan speed 1* • *Status Fan speed 2* • *Status Fan speed 3*

7.10.1.8 Send status values

This parameter can be used to set when the values of the following group objects are sent:
- *Status Fan On/Off*
- *Status Fan speed*
- *Status Fan speed 1*
- *Status Fan speed 2*
- *Status Fan speed 3*
- *Status Fan automatic*

Note
The following group objects are hidden when the parameter Switch fan speed via 1-bit group objects is deactivated:
- *Status Fan speed 1*
- *Status Fan speed 2*
- *Status Fan speed 3*

Options	
After a change	The status value is sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
After a change or cyclically	The status values are sent after a change or cyclically. The following dependent parameters are shown: • Every
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change or on request	The status values are sent after a change or on request.
On request or cyclically	The status values are sent on request or cyclically. The following dependent parameters are shown: • Every
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

7.10.1.8.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

Note
The standard value depends on the higher-level parameter.

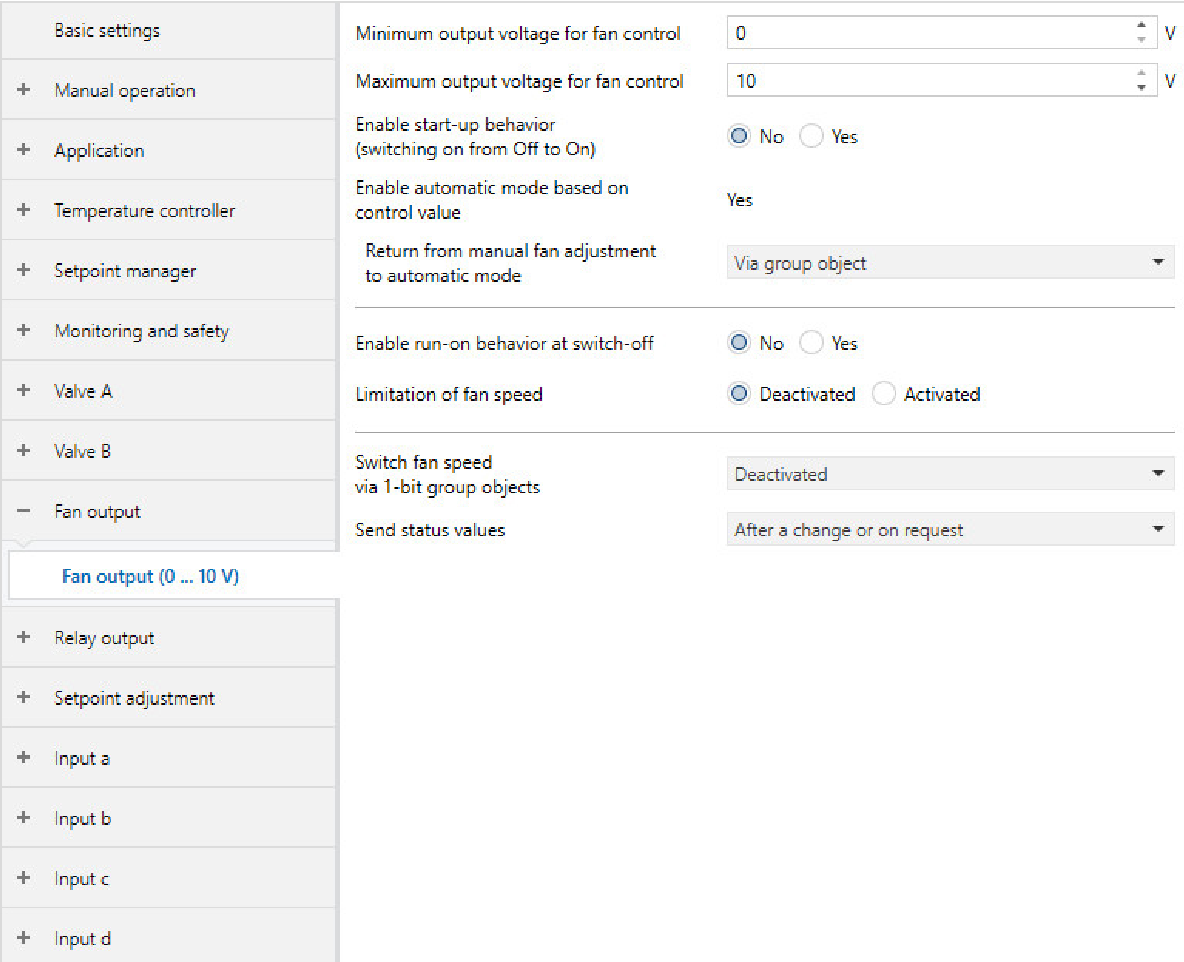
Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Send status values \ Option *Cyclically*

7.10.2 Parameter window Fan output (0 … 10 V)

The following settings can be made in this parameter window:
- Fan settings
- Limitation of fan speeds
- Fan speed switching reaction
- Status value sending reaction



2CDC078026F0218

Fig. 46: Parameter window Fan output

Prerequisites for visibility:
Visible for the following product variants:
- FCC/S 1.3.X.1
- FCC/S 1.5.X.1

Parameter
- Minimum output voltage for fan control
- Maximum output voltage for fan control
- Enable start-up behavior (switch on from Off to On)
  - Switch on at fan speed
  - Minimum dwell time at switch-on speed
- Enable automatic mode based on control value
  - Return from manual fan adjustment to automatic mode
    - Reset time
- Enable run-on behavior at switch-off
  - Run-on time at fan speed 20 %
- Limitation of fan speed
  - Limitation x lower limit
  - Limitation x upper limit
- Switch fan speed via 1-bit group objects
- Send status values
  - Every

7.10.2.1 Minimum output voltage for fan control

This parameter can be used to set the minimum output voltage for activating the fan. The fan is off (fan speed 0 %) when the output voltage is 0 V.

Note
The minimum output voltage must not be higher than the maximum output voltage.

Options
0 … 10 V

7.10.2.2 Maximum output voltage for fan control

This parameter can be used to set the maximum output voltage for activating the fan. The fan always runs at maximum speed at the maximum output voltage.

Note
Observe the technical data for the fan.

Options
0 … 10 V

7.10.2.3 Enable start-up behavior (switch on from Off to On)

This parameter can be used to set whether the fan starts at a preset fan speed from the OFF state.

Note
The start-up behavior is a technical property of the fan, and it is prioritized over a limitation or forced operation.
Forced operation remains valid and is taken into account.
The fan will switch off when an OFF command is received during the start-up time.

Options	
No	The preset start-up behavior is not enabled.
Yes	The preset start-up behavior is enabled. The following dependent parameters are shown: • Switch on at fan speed • Minimum dwell time at switch-on speed

7.10.2.3.1 —

DEPENDENT PARAMETER

Switch on at fan speed

This parameter can be used to set the start-up speed for the fans.

Note
High torque is required to ensure that the fan starts up. To ensure high torque, the fan must be started with a high fan speed.

Note
The preset fan speed is set directly with a changeover switch. The fan speeds are set one by one with a step switch.

Note
The dwell time at a fan speed is taken into account only after the start-up phase.

Note
Depending on the product variant, not all options are available.

Options
1
2
3
0 … 30 … 100 %

Prerequisites for visibility:
- Parameter Enable start-up behavior (switch on from Off to On) \ Option *Yes*

7.10.2.3.2

—

DEPENDENT PARAMETER

Minimum dwell time at switch-on speed

This parameter can be used to set the minimum time that the fan dwells at the switch-on speed.

Options
0 … 5 … 600 s

Prerequisites for visibility:
- Parameter Enable start-up behavior (switch on from Off to On) \ Option *Yes*

7.10.2.4 Enable automatic mode based on control value

This parameter can be used to enable automatic fan operation based on the control value.

Note
In order to ensure correct functioning of the FCC/S, automatic mode cannot be deactivated in actuator mode.

Note
If the basic and additional stages are operated in a fan coil unit in actuator mode, only the control values of the basic stage will be processed.
In order to be able to process the additional-stage control values, the additional stage must be operated with a separate fan coil unit. Automatic mode must be activated in the control unit of this fan coil unit.

Options	
Yes	Automatic mode is activated. The following dependent group objects are displayed: • *Activate/deactivate fan automatic* • *Status Fan automatic* The following dependent parameters are shown: • Return from manual fan adjustment to automatic mode
No	Automatic mode is deactivated. The fan reacts only to control via the fan objects.

7.10.2.4.1

—

DEPENDENT PARAMETER

Return from manual fan adjustment to automatic mode

This parameter can be used to set what is triggered upon return to automatic mode from manual fan adjustment.

Options	
Via group object	Return to automatic mode takes place only via group object *Activate/deactivate fan automatic*.
Automatic (time)	Return to automatic mode takes place automatically after a set time. The following dependent parameters are shown: • Reset time
Via group object or automatically (time)	Return to automatic mode takes place via group object *Activate/deactivate fan automatic* or after the set time. The following dependent parameters are shown: • Reset time

Prerequisites for visibility:
- Parameter Enable automatic mode based on control value \ Option *Yes*

7.10.2.4.1.1

—

DEPENDENT PARAMETER

Reset time

This parameter can be used to set the time after which the fan changes from manual adjustment to automatic mode.

The time restarts after each manual fan adjustment.

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

Prerequisites for visibility:

- Parameter Return from manual fan adjustment to automatic mode \ Option *Automatic (time)*

7.10.2.5 Enable run-on behavior at switch-off

This parameter can be used to activate the fan run-on time on switch-off.

> **Note**
> Run-on occurs independently of how the the fan speed was changed (automatic operation, direct operation, manual specification, fan switch-off).

Options	
No	The fan run-on behavior is deactivated.
Yes	The fan run-on behavior is active. If the fan is running at a fan speed higher than 20 % when it is switched off, the run-on behavior will be activated. In order to remove the remaining heat from the fan coil unit, the fan will continue to run at a fan speed of 20 % for the set run-on time. The following dependent parameters are shown: • Run-on time at fan speed 20 %

7.10.2.5.1

—

DEPENDENT PARAMETER

Run-on time at fan speed 20 %

This parameter can be used to set the run-on time after fan switch-off. The fan runs at 20% fan speed after it is switched off.

> **Note**
> A run-on time of 0 seconds means that run-on is deactivated.

Options
0 … 20 … 600 s

Prerequisites for visibility:

- Parameter Enable run-on behavior at switch-off \ Option *Yes*

7.10.2.6 Limitation of fan speed

This parameter is used to activate fan speed limitation.

> **Note**
> In order to ensure limitation, the lower limit value must be less than or equal to the upper limit value. If the same value is selected for the upper and lower limits, the fan will be permanently set to this speed.

Options	
Deactivated	Fan speed limitation is deactivated.
Activated	Fan speed limitation is activated. The following dependent parameters are shown: • Limitation x lower limit • Limitation x upper limit

7.10.2.6.1

—
DEPENDENT PARAMETER

Limitation x lower limit

This parameter can be used to set the fan speed that must not be fallen below.

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Limitation of fan speed \ Option *Activated*

7.10.2.6.2

—
DEPENDENT PARAMETER

Limitation x upper limit

This parameter can be used to set the fan speed that must not be exceeded.

Options
0 … 100 %

Prerequisites for visibility:
- Parameter Limitation of fan speed \ Option *Activated*

7.10.2.7 Switch fan speed via 1-bit group objects

This parameter can be used to set whether the fan speeds are switched via 1-bit group objects.

Only the group objects of the fan speeds used will be enabled (→ Number of fan speeds, Page 211).

Note
If the group objects are sent cyclically or simultaneously, the option *Switch off to any 1-bit fan speed using "0"* can lead to the fan switching on only briefly or not at all.

Options	
Deactivated	Switching the fan speeds via group objects is deactivated.
Switch off to active 1-bit fan speed using "0"	When this option is selected, the fan will be switched off only if the fan speed is active. The following group objects are displayed: • *Switch fan speed 1* • *Switch fan speed 2* • *Switch fan speed 3* • *Status Fan speed 1* • *Status Fan speed 2* • *Status Fan speed 3*
Switch off to any 1-bit fan speed using "0"	When this option is selected, the fan will be switched off independently of the active fan speed. The following group objects are displayed: • *Switch fan speed 1* • *Switch fan speed 2* • *Switch fan speed 3* • *Status Fan speed 1* • *Status Fan speed 2* • *Status Fan speed 3*

7.10.2.8 Send status values

This parameter can be used to set when the values of the following group objects are sent:
- *Status Fan On/Off*
- *Status Fan speed*
- *Status Fan speed 1*
- *Status Fan speed 2*
- *Status Fan speed 3*
- *Status Fan automatic*

Note
The following group objects are hidden when the parameter Switch fan speed via 1-bit group objects is deactivated:
- *Status Fan speed 1*
- *Status Fan speed 2*
- *Status Fan speed 3*

Options	
After a change	The status value is sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
After a change or cyclically	The status values are sent after a change or cyclically. The following dependent parameters are shown: • Every
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change or on request	The status values are sent after a change or on request.
On request or cyclically	The status values are sent on request or cyclically. The following dependent parameters are shown: • Every
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

7.10.2.8.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

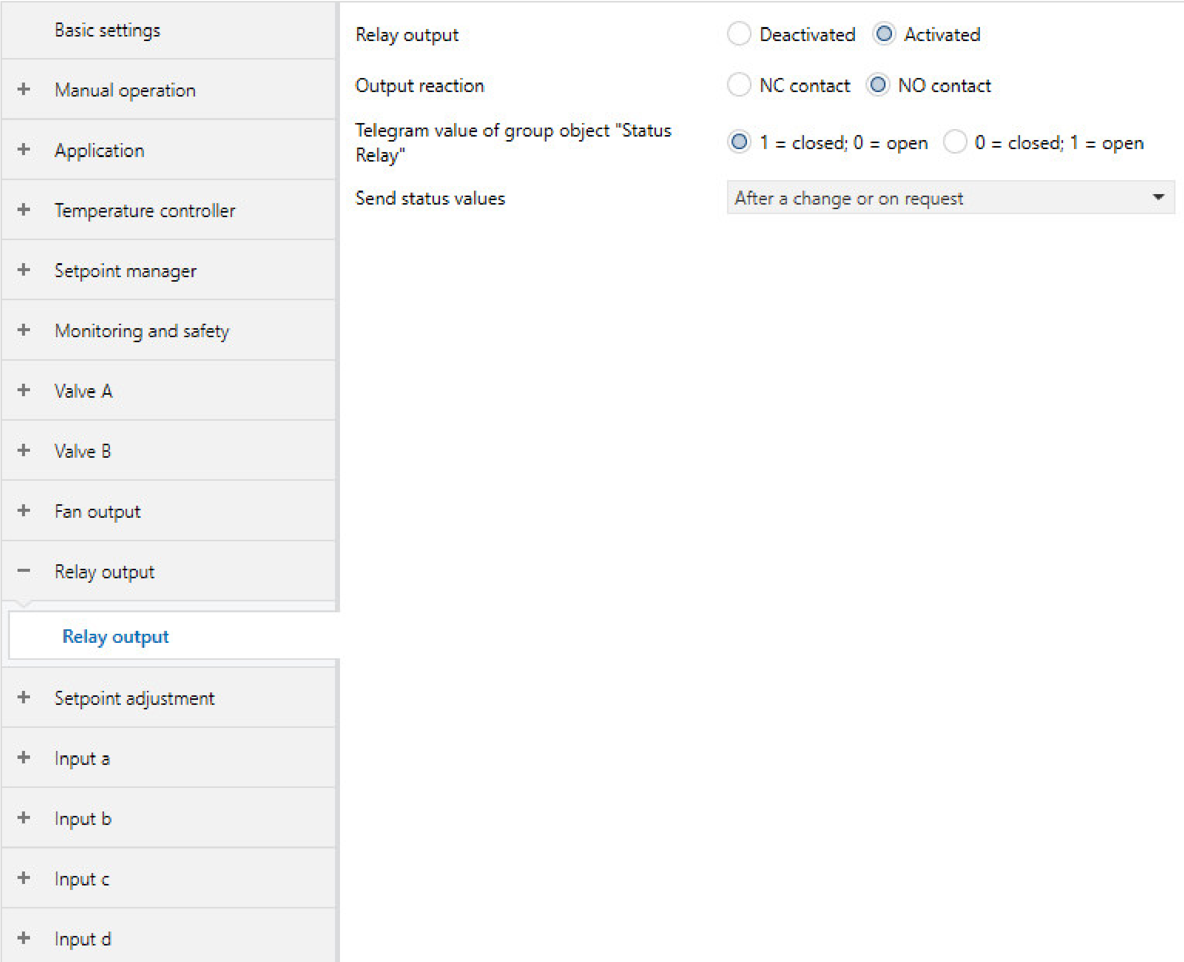
Note
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send status values \ Option *Cyclically*

7.11 Parameter window Relay output

The following settings can be made in this parameter window:
- Reaction of relay output



2CDC078027F0218

Fig. 47: Parameter window Relay output

Parameter
- Relay output
  - Output reaction
  - Telegram value of group object "Status Relay"
  - Send status values
    - Every

7.11.1 Relay output

This parameter can be used to activate the relay output.

CAUTION – Device damage due to great heat
If the relay output may be switched independently of the fan speed, it is possible to switch on the heater even when the fan is switched off. Heated air accumulates in the heater if the fan is not switched on. This can result in device damage or a fire.
▸ To avoid overheating the heater, install a temperature monitoring system with mechanical shut-off device.

Note
To prevent the fan coil unit from overheating, relay switch-on with inactive fan can be deactivated in the parameter Switch relay output independently of fan speed (including when fan = 0).

Options	
Deactivated	The relay cannot be switched. The dependent group objects are hidden.
Activated	The controller can switch the relay. The following dependent group objects are displayed: • *Status Relay* • *Switch relay* The following dependent parameters are shown: • Output reaction • Telegram value of group object "Status Relay" • Send status values

7.11.1.1

—

DEPENDENT PARAMETER

Output reaction

This parameter sets whether the output operates as a normally closed contact or normally open contact.

