PRODUCT MANUAL

ABB i-bus® KNX

BCI/S 1.1.1

Boiler/chiller interface

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1 About this document

1.1 Using the product manual

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

1.2 Legal disclaimer

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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 Boiler/Chiller Interfaces BCI/S are intended to be used to activate boilers/chillers in a KNX environment.

3 Product overview

3.1 Device description

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

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

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

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

3.2 Product name description

Abbreviation	Designation		
B	Boiler/		
C	Chiller		
I	Interface		
/S	MDRC		
X.	1	=	1-fold
X.	1	=	Generator activation 0 … 10 V
X	x	=	Version number (x = 1, 2, etc.)

Tab. 2: Product name description

3.3 Ordering details

Description	MW	Type	Order no.	Packaging [pcs.]	Weight (incl. packaging) [kg]
Boiler/chiller interface	6	BCI/S 1.1.1	2CDG110222R0011	1	0.26

Tab. 3: Ordering details

3.4 Connections

The device has the following connections:

- 7 inputs for sensors
- 1 pump output
- 1 generator relay output
- 1 analog output for generator activation
- 1 bus connection

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

Pump output

	BCI/S 1.1.1
Pump, 1-phase	1

Tab. 4: Pump output

Generator relay output, analog output

	BCI/S 1.1.1
Boiler/chiller	1

Tab. 5: Generator relay output, analog output

Physical inputs

	BCI/S 1.1.1
Binary sensors (floating)	5
Temperature sensors	2

Tab. 6: Physical inputs

3.4.1 Inputs

Function	a	b	c	d	e	f	g
Temperature sensor							
PT100	x	x					
PT1000	x	x					
KT/KTY	x	x					
KT/KTY user-defined	x	x					
NTC10k	x	x					
NTC20k	x	x					
NI-1000	x	x					
Binary sensor (floating)			x	x	x	x	x
Pump status (floating contact)			x				
Pump fault (floating contact)				x			
Pump repair switch (floating contact)					x		
Generator status (floating contact)						x	
Generator error (floating contact)							x

Tab. 7: Function of the inputs

3.4.2 Outputs

3.4.2.1 Pump output

Function		A
Individual pump		
	Automatic operation	x
	Direct operation	x
	Automatic switch off on fault	x

Tab. 8: Function of the pump output

3.4.2.2 Generator outputs

Function		B	C
Boiler/chiller			
	Generator relay (On/Off)	x	
	Generator activation (0 … 10 V)		x

Tab. 9: Function of the generator outputs

3.5 Boiler/Chiller Interface BC/I 1.1.1, MDRC

Fig. 1: Device illustration – BCI/S 1.1.1

3.5.1 Dimension drawing

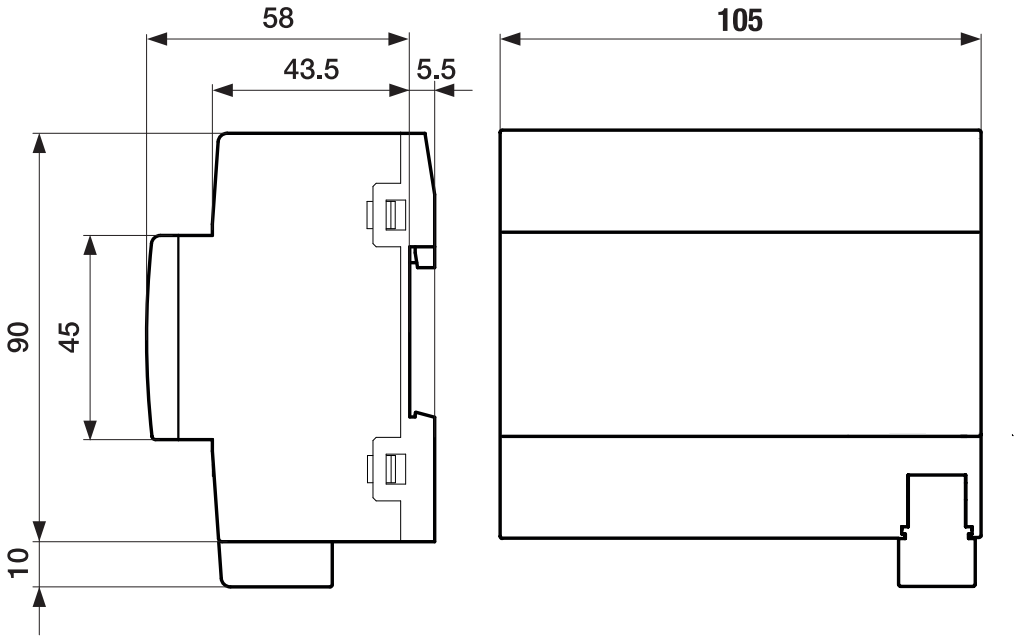

Fig. 2: Dimension drawing

2CDC072026F0017

3.5.2 Connection diagram

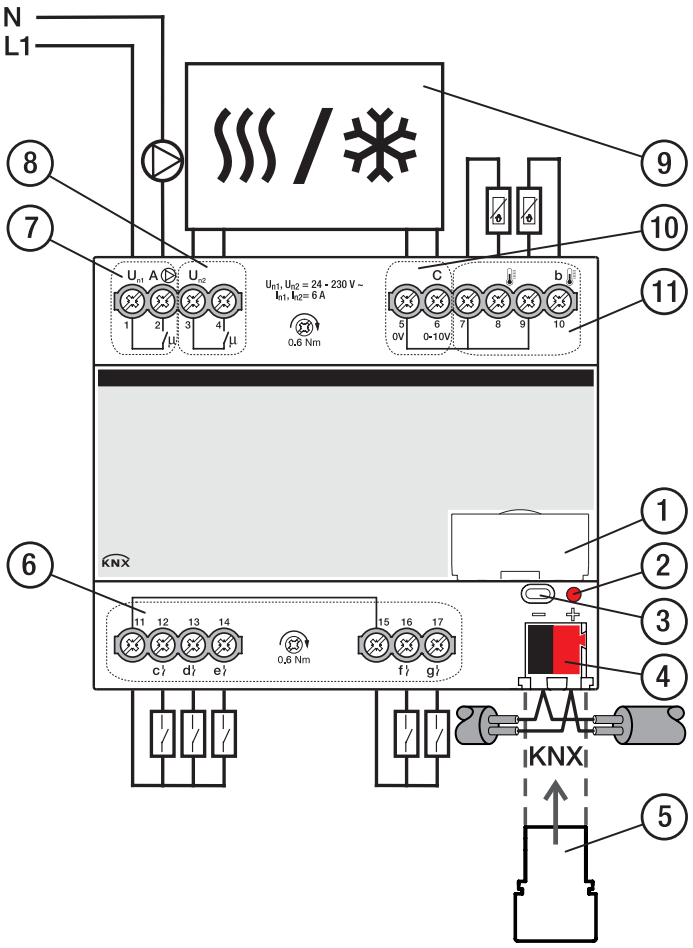

Fig. 3: Connection diagram

2CDC072044F0017

Legend

1 Label carriers
2 *Programming* LED
3 *Programming* button
4 Bus connection terminal
5 Cover cap
6 Binary input
7 Pump output (relay)
8 Generator output (relay)
9 Boiler/chiller
10 Generator output (analog)
11 Temperature input

3.5.3 Operating and display elements

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

Tab. 10: Operating and display elements

3.5.4 Technical data

3.5.4.1 General technical data

Device	Dimensions	90 × 105 × 63.5 mm (H x W x D)
	Mounting width in space units	6 modules, 17.5 mm each
	Weight	0.24 kg
	Mounting position	Any
	Mounting variant	35 mm mounting rail
	Design	proM
	Degree of protection	IP 20
	Protection class	II
	Overvoltage category	III
	Pollution degree	2
Materials	Housing	Polycarbonate, Makrolon FR6002, halogen free
Material note	Fire classification	Flammability V-0
Electronics	Rated voltage, bus	30 V DC
	Voltage range, bus	21 … 31 V DC
	Current consumption, bus	< 12 mA
	Power loss, device	≤ 3 W
	Power loss, bus	≤ 0.25 W
	Power loss, relay output 5 A	≤ 0.6 W
	KNX safety extra low voltage	SELV
Connections	Connection type, KNX bus	Plug-in terminal
	Cable diameter, KNX bus	0.6 … 0.8 mm, solid
	Connection type, inputs/outputs	Screw terminal with universal head (PZ 1)
	Pitch	6.35 mm
	Tightening torque, screw terminals	0.5 … 0.6 Nm
	Conductor cross-section, flexible	1 × (0.2 … 2.5 mm²) / 2 × (0.2 … 2.5 mm²)
	Conductor cross section, rigid	1 × (0.2 … 4 mm²) / 2 × (0.2 … 4 mm²)
	Conductor cross section with wire end ferrule without plastic sleeve	1 × (0.25 … 2.5 mm²)
	Conductor cross section with wire end ferrule with plastic sleeve	1 × (0.25 … 4 mm²)
	Conductor cross section with TWIN wire end ferrule	1 × (0.5 … 2.5 mm²)
	Length, wire end ferrule contact pin	≥ 10 mm
Certificates and declarations	Declaration of conformity CE	→ 2CDK508252D2701
Ambient conditions	Operation	-5 … +45 °C
	Transport	-25 … +70 °C
	Storage	-25 … +55 °C
	Humidity	≤ 95 %
	Condensation allowed	No
	Atmospheric pressure	≥ 80 kPa (corresponds to air pressure at 2,000 m above sea level)

Tab. 11: General technical data

3.5.4.2 Inputs - contact scanning

Rated values	Number of inputs	5
Contact scanning	Scanning current	≤ 1 mA
	Scanning voltage	≤ 12 V DC
Cable length	Between sensor and device input, one-way	≤ 100 m

Tab. 12: Inputs - contact scanning

3.5.4.3 Inputs - temperature sensor

Rated values	Number of inputs	2
Resistance	Selection	User-defined
	PT 1.000	2-conductor technology
	PT100	2-conductor technology
	KT	1k
	KTY	2k
	NI	1k
	NTC	10k, 20k
Cable length	Between sensor and device input, one-way	≤ 100 m

Tab. 13: Inputs - temperature sensor

3.5.4.4 Generator outputs - analog

Rated values	Number of outputs	1
	Control signal	0 … 10 V DC
	Signal type	Analog
	Output load	> 10 kohms
	Output tolerance	± 10 %
	Current limitation	Up to 1.5 mA

Tab. 14: Generator outputs - analog

3.5.4.5 Generator outputs - relay 5 A

Rated values	Number of outputs	1
	Rated voltage U_n	250 V AC
	Rated current I_n (per output)	5 A
	Rated frequency	50/60 Hz
	Back-up protection	≤ 6 A
	Relay type	Bi-stable
Switching currents	AC-1 operation (cos φ = 0.8)	≤ 5 A
	AC-3 operation (cos φ = 0.45)	≤ 5 A
	Switching current at 5 V AC	≥ 0.02 A
	Switching current at 12 V AC	≥ 0.01 A
	Switching current at 24 V AC	≥ 0.07 A
Service life	Mechanical service life	≥ 10^7 switching operations
	AC-1 operation (cos φ = 0.8)	≥ 10^6 switching operations
	AC-3 operation (cos φ = 0.45)	≥ 10^6 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

Tab. 15: Generator outputs - relay 5 A

3.5.4.6 Pump outputs - relay 5 A

Rated values	Number of outputs	1
	Rated voltage U_n	250 V AC
	Rated current I_n (per output)	5 A
	Rated frequency	50/60 Hz
	Back-up protection	≤ 6 A
	Relay type	Bi-stable
Switching currents	AC-1 operation (cos φ = 0.8)	≤ 5 A
	AC-3 operation (cos φ = 0.45)	≤ 5 A
	Switching current at 5 V AC	≥ 0.02 A
	Switching current at 12 V AC	≥ 0.01 A
	Switching current at 24 V AC	≥ 0.07 A
Service life	Mechanical service life	≥ 10^7 switching operations
	AC-1 operation (cos φ = 0.8)	≥ 10^6 switching operations
	AC-3 operation (cos φ = 0.45)	≥ 10^6 switching operations
Switching operations	Switching operations per minute when one relay switches	≤ 500

Tab. 16: Pump outputs - relay 5 A

3.5.4.7 Device type

Device type	Boiler/Chiller Interface	BCI/S 1.1. 1
	Application	Boiler/Chiller Interface/ …
		… = current version number of the application
	Maximum number of group objects	42
	Maximum number of group addresses	255
	Maximum number of assignments	255

Tab. 17: Device type

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

4 Function

4.1 Device functions

The device is an interface between the setpoint encoder and the boiler/chiller in a heating/cooling circuit.

The setpoint received via the bus (ABB i-bus® KNX) is converted into a 0-10 V signal. The generator is activated using the 0-10 V signal. The internal controller in the generator is responsible for reaching the setpoint temperature.

The generator can be switched on/off via the device's generator relay output.

The pump for the heating/cooling circuit can be switched as a function of the generator activation.

Generator and pump status, as well as supply flow and return flow temperature in the heating/cooling circuit, can be monitored via the device inputs.

4.2 Software functions

4.2.1 Functional overview

Pump activation

Single-phase pumps can be activated directly or depending on the generator activation using the boiler/chiller interface BCI/S. Three binary inputs are available for monitoring the pump status.

Generator activation

Using the boiler/chiller interface BCI/S, a boiler/chiller can be activated using a 0-10 V signal and switched on/off via the generator relay output. Two binary inputs are available for monitoring the generator status.

4.2.2 Safety mode

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

Error Setpoint temperature receipt

If no value is received on the group object *Absolute setpoint temperature* or *Setpoint temperature offset* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:

- Group object *Error "Setpoint temperature" receipt* is set to "Error"
- Value in the parameter *Setpoint temperature after exceeding monitoring time* becomes valid

The monitoring is activated in the parameter *Monitor receipt of "Setpoint temperature" group objects*.

Error Setpoint power receipt

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

The monitoring is activated in the parameter *Monitor receipt of "Setpoint power" group object*.

Error Pump fault receipt

If no value is received on group object *Pump fault* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Pump fault" receipt* is set to "Error"
- The pump remains switched off and cannot be switched on until a new value is received in the group object *Pump fault*

The monitoring is activated in the parameter *Monitor receipt of "Pump fault status" group object*.

Error Pump repair switch receipt

If no value is received on group object *Pump repair switch* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Pump repair switch" receipt* is set to "Error"
- The pump remains switched off and cannot be switched on until a new value is received in the group object *Pump repair switch*

The monitoring is activated in the parameter *Monitor receipt of "Pump repair switch status" group object*.

Error Generator error receipt

If no value is received on group object *Generator error* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Generator error" receipt* is set to "Error"
- The output voltage changes to the activation range for "Generator Off" until a new value is received in the group object *Generator error*

The monitoring is activated in the parameter *Monitor receipt of "Generator error status" group object*.

4.2.3 Generator activation

The generator is activated via a 0 … 10 V generator signal (output voltage). The device calculates the output voltage based on the setpoint received.

The output voltage is divided into the following voltage ranges that correspond to the operating modes of the generator:

Voltage range/operating mode "Generator fault"

If the output voltage is within the voltage range "Generator fault", there is a device fault or a bus voltage failure. The voltage range "Generator fault" is not output actively by the device. The minimum and maximum output voltage in the range are specified in the following parameters:
- *Min. output voltage generator fault*
- *Max. output voltage generator fault*

Voltage range/operating mode "Generator Off"

If the output voltage is within the voltage range "Generator Off", there is no request for heating/cooling:
- The setpoint is outside the permissible value range.
- The group object *Generator On/Off* has received a telegram with the value 0.

The value of the output voltage "Generator Off" corresponds to the average of the minimum and maximum output voltage "Generator Off".

The minimum and maximum output voltage in the range are specified in the following parameters:
- *Min. output voltage generator Off*
- *Max. output voltage generator Off / Min. output voltage for generator activation*

Note
The minimum output voltage for the voltage range "Generator Off" is calculated by the device and cannot be changed. The value is given by the value specified in the parameter *Max. output voltage generator fault* + 0.1 V.

Voltage range/operating mode "Generator activation"

If the output voltage is within the voltage range "Generator activation", there is a request for heating/cooling. The value of the output voltage "Generator activation" is calculated based on the setpoint received.

The minimum and maximum output voltage in the range are specified in the following parameters:
- *Max. output voltage generator Off / Min. output voltage for generator activation*
- *Max. output voltage for generator activation*

The minimum output voltage for the generator activation corresponds to the lower setpoint limit (minimum setpoint). The lower setpoint limit is specified in the following parameters (depending on the selection in the parameter *Type of generator activation*):
- *Lower temperature limit for generator activation*
- *Max. temperature decrease for generator activation*
- *Min. power specified for generator activation*

The maximum output voltage for the generator activation corresponds to the upper setpoint limit (maximum setpoint). The upper setpoint limit is specified in the following parameters (depending on the selection in the parameter *Type of generator activation*):
- *Upper temperature limit for generator activation*
- *Max. temperature increase for generator activation*
- *Max. power specified for generator activation*