Options	
NO contact	The relay output is used as a normally open contact.
NC contact	The relay output is used as a normally closed contact.

Prerequisites for visibility:
- Parameter Relay output \ Option *Activated*

7.11.1.2

—

DEPENDENT PARAMETER

Telegram value of group object "Status Relay"

This parameter can be used to set how the telegram value is interpreted in the group object *Status Relay*.

Options	
1 = closed, 0 = open	Telegram value 1 indicates that the relay is closed. Telegram value 0 indicates that the relay is open.
0 = closed, 1 = open	Telegram value 1 indicates that the relay is open. Telegram value 0 indicates that the relay is closed.

Prerequisites for visibility:
- Parameter Relay output \ Option *Activated*

7.11.1.3

—

DEPENDENT PARAMETER

Send status values

This parameter can be used to set when the values of the following group objects are sent:

- *Status Relay*

Options	
After a change	The status value is sent when the group object changes.
Cyclically	The status values are sent automatically after a selectable time. The following dependent parameters are shown: • Every
After a change or cyclically	The status values are sent after a change or cyclically. The following dependent parameters are shown: • Every
On request	The status values are sent when the corresponding value (0 or 1) is sent on group object *Request status values*.
After a change or on request	The status values are sent after a change or on request.
On request or cyclically	The status values are sent on request or cyclically. The following dependent parameters are shown: • Every
After a change, on request or cyclically	The status values are sent after a change, on request or cyclically.

Prerequisites for visibility:

- Parameter Relay output \ Option *Activated*

7.11.1.3.1

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

Note
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Send status values \ Option *Cyclically*

7.12 Parameter window Setpoint adjustment

The following settings can be made in this parameter window:

- Parametrization of setpoint adjustment
- Selection of data point types for setpoint and fan adjustment

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

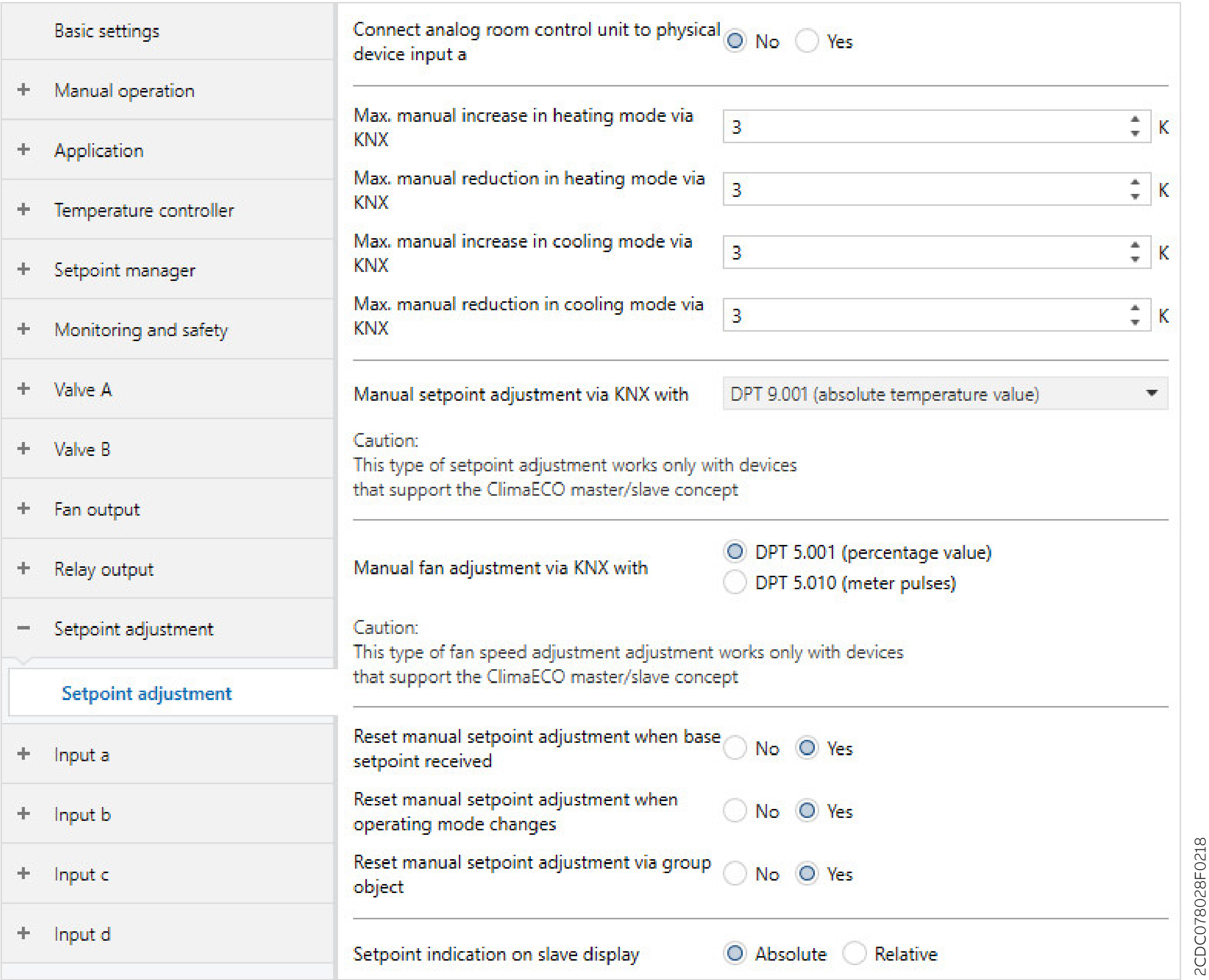


Fig. 48: Parameter window Setpoint adjustment

Parameter

- Connect analog room control unit to physical device input a
  - 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
  - Manual setpoint adjustment via KNX with
  - Manual fan adjustment via KNX with
  - 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
  - Maximum setpoint increase
  - Maximum setpoint reduction

7.12.1 Connect analog room control unit to physical device input a

This parameter can be used to set whether an analog room control unit is connected to input a.

For basic information on using an analog room control unit: → Use of an analog room control unit, Page 305.

> **Note**
> If an analog room control unit is connected in actuator mode, setpoint adjustment of the FCC/S 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.

Options	
No	An analog room control unit is not connected to input a. The following dependent parameters are shown only if the device is in controller mode (→ Device function, Page 91). 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 • Manual setpoint adjustment via KNX with • Manual fan adjustment via KNX with • 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. The dependent parameters are displayed according to the settings in the parameter Device function. 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 of the FCC/S. Setpoint adjustment is performed via the following group objects in actuator mode: • *Request setpoint adjustment (slave)* • *Request setpoint adjustment (slave)* • *Request fan speed (slave)* • *Request fan speed (slave)* • *Request fan manually (slave)* The following dependent parameters are shown: • Maximum setpoint increase • Maximum setpoint reduction • Manual setpoint adjustment via KNX with • Manual fan adjustment via KNX with

7.12.1.1

—

DEPENDENT PARAMETER

Max. manual increase in heating mode via KNX

This parameter can be used to limit the value by which the setpoint *Comfort heating* is increased via group object *Request setpoint adjustment (master)*.

The limitation will become active when the device receives a value that is larger than the value set here. When limitation is active, the maximum increase is confirmed on group object *Confirm setpoint adjustment (master)*.

Options
0 … 3 … 9 K

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.2

—
DEPENDENT PARAMETER

Max. manual reduction in heating mode via KNX

This parameter can be used to limit the value by which the setpoint *Comfort heating* is reduced via group object *Request setpoint adjustment (master)*.

The limitation will become active when the device receives a value that is larger than the value set here. When limitation is active, the maximum increase is confirmed on group object *Confirm setpoint adjustment (master)*.

Options
0 … 3 … 9 K

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.3

—
DEPENDENT PARAMETER

Max. manual increase in cooling mode via KNX

This parameter can be used to limit the value by which the setpoint *Comfort cooling* is increased via the group object.

The limitation will become active when the device receives a value that is larger than the value set here. When limitation is active, the maximum increase is confirmed on group object *Confirm setpoint adjustment (master)*.

Options
0 … 3 … 9 K

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.4

—
DEPENDENT PARAMETER

Max. manual reduction in cooling mode via KNX

This parameter can be used to limit the value by which the setpoint *Comfort cooling* is reduced via group object *Request setpoint adjustment (master)*.

The limitation will become active when the device receives a value that is larger than the value set here. When limitation is active, the maximum increase is confirmed on group object *Confirm setpoint adjustment (master)*.

Options
0 … 3 … 9 K

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.5

—

DEPENDENT PARAMETER

Manual setpoint adjustment via KNX with

This parameter can be used to set the data point type (DPT) used for manual setpoint adjustment.

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

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

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

Options	
DPT 6.010 (meter pulses)	Manual setpoint adjustment is performed via DPT 6.010. The following group objects are enabled: • *Request setpoint adjustment (master)* • *Confirm setpoint adjustment (master)*
DPT 9.001 (absolute temperature value)	Manual setpoint adjustment is performed via DPT 9.001. The following group objects are enabled: • *Request setpoint adjustment (master)* • *Confirm setpoint adjustment (master)*
DPT 9.002 (relative temperature value)	Manual setpoint adjustment is performed via DPT 9.002. The following group objects are enabled: • *Request setpoint adjustment (master)* • *Confirm setpoint adjustment (master)*

Prerequisites for visibility:

- Parameter Connect analog room control unit to physical device input a
  - Option *No* with *Controller mode*
  - Option *Yes* with *Actuator mode*

7.12.1.6

—

DEPENDENT PARAMETER

Manual fan adjustment via KNX with

This parameter can be used to set the data point type (DPT) used for fan speed adjustment.

DPT 5.010 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 fan speed adjustment is transmitted incrementally.

With newer devices, DPT 5.001 can be selected and the fan speed can be transmitted as a percentage.

All ABB devices still support adjustment via DPT 5.010.

Note
If DPT 5.010 is used, the setpoint adjustment cannot be sent to additionally connected devices (e.g. visualization system).
The current fan speed must be read via group object *Status Fan speed*.

Note
The fan speed can be adjusted via group object *Switch fan speed* as well.

Options	
DPT 5.001 (percentage value)	The fan speed is adjusted via DPT 5.001. The following group objects are enabled: • *Request fan speed (master)* • *Confirm fan speed (master)*
DPT 5.010 (meter pulses)	The fan speed is adjusted via DPT 5.010. The following group objects are enabled: *Request fan speed (master)* *Confirm fan speed (master)*

Prerequisites for visibility:

- Parameter Connect analog room control unit to physical device input a
  - Option *No* with *Controller mode*
  - Option *Yes* with *Actuator mode*

7.12.1.7

—

DEPENDENT PARAMETER

Reset manual setpoint adjustment when base setpoint received

This parameter can be used to set 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 °C
- Old temperature setpoint: 22.5 °C

New value is received in group object *Basic setpoint*:
- New base setpoint: 18 °C
- New temperature setpoint: 19.5 °C.

Options	
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.8

—

DEPENDENT PARAMETER

Reset manual setpoint adjustment when operating mode changes

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

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

Change in operating mode (e.g. Economy)
- Economy setpoint: 17 °C
- New temperature setpoint: 18.5 °C

Options	
No	Manual adjustment is not reset. The new temperature setpoint is calculated from the set setpoint 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.9

—

DEPENDENT PARAMETER

Reset manual setpoint adjustment via group object

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

Options	
No	Manual setpoint adjustment cannot be reset via group object.
Yes	Manual setpoint adjustment can be reset via group object *Reset manual setpoint adjustment*.

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.10

—

DEPENDENT PARAMETER

Setpoint indication on slave display

This parameter can be used to set how the setpoint is indicated on the display of a slave.

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

Prerequisites for visibility:

- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

7.12.1.11

—

DEPENDENT PARAMETER

Maximum setpoint increase

This parameter can be used to set the permissible value of the setpoint increase via an analog room control unit. Adjustment via a room control unit refers only to operating mode *Comfort*.

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

Options
0 … 3 … 5 K

Prerequisites for visibility:

- Parameter Connect analog room control unit to physical device input a \ Option *Yes*

7.12.1.12

—

DEPENDENT PARAMETER

Maximum setpoint reduction

This parameter can be used to set the permissible value of the setpoint reduction via an analog room control unit. Adjustment via a room control unit refers only to operating mode *Comfort*.

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

Options
0 … 3 … 5 K

Prerequisites for visibility:
- Parameter Connect analog room control unit to physical device input a \ Option *Yes*

7.13 Parameter window Input x

The following settings can be made in this parameter window:
- Configuration of the device input

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

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

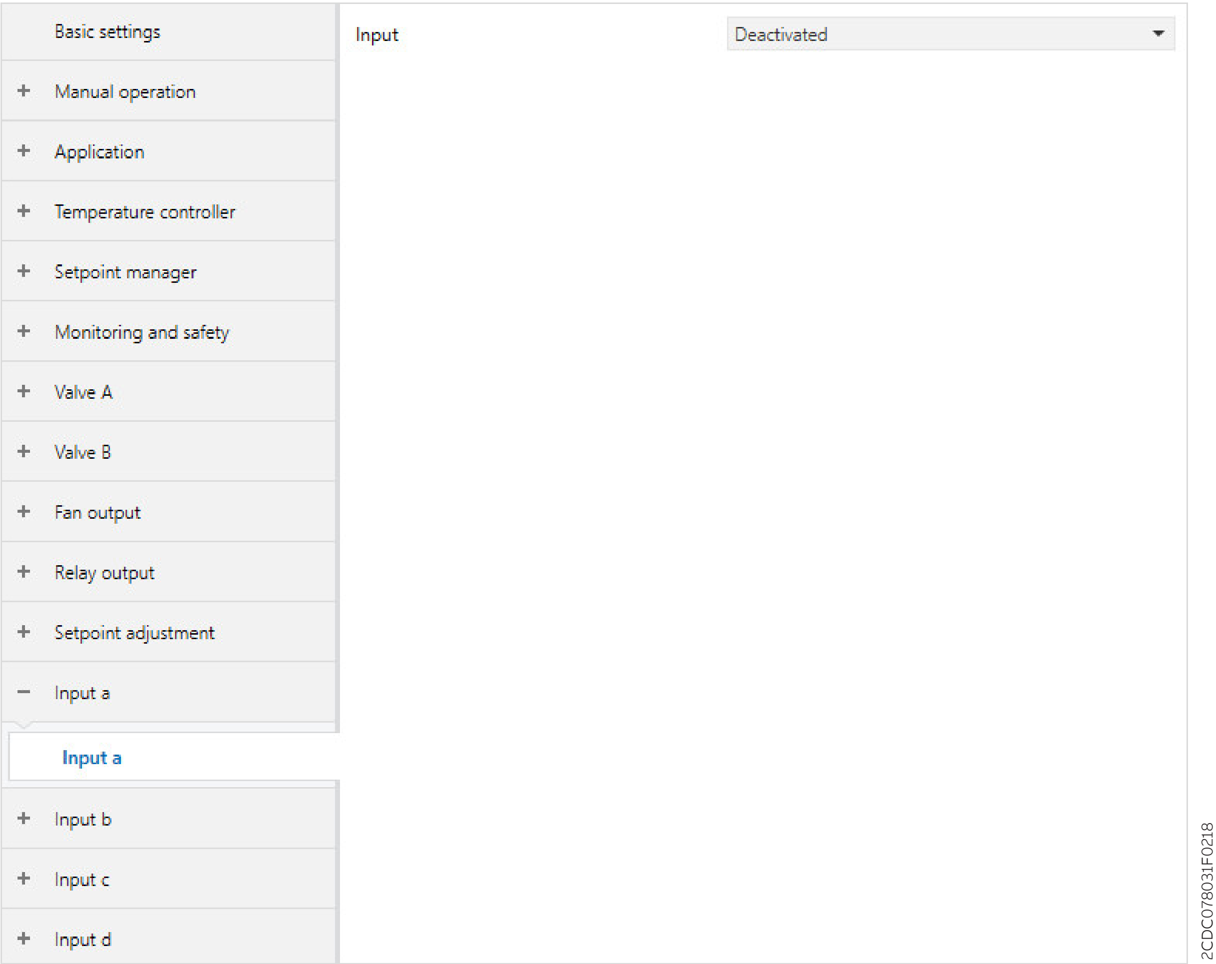


Fig. 49: Parameter window Input x

Parameter

- Input
  - Window open when
  - Send status value
    - Cycle for sending the input status
  - Dew point reached when
  - Send status value
    - Cycle for sending the input status
  - Fill level reached when
  - Send status value
    - Cycle for sending the input status
  - Temperature sensor type
    - NTC type
    - KTY type
      - Resistance in ohms at x °C
  - Temperature offset
  - Cable error compensation
    - Cable length, single distance
    - Cross-section of conductor, value* 0.01 mm²
    - Cable resistance (total of fwd and rtn conductor)
  - Filter
  - Send status value
    - Value is sent from a change of
    - Every
  - Maximum dead time
  - Distinction between long and short operation
    - Activate minimum signal duration
    - When contact opens
    - When closing the contact
    - Input on operation
    - Long operation after
  - Enable group object "Disable input x"
  - Reaction on event X
  - Internal connection
  - Send status value
    - Telegram is repeated every
    - On object value
  - Scan input after download, ETS reset and bus voltage recovery
  - Send status value
    - Cycle for sending the input status

7.13.1 Input

This parameter can be used to select the use of the input. Dependent parameters are displayed based on the selected option.