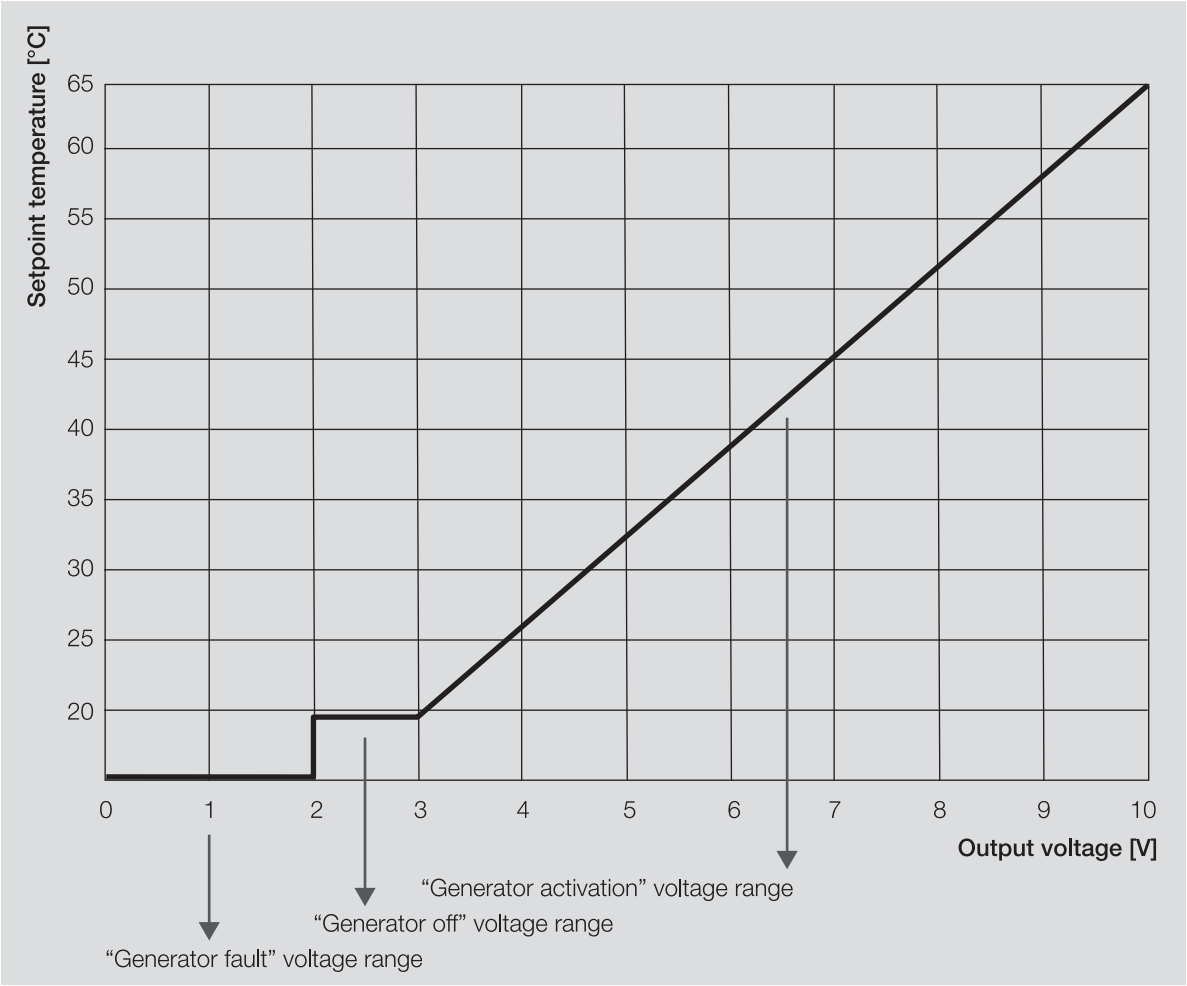

Fig. 4: Generator activation

Example

- Type of generator activation: absolute temperature
- Maximum output voltage for generator activation: 10 V
- Minimum output voltage for generator activation: 3 V
- Upper temperature limit for generator activation: 65 °C
- Lower temperature limit for generator activation: 20 °C
- Absolute setpoint temperature: 45 °C
  ⇒ The setpoint temperature 45 °C is converted to the output voltage 7 V.

4.2.3.1 Generator activation via generator relay output

If the generator is also activated via the generator relay output (→ parameter *Use generator relay output for generator activation*), the relay contact is switched based on the output voltage:

- If the output voltage is within the voltage range "Generator activation", the device switches on the relay contact.
- If the output voltage is within the voltage range "Generator Off", the device switches off the relay contact.

Note

Whether the relay contact is opened or closed depends on the setting in the parameter *Reaction of output*.

4.2.3.2 Group object "Generator On/Off"

If the generator is activated via the group object *Generator On/Off*, the voltage ranges "Generator Off" and "Generator activation" are switched directly via the group object:
- If the group object receives a telegram with the value 0, the generator signal changes to the voltage range "Generator Off".
- If the group object receives a telegram with the value 1, the generator signal changes to the voltage range "Generator activation". The device calculates the output voltage based on the setpoint received last.

If the voltage range is changed to "Generator Off" via the group object, it is also necessary to change back to the voltage range "Generator activation" via the group object. In this way, if the generator is consciously switched off (e.g. due to a summer shutdown), this situation is not reversed by a setpoint sent regularly.

If the generator is also activated via the generator relay output (→ parameter *Use generator relay output for generator activation*), the relay contact is switched via the group object:
- If the group object receives a telegram with the value 0, the device switches off the relay contact.
- If the group object receives a telegram with the value 1, the generator signal changes to the voltage range "Generator activation".

Note
Whether the relay contact is opened or closed depends on the setting in the parameter *Reaction of output*.

Note
If the device is in direct operation, the values received on the group object *Generator On/Off* are ignored. If direct operation is ended, the last value received on the group object *Generator On/Off* applies.

4.2.3.3 Automatic operation

In automatic operation the setpoint is specified via one of the following group objects, depending on the setting in the parameter *Type of generator activation*:
- *Absolute setpoint temperature*
- *Setpoint temperature offset*
- *Setpoint power*

In automatic operation, the generator relay can be switched via the group object *Generator On/Off*.

4.2.3.4 Direct operation

Note
The generator override setpoint becomes active only when manual generator override has been enabled via group object *Enable/block manual generator override*.

The setpoint specified in automatic operation is overridden in direct operation. Direct operation must be enabled in the parameter *Enable manual generator override*.

In direct operation, the setpoint is specified via one of the following group objects, depending on the setting in the parameter *Type of generator activation*:
- *Generator setpoint override* (DPT 9.001)
- *Generator setpoint override* (DPT 9.002)
- *Generator setpoint override* (DPT 5.001)

In direct operation, the generator relay can be switched via the group object *Generator relay override*.

The parameter *Return from manual generator override to automatic mode* specifies whether direct operation is ended via group object or after a set time has elapsed.

Note
If the device is in direct operation, the values received on the group object *Generator On/Off* are ignored. If direct operation is ended, the last value received on the group object *Generator On/Off* applies.

4.2.4 Pump activation

The pump output can be used to activate a single-phase pump. The pump can be activated in automatic operation or in the direct operation.

If automatic operation and direct operation are not enabled, the pump is activated via the group object *Pump On/Off*.

The parameter *Switch-off delay* specifies whether the heat/cold generated is still pumped into the heating/cooling circuit after the pump is switched off.

Automatic operation

The pump follows the generator activation in automatic operation. Automatic operation must be enabled in the parameter *Switch on pump when generator is in activation range*.

Direct operation

In direct operation the pump is activated via the following group objects:
- *Enable/block manual pump override*
- *Override pump*

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

Direct operation must be enabled in the parameter *Enable manual pump override*.

The parameter *Return from manual pump override to automatic mode* specifies whether direct operation is ended via a group object or after a set time has elapsed.

4.3 Integration into i-bus® Tool

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

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

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

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

4.4 Special operating states

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

4.4.1 Reaction on bus voltage failure (BSA)

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

4.4.2 Reaction after bus voltage recovery (BSW)

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

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

4.4.3 Reaction on ETS reset

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

4.4.4 Reaction on download (DL)

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

Note

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

- Download again.

5 Mounting and installation

5.1 Information about mounting

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

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

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

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

6 Commissioning

6.1 Prerequisites for commissioning

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

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

6.2 Commissioning overview

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

The device can be programmed only using ETS.

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

6.3 Putting device into operation

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

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

⇨ Device is ready for operation.

6.4 Assignment of the physical address

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

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

⇨ Physical address is assigned. Device restarts.

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

6.5 Software/application

6.5.1 Download reaction

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

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

6.5.2 Copying, exchanging and converting

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

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

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

7 Parameters

7.1 General

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

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

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

No (checkbox cleared)

Yes (checkbox ticked)

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

7.2 Parameter window

7.2.1 Parameter window Basic settings

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

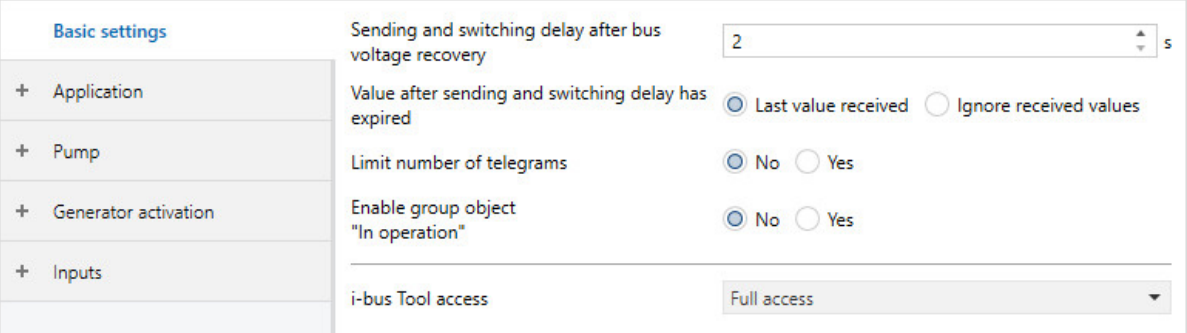

Fig. 5: Parameter window Basic settings

This parameter window includes the following parameters:

→ Sending and switching delay after bus voltage recovery, Page 65
→ Value after sending and switching delay has expired, Page 84
→ Limit number of telegrams, Page 41
  → Maximum number of telegrams, Page 54
  → In period (0 = deactivated), Page 48
→ Enable group object "In operation", Page 48
  → Send value group object "In operation", Page 83
  → Sending cycle, Page 65
→ I-bus® Tool access, Page 85

Prerequisites for visibility

- The parameter window is always visible.