Options	
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 group objects are displayed: • *Window contact* The following dependent parameters are shown: • Window open when • Send status value
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 group objects are displayed: • *Dew point alarm* The following dependent parameters are shown: • Dew point reached when • Send status value
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 group objects are displayed: • *Fill level alarm* The following dependent parameters are shown: • Fill level reached when • Send status value
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 measured temperature value is included in room temperature control. The measured temperature value can be used for temperature limitation as well → Input for temperature limit sensor, Page 131. The following dependent group objects are displayed: • *Temperature* • *Error Input* The following dependent parameters are shown: • Temperature sensor type • Temperature offset • Cable error compensation • Filter • Send status value
Binary signal input	The input is used as a binary signal input. The following dependent group objects are displayed: • *Switch* The following dependent parameters are shown: • Maximum dead time • Distinction between long and short operation • Enable group object "Disable input x" • Reaction on event X • Internal connection • Send status value • Scan input after download, ETS reset and bus voltage recovery
Analog room control unit	An analog room control unit is connected to the input. Parameterization is performed in the parameter window Setpoint adjustment. The following dependent parameters are shown: • Send status value

7.13.1.1

—
DEPENDENT PARAMETER

Window open when

This parameter can be used to set whether the connected contact is a normally closed or normally open contact.

Options	
<u>*Contact open*</u>	The status "Window open" is sent when the contact is open.
Contact closed	The status "Window open" is sent when the contact is closed.

Prerequisites for visibility:
- Parameter <u>Input</u> \ Option *Window contact*

7.13.1.2

—
DEPENDENT PARAMETER

Send status value

This parameter can be used to set when the values of the following group objects are sent:
- <u>*Window contact*</u>

Note
Sending on request takes place when a value is received on group object <u>*Request status values*</u>.

Options	
<u>*After a change*</u>	The status value is sent when the group object changes.
After a change or cyclically	The status value is sent after a change or cyclically. The following dependent parameters are shown: • <u>Cycle for sending the input status</u>

Prerequisites for visibility:
- Parameter <u>Input</u> \ Option *Window contact*

7.13.1.2.1

—
DEPENDENT PARAMETER

Cycle for sending the input status

This parameter can be used to set the sending cycle for the status value of the input.

Options
<u>*00:00:30*</u> *… 18:12:15 hh:mm:ss*

Prerequisites for visibility:
- Parameter <u>Send status value</u> \ Option *After a change or cyclically*

7.13.1.3

—

DEPENDENT PARAMETER

Dew point reached when

This parameter can be used to set the contact position that is interpreted as status "Dew point alarm".

Options	
Contact open	The status "Dew point alarm" is sent when the contact is open.
Contact closed	The status "Dew point alarm" is sent when the contact is closed.

Prerequisites for visibility:
- Parameter Input \ Option *Dew point sensor*

7.13.1.4

—

DEPENDENT PARAMETER

Send status value

This parameter can be used to set when the values of the following group objects are sent:
- *Dew point alarm*

> **Note**
> Sending on request takes place when a value is received on group object *Request status values*.

Options	
After a change	The status value is sent when the group object changes.
After a change or cyclically	The status value is sent after a change or cyclically. The following dependent parameters are shown: • Cycle for sending the input status

Prerequisites for visibility:
- Parameter Input \ Option *Dew point sensor*

7.13.1.4.1

—

DEPENDENT PARAMETER

Cycle for sending the input status

This parameter can be used to set the sending cycle for the status value of the input.

Options
00:00:30 … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send status value \ Option *After a change or cyclically*

7.13.1.5

—

DEPENDENT PARAMETER

Fill level reached when

This parameter can be used to set the contact position that is interpreted as status "Fill level alarm".

Options	
Contact open	The status "Fill level alarm" is sent when the contact is open.
Contact closed	The status "Fill level alarm" is sent when the contact is closed.

Prerequisites for visibility:
- Parameter Input \ Option *Fill level sensor*

7.13.1.6

—

DEPENDENT PARAMETER

Send status value

This parameter can be used to set when the values of the following group objects are sent:
- *Fill level alarm*

Note
Sending on request takes place when a value is received on group object *Request status values*.

Options	
After a change	The status value is sent when the group object changes.
After a change or cyclically	The status value is sent after a change or cyclically. The following dependent parameters are shown: • Cycle for sending the input status

Prerequisites for visibility:
- Parameter Input \ Option *Fill level sensor*

7.13.1.6.1

—

DEPENDENT PARAMETER

Cycle for sending the input status

This parameter can be used to set the sending cycle for the status value of the input.

Options
00:00:30 … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send status value \ Option *After a change or cyclically*

7.13.1.7

—

DEPENDENT PARAMETER

Temperature sensor type

This parameter is used to set the type of temperature sensor connected. The sensor measuring range is indicated in brackets.

The dependent parameters are displayed based on the selection.

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

Options
PT1000 [-30…+110°C]
PT100 [-30…+110°C]
NTC
KTY [-15…+110]
NI1000 - 01 [-30…+110°C]
NI1000 - 02 [-30…+110°C]

Prerequisites for visibility:

- Parameter Input \ Option *Temperature sensor*

7.13.1.7.1

—

DEPENDENT PARAMETER

NTC type

This parameter is used to set the NTC subtype.

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

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

Prerequisites for visibility:

- Parameter Temperature sensor type \ Option *NTC*

7.13.1.7.2

—
DEPENDENT PARAMETER

KTY type

This parameter can be used to set the KTY subtype. In addition to using the predefined sensor types, users can also perform parametrization as required.

> **Note**
> To ensure trouble-free functioning of the analog input with regard to user-defined input, the resistance values must increase correspondingly to the temperature values.
> An incorrect entry can result in unrealistic output values.

Options
KT 100 / 110 / 130
KT 210 / 230
KTY 10-5 / 11-5 / 13-5
KTY 10-6 / 10-62 / 11-6 / 13-6 / 16-6 / 19-6
KTY 10-7 / 11-7 / 13-7
KTY 21-5 / 23-5
KTY 21-6 / 23-6
KTY 21-7 / 23-7
KTY 81-110 / 81-120 / 81-150
KTY 82-110 / 82-120 / 82-150
KTY 81-121 / 82-121
KTY 81-122 / 82-122
KTY 81-151 / 82-151
KTY 81-152 / 82-152
KTY 81-210 / 81-220 / 81-250
KTY 82-210 / 82-220 / 82-250
KTY 81-221 / 82-221
KTY 81-222 / 82-222
KTY 81-251 / 82-251
KTY 81-252 / 82-252
KTY 83-110 / 83-120 / 83-150
KTY 83-121
KTY 83-122
KTY 83-151
User-defined

Prerequisites for visibility:
- Parameter Temperature sensor type \ Option *KTY [-15…+110]*

7.13.1.7.2.1

—
DEPENDENT PARAMETER

Resistance in ohms at x °C

These eight parameters can be used to enter the resistance values of the connected sensor. The entered values are used to form a characteristic curve of resistance.

Options
650 … 4,600 ohms

Prerequisites for visibility:
- Parameter KTY type \ Option *User-defined*

7.13.1.8

—

DEPENDENT PARAMETER

Temperature offset

This parameter can be used to set the offset of the measured temperature.

Options
-10.0 … 00.0 … +10.0 K

Prerequisites for visibility:

- Parameter Input \ Option *Temperature sensor*

7.13.1.9

—

DEPENDENT PARAMETER

Cable error compensation

This parameter can be used to set how occurring cable errors are compensated.

Note

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

Options	
None	Occurring cable errors are not compensated.
Via cable length	Cable errors are compensated based on the specified cable length. The following dependent parameters are shown: • Cable length, single distance • Cross-section of conductor, value* 0.01 mm^2
Via cable resistance	Cable errors are compensated based on the specified cable resistance. The following dependent parameters are shown: • Cable resistance (total of fwd and rtn conductor)

Prerequisites for visibility:

- Parameter Input \ Option *Temperature sensor*

7.13.1.9.1

—

DEPENDENT PARAMETER

Cable length, single distance

The one-way cable length between sensor and device input is entered in this parameter.

Options
01.0 … 10.0 … 100.0 m

Prerequisites for visibility:

- Parameter Cable error compensation \ Option *Via cable length*

7.13.1.9.2

—

DEPENDENT PARAMETER

Cross-section of conductor, value* 0.01 mm²

The cross section of the conductor to which the temperature sensor is connected is entered in this parameter.

Note
The option *150* corresponds to a conductor cross-section of 1.5 mm^2.

Options
1 … 100 … 150

Prerequisites for visibility:
- Parameter Cable error compensation \ Option *Via cable length*

7.13.1.9.3

—

DEPENDENT PARAMETER

Cable resistance (total of fwd and rtn conductor)

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

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

Options
0 … 500 … 10,000 mohms

Prerequisites for visibility:
- Parameter Cable error compensation \ Option *Via cable resistance*

7.13.1.10

—

DEPENDENT PARAMETER

Filter

This parameter can be used to activate a floating mean value filter → Floating mean value, Page 294.

Options	
Deactivated	The 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 Input \ Option *Temperature sensor*

7.13.1.11

—

DEPENDENT PARAMETER

Send status value

This parameter can be used to set when the values of the following group objects are sent:
- *Temperature*

Note
Sending on request takes place when a value is received on group object *Request status values*.

Options	
After a change	The temperature value is sent after a change. The following dependent parameters are shown: • Value is sent from a change of
Cyclically	The temperature value is sent cyclically. The following dependent parameters are shown: • Every
After a change or cyclically	The temperature value is sent after a change or cyclically. The following dependent parameters are shown: • Value is sent from a change of • Every
On request	The temperature value is sent on request.
After a change or on request	The temperature 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 temperature is sent on request or cyclically. The following dependent parameters are shown: • Every
After a change, on request or cyclically	The temperature value is sent after a change, on request or cyclically. The following dependent parameters are shown: • Every

Prerequisites for visibility:
- Parameter Input \ Option *Temperature sensor*

7.13.1.11.1

—

DEPENDENT PARAMETER

Value is sent from a change of

This parameter can be used to set the minimum temperature change for sending the output value.

Options
00.2 … 01.0 … 10.0 K

Prerequisites for visibility:
- Parameter Send status value \ Option *After a change*

7.13.1.11.2

—

DEPENDENT PARAMETER

Every

This parameter can be used to set the cycle in which the group object value is sent.

Note
The standard value depends on the higher-level parameter.

Options
00:00:30 … 12:05:00 AM … 18:12:15 hh:mm:ss

Prerequisites for visibility:
- Parameter Send status value \ Option *Cyclically*

7.13.1.12

—

DEPENDENT PARAMETER

Maximum dead time

The maximum dead time is 200 ms.

The maximum dead time prevents unwanted multiple operations on the input, e.g. due to bouncing of the contact.

Prerequisites for visibility:
- Parameter Input \ Option *Binary signal input*

7.13.1.13

—

DEPENDENT PARAMETER

Distinction between long and short operation

This parameter can be used to set whether a distinction is made between short and long operation of the connected button/switch.

The following figure shows the distinction:

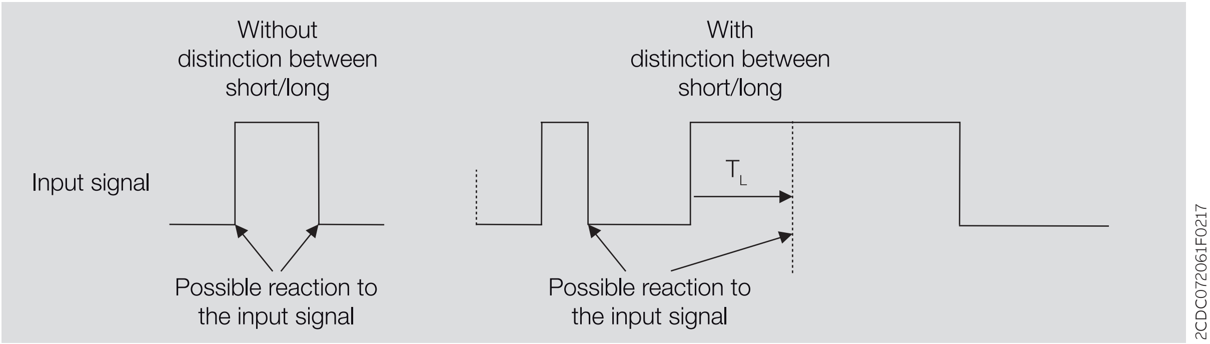


Fig. 50: Distinguishing between short/long operation

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

Options	
No	There is no distinction between short operation and long operation. The following dependent parameters are shown: • Activate minimum signal duration • When contact opens • When closing the contact
Yes	After the connected button/switch is operated, the FCC/S evaluates whether the operation is short operation (event 0) or long operation (event 1). The reaction specified in the parameter Reaction on event X is triggered. The following dependent parameters are shown: • Input on operation • Long operation after

Prerequisites for visibility:

- Parameter Input \ Option *Binary signal input*

7.13.1.13.1

—

DEPENDENT PARAMETER

Activate minimum signal duration

This parameter can be used to activate the minimum signal duration.

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

Options	
No	The minimum signal duration is deactivated.
Yes	The minimum signal duration is active.

Prerequisites for visibility:

- Parameter Distinction between long and short operation \ Option *No*

7.13.1.13.2

—
DEPENDENT PARAMETER

When contact opens

This parameter is used to set the minimum signal time when opening the contact.

Options
00.0 … 01.0 … 100.0

Prerequisites for visibility:
- Parameter Distinction between long and short operation \ Option *No*

7.13.1.13.3

—
DEPENDENT PARAMETER

When closing the contact

This parameter is used to set the minimum signal time when closing the contact.

Options
00.0 … 01.0 … 100.0

Prerequisites for visibility:
- Parameter Distinction between long and short operation \ Option *No*

7.13.1.13.4

—
DEPENDENT PARAMETER

Input on operation

This parameter can be used to set the position the input assumes when a connected contact is actuated.

Options	
Open	The input is open on operation.
Closed	The input is closed on operation.

Prerequisites for visibility:
- Parameter Distinction between long and short operation \ Option *Yes*

7.13.1.13.5

—
DEPENDENT PARAMETER

Long operation after

This parameter can be used to set the time T_L as of which actuation of a connected button/switch is interpreted as long operation.

Options
01.0 … 10.0 s

Prerequisites for visibility:
- Parameter Distinction between long and short operation \ Option *Yes*

7.13.1.14

—

DEPENDENT PARAMETER

Enable group object "Disable input x"

This parameter can be used to enable group object 0056_Disable input a.

> **Note**
> When disabling is active, the distinction between short operation and long operation and the minimum signal duration are deactivated. Data can still be sent cyclically.

> **Note**
> Disabling is canceled after ETS reset, bus voltage recovery or download.

Options	
No	The group object is not enabled.
Yes	The 1-bit group object 0056_Disable input a is enabled. The binary signal input can be disabled.

Prerequisites for visibility:
- Parameter Input \ Option *Binary signal input*

7.13.1.15

—

DEPENDENT PARAMETER

Reaction on event X

This parameter can be used to set how group object *Switch* reacts to a change of the binary signal input.

> **Note**
> The action triggered by event 0/event 1 depends on the option in the parameter Distinction between long and short operation:
> - No
>   - Event 0 = Opening the contacts
>   - Event 1 = Closing the contacts
> - Yes
>   - Event 0 = Short operation
>   - Event 1 = Long operation

> **Note**
> The option *End cyclic transmission* becomes effective only if, in the parameter Send status value, the option *After a change or cyclically* is selected.

Options	
No edge evaluation	The edge (1 --> 0 or 0 --> 1 change) is not evaluated.
On	Only the switch-on process (0 --> 1) is evaluated.
Off	Only the switch-off process (1 --> 0) is evaluated.
Toggle	Every change between 0 and 1 is evaluated.
End cyclic transmission	Cyclical transmission of the status value is ended.

Prerequisites for visibility:
- Parameter Input \ Option *Binary signal input*

7.13.1.16

—

DEPENDENT PARAMETER

Internal connection

This parameter can be used to set whether a direct (internal) connection exists between the binary signal input and the relay output. It is not necessary to assign a group address if an internal connection exists.

CAUTION – Device damage due to great heat
If an internal connection exists between the binary signal input and the relay output, heater can be switched on even though the fan is switched off. Heated air accumulates in the heater if the fan is not switched on. This can result in device damage or a fire.
▶ To avoid overheating the heater, install a temperature monitoring system with mechanical shut-off device.

Options	
<u>*No*</u>	The binary signal input is not connected directly to the relay output.
Relay output	The relay output can be activated directly via the input signal. The status object of the input is updated together with the status object of the output.

Prerequisites for visibility:
- Parameter <u>Input</u> \ Option *Binary signal input*

7.13.1.17

—

DEPENDENT PARAMETER

Send status value

This parameter can be used to set when the values of the following group objects are sent:
- <u>*Switch*</u>

Note
Sending on request takes place when a value is received on group object <u>*Request status values*</u>.

Options	
<u>*After a change*</u>	The status value is sent when the group object changes.
After a change or cyclically	The status value is sent after a change or cyclically. The following dependent parameters are shown: • <u>Telegram is repeated every</u> • <u>On object value</u>

Prerequisites for visibility:
- Parameter <u>Input</u> \ Option *Binary signal input*

7.13.1.17.1

—

DEPENDENT PARAMETER

Telegram is repeated every

This parameter can be used to set the cycle in which the telegram is repeated.

Options
<u>*00:00:30*</u> *… 18:12:15 hh:mm:ss*

Prerequisites for visibility:
- Parameter <u>Send status value</u> \ Option *After a change or cyclically*

7.13.1.17.2

—

DEPENDENT PARAMETER

On object value

This parameter can be used to set when the value of the group object is sent cyclically.

Options	
0	Sends the group object value cyclically if 0.
1	Sends the group object value cyclically if 1.
0 or 1	Sends the group object value cyclically if 0 or 1.

Prerequisites for visibility:
- Parameter Send status value \ Option *After a change or cyclically*

7.13.1.18

—

DEPENDENT PARAMETER

Scan input after download, ETS reset and bus voltage recovery

This parameter can be used to set whether the input state is actively scanned after download, ETS reset or bus voltage recovery or whether the system waits for another signal change.

Options	
No	The binary signal input is not scanned.
Yes	The binary signal input is scanned after download, ETS reset and bus voltage recovery.

Prerequisites for visibility:
- Parameter Input \ Option *Binary signal input*

7.13.1.19

—

DEPENDENT PARAMETER

Send status value

This parameter can be used to set when the values of the following group objects are sent:
- *Error Input*

Note
Sending on request takes place when a value is received on group object *Request status values*.

Options	
After a change	The status value is sent when the group object changes.
After a change or cyclically	The status value is sent after a change or cyclically. The following dependent parameters are shown: • Cycle for sending the input status

Prerequisites for visibility:
- Parameter Input \ Option *Analog room control unit*

7.13.1.19.1

—

DEPENDENT PARAMETER

Cycle for sending the input status

This parameter can be used to set the sending cycle for the status value of the input.

Options
00:00:30 … 18:12:15 hh:mm:ss

Prerequisites for visibility:

- Parameter Send status value \ Option *After a change or cyclically*

8 Group objects

8.1 Overview of group objects

Funktion	Kommunikationsobjektname	Datenpunkttyp	Länge	Flags
In operation	General	DPT 1.002	1 bit	C R T
Status byte Device	General	Non DPT	1 byte	C R T
Request status values	General	DPT 1.017	1 bit	C W
Status Manual operation	General	DPT 1.011	1 bit	C R T
Enable/disable manual operation	General	DPT 1.003	1 bit	C W
Status Fan On/Off	Channel – Fan	DPT 1.001	1 bit	C R T
Status byte Fan	Channel – Fan	Non DPT	1 byte	C R T
Status Fan automatic	Channel – Fan	DPT 1.011	1 bit	C R T
Status Fan speed	Channel – Fan	DPT 5.001	1 byte	C R T
Status Fan speed 1	Channel – Fan	DPT 1.001	1 bit	C R T
Status Fan speed 2	Channel – Fan	DPT 1.001	1 bit	C R T
Status Fan speed 3	Channel – Fan	DPT 1.001	1 bit	C R T
Activate/deactivate fan automatic	Channel – Fan	DPT 1.003	1 bit	C W
Switch fan speed 1	Channel – Fan	DPT 1.001	1 bit	C W
Switch fan speed 2	Channel – Fan	DPT 1.001	1 bit	C W
Switch fan speed 3	Channel – Fan	DPT 1.001	1 bit	C W
Switch fan speed	Channel – Fan	DPT 5.001	1 byte	C W
Increase/decrease fan speed	Channel – Fan	DPT 1.007	1 bit	C W
Limitation x	Channel – Fan	DPT 1.003	1 bit	C W
Status byte Valve A	Channel – Valve A	Non DPT	1 byte	C R T
Status Valve control value A	Channel – Valve A	DPT 5.001	1 byte	C R T
Fault Valve output A	Channel – Valve A	DPT 1.002	1 bit	C R T
Status Valve purge A	Channel – Valve A	DPT 1.011	1 bit	C R T
Fault Reset valve output A	Channel – Valve A	DPT 1.015	1 bit	C W
Activate valve purge A	Channel – Valve A	DPT 1.017	1 bit	C W
Enable/disable manual valve override A	Channel – Valve A	DPT 1.003	1 bit	C W
Override valve control value A	Channel – Valve A	DPT 5.001	1 byte	C W
Control value VAV damper control A	Channel – Valve A	DPT 5.001	1 byte	C W
	Channel – Valve B			
Status Relay	Channel – Relay	DPT 1.009	1 bit	C R T
Switch relay	Channel – Relay	DPT 1.001	1 bit	C W
Forced operation, 2-bit	Channel – General	DPT 2.001	2 bit	C W
Forced operation, 1-bit	Channel – General	DPT 1.002	1 bit	C W
Error "Heating/cooling changeover" receipt	Channel – General	DPT 1.002	1 bit	C R T
Error "Window contact" receipt	Channel – General	DPT 1.002	1 bit	C R T
Error "Dew point alarm" receipt	Channel – General	DPT 1.002	1 bit	C R T
Error "Fill level alarm" receipt	Channel – General	DPT 1.002	1 bit	C R T
Temperature	Channel – Input a	DPT 9.001	2 bytes	C R T
Error Input	Channel – Input a	DPT 1.002	1 bit	C R T
Switch	Channel – Input a	DPT 1.001	1 bit	C R T
Window contact	Channel – Input a	DPT 1.005	1 bit	C R T
Dew point alarm	Channel – Input a	DPT 1.005	1 bit	C R T
Fill level alarm	Channel – Input a	DPT 1.005	1 bit	C R T
Status Heating/cooling	Channel – Controller	DPT 1.100	1 bit	C R T
Control value Basic-stage heating	Channel – Controller	DPT 5.001	1 byte	C R T
Control value Basic-stage heating	Channel – Controller	DPT 1.001	1 bit	C R T
Control value Additional-stage heating	Channel – Controller	DPT 5.001	1 byte	C R T
Control value Additional-stage heating	Channel – Controller	DPT 1.001	1 bit	C R T
Control value Basic-stage cooling	Channel – Controller	DPT 5.001	1 byte	C R T
Control value Basic-stage cooling	Channel – Controller	DPT 1.001	1 bit	C R T
Control value Additional-stage cooling	Channel – Controller	DPT 5.001	1 byte	C R T
Control value Additional-stage cooling	Channel – Controller	DPT 1.001	1 bit	C R T
Actual temperature	Channel – Controller	DPT 9.001	2 bytes	C R T
External temperature 1	Channel – Controller	DPT 9.001	2 bytes	C W T U
External temperature 2	Channel – Controller	DPT 9.001	2 bytes	C W T U
Fault Actual temperature (master)	Channel – Controller	DPT 1.002	1 bit	C R T
Current setpoint	Channel – Controller	DPT 9.001	2 bytes	C R T
Operating mode normal (master)	Channel – Controller	DPT 20.102	1 byte	C W T U
Operating mode override (master)	Channel – Controller	DPT 20.102	1 byte	C W T U
Window contact (master/slave)	Channel – Controller	DPT 1.019	1 bit	C W
Presence detector (master/slave)	Channel – Controller	DPT 1.018	1 bit	C W
Status Heating	Channel – Controller	DPT 1.001	1 bit	C R T
Status Cooling	Channel – Controller	DPT 1.001	1 bit	C R T

Funktion	Kommunikationsobjektname	Datenpunkttyp	Länge	Flags
Activate minimum control value (basic load)	Channel – Controller	DPT 1.003	1 bit	C W
Heating/cooling changeover	Channel – Controller	DPT 1.100	1 bit	C W T U
Basic setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Reset manual setpoint adjustment	Channel – Controller	DPT 1.017	1 bit	C W
Dew point alarm	Channel – Controller	DPT 1.005	1 bit	C W
Fill level alarm	Channel – Controller	DPT 1.005	1 bit	C W
Outside temperature for summer compensation	Channel – Controller	DPT 9.001	2 bytes	C W
Summer compensation active/inactive	Channel – Controller	DPT 1.002	1 bit	C R T
Comfort setpoint reached	Channel – Controller	DPT 1.002	1 bit	C R T
Request On/Off (master)	Channel – Controller	DPT 1.001	1 bit	C W
Confirm On/Off (master)	Channel – Controller	DPT 1.001	1 bit	C R T
Setpoint display (master)	Channel – Controller	DPT 9.002	2 bytes	C R T
Request setpoint adjustment (master)	Channel – Controller	DPT 9.001	2 bytes	C W
Request setpoint adjustment (master)	Channel – Controller	DPT 9.002	2 bytes	C W
Request setpoint adjustment (master)	Channel – Controller	DPT 6.010	1 byte	C W
Confirm setpoint adjustment (master)	Channel – Controller	DPT 9.001	2 bytes	C R T
Confirm setpoint adjustment (master)	Channel – Controller	DPT 9.002	2 bytes	C R T
Confirm setpoint adjustment (master)	Channel – Controller	DPT 6.010	1 byte	C R T
Request heating/cooling (master)	Channel – Controller	DPT 1.100	1 bit	C W
Request fan manually (master)	Channel – Controller	DPT 1.001	1 bit	C W
Confirm fan manually (master)	Channel – Controller	DPT 1.001	1 bit	C R T
Request fan speed (master)	Channel – Controller	DPT 5.001	1 byte	C W
Request fan speed (master)	Channel – Controller	DPT 5.010	1 byte	C W
Confirm fan speed (master)	Channel – Controller	DPT 5.001	1 byte	C R T
Confirm fan speed (master)	Channel – Controller	DPT 5.010	1 byte	C R T
Status Controller RHCC	Channel – Controller	DPT 22.101	2 bytes	C R T
Controller Status HVAC (master)	Channel – Controller	DPT 5.001	1 byte	C R T
Current HVAC operating mode	Channel – Controller	DPT 20.102	1 byte	C R T
Comfort heating setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Setpoint Comfort heating/cooling	Channel – Controller	DPT 9.001	2 bytes	C W
Comfort cooling setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Economy heating setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Economy cooling setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Standby heating setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Standby cooling setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Building Protection heating setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Building Protection cooling setpoint	Channel – Controller	DPT 9.001	2 bytes	C W
Basic-stage heating limit temperature	Channel – Controller	DPT 9.001	2 bytes	C W T U
Additional-stage heating limit temperature	Channel – Controller	DPT 9.001	2 bytes	C W T U
Basic-stage cooling limit temperature	Channel – Controller	DPT 9.001	2 bytes	C W T U
Additional-stage cooling limit temperature	Channel – Controller	DPT 9.001	2 bytes	C W T U
Heating/cooling changeover	Channel – Actuator	DPT 1.100	1 bit	C W T U
Request setpoint adjustment (slave)	Channel – Actuator	DPT 9.002	2 bytes	C R T
Request setpoint adjustment (slave)	Channel – Actuator	DPT 6.010	1 byte	C R T
Request fan manually (slave)	Channel – Actuator	DPT 1.001	1 bit	C R T
Confirm fan manually (slave)	Channel – Actuator	DPT 1.001	1 bit	C W
Request fan speed (slave)	Channel – Actuator	DPT 5.001	1 byte	C R T
Request fan speed (slave)	Channel – Actuator	DPT 5.010	1 byte	C R T
Control value Heating	Channel – Actuator	DPT 5.001	1 byte	C W T U
Control value Cooling	Channel – Actuator	DPT 5.001	1 byte	C W T U

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 cycle time is set in the parameter Sending cycle time.
The telegram value depends on the setting in the parameter Send telegram value.
Telegram value:

- 1 = Device in operation
- 0 = Device in operation

Prerequisites for visibility:

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

Function	Group object name	Data point type	Length	Flags
Status byte Device	**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 76)
  - 1 = Safety mode active
  - 0 = Safety mode inactive
- Bit 4: Manual operation
  - 1 = Manual operation active
  - 0 = Manual operation inactive
- Bit 3: Manual valve override
  - 1 = Manual valve override active
  - 0 = Manual valve override inactive
- Bit 2: Forced operation
  - 1 = Forced operation active
  - 0 = Forced operation inactive
- Bit 1: Building Protection (→ Explanation of the operating modes, Page 291)
  This bit is always 0 for an actuator device (→ Device function, Page 91).
  - 1 = Building Protection active
  - 0 = Building Protection inactive
- Bit 0: Operating mode override
  This bit is always 0 for an actuator device (→ Device function, Page 91).
  - 1 = Override active
  - 0 = Override 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 enabled.

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 telegram values of all Status group objects are sent on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Send status values
- 0 = Send status values

Note
In order to send the status values, one of the following options must be selected in the respective parameters:
- On request
- After a change or on request
- After a change, on request or cyclically

Prerequisites for visibility:
- This group object is always 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 *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*

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

This group object is used to enable or disable *Manual operation* mode.
If *Manual operation* mode is active, it will be ended and disabled with telegram value 0.
Telegram value:
- 1 = Enable manual operation
- 0 = Disable manual operation

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

8.3 Group objects Channel – Fan

Function	Group object name	Data point type	Length	Flags
Status Fan On/Off	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the fan status on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
Telegram value:
- 1 = Fan On
- 0 = Fan Off

Prerequisites for visibility:
- This group object is always enabled.

Function	Group object name	Data point type	Length	Flags
Status byte Fan	**Channel – Fan**	**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: Automatic mode
  - 1 = Automatic mode active
  - 0 = Automatic mode inactive
- Bit 5: Fan speed limited by limitation 3
  - 1 = Limitation 3 active
  - 0 = Limitation 3 inactive
- Bit 4: Fan speed limited by limitation 2
  - 1 = Limitation 2 active
  - 0 = Limitation 2 inactive
- Bit 3: Fan speed limited by limitation 1
  - 1 = Limitation 1 active
  - 0 = Limitation 1 inactive
- Bit 2: Forced operation
  - 1 = Forced operation active
  - 0 = Forced operation inactive
- Bit 1: Fault on analog fan output (short circuit or overload). This bit is always 0 for devices with fan activation via relay output (FCC/S 1.1.x.1, 1.2.x.1, 1.4.1.1).
  - 1 = Error at output
  - 0 = No error
- Bit 0: Status Fan
  - 1 = Fan On
  - 0 = Fan Off

The sending behavior depends on the option selected in the parameter Send status values.

Prerequisites for visibility:
- This group object is always enabled.

Function	Group object name	Data point type	Length	Flags
Status Fan automatic	**Channel – Fan**	**DPT 1.011**	**1 bit**	**C R T**

This group object sends the status of fan automatic on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
Telegram value:
- 1 = Fan automatic active
- 0 = Fan automatic inactive

Prerequisites for visibility:
- Parameter window Fan output
  - Parameter window Fan output (0 … 10 V) \ Parameter Enable automatic mode based on control value \ Option *Yes*

  or
  - Parameter window Fan output \ Parameter Enable automatic mode based on control value \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Status Fan speed	**Channel – Fan**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends the fan speed status on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
Telegram value for 3-speed fan:
- 0 % = Fan Off (0)
- 33 % = Fan speed 1 (85)
- 66 % = Fan speed 2 (170)
- 100 % = Fan speed 3 (255)

Telegram value for 2-speed fan:
- 0 % = Fan Off (0)
- 50 % = Fan speed 1 (128)
- 100 % = Fan speed 2 (255)

Telegram value for 1-speed fan:
- 0 % = Fan Off (0)
- 100 % = Fan speed 1 (255)

Telegram value for analog/continuous fan (corresponds to actual fan speed):
- 0 … 100 %

Prerequisites for visibility:
- This group object is always enabled.

Function	Group object name	Data point type	Length	Flags
Status Fan speed 1	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the status of fan speed 1 on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
Telegram value:
- 1 = Fan speed 1 On
- 0 = Fan speed 1 Off

Note
If an analog fan output (FCC/S 1.3.x. 1 or 1.5.x. 1) is used, fan speed 1 corresponds to an actual fan speed of 1 … 33 %.

Prerequisites for visibility:
- Parameter window Fan output
  - Parameter window Fan output (0 … 10 V) \ Parameter Switch fan speed via 1-bit group objects \ all options except *Deactivated*

  or
  - Parameter window Fan output \ Parameter Switch fan speed via 1-bit group objects \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Status Fan speed 2	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the status of fan speed 2 on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
Telegram value:
- 1 = Fan speed 2 On
- 0 = Fan speed 2 Off

Note
If an analog fan output (FCC/S 1.3.x. 1 or 1.5.x. 1) is used, fan speed 2 corresponds to an actual fan speed of 34 … 66 %.

Prerequisites for visibility:
- Parameter window Fan output
  - Parameter window Fan output (0 … 10 V) \ Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*

  or
  - Parameter window Fan output \ Parameter Number of fan speeds
    - Option *2*
    or
    - Option *3*
  - Parameter Switch fan speed via 1-bit objects \ :all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Status Fan speed 3	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the status of fan speed 3 on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
Telegram value:
- 1 = Fan speed 3 On
- 0 = Fan speed 3 Off

Note
If an analog fan output (FCC/S 1.3.x. 1 or 1.5.x. \ 1) is used, fan speed 3 corresponds to an actual fan speed of 67 … 100 %.

Prerequisites for visibility:
- Parameter window Fan output
  - Parameter window Fan output (0 … 10 V) \ Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*

  or
  - Parameter window Fan output
    - Parameter Number of fan speeds \ Option *3*
    - Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Activate/deactivate fan automatic	**Channel – Fan**	**DPT 1.003**	**1 bit**	**C W**

This group is used to activate or deactivate fan automatic.
Telegram value
- 1 = Activate fan automatic
- 0 = Deactivate fan automatic

Prerequisites for visibility:
- Parameter window Fan output
  - Parameter window Fan output (0 … 10 V) \ Parameter \ Option *Yes*

  or
  - Parameter window Fan output \ Parameter \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Switch fan speed 1	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to receive the command for switching fan speed 1 via the bus (ABB i-bus® KNX).
If telegram value 1 is received on this group object, the speed is changed to fan speed 1. The reaction when telegram value 0 is received depends on the option set in the parameter Switch fan speed via 1-bit group objects:
- If the option *Switch off to active 1-bit fan speed using "0"* is selected, the fan is switched off only if the fan speed is active
- If the option *Switch off to any 1-bit fan speed using "0"* is selected, the fan is switched off independently of the active fan speed.

Telegram value:
- 1 = Switch on fan speed 1
- 0 = Depends on the setting in the parameter Switch fan speed via 1-bit group objects.

Note
If an analog fan output (FCC/S 1.3.x. 1 or 1.5.x. 1) is used, the fan speed is set to 33 % when fan speed 1 is switched.

Prerequisites for visibility:
- Parameter window Fan output
  - Parameter window Fan output (0 … 10 V) \ Parameter Switch fan speed via 1-bit group objects \ all options except *Deactivated*

  or
  - Parameter window Fan output \ Parameter Switch fan speed via 1-bit group objects \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags	
Switch fan speed 2	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C**	**W**

This group object is used to receive the command for switching fan speed 2 via the bus (ABB i-bus® KNX).
If telegram value 1 is received on this group object, the speed is changed to fan speed 2. The reaction when telegram value 0 is received depends on the option set in the parameter Switch fan speed via 1-bit group objects:

- If the option *Switch off to active 1-bit fan speed using "0"* is selected, the fan is switched off only if the fan speed is active
- If the option *Switch off to any 1-bit fan speed using "0"* is selected, the fan is switched off independently of the active fan speed.