7.2.2 Parameter window Application

7.2.2.1 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

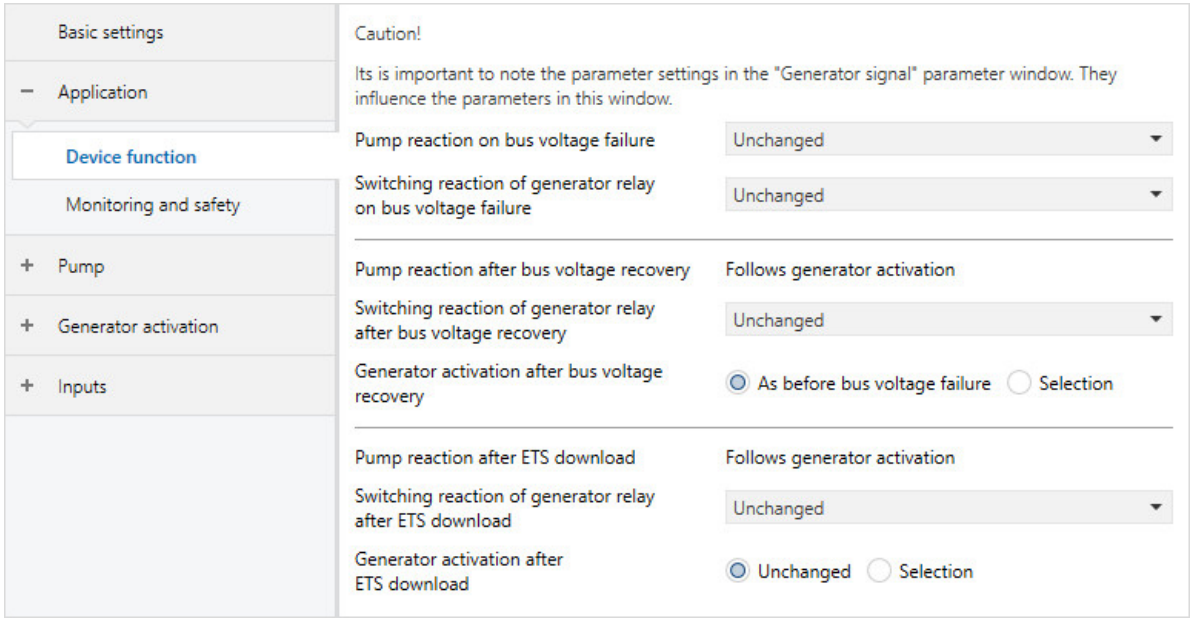

Fig. 6: Parameter window Device function

This parameter window includes the following parameters:

→ Pump reaction on bus voltage failure, Page 57
→ Generator relay switching reaction on bus voltage failure, Page 62
→ Pump reaction after bus voltage recovery, Page 58
→ Switching behavior of generator relay after bus voltage recovery, Page 64
→ Generator activation after bus voltage recovery, Page 45
→ Generator reaction after bus voltage recovery, Page 47
→ Setpoint generator signal, Page 67
→ Pump reaction after ETS download, Page 59
→ Switching behavior of generator relay after ETS download, Page 64
→ Generator activation after ETS download, Page 45
→ Generator reaction after ETS download, Page 47

Prerequisites for visibility

- The parameter window is in the parameter window *Application*.

7.2.2.2 Parameter window Monitoring and safety

The following settings can be made in this parameter window:

- Forced operation
- Cyclical monitoring

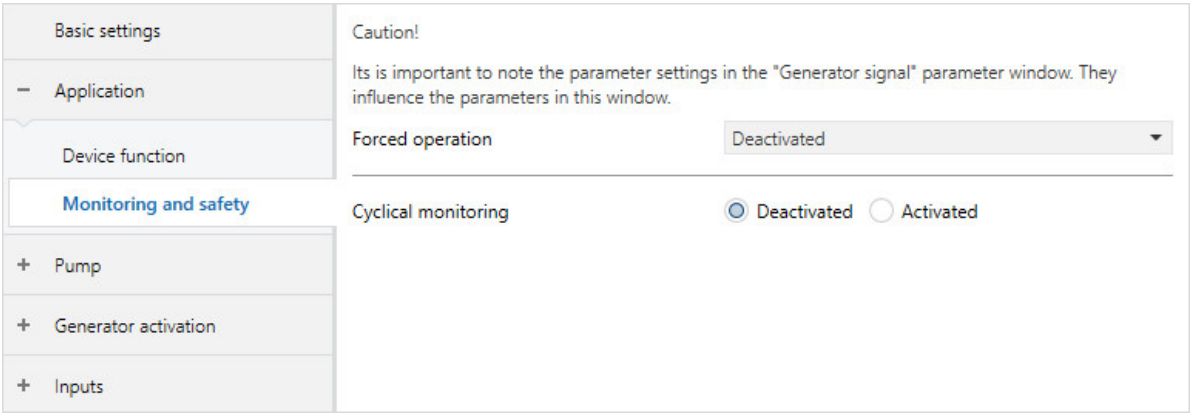

Fig. 7: Monitoring and safety parameter window

This parameter window includes the following parameters:

→ Forced operation, Page 86
- → Generator relay switching reaction on forced operation, Page 63
- → Generator reaction on forced operation, Page 46
  - → Setpoint generator signal on forced operation, Page 67
- → Pump reaction on forced operation, Page 57
- → Switching reaction of generator relay on forced operation active "ON", Page 64
- → Generator reaction on forced operation active "ON", Page 46
  - → Setpoint generator signal on forced operation active "ON", Page 68
- → Pump reaction during forced operation active "ON", Page 58
- → Switching reaction of generator relay on forced operation active "OFF", Page 63
- → Generator reaction on forced operation active "OFF", Page 46
  - → Setpoint generator signal on forced operation active "OFF", Page 68
- → Pump reaction during forced operation active "OFF", Page 58

→ Cyclical monitoring, Page 87
- → Monitor receipt of "Setpoint temperature" group objects, Page 79
  - → Time interval for cyclical monitoring, Page 87
  - → Setpoint temperature after exceeding monitoring time, Page 66
  - → Temperature offset when monitoring time exceeded, Page 75
- → Monitor receipt of "Setpoint power" group object, Page 77
  - → Setpoint power on exceeding monitoring time, Page 66
- → Monitor receipt of "Pump fault status" group object, Page 78
- → Monitor receipt of "Pump repair switch status" group object, Page 79
- → Monitor receipt of "Generator error status" group object, Page 78

Prerequisites for visibility

- The parameter window is in the parameter window *Application*.

7.2.3 Parameter window Pump

The following settings can be made in this parameter window:

- Pump reaction defined
- Enable manual pump override
- Defining status monitoring

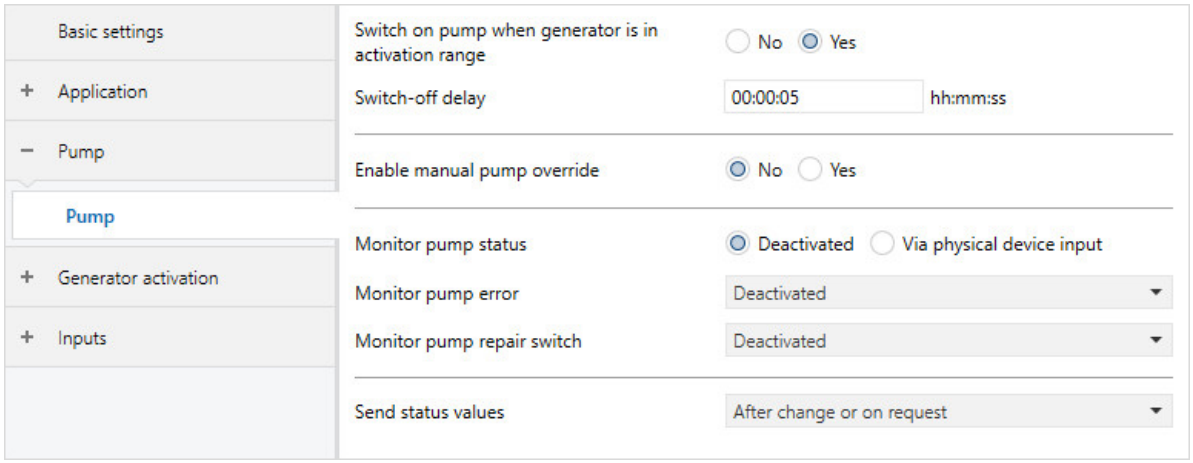

Fig. 8: Pump parameter window

This parameter window includes the following parameters:

→ Switch on pump when generator is in activation range, Page 57
→ Switch-off delay, Page 56
→ Enable manual pump override, Page 52
→ Return from manual pump override to automatic mode, Page 61
→ Reset time, Page 62
→ Monitor pump status, Page 82
→ Monitor pump error, Page 81
→ Monitor pump repair switch, Page 81
→ Send status values [pump], Page 72
→ Send cyclically every, Page 86

Prerequisites for visibility

- The parameter window is always visible.