Telegram value:

- 1 = Switch on fan speed 2
- 0 = Depends on the setting in the parameter Switch fan speed via 1-bit group objects.

Note
If an analog fan output (FCC/S 1.3.x. 1 or 1.5.x. 1) is used, the fan speed is set to 66% when fan speed 2 is switched.

Prerequisites for visibility:

- Parameter window Fan output
  – Parameter window Fan output (0 … 10 V) \ Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*
  or
  – Parameter window Fan output
  - Parameter Number of fan speeds
    - Option *2*
    or
    - Option *3*
  - Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags	
Switch fan speed 3	**Channel – Fan**	**DPT 1.001**	**1 bit**	**C**	**W**

This group object is used to receive the command for switching fan speed 3 via the bus (ABB i-bus® KNX).
If telegram value 1 is received on this group object, the speed is changed to fan speed 3. The reaction when telegram value 0 is received depends on the option set in the parameter Switch fan speed via 1-bit group objects:

- If the option *Switch off to active 1-bit fan speed using "0"* is selected, the fan is switched off only if the fan speed is active
- If the option *Switch off to any 1-bit fan speed using "0"* is selected, the fan is switched off independently of the active fan speed.

Telegram value:

- 1 = Switch on fan speed 3
- 0 = Depends on the setting in the parameter Switch fan speed via 1-bit group objects.

Note
If an analog fan output (FCC/S 1.3.x. 1 or 1.5.x. 1) is used, the fan speed is set to 100 % when fan speed 3 is switched.

Prerequisites for visibility:

- Parameter window Fan output
  – Parameter window Fan output (0 … 10 V) \ Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*
  or
  – Parameter window Fan output
  - Parameter Number of fan speeds \ Option *3*
  - Parameter Switch fan speed via 1-bit objects \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags	
Switch fan speed	**Channel – Fan**	**DPT 5.001**	**1 byte**	**C**	**W**

This group object is used to receive the fan speed to be set via the bus (ABB i-bus® KNX).
Telegram value for 3-speed fan:

- 0 % = Fan Off (0)
- 1 … 33 % = Fan speed 1 (1 … 85)
- 34 … 66 % = Fan speed 2 (86 … 170)
- 67 … 100 % = Fan speed 3 (171 … 255%)

Telegram value for 2-speed fan:

- 0 % = Fan Off (0)
- 1 … 50 % = Fan speed 1 (1 … 128)
- 51 … 100 % = Fan speed 2 (129 … 255)

Telegram value for 1-speed fan:

- 0 % = Fan Off (0)
- 1 … 100 % = Fan speed 1 (1 … 255)

Telegram value for analog/continuous fan (corresponds to actual fan speed):

- 0 … 100 %

Prerequisites for visibility:

- This group object is always enabled.

Function	Group object name	Data point type	Length	Flags	
Increase/decrease fan speed	**Channel – Fan**	**DPT 1.007**	**1 bit**	**C**	**W**

This group object is used to receive the command for increasing or decreasing the fan speed via the bus (ABB i-bus® KNX).
When the maximum/minimum fan speed is reached, the corresponding telegrams are ignored. Limitations in the parameter Limitation of fan speed are taken into account.
Telegram value:

- 1 = Increase fan speed
- 0 = Decrease fan speed

Prerequisites for visibility:

- This group object is always enabled.

Function	Group object name	Data point type	Length	Flags
Limitation x	**Channel – Fan**	**DPT 1.003**	**1 bit**	**C W**

These group objects are used to receive the limitation of the fan speed via the bus (ABB i-bus® KNX).
If limitations are active, only the fan speed permitted in the parameter Limitation x (x = 1, 2, 3) can be set.
Telegram value:
- 1 = Activate limitation x
- 0 = Cancel limitation x

Prerequisites for visibility:
- Parameter window Fan output \
  - Parameter window Fan output (0 … 10 V) \ Parameter Limitation of fan speed \ Option *Activated*
    or
  - Parameter window Fan output \ Parameter Limitation of fan speed \ Option *Activated*

8.4 Group objects Channel – Valve A

Function	Group object name	Data point type	Length	Flags
Status byte Valve A	**Channel – Valve A**	**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 = Valve purge active
  - 0 = Valve purge inactive
- Bit 2: Forced operation
  - 1 = Forced operation active
  - 0 = Forced operation 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
The value of bit 0 is 0 if one of the following parameters is selected with the Deactivated option:
- Monitor receipt of group object "Operating mode"
- Monitor receipt of group object "Control value"

The sending behavior depends on the option selected in the parameter Send status values.

Prerequisites for visibility:
- Parameter window Valve A \ Parameter window Valve output A \ Parameter Valve output \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Status Valve control value A	**Channel – Valve A**	**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 sending behavior depends on the option selected in the parameter Send status values.
Telegram value:
- 0 … 100 %

Prerequisites for visibility:
- Parameter window Valve A \ Parameter window Valve output A \ Parameter Valve output \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Fault Valve output A	**Channel – Valve A**	**DPT 1.002**	**1 bit**	**C R T**

This group object sends a fault messages of the valve output on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status values.
If a fault occurs, the output is switched off. The group object *Fault Reset valve output A* is used to reset the fault message.
Telegram value:
- 1 = Fault
- 0 = No fault

Note
On devices with manual operation via membrane keypad, the *Valve output change* LED and, with selected channel, the *Valve output opening* LED flashes.

Prerequisites for visibility:
- Parameter window Valve A \ Parameter window Valve output A \ Parameter Valve output \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags
Status Valve purge A	**Channel – Valve A**	**DPT 1.011**	**1 bit**	**C R T**

This group object sends the valve purge status on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send group object "Status Valve purge".
Telegram value:
- 1 = Valve purge active
- 0 = Valve purge inactive

Prerequisites for visibility:
- Parameter window Valve A \ Parameter window Valve output A \ Parameter Valve output \ all options except *Deactivated*

Function	Group object name	Data point type	Length	Flags	
Fault Reset valve output A	**Channel – Valve A**	**DPT 1.015**	**1 bit**	**C**	**W**

This group object is used to receive the reset of a fault on the valve output via the bus (ABB i-bus® KNX).
A reset is successful only if the fault has been corrected. A fault can be reset by restarting the device or by means of ETS reset as well.
Telegram value:

- 1 = Reset fault
- 0 = Not used

> **Note**
> On devices with manual operation via membrane keypad, the *Valve output change* LED goes out after a successful reset.

Prerequisites for visibility:

- Parameter window Valve A \ Parameter window Valve output A \ Parameter Valve output \ all options except *Deactivated*

Activate valve purge A	**Channel – Valve A**	**DPT 1.017**	**1 bit**	**C**	**W**

This group object can be used to trigger a valve purge.
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 Valve A \ Parameter window Valve output A \ Parameter Valve output \ all options except *Deactivated*

Enable/disable manual valve override A	**Channel – Valve A**	**DPT 1.003**	**1 bit**	**C**	**W**

This group object is used to receive enabling or disabling of 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 values of the following group objects:

- Controller mode: Group object *Override valve control value A*
- Actuator mode: Group objects *Control value Heating* or *Control value Cooling*

If manual valve override is disabled, the following active valve control value applies.
Telegram value:

- 1 = Manual valve override enabled
- 0 = Manual valve override disabled

Prerequisites for visibility:

- Parameter window Valve A \ Parameter window Valve output A
  - Parameter Valve output \ all options except *Deactivated*
  - Parameter Enable manual valve override \ Option *Yes*

Override valve control value A	**Channel – Valve A**	**DPT 5.001**	**1 byte**	**C**	**W**

This group object is used to receive a valve control value via the bus (ABB i-bus® KNX).
The value received on this group object becomes active only when overriding is enabled by group object *Enable/disable manual valve override A*.
Telegram value:

- 0 … 100 %

Prerequisites for visibility:

- Parameter window Valve A \ Parameter window Valve output A
  - Parameter Valve output \ all options except *Deactivated*
  - Parameter Enable manual valve override \ Option *Yes*

Control value VAV damper control A	**Channel – Valve A**	**DPT 5.001**	**1 byte**	**C**	**W**

This group object sends the control value defined in the parameter Voltage range for VAV damper control value on the bus (ABB i-bus® KNX).
Telegram value:

- 0 … 100 %

> **Note**
> This group object is available only for the devices FCC/S 1.2.x. 1 and FCC/S 1.3.x. 1.

Prerequisites for visibility:

- Parameter window Valve A \ Parameter window Valve output A \ Parameter Valve output \ Option *Use as VAV damper output*

8.5 Group objects Channel – Valve B

Function	Group object name	Data point type	Length	Flags
	Channel – Valve B			

→ Group objects Channel – Valve A, Page 264

8.6 Group objects Channel – Relay

Function	Group object name	Data point type	Length	Flags
Status Relay	**Channel – Relay**	**DPT 1.009**	**1 bit**	**C R T**

This group object sends the relay contact position on the bus (ABB i-bus® KNX).
The sending behavior depends on the option selected in the parameter Send status value.
Telegram value:
- Depends on the setting in the parameter Telegram value of group object "Status Relay"

Prerequisites for visibility:
- Parameter window Relay output \ Parameter Relay output \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Switch relay	**Channel – Relay**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to switch the relay.
Whether the relay opens or closes depends on the setting as an NC or NO contact in the parameter Output reaction.
NO contact telegram value:
- 1 = Contact closed
- 0 = Contact open

NC contact telegram value:
- 1 = Contact open
- 0 = Contact closed

Note
To prevent the fan coil unit from overheating, relay switch-on when the fan is inactive can be deactivated in the parameter Switch relay output independently of fan speed (including when fan = 0).

Prerequisites for visibility:
- Parameter window Relay output \ Parameter Relay output \ Option *Activated*

8.7 Group objects Channel – General

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

This group object is used to activate 2-bit forced operation, as well as to define the valve and fan control values and the relay output state during forced operation.
Forced operation is activated or deactivated with bit 1. Bit 0 is used to toggle between the states *Forced operation active "ON"* and *Forced operation active "OFF"*.
Valve and fan control values and the relay output cannot be controlled via KNX commands while forced operation is active.
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 Monitoring and safety \ Parameter Forced operation \ Option *Activated 2-bit*

Function	Group object name	Data point type	Length	Flags
Forced operation, 1-bit	**Channel – General**	**DPT 1.002**	**1 bit**	**C W**

This group object is used to activate 1-bit forced operation.
Valve and fan control values and the relay output cannot be controlled via KNX commands while forced operation is active.
Telegram value:
- Depends on the setting in the parameter Forced operation

Prerequisites for visibility:
- Parameter window Monitoring and safety \ Parameter Forced operation
  - Option *Activated 1-bit – 0 active*

  or
  - Option *Activated 1-bit – 1 active*

Function	Group object name	Data point type	Length	Flags
Error "Heating/cooling changeover" receipt	**Channel – General**	**DPT 1.002**	**1 bit**	**C R T**

This group object monitors receipt of a telegram on group object *Heating/cooling changeover* and sends a message on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter Every.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Heating/cooling changeover
  - Option *Via group object*

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

Function	Group object name	Data point type	Length	Flags
Error "Window contact" receipt	**Channel – General**	**DPT 1.002**	**1 bit**	**C R T**

This group object monitors receipt of a telegram on group object *Window contact* and sends a message on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter Every.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - 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*

Function	Group object name	Data point type	Length	Flags
Error "Dew point alarm" receipt	**Channel – General**	**DPT 1.002**	**1 bit**	**C R T**

This group object monitors receipt of a telegram on group object *Dew point alarm* and sends a message on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter Every.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - 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 – General**	**DPT 1.002**	**1 bit**	**C R T**

This group object monitors receipt of a telegram on group object *Fill level alarm* and sends a message on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter Every.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - 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*

8.8 Group objects Channel – Input a

Function	Group object name	Data point type	Length	Flags
Temperature	**Channel – Input a**	**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 sending behavior depends on the option selected in the parameter Send status value.
Telegram value:
- —273 … 670760 °C

Prerequisites for visibility:
- Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *No*
- Parameter window Input x \ Parameter Input \ Option *Temperature sensor*

Function	Group object name	Data point type	Length	Flags
Error Input	**Channel – Input a**	**DPT 1.002**	**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 --- FEHLENDER LINK --- \ Parameter --- FEHLENDER LINK --- \ Option *Temperature sensor*

Function	Group object name	Data point type	Length	Flags
Switch	**Channel – Input a**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends the contact position of the connected sensor 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

Prerequisites for visibility:
- Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *No*
- Parameter window Input x \ Parameter Input \ Option *Binary signal input*

Function	Group object name	Data point type	Length	Flags
Window contact	**Channel – Input a**	**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 sending behavior depends on the option selected in the parameter Send status value. Telegram value: • Depends on the setting in the parameter Window open when Prerequisites for visibility: • Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *No* • Parameter window Input x \ Parameter Input \ Option *Window contact*t				
Dew point alarm	**Channel – Input a**	**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 sending behavior depends on the option selected in the parameter Send status value. Telegram value: • Depends on the setting in the parameter Dew point reached when Prerequisites for visibility: • Parameter window Setpoint adjustment \ Parameter → Connect analog room control unit to physical device input a, Page 233 \ Option *No* • Parameter window Input x \ Parameter Input \ Option *Dew point sensor*				
Fill level alarm	**Channel – Input a**	**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 sending behavior depends on the option selected in the parameter Send status value. Telegram value: • Depends on the setting in the parameter Fill level reached when Prerequisites for visibility: • Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *No* • Parameter window --- FEHLENDER LINK --- \ Parameter --- FEHLENDER LINK --- \ Option *Fill level sensor*				

8.9 Group objects Channel – Input b

8.10 Group objects Channel – Input c

8.11 Group objects Channel – Input d

8.12 Group objects Channel – Controller

Function	Group object name	Data point type	Length	Flags
Status Heating/cooling	**Channel – Controller**	**DPT 1.100**	**1 bit**	**C R T**
This group object sends the current Status *Heating/cooling* on the bus (ABB i-bus® KNX). The activated devices are toggled between *Heating* and *Cooling*. Telegram value: • 1 = Heating • 0 = Cooling Prerequisites for visibility: • Parameter window Application \ Parameter window Application parameters \ – Parameter Device function \ Option *Controller* – Parameter Basic-stage heating \ all options except *Deactivated* – Parameter Basic-stage cooling \ all options except *Deactivated*				

Function	Group object name	Data point type	Length	Flags
Control value Basic-stage heating	**Channel – 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 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 %

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
  – Parameter Basic-stage heating
    - Option *Convector (e.g. radiator)*
    or
    - Option *Area heating (e.g. floor)*
    or
    - Option *Free configuration*
    or
    - Option *Water heating coil (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Basic-stage heating	**Channel – 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 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 Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
  – Parameter Basic-stage heating \
    - Option *Electric heater (in room)*
    or
    - Option *Free configuration*
    or
    - Option *Electric heater (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Additional-stage heating	**Channel – Controller**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends the control value for additional level 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 %

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
    Parameter Additional-stage heating
    - Option *Convector (e.g. radiator)*
    or
    - Option *Area heating (e.g. floor)*
    or
    - Option *Free configuration*
    or
    - Option *Water heating coil (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Additional-stage heating	**Channel – 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 Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
  – Parameter Additional-stage heating \
    - Option *Electric heater (in room)*
    Or
    - Option *Free configuration*
    or
    Option *Electric heater (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Basic-stage cooling	**Channel – 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 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 %

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
  – Parameter Basic-stage cooling
    - Option *Area cooling (e.g. cooling ceiling)*
    or
    - Option *Free configuration*
    or
    - Option *Water cooling coil (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Basic-stage cooling	**Channel – 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 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 Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
  – Parameter Basic-stage cooling \ Option *Free configuration*

Function	Group object name	Data point type	Length	Flags
Control value Additional-stage cooling	**Channel – 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 %

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  – Parameter Device function \ Option *Controller*
  – Parameter Additional-stage cooling
    - Option *Area cooling (e.g. cooling ceiling)*
    or
    - Option *Free configuration*
    or
    - Option *Water cooling coil (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Additional-stage cooling	**Channel – 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Additional-stage cooling \ Option *Free configuration*

Function	Group object name	Data point type	Length	Flags
Actual temperature	**Channel – 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 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.