7.2.4 Parameter window Generator activation

7.2.4.1 Parameter window Generator signal

The following settings can be made in this parameter window:

- Defining temperature or power limits
- Defining voltage ranges for generator activation
- Defining status monitoring
- Enable manual generator override

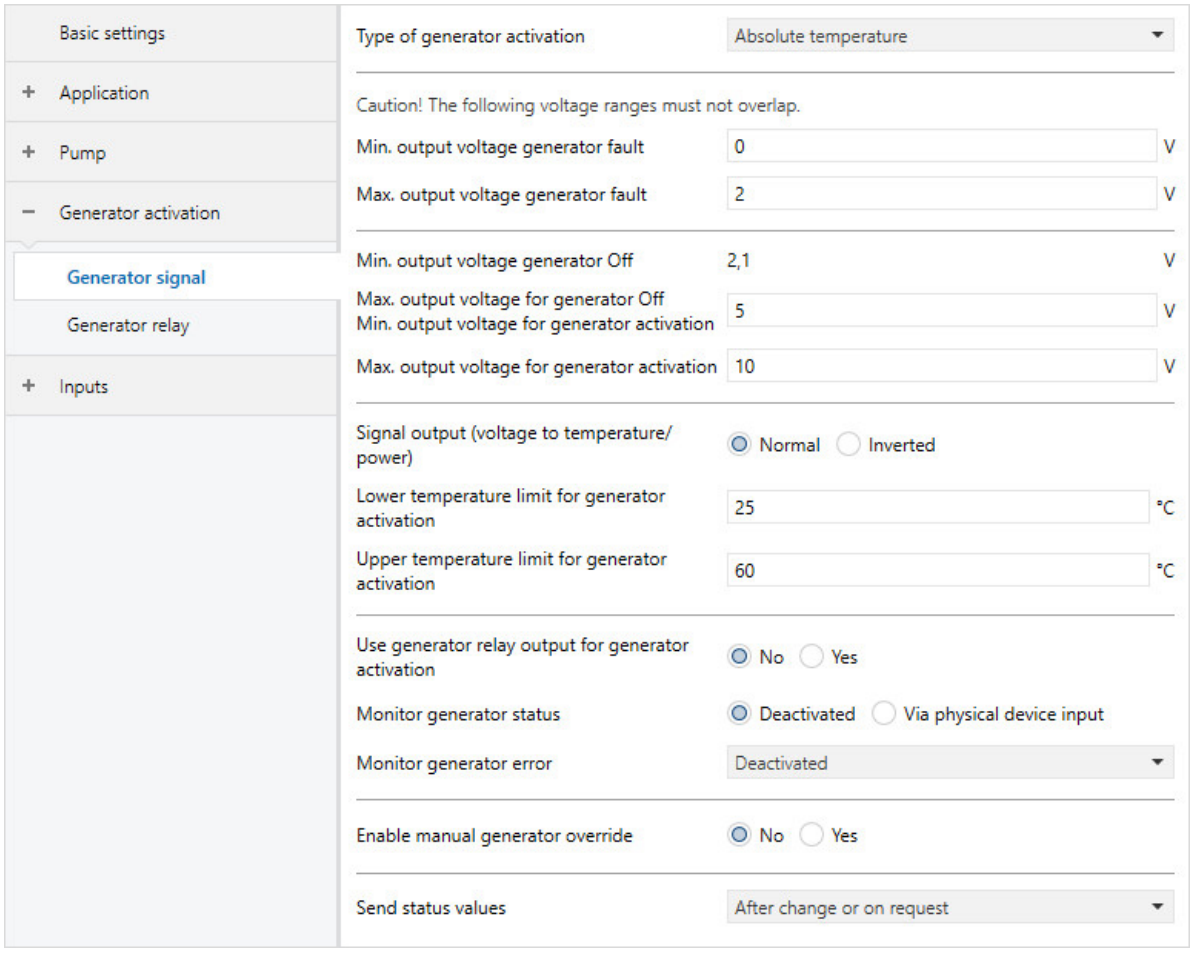

Fig. 9: Generator signal parameter window

This parameter window includes the following parameters:

Prerequisites for visibility

- The parameter window is in the parameter window *Generator activation*.

7.2.4.2 Parameter window Generator relay

The following settings can be made in this parameter window:

- Parameterizing generator relay output

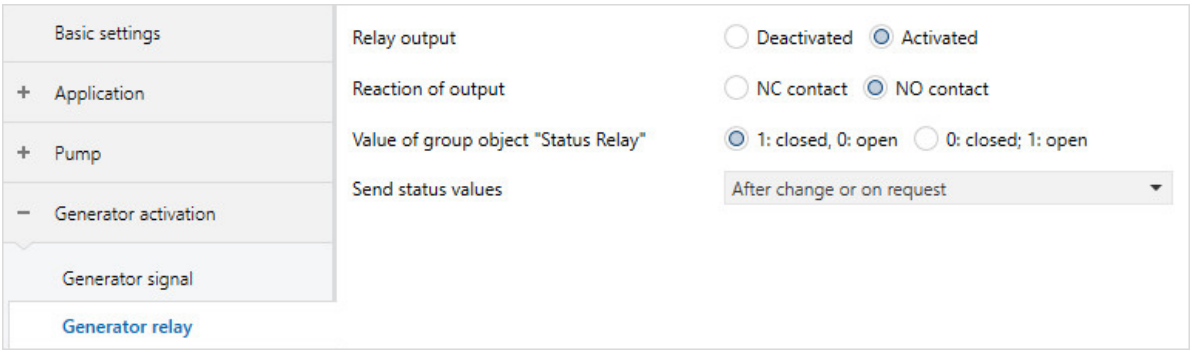

Fig. 10: Generator relay parameter window

This parameter window includes the following parameters:

→ Relay output [generator], Page 60
→ Reaction of output, Page 83
→ Value of group object "Status generator relay", Page 84
→ Send status values [generator relay output], Page 70
→ Send cyclically every, Page 86

Prerequisites for visibility

- The parameter window is in the parameter window *Generator activation*.

7.2.5 Parameter window Inputs

7.2.5.1 Parameter window Input x: Supply flow temperature

The following settings can be made in this parameter window:

- Parameterizing supply flow temperature input

Fig. 11: Parameter window Input x: Supply flow temperature

This parameter window includes the following parameters:

→ Temperature input [supply flow temperature], Page 74
- → Temperature sensor type, Page 75
  - → NTC type, Page 56
  - → KTY type, Page 49
- → Temperature offset, Page 74
- → Cable error compensation, Page 50
  - → Cable length, single distance, Page 50
  - → Cross-section of conductor, value* 0.01 mm², Page 59
  - → Cable resistance (total of fwd and rtn conductor), Page 51
- → Filter, Page 47
- → Send temperature value [supply flow temperature], Page 76
  - → Value is sent from a change of, Page 84
  - → Send cyclically every, Page 86

Prerequisites for visibility

- The parameter window is in the parameter window *Inputs*.

7.2.5.2 Parameter window Input x: Return flow temperature

The following settings can be made in this parameter window:

- Parameterizing return flow temperature input

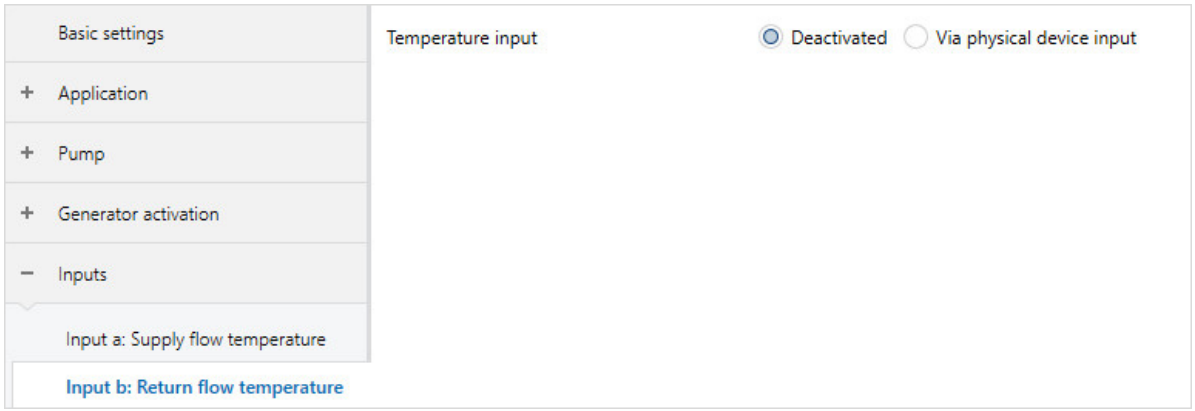

Fig. 12: Parameter window Input x: Return flow temperature

This parameter window includes the following parameters:

→ Temperature input [return flow temperature], Page 73
- → Temperature sensor type, Page 75
  - → NTC type, Page 56
  - → KTY type, Page 49
- → Temperature offset, Page 74
- → Cable error compensation, Page 50
  - → Cable length, single distance, Page 50
  - → Cross-section of conductor, value* 0.01 mm², Page 59
  - → Cable resistance (total of fwd and rtn conductor), Page 51
- → Filter, Page 47
- → Send temperature value [return flow temperature], Page 75
  - → Value is sent from a change of, Page 84
  - → Send cyclically every, Page 86

Prerequisites for visibility

- The parameter window is in the parameter window *Inputs*.