The sending behavior of this group object is set in the parameter window Temperature controller.
Telegram value:
- -273 … 670760 °C

Note
This group object can also be used for display on control units and visual display systems.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
External temperature 1	**Channel – 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 when determining 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Actual temperature receipt
    - Option *Via group object*
    or
    - Option *Via phys. device input or group object*

Function	Group object name	Data point type	Length	Flags
External temperature 2	**Channel – 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 when determining 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Actual temperature receipt \
    - Option *Via group object*
    or
    - Option *Via phys. device input or group object*
  - Parameter Number of group objects Actual temperature \ Option *2*

Function	Group object name	Data point type	Length	Flags
Fault Actual temperature (master)	**Channel – Controller**	**DPT 1.002**	**1 bit**	**C R T**

This group object monitors the temperature input and sends the current status on the bus (ABB i-bus® KNX).
The group object sends telegram value 1 if the input monitoring time is exceeded or an error is determined on the monitored input.
The telegram with the current status is sent after every change.
Telegram value:
- 1 = Fault Actual temperature
- 0 = No fault

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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- 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 – Controller**	**DPT 9.001**	**2 bytes**	**C R T**

This group object sends the current setpoint temperature value 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:
- —273 … 670760 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Operating mode normal (master)	**Channel – 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). The following operating modes are available:
- Comfort
- Standby
- Economy
- Building Protection

More information: → Explanation of the operating modes, Page 291
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Operating mode override (master)	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Window contact (master/slave)	**Channel – 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). The device's operating mode is set to *Building Protection* 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Window status receipt \ Option *Via group object*

Presence detector (master/slave)	**Channel – 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).
The device's operating mode is set to *Comfort* when telegram value 1 is received. The operating mode set via group object *Operating mode normal (master)* is set 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

<table>
<tr><th>Function</th><th>Group object name</th><th>Data point type</th><th>Length</th><th>Flags</th></tr>
<tr><td>Status Heating</td><td>Channel – Controller</td><td>DPT 1.001</td><td>1 bit</td><td>C R T</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage heating \ all options except Deactivated</td></tr>
<tr><td>Status Cooling</td><td>Channel – Controller</td><td>DPT 1.001</td><td>1 bit</td><td>C R T</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage cooling \ all options except Deactivated</td></tr>
<tr><td>Activate minimum control value (basic load)</td><td>Channel – Controller</td><td>DPT 1.003</td><td>1 bit</td><td>C W</td></tr>
<tr><td colspan="5">This group object is used to receive the activation of the basic load via the bus (ABB i-bus® KNX).
The basic load is activated in the parameter Min. control value (basic load), and it can be defined 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option Controller
• Parameter window Temperature controller \ Parameter Min. control value (basic load) \ Option Activate via group object</td></tr>
<tr><td>Heating/cooling changeover</td><td>Channel – Controller</td><td>DPT 1.100</td><td>1 bit</td><td>C W T U</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage heating \ all options except Deactivated
– Parameter Basic-stage cooling \ all options except Deactivated
– Parameter Heating/cooling changeover
- Option Via group object
or
- Option Via group object or via slave</td></tr>
<tr><td>Basic setpoint</td><td>Channel – Controller</td><td>DPT 9.001</td><td>2 bytes</td><td>C W</td></tr>
<tr><td colspan="5">This group object is used to receive an override 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).
The override can shift the setpoints assigned to the operating modes Comfort, Standby and Economy. The relative distances between the setpoints remain unchanged. The setpoints for Building Protection are not influenced.
Telegram value:
• 10 … 40 °C

Prerequisites for visibility:
• Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option Controller
• Parameter window Setpoint manager \ Parameter Setpoint specification and adjustment \ Option Relative</td></tr>
<tr><td>Reset manual setpoint adjustment</td><td>Channel – Controller</td><td>DPT 1.017</td><td>1 bit</td><td>C W</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters \ Parameter Device function \ Option Controller
• 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</td></tr>
</table>

Function	Group object name	Data point type	Length	Flags
Dew point alarm	**Channel – Controller**	**DPT 1.005**	**1 bit**	**C W**

This group object is used to receive the dew point status via the bus (ABB i-bus® KNX). Operating mode *Building Protection* is set 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* 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage heating \ all options except *Deactivated*
  - Parameter Basic-stage cooling \ 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 – Controller**	**DPT 1.005**	**1 bit**	**C W**

This group object is used to receive the fill level status via the bus (ABB i-bus® KNX). The operating mode is set to *Building Protection* 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* 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage heating \ all options except *Deactivated*
  - Parameter Basic-stage cooling \ 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 – 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 292.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint manager \ Parameter Activate summer compensation \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Summer compensation active/inactive	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint manager \ Parameter Activate summer compensation \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Comfort setpoint reached	**Channel – 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 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Request On/Off (master)	**Channel – 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. Control is switched off if the setpoints for *Building Protection* have not been reached yet. 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Confirm On/Off (master)	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Setpoint display (master)	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (master)	**Channel – 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)*.
The data point type of the group object depends on the setting in the parameter Manual setpoint adjustment via KNX with.
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  – Parameter Connect analog room control unit to physical device input a \ Option *No*
  – Parameter Manual setpoint adjustment via KNX with \ Option *DPT 9.001 (absolute temperature value)*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (master)	**Channel – 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)*.
The data point type of the group object depends on the setting in the parameter Manual setpoint adjustment via KNX with.
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  – Parameter Connect analog room control unit to physical device input a \ Option *No*
  – Parameter Manual setpoint adjustment via KNX with \ Option *DPT 9.002 (relative temperature value)*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (master)	**Channel – 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)*.
The data point type of the group object depends on the setting in the parameter Manual setpoint adjustment via KNX with.
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment \
  – Parameter Connect analog room control unit to physical device input a \ Option *No*
  – Parameter Manual setpoint adjustment via KNX with \ Option *DPT 6.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Confirm setpoint adjustment (master)	**Channel – 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)*.
The data point type of the group object depends on the setting in the parameter Manual setpoint adjustment via KNX with.
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual setpoint adjustment via KNX with \ Option *DPT 9.001 (absolute temperature value)*

Confirm setpoint adjustment (master)	**Channel – 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)*.
The data point type of the group object depends on the setting in the parameter Manual setpoint adjustment via KNX with.
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment \
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual setpoint adjustment via KNX with \ Option *DPT 9.002 (relative temperature value)*

Confirm setpoint adjustment (master)	**Channel – 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)*.
The data point type of the group object depends on the setting in the parameter Manual setpoint adjustment via KNX with.
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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual setpoint adjustment via KNX with \ Option *DPT 6.010 (meter pulses)*

Request heating/cooling (master)	**Channel – 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 Application \ Parameter window Application parameters \ P
  - Parameter Device function \ Option *Controller*
  - Parameter Heating/cooling changeover \ Option *Via group object or via slave*

Request fan manually (master)	**Channel – Controller**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to receive the request for manual fan adjustment via the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Activate manual adjustment
- 0 = Deactivate manual adjustment

> **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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *No*

Function	Group object name	Data point type	Length	Flags
Confirm fan manually (master)	**Channel – Controller**	**DPT 1.001**	**1 bit**	**C R T**

This group object sends confirmation of the completed fan adjustment on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Manual adjustment activated
- 0 = Manual adjustment deactivated

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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *No*

Function	Group object name	Data point type	Length	Flags
Request fan speed (master)	**Channel – Controller**	**DPT 5.001**	**1 byte**	**C W**

This group object is used to receive a fan speed adjustment via the bus (ABB i-bus® KNX).
The data point type of the group object depends on the setting in the parameter Manual fan adjustment via KNX with.
Telegram value:
- 0 … 100 %

Note
If limitations are active for the fan, it might not be possible to set the required fan speed.

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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual fan adjustment via KNX with \ Option *DPT 5.001 (percentage value)*

Function	Group object name	Data point type	Length	Flags
Request fan speed (master)	**Channel – Controller**	**DPT 5.010**	**1 byte**	**C W**

This group object is used to receive a fan speed adjustment via the bus (ABB i-bus® KNX).
The data point type of the group object depends on the setting in the parameter Manual fan adjustment via KNX with.
Telegram value:
- 0 … 255

Note
If limitations are active for the fan, it might not be possible to set the required fan speed.

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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual fan adjustment via KNX with \ Option *DPT 5.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Confirm fan speed (master)	**Channel – Controller**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends confirmation of a fan speed adjustment on the bus (ABB i-bus® KNX) as was requested via the group object *Request fan speed (master)*.
The data point type of the group object depends on the setting in the parameter Manual fan adjustment via KNX with.
Telegram value:
- 0 … 100 %

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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual fan adjustment via KNX with \ Option *DPT 5.001 (percentage value)*

Function	Group object name	Data point type	Length	Flags
Confirm fan speed (master)	**Channel – Controller**	**DPT 5.010**	**1 byte**	**C R T**

This group object sends confirmation of a fan speed adjustment on the bus (ABB i-bus® KNX) as was requested via the group object *Request fan speed (master)*.
The data point type of the group object depends on the setting in the parameter Manual fan adjustment via KNX with.
Telegram value:
- 0 … 255

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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *No*
  - Parameter Manual fan adjustment via KNX with \ Option *DPT 5.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Status Controller RHCC	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Controller Status HVAC (master)	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Current HVAC operating mode	**Channel – 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 Application \ Parameter window Application parameters \ Parameter Device function \ Option *Controller*

Function	Group object name	Data point type	Length	Flags
Comfort heating setpoint	**Channel – 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage heating \ all options except *Deactivated*
- 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 – 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage heating \ all options except *Deactivated*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
- 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 – 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
- Parameter window Setpoint manager \ Parameter Setpoint specification and adjustment \ Option *Absolute*

Function	Group object name	Data point type	Length	Flags	
Economy heating setpoint	**Channel – 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage heating \ all options except *Deactivated*
- 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 – 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 Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
- 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 – 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 Application \ Parameter window Application parameters \ P
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage heating \ all options except *Deactivated*
- Parameter window Setpoint manager \ P
  - Parameter Operating modes
    - Option *Comfort, Standby, Economy, Building Protection*
    or
    - Option *Comfort, Standby, Building Protection*
  - Parameter Setpoint specification and adjustment \ Option *Absolute*

<table>
<tr><th>Function</th><th>Group object name</th><th>Data point type</th><th>Length</th><th>Flags</th></tr>
<tr><td>Standby cooling setpoint</td><td>Channel – Controller</td><td>DPT 9.001</td><td>2 bytes</td><td>C W</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage cooling \ all options except Deactivated
• Parameter window Setpoint manager
– Parameter Operating modes
- Option Comfort, Standby, Economy, Building Protection
or
- Option Comfort, Standby, Building Protection
– Parameter Setpoint specification and adjustment \ Option Absolute</td></tr>
<tr><td>Building Protection heating setpoint</td><td>Channel – Controller</td><td>DPT 9.001</td><td>2 bytes</td><td>C W</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage heating \ all options except Deactivated
• Parameter window Setpoint manager \ Parameter Setpoint specification and adjustment \ Option Absolute</td></tr>
<tr><td>Building Protection cooling setpoint</td><td>Channel – Controller</td><td>DPT 9.001</td><td>2 bytes</td><td>C W</td></tr>
<tr><td colspan="5">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 Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage cooling \ all options except Deactivated
• Parameter window Setpoint manager \ Parameter Setpoint specification and adjustment \ Option Absolute</td></tr>
<tr><td>Basic-stage heating limit temperature</td><td>Channel – Controller</td><td>DPT 9.001</td><td>2 bytes</td><td>C W T U</td></tr>
<tr><td colspan="5">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 Limit temperature.
Telegram value:
• -273 … 670760 °C
Prerequisites for visibility:
• Parameter window Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage heating \ all options except Deactivated
• 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</td></tr>
<tr><td>Additional-stage heating limit temperature</td><td>Channel – Controller</td><td>DPT 9.001</td><td>2 bytes</td><td>C W T U</td></tr>
<tr><td colspan="5">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 Limit temperature.
Telegram value:
• -273 … 670760 °C
Prerequisites for visibility:
• Parameter window Application \ Parameter window Application parameters
– Parameter Device function \ Option Controller
– Parameter Basic-stage heating \ all options except Deactivated
– Parameter Additional-stage heating \ all options except Deactivated
• 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</td></tr>
</table>

Function	Group object name	Data point type	Length	Flags
Basic-stage cooling limit temperature	**Channel – 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.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
- 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 cooling limit temperature	**Channel – 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.
Telegram value:
- -273 … 670760 °C

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Controller*
  - Parameter Basic-stage cooling \ all options except *Deactivated*
  - Parameter Additional-stage cooling \ all options except *Deactivated*
- 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*

8.13 Group objects Channel –Actuator

Function	Group object name	Data point type	Length	Flags
Heating/cooling changeover	**Channel – 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:
With this group object
- 1 = Heating
- 0 = Cooling

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Actuator device*
  - Parameter Basic-stage heating \ Option *Water heating coil (in fan coil unit)*
  - Parameter Basic-stage cooling \ Option *Water cooling coil (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (slave)	**Channel – 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 Manual setpoint adjustment via KNX with.
Telegram value:
- -9 … 9 K

Note
This group object must be connected to the corresponding group object of the slave for master/slave operation to function.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Actuator device*
- Parameter window Setpoint adjustment \ P
  - Parameter Connect analog room control unit to physical device input a \ Option *Yes*
  - Parameter Manual setpoint adjustment via KNX with \ Option *DPT 9.002 (relative temperature value)*

Function	Group object name	Data point type	Length	Flags
Request setpoint adjustment (slave)	**Channel – 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 Manual setpoint adjustment via KNX with.
Telegram value:
- -128 … 127 °C

Note
This group object must be connected to the corresponding group object of the slave for master/slave operation to function.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Actuator device*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *Yes*
  - Parameter Manual setpoint adjustment via KNX with \ Option *DPT 6.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Request fan manually (slave)	**Channel – Actuator**	**DPT 1.001**	**1 bit**	**C R T**

This group object is used to send the request for manual adjustment of the fan automatic on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Activate manual adjustment
- 0 = Deactivate manual adjustment

Note
This group object must be connected to the corresponding group object of the controller (master) for master/slave operation to function.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Actuator device*
  - Parameter Connect analog room control unit to physical device input a \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Confirm fan manually (slave)	**Channel – Actuator**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to receive confirmation of completed manual adjustment of the fan automatic via the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Manual adjustment activated
- 0 = Manual adjustment deactivated

Note
The analog control unit is used only for adjustment, and feedback therefore cannot be displayed via this group object. However, feedback is required for proper functioning of the device.

Note
In case of actuator operation with connected analog control unit, discrepancies between the display and the device reaction can occur.
If an adjustment is made on a different KNX control unit, this adjustment is sent to the actuator to which the analog control unit is connected. The analog control unit cannot receive this information or perform adjustment, however. The old display therefore remains unchanged.
The following example makes this clear:
State: Active fan speed 3; automatic mode
1. KNX control unit 1: Adjustment in manual mode and fan speed 1
2. Adjustment is sent from the controller to the actuator: Fan speed 1, manual
3. The actuator changes to fan speed 1, but the control unit still indicates automatic mode.

This problem can be avoided if the device to which the analog control unit is connected is used in actuator mode. In this case, it is ruled out that there are additional control units via which adjustments and thus adaptations via KNX can be made. The analog control unit is the only control unit in this case.

Note
This group object must be connected to the corresponding group object of the controller (master) for master/slave operation to function.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Actuator device*
- Parameter window Setpoint adjustment \ Parameter Connect analog room control unit to physical device input a \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Request fan speed (slave)	**Channel – Actuator**	**DPT 5.001**	**1 byte**	**C R T**

This group object sends a fan speed adjustment on the bus (ABB i-bus® KNX).
The data point type of the group object depends on the setting in the parameter Manual fan adjustment via KNX with.
Telegram value:
- 0 … 100 %

Note
This group object must be connected to the corresponding group object of the controller (master) for master/slave operation to function.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Actuator device*
  - Parameter Connect analog room control unit to physical device input a \ Option *Yes*
- Parameter window Setpoint adjustment \ Parameter Manual fan adjustment via KNX with \ Option *DPT 5.001 (percentage value)*

Function	Group object name	Data point type	Length	Flags
Request fan speed (slave)	**Channel – Actuator**	**DPT 5.010**	**1 byte**	**C R T**

This group object sends a fan speed adjustment on the bus (ABB i-bus® KNX).
The data point type of the group object depends on the setting in the parameter Manual fan adjustment via KNX with.
Telegram value:
- 0 … 255

Note
This group object must be connected to the corresponding group object of the controller (master) for master/slave operation to function.

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters \ Parameter Device function \ Option *Actuator device*
- Parameter window Setpoint adjustment
  - Parameter Connect analog room control unit to physical device input a \ Option *Yes*
  - Parameter Manual fan adjustment via KNX with \ Option *DPT 5.010 (meter pulses)*

Function	Group object name	Data point type	Length	Flags
Control value Heating	**Channel – 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 %

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Actuator device*
  - Parameter Basic-stage heating \ Option *Water heating coil (in fan coil unit)*

Function	Group object name	Data point type	Length	Flags
Control value Cooling	**Channel – 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 %

Prerequisites for visibility:
- Parameter window Application \ Parameter window Application parameters
  - Parameter Device function \ Option *Actuator device*
  - Parameter Basic-stage cooling \ Option *Water cooling coil (in fan coil unit)*

9 Operation

9.1 Manual operation

Note
Operation via the membrane keypad is available and functions identically for all devices FCC/S 1.X.2.1.

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/disabled.

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.

Note
If manual operation is disabled via the parameter window Manual operation, *KNX operation* will not be switched to *Manual operation* mode. The LED remains off.

9.1.2 Ending manual operation

► Briefly press the *Manual operation* button.
⇨ The yellow LED is off.

Note
Bear the following points in mind for manual operation:
- Values calculated by the controller or received via KNX will be overridden.
- Changes made by manual operation will become invalid on deactivation.
- Forced operation or the safety state 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.

Example:
The fan reacts to the valve control value in automatic operation until the *Fan speed* button is pressed for the first time.

9.1.3 Disabling manual operation

Manual operation can be disabled in the parameter Manual operation or via the group object *Enable/disable manual operation*.

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 cloth dampened with a soapy solution.

11 Removal and disposal

11.1 Removal

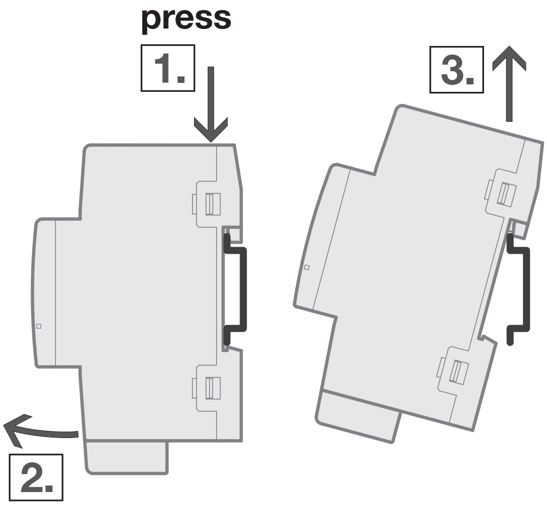


Fig. 51: Removing from the mounting rail

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 (dew point or filling level sensor or window contact)
d) Forced operation
e) i-bus® Tool
f) Direct operation via membrane keypad (only FCC/S 1.X.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

Fan

a) Bus voltage failure
b) Operating mode overridden
c) Safety (dew point or filling level sensor or window contact)
d) Forced operation
e) i-bus® Tool
f) Direct operation via membrane keypad (only FCC/S 1.X.2.1)
g) Manual fan adjustment (including limitation)
h) Automatic mode via control value
i) Bus voltage recovery

Relay

a) Bus voltage failure
b) Operating mode overridden (only if the relay is used for control; no other influence)
c) Safety (dew point or level sensor or window contact) (only if the relay is used for control; no other influence)
d) Forced operation
e) i-bus® Tool
f) Direct operation via membrane keypad (only FCC/S1.X.2.1)
g) Manual relay control
h) Automatic mode via control value (only if the relay is used for control; no other influence)
i) Bus voltage recovery

12.1.2 Priorities for actuator mode

Valve

a) Bus voltage failure
b) Forced operation
c) i-bus® Tool
d) Direct operation via membrane keypad (only FCC/S 1.X.2.1)
e) Manual valve override
f) Actuator mode via group objects
g) Bus voltage recovery

Fan
a) Bus voltage failure
b) Forced operation
c) i-bus® Tool
d) Direct operation via membrane keypad (only FCC/S 1.X.2.1)
e) Manual fan adjustment (including limitation)
f) Automatic mode via control value
g) Bus voltage recovery

Relay
a) Bus voltage failure
b) Forced operation
c) i-bus® Tool
d) Direct operation via membrane keypad (only FCC/S 1.X.2.1)
e) Manual relay control
f) 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 device with warm or cold water. Switching between heating and cooling is performed centrally via a bus signal.