7.2.5.3 Parameter window Input x: Binary input

The following settings can be made in this parameter window:

- Parameterizing binary input

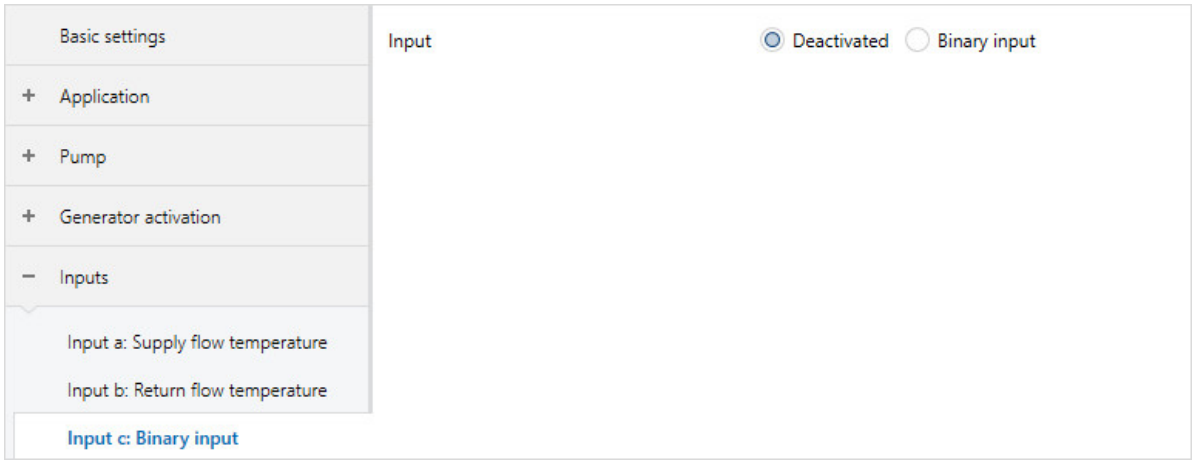

Fig. 13: Parameter window Input x: Binary input

This parameter window includes the following parameters:

→ Input, Page 43
→ Active detected if, Page 41
→ Send status values [pump status input], Page 73
→ Send cyclically every, Page 86
→ Send status values [pump fault output], Page 72
→ Send status values [pump repair status input], Page 73
→ Send status values [generator status input], Page 71
→ Send status values [generator error], Page 69
→ Distinction between long and short operation, Page 82
→ Input on operation, Page 45
→ Long operation after, Page 49
→ Activate minimum signal duration, Page 55
→ When opening the contact, Page 42
→ When closing the contact, Page 43
→ Enable group object "Block input", Page 48
→ Reaction on event x, Page 60
→ Send status values [binary input], Page 69
→ On group object value, Page 42
→ Scan input after download, ETS reset or bus voltage recovery, Page 44

Prerequisites for visibility

- The parameter window is in the parameter window *Inputs*.

7.3 Overview of parameters

7.4 Parameter descriptions

7.4.1 Active detected if

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

Option
Contact open
Contact closed

Prerequisites for visibility

- Parameter window *Pump* \ Parameter *Monitor pump status* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

or

- Parameter window *Pump* \ Parameter *Monitor pump error* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

or

- Parameter window *Pump* \ Parameter *Monitor pump repair switch* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.2 Limit number of telegrams

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

More information: → Telegram rate limit, Page 100.

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

Prerequisites for visibility

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

7.4.3 Type of generator activation

The type of generator activation (generator setpoint) is defined using this parameter.

Option	
Absolute temperature	The following dependent parameters are shown: • *Lower temperature limit for generator activation* • *Upper temperature limit for generator activation* The following dependent group objects are displayed: • *Absolute setpoint temperature*
Temperature offset	The following dependent parameters are shown: • *Max. temperature decrease for generator activation* • *Max. temperature increase for generator activation* The following dependent group objects are displayed: • *Setpoint temperature offset*
Power specified	The following dependent parameters are shown: • *Min. power specified for generator activation* • *Max. power specified for generator activation* The following dependent group objects are displayed: • *Setpoint power*

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.4 On group object value

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

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

Prerequisites for visibility

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

7.4.5 When opening the contact

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

Option
0.0 … 1.0 … 100.0 s

Prerequisites for visibility

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

7.4.6 When closing the contact

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

Option
0.0 … 1.0 … 100.0 s

Prerequisites for visibility

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

7.4.7 Input

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

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

Option	
Deactivated	The input is deactivated.
Pump status input	The input is used as the pump status input. The following dependent parameters are shown: • *Active detected if* • *Send status values [pump status input]*
Pump error input	The input is used as the pump error input. The following dependent parameters are shown: • *Active detected if* • *Send status values [pump fault output]*
Pump repair status input	The input is used as the pump repair status input. The following dependent parameters are shown: • *Active detected if* • *Send status values [pump repair status input]*
Generator status input	The input is used as the generator status input. The following dependent parameters are shown: • *Active detected if* • *Send status values [generator status input]*
Generator error input	The input is used as the generator error input. The following dependent parameters are shown: • *Active detected if* • *Send status values [generator error]*
Binary input	The input is used as the binary input. The following dependent parameters are shown: • *Distinction between long and short operation* • *Activate minimum signal duration* • *Enable group object "Block input"* • *Reaction on event x* • *Send status values [binary input]* • *Scan input after download, ETS reset or bus voltage recovery* The following dependent group objects are displayed: • *Contact position binary input*

Prerequisites for visibility

- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

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

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

Note

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

Option
No
Yes

Prerequisites for visibility

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

7.4.9 Input on operation

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

Option
Open
Closed

Prerequisites for visibility

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

7.4.10 Generator activation after bus voltage recovery

This parameter is used to define the generator activation after bus voltage recovery.

Option	
As before bus voltage failure	The generator activation before bus voltage failure is applied.
Selection	The generator activation can be set. The following dependent parameters are shown: • *Generator reaction after bus voltage recovery*

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.11 Generator activation after ETS download

This parameter is used to define the generator activation after ETS download.

Option	
Unchanged	The generator activation before ETS download is applied.
Selection	The generator activation can be set. The following dependent parameters are shown: • *Generator reaction after ETS download*

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.12 Use generator relay output for generator activation

This parameter is used to define whether the generator relay output is to be used internally in the device to activate the generator.

More information: → Generator activation via generator relay output, Page 21.

Option
No
Yes

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.13 Generator reaction on forced operation

This parameter is used to define the reaction of the generator if 1-bit forced operation is active.

Option	
On	The generator is switched on. The following dependent parameters are shown: • *Setpoint generator signal on forced operation*
Off	The generator is switched off.

Prerequisites for visibility

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

7.4.14 Generator reaction on forced operation active "OFF"

This parameter is used to define the reaction of the generator if 2-bit forced operation "OFF" is active.

Option	
On	The generator is switched on. The following dependent parameters are shown: • *Setpoint generator signal on forced operation active "OFF"*
Off	The generator is switched off.

Prerequisites for visibility

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

7.4.15 Generator reaction on forced operation active "ON"

This parameter is used to define the reaction of the generator if 2-bit forced operation "ON" is active.

Option	
On	The generator is switched on. The following dependent parameters are shown: • *Setpoint generator signal on forced operation active "ON"*
Off	The generator is switched off.

Prerequisites for visibility

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

7.4.16 Generator reaction after bus voltage recovery

This parameter is used to define the reaction of the generator after bus voltage recovery.

Option	
On	The generator is switched on. The following dependent parameters are shown: • *Setpoint generator signal*
Off	The generator is switched off.

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Device function* \ Parameter *Generator activation after bus voltage recovery* \ Option *Selection*
- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.17 Generator reaction after ETS download

This parameter is used to define the reaction of the generator after ETS download.

Option	
On	The generator is switched on. The following dependent parameters are shown: • *Setpoint generator signal*
Off	The generator is switched off.

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Device function* \ Parameter *Generator activation after ETS download* \ Option *Selection*
- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.18 Filter

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

More information: Floating mean value.

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.19 In period (0 = deactivated)

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

More information: → Telegram rate limit, Page 100.

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

Prerequisites for visibility

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

7.4.20 Enable group object "Block input"

This parameter enables the group object *Block input*.

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

Prerequisites for visibility

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

7.4.21 Enable group object "In operation"

This parameter enables the group object *In operation*.

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

Prerequisites for visibility

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

7.4.22 KTY type

This parameter is used to set the KTY subtype.

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

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.23 Long operation after

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

Option
1.0 … 10.0 s

Prerequisites for visibility

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

7.4.24 Cable length, single distance

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

Option
1.0 … 10.0 … 100.0 m

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature*
  - Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
  - Parameter *Cable error compensation* \ Option *Via cable length*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature*
  - Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
  - Parameter *Cable error compensation* \ Option *Via cable length*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.25 Cable error compensation

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

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

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.26 Cable resistance (total of fwd and rtn conductor)

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

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

Option
0 … 500 … 10,000 mohms

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature*
  - Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
  - Parameter *Cable error compensation* \ Option *Via cable resistance*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature*
  - Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
  - Parameter *Cable error compensation* \ Option *Via cable resistance*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.27 Enable manual generator override

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

More information: → Direct operation, Page 22.

Note
The generator override setpoint becomes active only when manual generator override has been enabled via group object *Enable/block manual generator override*.