4-pipe system

In a 4-pipe system, two separate pipes are used to supply the device 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 a bus signal or is controlled by the controller. The controller evaluates the actual temperature and setpoint temperature and, if necessary, sends a signal to switch between heating and cooling on the bus (ABB i-bus® KNX).

12.2.2 Evaluation of the thresholds

The device evaluates the thresholds in ascending order:
1) Threshold value speed 0 <-> 1
2) Threshold value speed 1 <-> 2
3) Threshold value speed 2 <-> 3

To ensure that the device functions properly, the thresholds must be set as follows:
- Threshold value speed 0 <-> 1 less than Threshold value speed 1 <-> 2
- Threshold value speed 1 <-> 2 less than Threshold value speed 2 <-> 3

12.2.3 Basic setpoint

The basic setpoint can be used to change the operating modes *Comfort*, *Standby* and *Economy* via the bus (ABB i-bus® KNX).

Depending on the selected option, the basic setpoint shifts the setpoint for Comfort heating or Comfort cooling → Base setpoint is, Page 170. The values of operating modes *Standby* and *Economy* are shifted in accordance with the relative difference from the Comfort setpoint. The set setpoints are overwritten.

> **Note**
> The setpoints for frost protection and heat protection cannot be changed using the basic setpoint.

12.2.4 Explanation of the operating modes

Comfort

In operating mode *Comfort*, the controller attempts to reach the specified room temperature by heating or cooling.

Standby

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.

The change between Comfort and Standby takes place via group object *Operating mode normal (master)*.

If a presence detector is used, the change from *Standby* to *Comfort* can additionally be performed via group object *Presence detector (master/slave)*.

> **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.

Unlike the operating mode *Standby*, the operating mode *Economy* is used only when a room is not used for an extended time (e.g. on weekends).

Building Protection

The operating mode *Building Protection* is activated to save energy and to 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 parametrized.

In the operating mode *Building Protection*, the setpoints for the operating modes *Heating* and *Cooling* are specified via the following parameters:
- Setpoint for frost protection (building protection, heating)
- Heat protection setpoint (building protection, cooling)

The operating mode *Building Protection* can be activated via the following group objects:
- *Dew point alarm*
- *Fill level alarm*
- *Window contact*
- *Operating mode normal (master)*

12.2.5 Summer compensation

12.2.5.1 Sumer 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.

12.2.5.2 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 entered offset when summer compensation ends.

When summer compensation is active, dynamic adaptation begins when the starting temperature is exceeded. As long as summer compensation is active, the setpoint can only be raised.

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 table

Outdoor temperature [°C]	Setpoint with offset on ending [°C]		
	4	5	6
21	21.00	21.00	21.00
22	21.64	21.55	21.45
23	22.27	22.09	21.91
24	22.91	22.64	22.36
25	23.55	23.18	22.82
26	24.18	23.73	23.27
27	24.82	24.27	23.73
28	25.45	24.82	24.18
29	26.09	25.36	24.64
30	26.73	25.91	25.09
31	27.36	26.45	25.55
32	28.00	27.00	26.00
33	29.00	28.00	27.00
34	30.00	29.00	28.00
35	31.00	30.00	29.00
36	32.00	31.00	30.00

Tab. 23: 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.

12.2.6 Weighting of the temperature inputs

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 results in 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 exceeds 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

12.2.7 Floating mean value

With a floating mean value filter, the output value is calculated as a mean value over a specified time interval (smoothing). A change of the sensor signal specifies the middle of the set time interval. The higher the degree of filtering, the smoother the result. Smoothing causes the output values to be sent with a time delay.

Example:
If a time interval of 60 seconds is selected for the floating mean value filter, a mean value is formed from the values 30 seconds before and 30 seconds after the sensor signal is changed. Consequently, the output value is issued only 30 seconds after the sensor signal is changed.

12.2.8 Basics of PI control

P-proportion

The P-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 set P-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. To ensure that the setpoint is reached, the readjustment time must be set accordingly. In principle the following applies: the more sluggish the overall system, the larger the integral time is.

Min. control value (basic load)

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

Example:
When the controller reaches the control value 0, heating medium nevertheless still flows through the floor heater. This prevents the floor from cooling.

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 Reference adjustment

Adjustment of the valve drive serves as the basis for position activation. The "closed" valve position (control value = 0 %) is approached periodically to correct deviations between the control value and the actual valve position.

To ensure that the valve closes completely, the output is activated 5 % longer than is theoretically necessary (min. 1 s, max. 60 s).

Example:
With a switch-on time (t_{On}) of 100 s and a control value of 50 %, the theoretical movement time corresponds to 50 s. The 5 % extension causes the valve to be activated for 55 s ($t_{Adjustment}$).
$t_{Adjustment} = 0.05 \times t_{On} + \text{control value} \times t_{On}$

The reference adjustment cannot be interrupted.

After every reference adjustment, the control value calculated by the controller is activated and the adjustment counter is set to 0.

12.2.11 Fan output

12.2.11.1 Single-phase fans

A single-phase fan, a blower or a convector can be activated with the fan output. Activation is performed by means of three-step speed control. Three windings are tapped on the fan motor for this purpose. The speed depends on the tapped motor winding.

The circuit is simulated in the device with a group of outputs.

Fan in changeover switching

A thee-step changeover switch with zero position can be used to activate the fan. If changeover switching is used, the device ensures that two contacts are not switched on at the same time.

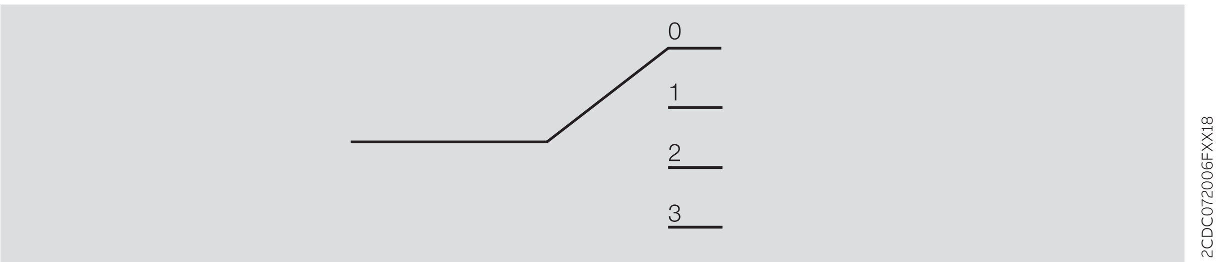


Fig. 52: Three-step changeover switch

The following control table results for a three-speed fan:

Fan speed	Terminal C	Terminal D	Terminal E
OFF	0	0	0
1	1	0	0
2	0	1	0
3	0	0	1

Tab. 24: Terminal assignment

Fan in step switching

With step switching, the device is activated according to the following schematic diagram:

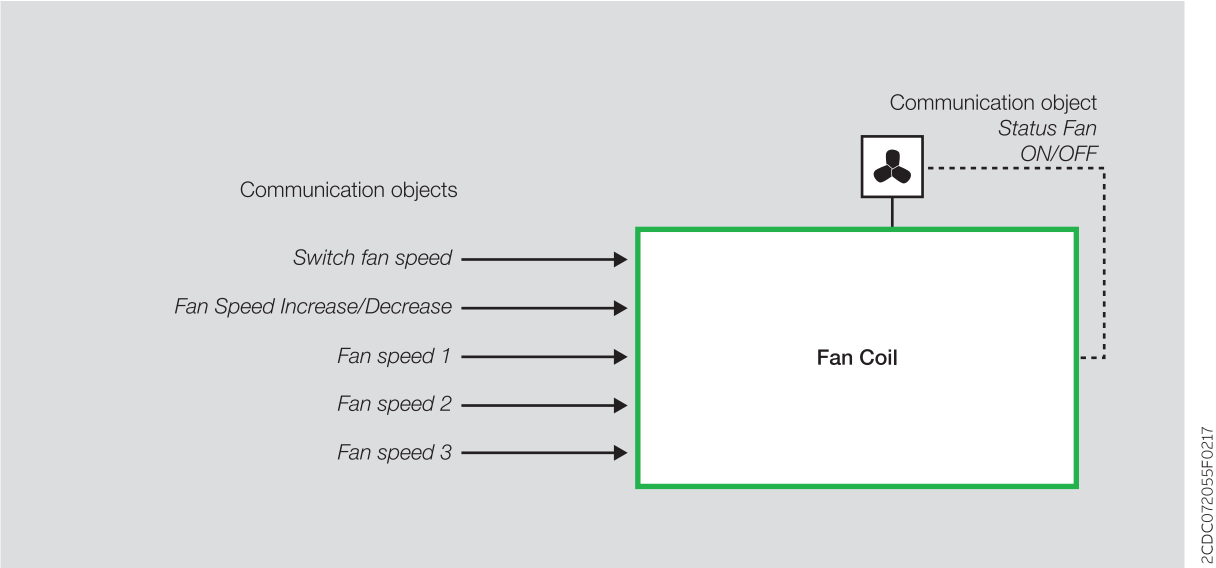


Fig. 53: Step switching diagram

The three mutually independent group objects *Switch fan speed 1*, *Switch fan speed 2*, *Switch fan speed 3* are used to activate the fan speeds via the outputs of the Fan Coil Actuator.

Alternatively, the fan can be activated via the following group objects:
- *Switch fan speed*
- *Increase/decrease fan speed*

A central main switch is additionally required for some step switching variants. The main switch can be implemented with another output of the device. The selected output must be linked with group object *Status Fan On/Off*. The main switch is switched on if at least one fan speed is switched on (telegram value = 1).

The following control table results for a three-speed fan:

Fan speed	Terminal C	Terminal D	Terminal E
OFF	0	0	0
1	1	0	0
2	1	1	0
3	1	1	1

Tab. 25: Terminal assignment

12.2.11.2 Continuous fans

A continuous fan, a blower or a convector can be activated with the fan output. Activation is via the 0-10-V signal. The flexible output signal can be used to control the fan speed based on the control value.

Alternatively, the fan can be activated via the following group objects:
- *Switch fan speed*
- *Switch fan speed 1*
- *Switch fan speed 2*
- *Switch fan speed 3*

A central main switch is additionally required for some step switching variants. The main switch can be implemented with another output of the device. The selected output must be linked with group object *Status Fan On/Off*. The main switch is switched on if at least one fan speed is switched on (telegram value = 1).

12.2.11.3 Automatic operation

In automatic mode, the fan speed is set based on the control value. A continuous fan directly follows the valve control value in automatic mode (example: control value 50 % = fan speed 50 %). With a single-phase fan, the thresholds can be specified for each fan speed (parameter window Fan output).

Example:

Control value	Fan speed
0 … 9 %	0 (fan off)
10 … 39 %	1
40 … 69 %	2
70 … 100 %	3

Tab. 26: Fan speed based on the control value

Automatic mode is always active when the device is operated as a controller.

If the device is operated as an actuator and control is via a room thermostat, automatic mode can be deactivated in the parameter window Fan output.

The fan leaves automatic mode after manual fan adjustment. In the parameter Return from manual fan adjustment to automatic mode, it can be set whether the return to automatic mode is triggered by a group object or occurs after a set time.

12.2.11.4 Direct operation

Operation in direct mode is possible only if the device is operated as a controller.

In direct mode, the fan can be changed via a slave device and via the following group objects:
- *Switch fan speed*
- *Switch fan speed 1*
- *Switch fan speed 2*
- *Switch fan speed 3*

Single-phase fans

With a 3-speed fan, the fan speeds are activated via the following values:
- Fan Off: 0 % (0)
- Fan speed 1: 1 … 33 % (1 … 85)
- Fan speed 2: 34 … 67 % (86 … 170)
- Fan speed 3: 68 … 100 % (171 … 255)

With a 2-speed fan, the fan speed is activated via the following values:
- Fan Off: 0 % (0)
- Fan speed 1: 1 … 50 % (1 … 128)
- Fan speed 2: 51 … 100 % (129 … 255)

With a 1-speed fan, the fan speed is activated via the following values:
- Fan Off: 0 % (0)
- Fan speed 1: 1 … 100 % (1 … 255)

Continuous fans

With a continuous fan, the required fan speed is entered and sent to the fan.

1-byte value	Percent	Hexadecimal	Binary value bit 76543210	Fan speed
0	0	00	00000000	0 (fan off)
1 … 85	1 % … 33 %	55	00000001 … 01010101	Fan speed 1
86 … 170	34 % … 67 %	AA	01010110 … 10101010	Fan speed 2
171 … 255	68 % … 100 %	FF	10101011 … 11111111	Fan speed 3

Tab. 27: Fan speed based on the entered value

12.2.11.5 Switchover between automatic and direct operation

Changeover to direct mode is performed via a 1-bit value or automatically after a set time expires. The fan speed is switched based on the received 1-byte value.

Fan control is changed back to automatic mode if a 1 is received on the respective group object.

The current status of automatic control is reported back via a 1-bit value.

12.2.12 Fan switching

12.2.12.1 Step switch

With a step switch, the fan speeds are activated one by one until the required fan speed is reached. The corresponding device outputs are switched on.

A delay time can be set to prevent premature activation of the fan speeds → Sending and switching delay, Page 304. In automatic mode, the minimum dwell time at switch-on speed can additionally be set → Minimum dwell time, Page 303.

12.2.12.1.1 Speed switching logic

The control value for switching the fan speed is calculated as follows:
- Switching up: Control value ≥ threshold + 1/2 hysteresis
- Switching down: Control value ≤ threshold- 1/2 hysteresis

Exception: If the value 0 is selected as the switching point between 0 and 1, switching up (0 → 1) is performed at a control value greater than 0 and switching down (1 → 0) at control value 0.

Additionally:
- The highest fan speed is always switched at 100 %.
- The fan is always switched off at 0 %.

The following example explains the sequence of step switching based on the control value and the parametrized thresholds and hysteresis:
- Threshold value speed 0 <-> 1 = 0 %
- Threshold value speed 1 <-> 2 = 30 %
- Threshold value speed 2 <-> 3 = 70 %
- Threshold value hysteresis = 10

The following switching points apply:

Control value	Fan speed
0 %	0
1 %	1
2 %	1
34 %	1
35 %	2

Control value	Fan speed
36 %	2
74 %	2
75 %	3
76 %	3
100 %	3

Tab. 28: Switching up

Control value	Fan speed
100 %	3
66 %	3
65 %	2
64 %	2
26 %	2
25 %	1
24 %	1
1 %	1
0 %	0

Tab. 29: Switching down

12.2.12.2 Changeover switch

With a changeover switch, only the associated output is switched to set the fan speed.

A delay time can be set to prevent premature switching of the fan speed → Sending and switching delay, Page 304. In automatic mode, the minimum dwell time at switch-on speed can additionally be set → Minimum dwell time, Page 303.

12.2.13 Manual valve override

With manual valve override, the value calculated by the controller is overridden by a specified value.

The following applications are possible:
- System function test
- Specific controller override

12.2.14 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

12.2.14.1 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 parametrized setpoint, the associated control value is 0.
- If the actual value is lower than the parametrized 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 an electrothermal 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 switching operations (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.

12.2.14.1.1 Pulse width modulation (PWM)

With pulse width modulation, the valve is operated exclusively in the completely open and completely closed positions. Contrary to the procedure for 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 parametrized cycle time. Based on this PWM calculation, valve actuation is performed via a variable pulse-to-pause ratio.

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 electrothermal 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 (0.02 × 15) and closed for 12 minutes.

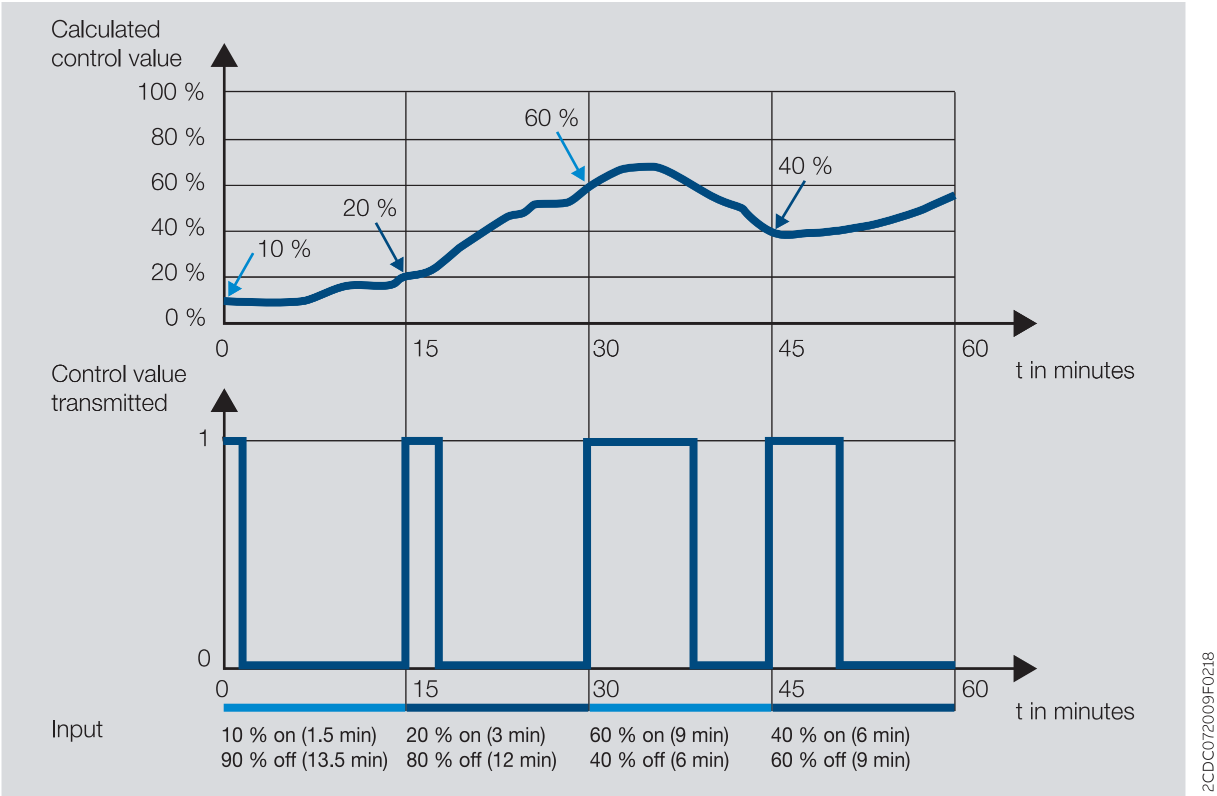


Fig. 54: Pulse width modulation – example

12.2.14.2 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

What is 1-byte activation?

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 open 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.

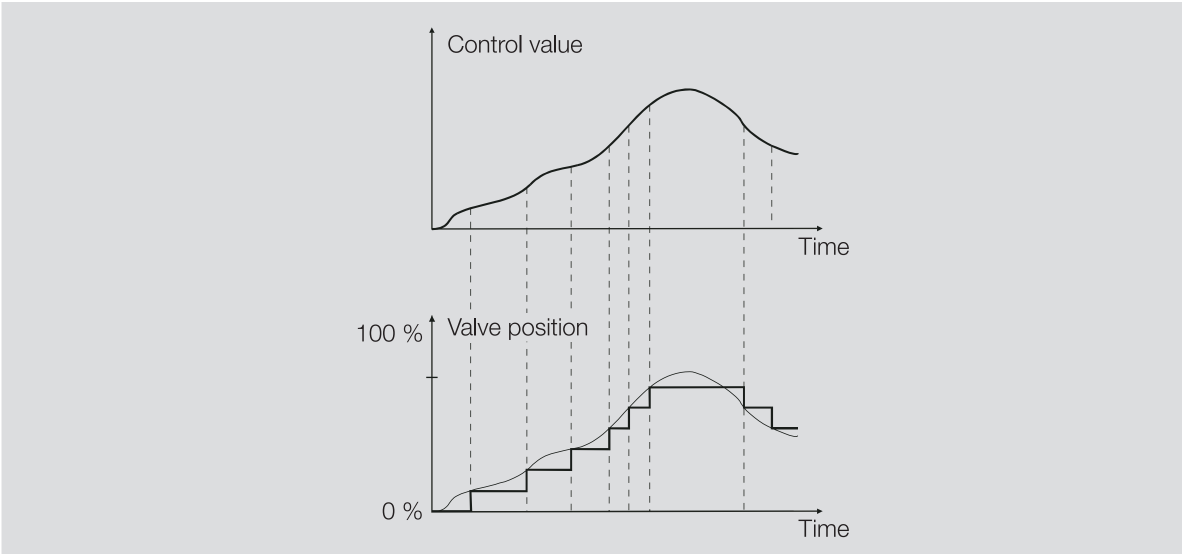


Fig. 55: Continuous control

12.2.14.2.1 PI controller (continuous) for Fan Coil

This controller functions like a PI controller (continuous). To control a fan coil unit, the fan output integrated in the device is additionally activated.

12.2.14.3 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) provides the advantages of continuous control (precise attainment of the setpoint temperature) to drives that are designed only for switch-on/switch-off signals (e.g. electrothermal drives).

The 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:

- Electrothermal Valve Drive: 15 minutes
  It takes approx. 2 … 3 minutes to fully open a control valve with electrothermal 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.

12.2.14.4 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 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).

PI continuous (0 … 100 %) for fan coil unit

The controller functions like a PI controller (continuous). The fan output is additionally activated in automatic mode, corresponding to the control value of the heating/cooling stage.

12.2.15 Minimum dwell time

The minimum dwell time is the time a fan remains at a fan speed before the switch to the next higher/lower fan speed. The dwell time is taken into account only after the fan starting phase.

Example

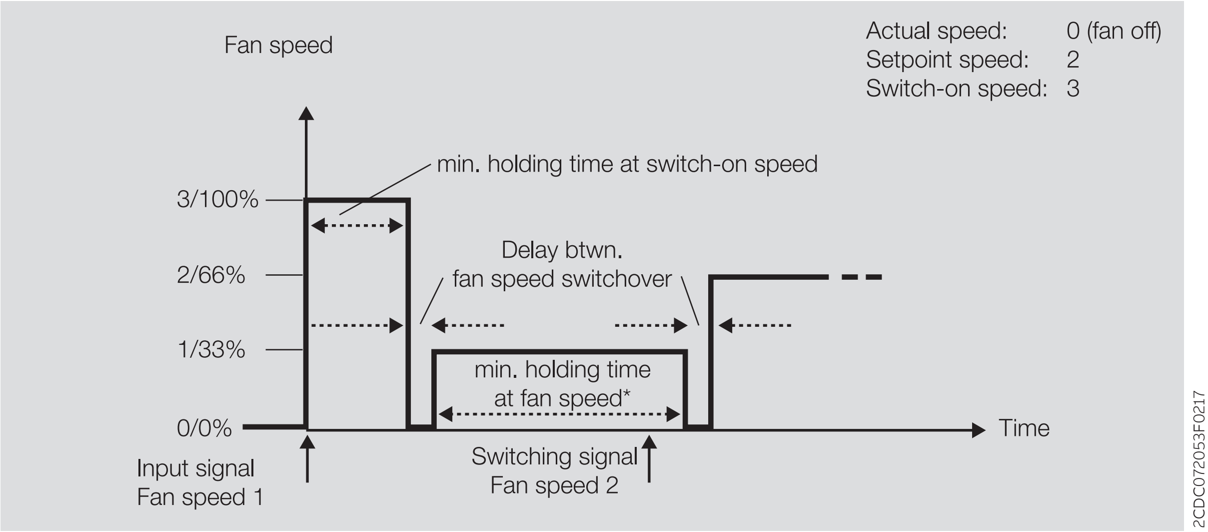


Fig. 56: Start-up behavior of a 3-speed fan (changeover switching)

- Required fan speed = 2/66 %
- Fan switch-on speed = 3/100 %

The fan is switched on and remains at switch-on speed 3/100 % for the set dwell time. The fan then switches to fan speed 1/33 %. The fan is switched to the required fan speed 2/66 % only after the time set in the parameter Minimum dwell time at fan speed expires.

12.2.16 Sending and switching delay

No telegrams are sent on the bus during the sending and switching delay (ABB i-bus® KNX).

Received telegrams (e.g. requests from a visualization system) are processed and 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.

Note
The sending and switching delay includes the device initialization time.

12.2.17 Valve drives

12.2.17.1 Electromotor Valve Drives

Electromotor Valve Drives open and close valves via a small electric motor. Electromotor Valve Drives are available in the following variants:
- Proportional valve drives
- 2-point valve drives
- 3-point valve drives

Proportional valve drives are activated via an analog signal (e.g. 0 … 10 V).

2- and 3-point valve drives are activated by switching the supply voltage.

2-point valve drives

2-point valve drives can only fully open or fully close the valve. The valve position is activated via 2-point control or pulse width modulation (PWM).

3-point valve drives

A 3-point valve drive is connected via three connecting cables. The cables for the opening and closing signals are connected to terminals A and B.

The valve position is activated directly based on the control value, usually in the form of continuous control Any position between 0 and 100 % can be approached.

The valve is not moved (idle position) if no voltage is connected to the motor.

12.2.17.2 Electrothermal Valve Drives

An Electrothermal Valve Drive is connected via two connecting cables. Electrothermal Valve Drives are adjusted by the heat expansion of a material caused by a flow of electric current. The valve position is activated via 2-point control or pulse width modulation (PWM).

Electrothermal Valve Drives are available in the following variants:
- Normally closed
- Normally open

12.2.18 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.

12.2.19 Use of 6-way valve

A 6-way valve can control heating and cooling stages simultaneously.

The drive of the 6-way valve is connected to valve output A, and the control values for heating and cooling are issued at this output.

A 6-way valve can be used only if the following prerequisites are met:
- Basic-stage heating is used for a water heater
- Basic-stage cooling is active

12.2.20 Use of an analog room control unit

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 79.

The following analog room control units can be connected:
- SAF/A 1.0.1-24 Room Temperature and Fan Coil Control Panel
- SAR/A 1.0.1-24 Room Temperature Control Panel

CAUTION
Connecting several analog room control units can cause malfunctions when the device is operated.

12.2.20.1 Connecting an analog room control unit in actuator mode

An actuator cannot evaluate the values for setpoint adjustment, and a KNX room control unit therefore must be connected in addition to the analog room control unit. In this combination, the KNX room control unit functions as the controller. The actuator forwards the setpoint adjustment of the analog room control unit to the KNX room control unit, which returns the setpoint/the fan speeds.

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.

12.2.21 What do the terms AC-1, AC-3 and AC-5a mean?

In intelligent installation systems, different switching capacities and performance specifications that are dependent on the special applications have become established in domestic and industrial installations. These performance specifications are rooted in the respective national and international standards. The tests are defined to simulate typical applications, e.g. motor loads (industrial) or fluorescent lamps (residential).

Specifications AC-1 and AC-3 are switching performance specifications that have become established in the industrial field. These switching capacities are defined in the standard EN 60947-4-1, "Low-voltage switchgear and controlgear – Part 4-1: Contactors and motor-starters – Electromechanical contactors and motor-starters". The standard describes starters and/or contactors that are used mainly in industrial applications.

Typical applications:
- AC-1 – Non-inductive or slightly inductive load, resistive furnaces (relates to switching of ohmic/resistive loads)
- AC-3 – squirrel-cage motors: starting, switching off during running (relates to (inductive) motor load)
- AC-5a – switching of electric discharge lamps

12.2.22 Forced operation

Forced operation causes the device outputs to assume a predefined state. Forced operation is triggered by the switching of a 1- or 2-bit group object. Forced operation overrides device control (value specification via controller or group object). In order to restore the device function, forced operation must be actively canceled.

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.

To ensure that an activated actuator and the controller react identically, forced operation must be parametrized identically for both devices (including the same group address).

For the prioritization of forced operation compared to other properties of the device: → Priorities, Page 289.

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

Valve and fan control values and the state of the relay output during forced operation are specified in the following parameters:
- Control value
- Fan output
- Relay output

Forced operation, 2-bit

Two forced operation states can be implemented with 2-bit forced operation. 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. 30: Forced operation states

Valve and fan control values and the state of the relay output with *Forced operation active "ON"* are specified in the following parameters:
- Forced operation active "ON" control value
- Forced operation active "ON" fan output
- Forced operation active "ON" relay output

Valve and fan control values and the state of the relay output with *Forced operation active "OFF"* are specified in the following parameters:
- Forced operation active "OFF" control value
- Forced operation active "OFF" fan output
- Forced operation active "OFF" relay output

12.2.23 Fan coil unit overview

Design types

A fan coil unit can be configured as a compact device or a modular installation device:
- Compact devices are supplied with enclosures and are available as standing units or units for wall or ceiling mounting.
- Built-in devices have no enclosure and are mounted in the wall, ceiling or floor. The air is blown into the room through a grille.

Air supply

Fan coil units are available as recirculation or as mixed air devices.
- Recirculation units: The fan blows the room air past the heat exchangers.
- Mixed air units: The room air is mixed with fresh air. The mixing ratio of recirculated air to fresh air is adjustable.

12.2.24 Sensor signals

PT100

The PT100 is precise and exchangeable but subject to faults in the cables (resistance and heating). A terminal resistance as low as 200 milliohms causes a temperature error of 0.5 °C.

PT1000

The PT1000 responds just like the PT100, but the influences of cable errors are lower by a factor of 10. This sensor should be preferred.

KT/KTY

The KT/KTY has a low level of accuracy, can be exchanged only under certain circumstances and can be used only for very simple applications.

Sensor tolerance classes

The tolerance classes for sensor versions PT100 and PT1000 differ. The following table illustrates the individual classes to IEC 60751 (status: 2008):

Description	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. 31: Tolerance classes

Example:
Class B:
Measured-value deviations of ± 0.8 °C at 100 °C are permissible.

13 Appendix

13.1 Scope of delivery

The Fan Coil Controller is supplied together with the following components. The delivered items should be checked against the list below:

- 1 x Fan Coil Controller, alternatively:
  - FCC/S 1.1.1.1: Fan Coil Controller, 2 × PWM, 3-speed, MDRC
  - FCC/S 1.1.2.1: Fan Coil Controller, 2 × PWM, 3-speed, manual operation, MDRC
  - FCC/S 1.2.1.1: Fan Coil Controller, 2 × 0…10 V, 3-speed, MDRC
  - FCC/S 1.2.2.1: Fan Coil Controller, 2 × 0…10 V, 3-speed, manual operation, MDRC
  - FCC/S 1.3.1.1: Fan Coil Controller, 3 × 0…10 V, MDRC
  - FCC/S 1.3.2.1: Fan Coil Controller, 3 × 0…10 V, manual operation, MDRC
  - FCC/S 1.4.1.1: Fan Coil Controller, 1 × PWM, 3-speed, MDRC
  - FCC/S 1.5.1.1: Fan Coil Controller, 2 × PWM, 0…10 V, MDRC
  - FCC/S 1.5.2.1: Fan Coil Controller, 2 × PWM, 0…10 V, manual operation, MDRC
- 1 x installation and operating instructions
- 1 x bus connection terminal (red/black)
- 1x KNX connection cover cap

13.2 Status byte Fan

x = value 1, applicable
empty = value 0, not applicable

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Automatic mode	Limitation 3	Limitation 2	Limitation 1	Forced operation active/inactive	Output error	Fan On/Off
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Automatic mode	Limitation 3	Limitation 2	Limitation 1	Forced operation active/inactive	Output error	Fan On/Off
64	40		x						
65	41		x						x
66	42		x					x	
67	43		x					x	x
68	44		x				x		
69	45		x				x		x
70	46		x				x	x	
71	47		x				x	x	x
72	48		x			x			
73	49		x			x			x
74	4A		x			x		x	
75	4B		x			x		x	x
76	4C		x			x	x		
77	4D		x			x	x		x
78	4E		x			x	x	x	
79	4F		x			x	x	x	x
80	50		x		x				
81	51		x		x				x
82	52		x		x			x	
83	53		x		x			x	x
84	54		x		x		x		
85	55		x		x		x		x
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Automatic mode	Limitation 3	Limitation 2	Limitation 1	Forced operation active/inactive	Output error	Fan On/Off
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
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
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. 32: Status byte Fan

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	Not assigned	Not assigned	Not assigned	Not assigned	Valve purge	Forced operation	Output error	Setpoint received
0	0								
1	1								x
2	2							x	
3	3							x	x
4	4						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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Not assigned	Not assigned	Not assigned	Valve purge	Forced operation	Output error	Setpoint received
64	40		x						
65	41		x						x
66	42		x					x	
67	43		x					x	x
68	44		x				x		
69	45		x				x		x
70	46		x				x	x	
71	47		x				x	x	x
72	48		x			x			
73	49		x			x			x
74	4A		x			x		x	
75	4B		x			x		x	x
76	4C		x			x	x		
77	4D		x			x	x		x
78	4E		x			x	x	x	
79	4F		x			x	x	x	x
80	50		x		x				
81	51		x		x				x
82	52		x		x			x	
83	53		x		x			x	x
84	54		x		x		x		
85	55		x		x		x		x
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Not assigned	Not assigned	Not assigned	Valve purge	Forced operation	Output error	Setpoint received
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
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
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. 33: Status byte Valve

13.4 Status byte Device

x = value 1, applicable
empty = value 0, not applicable

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Not assigned	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building protection (Dew point/Fill level/ Window)	Operating mode overridden
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Not assigned	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building protection (Dew point/Fill level/ Window)	Operating mode overridden
64	40		x						
65	41		x						x
66	42		x					x	
67	43		x					x	x
68	44		x				x		
69	45		x				x		x
70	46		x				x	x	
71	47		x				x	x	x
72	48		x			x			
73	49		x			x			x
74	4A		x			x		x	
75	4B		x			x		x	x
76	4C		x			x	x		
77	4D		x			x	x		x
78	4E		x			x	x	x	
79	4F		x			x	x	x	x
80	50		x		x				
81	51		x		x				x
82	52		x		x			x	
83	53		x		x			x	x
84	54		x		x		x		
85	55		x		x		x		x
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

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Not assigned	Not assigned	Safety mode	Manual operation via membrane keypad	Manual valve override	Forced operation	Building protection (Dew point/Fill level/ Window)	Operating mode overridden
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
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
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. 34: Status byte Device

—
ABB STOTZ-KONTAKT GmbH
Eppelheimer Straße 82
69123 Heidelberg, Germany
Tel.: +49 (0)6221 701 607
Fax: +49 (0)6221 701 724
Email: knx.marketing@de.abb.com

Additional information and regional points of contact:
www.abb.de/knx
www.abb.com/knx

—

Publication number 2CDC508200D0211 Rev B | 24.01.2020