Option	
No	Manual generator override cannot be enabled via a group object.
Yes	The following dependent parameters are shown: • *Return from manual generator override to automatic mode* The following dependent group objects are displayed: • *Enable/block manual generator override* • *Generator setpoint override* (DPT 9.001) • *Generator setpoint override* (DPT 9.002) • *Generator setpoint override* (DPT 5.001) • *Generator relay override*

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.28 Enable manual pump override

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

More information: → Pump activation, Page 23.

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

Option	
No	Manual pump override cannot be enabled via a group object.
Yes	The following dependent parameters are shown: • *Return from manual pump override to automatic mode* The following dependent group objects are displayed: • *Enable/block manual pump override* • *Override pump* • *Status pump automatic mode*

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.29 Max. output voltage generator Off / Min. output voltage for generator activation

This parameter is used to define the output voltage:

- Maximum output voltage for the voltage range "Generator Off"
- Minimum output voltage for the voltage range "Generator activation"

More information: → Generator activation, Page 19.

Option
0.0 … 5.0 … 10.0 V

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.30 Max. output voltage generator fault

This parameter is used to define the maximum output voltage for the voltage range "Generator fault".

More information: → Generator activation, Page 19.

Option
0.0 … 2.0 … 10.0 V

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.31 Max. output voltage for generator activation

This parameter is used to define the maximum output voltage for the voltage range "Generator activation".

More information: → Generator activation, Page 19.

Option
0.0 … 10.0 V

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.32 Max. power specified for generator activation

This parameter is used to define the maximum power specified for the generator activation.

More information: → Generator activation, Page 19.

Option
0.0 … 100.0 %

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Power specified*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.33 Max. temperature decrease for generator activation

This parameter is used to define the maximum temperature decrease for the generator activation.

More information: → Generator activation, Page 19.

Option
–50 … 0 … 50 K

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Temperature offset*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.34 Max. temperature increase for generator activation

This parameter is used to define the maximum temperature increase for the generator activation.

More information: → Generator activation, Page 19.

Option
–50 … 0 … 50 K

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Temperature offset*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.35 Maximum number of telegrams

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

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

More information: → Telegram rate limit, Page 100.

Option
1 … 20 … 50

Prerequisites for visibility

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

7.4.36 Min. output voltage generator Off

The minimum output voltage for the voltage range "Generator Off" is calculated by the device and cannot be changed. The value is given by the value specified in the parameter *Max. output voltage generator fault* + 0.1 V.

More information: → Generator activation, Page 19.

Option
0.1 … 10.0 V

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.37 Min. output voltage generator fault

This parameter is used to define the minimum output voltage for the voltage range "Generator fault".

More information: → Generator activation, Page 19.

Option
0.00 … 10.00 V

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.38 Min. power specified for generator activation

This parameter is used to define the minimum power specified for the generator activation.

More information: → Generator activation, Page 19.

Option
0.0 … 1.0 … 100.0 %

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Power specified*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.39 Activate minimum signal duration

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

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

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

Prerequisites for visibility

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

7.4.40 Switch-off delay

This parameter is used to define the run-on time after switching off the pump.

Option
00:00:00 … 00:00:05 … 01:00:00 hh:mm:ss

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.41 NTC type

This parameter is used to define the NTC type used.

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

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.42 Upper temperature limit for generator activation

This parameter is used to define the upper temperature limit for the generator activation.

More information: → Generator activation, Page 19.

> **Note**
> The possible options and the standard option depend on the selection made in the parameter *Signal output (voltage to temperature/power)*.

Option
0.0 … 60.0 … 100.0 °C
0.0 … 20.0 … 100.0 °C

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Absolute temperature*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.43 Switch on pump when generator is in activation range

This parameter is used to define whether the pump is switched as a function of the generator activation.

More information: → Generator activation, Page 19.

Option	
No	The pump is switched via the group object *Pump On/Off*. The following dependent group objects are displayed: • *Pump On/Off*
Yes	The pump is switched as a function of the generator activation: • If the setpoint is in the activation range "Generator On", the pump is switched on. • If the setpoint is in the activation range "Generator Off", the pump is switched off.

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.44 Pump reaction on bus voltage failure

This parameter is used to define the pump reaction on bus voltage failure.

Option	
On	The pump is switched on.
Off	The pump is switched off.
Unchanged	The state of the pump remains unchanged.

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.45 Pump reaction on forced operation

This parameter is used to define the pump reaction when 1-bit forced operation is active.

Option	
On	The pump is switched on.
Off	The pump is switched off.
Follows generator activation	The pump is switched on or off depending on the signal for generator activation.

Prerequisites for visibility

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

7.4.46 Pump reaction during forced operation active "OFF"

This parameter is used to define the pump reaction if 2-bit forced operation "OFF" is active.

Option	
On	The pump is switched on.
Off	The pump is switched off.
Follows generator activation	The pump is switched on or off depending on the signal for generator activation.

Prerequisites for visibility

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

7.4.47 Pump reaction during forced operation active "ON"

This parameter is used to define the pump reaction on active 2-bit forced operation "ON".

Option	
On	The pump is switched on.
Off	The pump is switched off.
Follows generator activation	The pump is switched on or off depending on the signal for generator activation.

Prerequisites for visibility

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

7.4.48 Pump reaction after bus voltage recovery

This parameter is used to define the pump reaction after bus voltage recovery.

Note
The possible options and the standard option depend on the selection made in the parameter *Switch on pump when generator is in activation range*.

Option	
On	The pump is switched on.
Off	The pump is switched off.
Unchanged	The pump state prior to bus voltage failure or ETS download is adopted.
Follows generator activation	The pump is switched on or off depending on the signal for generator activation.

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.49 Pump reaction after ETS download

This parameter is used to define the pump reaction after ETS download.

Note
The possible options and the standard option depend on the selection made in the parameter *Switch on pump when generator is in activation range*.

Option	
On	The pump is switched on.
Off	The pump is switched off.
Unchanged	The pump state prior to bus voltage failure or ETS download is adopted.
Follows generator activation	The pump is switched on or off depending on the signal for generator activation.

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.50 Cross-section of conductor, value* 0.01 mm²

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

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

Option
1 … 100 … 150

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature*
  - Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
  - Parameter *Cable error compensation* \ Option *Via cable length*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature*
  - Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
  - Parameter *Cable error compensation* \ Option *Via cable length*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.51 Reaction on event x

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

Note
The action that triggers event 0 or event 1 depends on the option in the parameter *Distinction between long and short operation*:
- No
  - Event 0 = Opening the contact
  - Event 1 = Closing the contact
- Yes
  - Event 0 = Short operation
  - Event 1 = Long operation

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

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

Prerequisites for visibility
- Parameter window *Inputs* \ Parameter window *Input x: Binary input* \ Parameter *Input* \ Option *Binary input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.52 Relay output [generator]

This parameter is used to activate/deactivate the generator relay output.

Option	
Deactivated	The output is deactivated.
Activated	The following dependent parameters are shown: • *Reaction of output* • *Value of group object "Status generator relay"* • *Send status values [generator relay output]* The following dependent group objects are displayed: • *Status generator relay* • *Switch*

Prerequisites for visibility
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator relay*.

7.4.53 Return from manual generator override to automatic mode

This parameter is used to define how the return to automatic mode from manual generator override takes place.

More information: → Direct operation, Page 22.

Option	
Via group object	Return to automatic mode takes place only via group object *Enable/block manual generator override*.
Via group object or automatic	The return to automatic mode takes place via the group object *Enable/block manual generator override* or automatically after the reset time set. The following dependent parameters are shown: • *Reset time*

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Enable manual generator override* \ Option *Yes*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.54 Return from manual pump override to automatic mode

This parameter is used to define how the return to automatic mode from manual pump override takes place.

More information: → Pump activation, Page 23.

Option	
Via group object	Return to automatic mode takes place only via group object *Enable/block manual pump override*.
Via group object or automatic	The return to automatic mode takes place via the group object *Enable/block manual pump override* or automatically after the reset time set. The following dependent parameters are shown: • *Reset time*

Prerequisites for visibility

- Parameter window *Pump* \ Parameter *Enable manual pump override* \ Option *Yes*
- The parameter is in the parameter window *Pump*.

7.4.55 Reset time

This parameter is used to define the time for the change from manual adjustment to the automatic mode.

The reset time is restarted after each manual adjustment.

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

Prerequisites for visibility

- Parameter window *Pump*
  - Parameter *Enable manual pump override* \ Option *Yes*
  - Parameter *Return from manual pump override to automatic mode* \ Option *Via group object or automatic*
- The parameter is in the parameter window *Pump*.

or

- Parameter window *Generator activation* \ Parameter window *Generator signal*
  - Parameter *Enable manual generator override* \ Option *Yes*
  - Parameter *Return from manual generator override to automatic mode* \ Option *Via group object or automatic*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.56 Generator relay switching reaction on bus voltage failure

This parameter is used to define the reaction of the generator relay on bus voltage failure.

Option	
Unchanged	The position of the relay contact remains unchanged.
Contact closed	The relay contact is closed.
Contact open	The relay contact is opened.

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.57 Generator relay switching reaction on forced operation

This parameter is used to define the reaction of the generator relay if 1-bit forced operation is active.

Note
Whether the relay contact is opened or closed depends on the setting in the parameter *Reaction of output*.

Option	
Unchanged	The position of the relay contact remains unchanged.
On	Parameterization as normally closed contact: The relay contact is opened. Parameterization as normally open contact: The relay contact is closed.
Off	Parameterization as normally closed contact: The relay contact is closed. Parameterization as normally open contact: The relay contact is opened.

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 1 bit – 1 active* / *Activated 1 bit – 0 active*
- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.58 Switching reaction of generator relay on forced operation active "OFF"

This parameter is used to define the reaction of the generator relay if 2-bit forced operation "OFF" is active.

Note
Whether the relay contact is opened or closed depends on the setting in the parameter *Reaction of output*.

Option	
Unchanged	The position of the relay contact remains unchanged.
On	Parameterization as normally closed contact: The relay contact is opened. Parameterization as normally open contact: The relay contact is closed.
Off	Parameterization as normally closed contact: The relay contact is closed. Parameterization as normally open contact: The relay contact is opened.

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 2 bit*
- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.59 Switching reaction of generator relay on forced operation active "ON"

This parameter is used to define the reaction of the generator relay if 2-bit forced operation "ON" is active.

> **Note**
> Whether the relay contact is opened or closed depends on the setting in the parameter *Reaction of output*.

Option	
Unchanged	The position of the relay contact remains unchanged.
On	Parameterization as normally closed contact: The relay contact is opened. Parameterization as normally open contact: The relay contact is closed.
Off	Parameterization as normally closed contact: The relay contact is closed. Parameterization as normally open contact: The relay contact is opened.

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 2 bit*
- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.60 Switching behavior of generator relay after bus voltage recovery

This parameter is used to define the reaction of the generator relay after bus voltage recovery.

Option	
Unchanged	The position of the relay contact remains unchanged.
Contact closed	The relay contact is closed.
Contact open	The relay contact is opened.

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.61 Switching behavior of generator relay after ETS download

This parameter is used to define the reaction of the generator relay after ETS download.

Option	
Unchanged	The position of the relay contact remains unchanged.
Contact closed	The relay contact is closed.
Contact open	The relay contact is opened.

Prerequisites for visibility

- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.62 Sending and switching delay after bus voltage recovery

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

More information: → Sending and switching delay, Page 99.

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

Option
2 … 255 s

Prerequisites for visibility

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

7.4.63 Sending cycle

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

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

Prerequisites for visibility

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

7.4.64 Signal output (voltage to temperature/power)

This parameter is used to define how the output signal for generator activation is issued.

More information: → Setpoint generator signal, Page 100.

Option	
Normal	The output signal is issued normally. If the setpoint is increased, the output voltage is increased. If the setpoint is reduced, the output voltage is reduced. This type of generator activation is typically used for boilers.
Inverted	The output signal is issued inverted. If the setpoint is increased, the output voltage is reduced. If the setpoint is reduced, the output voltage is increased. This type of generator activation is typically used for chillers.

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.65 Setpoint power on exceeding monitoring time

This parameter is used to define a setpoint power to be set if the monitoring time is exceeded. The setpoint power set is valid until a new setpoint power is received via the bus (ABB i-bus® KNX).

Option
0 … 50 … 100 %

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Power specified*
- Parameter window *Generator activation* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of "Setpoint power" group object* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Monitoring and safety*.

7.4.66 Setpoint temperature after exceeding monitoring time

This parameter is used to define a setpoint temperature to be set if the monitoring time is exceeded. The setpoint temperature set is valid until a new setpoint temperature is received via the bus (ABB i-bus® KNX).

Note
The possible options and the standard option depend on the selection made in the following parameters:

- *Type of generator activation*
- *Signal output (voltage to temperature/power)*

More information: → Setpoint generator signal, Page 100.

Option
0 … 50 … 100 °C
0 … 15 … 100 °C

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Absolute temperature*
- Parameter window *Generator activation* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of "Setpoint temperature" group objects* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Monitoring and safety*.

7.4.67 Setpoint generator signal

This parameter is used to define the setpoint for the generator signal after bus voltage recovery or download. The setpoint set is valid until a new setpoint has been received.

Note
The possible options and the standard option depend on the selection made in the following parameters:
- *Type of generator activation*
- *Signal output (voltage to temperature/power)*

More information: → Setpoint generator signal, Page 100.

Option
0 … 50 … 100 °C
0 … 15 … 100 °C
–50 … 0 … 50 K
0 … 50 … 100 %

Prerequisites for visibility
- Parameter window *Application* \ Parameter window *Device function*
  - Parameter *Generator activation after bus voltage recovery* \ Option *Selection*
  - Parameter *Generator reaction after bus voltage recovery* \ Option *On*
- The parameter is in the parameter window *Application* \ parameter window *Device function*.

or
- Parameter window *Application* \ Parameter window *Device function*
  - Parameter *Generator activation after ETS download* \ Option *Selection*
  - Parameter *Generator reaction after ETS download* \ Option *On*
- The parameter is in the parameter window *Application* \ parameter window *Device function*.

7.4.68 Setpoint generator signal on forced operation

This parameter is used to define the setpoint for the generator signal if 1-bit forced operation is active.

Note
The possible options and the standard option depend on the selection made in the following parameters:
- *Type of generator activation*
- *Signal output (voltage to temperature/power)*

More information: → Setpoint generator signal, Page 100.

Option
0 … 50 … 100 °C
0 … 15 … 100 °C
–50 … 0 … 50 K
0 … 50 … 100 %

Prerequisites for visibility
- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Forced operation* \ Option *Activated 1 bit – 1 active / Activated 1 bit – 0 active*
  - Parameter *Generator reaction on forced operation* \ Option *On*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.69 Setpoint generator signal on forced operation active "OFF"

This parameter is used to define the setpoint for the generator signal if 2-bit forced operation "OFF" is active.

> **Note**
> The possible options and the standard option depend on the selection made in the following parameters:
> - *Type of generator activation*
> - *Signal output (voltage to temperature/power)*
>
> More information: → Setpoint generator signal, Page 100.

Option
0 … 50 … 100 °C
0 … 15 … 100 °C
–50 … 0 … 50 K
0 … 50 … 100 %

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Forced operation* \ Option *Activated 1 bit – 1 active / Activated 1 bit – 0 active*
  - Parameter *Generator reaction on forced operation active "OFF"* \ Option *On*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.70 Setpoint generator signal on forced operation active "ON"

This parameter is used to define the setpoint for the generator signal if 2-bit forced operation "ON" is active.

> **Note**
> The possible options and the standard option depend on the selection made in the following parameters:
> - *Type of generator activation*
> - *Signal output (voltage to temperature/power)*
>
> More information: → Setpoint generator signal, Page 100.

Option
0 … 50 … 100 °C
0 … 15 … 100 °C
–50 … 0 … 50 K
0 … 50 … 100 %

Prerequisites for visibility

- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Forced operation* \ Option *Activated 1 bit – 1 active / Activated 1 bit – 0 active*
  - Parameter *Generator reaction on forced operation active "ON"* \ Option *On*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.71 Send status values [binary input]

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

- *Contact position binary input*

Option	
After change	The value is sent if there is a change.
After change or cyclically	The value is sent after a change or cyclically. The cycle time can be set.

Prerequisites for visibility

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

7.4.72 Send status values [generator error]

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

- *Generator error alarm*

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

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

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator error* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.73 Send status values [generator relay output]

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

- *Status generator relay*

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

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

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator relay*.

7.4.74 Send status values [generator signal]

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

- *Generator status On/Off*
- *Generator activation status*

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

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

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.75 Send status values [generator status input]

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

- *Generator status*

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

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

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator status* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.76 Send status values [pump]

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

- *Status pump automatic mode*
- *Status pump relay*

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

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

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.77 Send status values [pump fault output]

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

- *Pump fault alarm*

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

Prerequisites for visibility

- Parameter window *Pump* \ Parameter *Monitor pump error* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.78 Send status values [pump repair status input]

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

- *Pump repair switch*

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

Prerequisites for visibility

- Parameter window *Pump* \ Parameter *Monitor pump repair switch* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.79 Send status values [pump status input]

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

- *Status pump*

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

Prerequisites for visibility

- Parameter window *Pump* \ Parameter *Monitor pump status* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Binary input*.

7.4.80 Temperature input [return flow temperature]

This parameter is used to define how the device receives the return flow temperature.

Note
The return flow temperature has no influence on the control. The acquisition of the return flow temperature can be used for function testing.

Option	
Deactivated	The input is deactivated.
Via physical device input	The following dependent parameters are shown: • *Temperature sensor type* • *Temperature offset* • *Cable error compensation* • *Filter* • *Send temperature value [return flow temperature]* The following dependent group objects are displayed: • *Return flow temperature* • *Error Input*

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature*Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window Channel X \ parameter window *Input x: Return flow temperature*.

7.4.81 Temperature input [supply flow temperature]

This parameter is used to define how the device receives the supply flow temperature.

> **Note**
> The supply flow temperature has no influence on the control. The acquisition of the supply flow temperature can be used for function testing.

Option	
Deactivated	The input is deactivated.
Via physical device input	The following dependent parameters are shown: • *Temperature sensor type* • *Temperature offset* • *Cable error compensation* • *Filter* • *Send temperature value [supply flow temperature]* The following dependent group objects are displayed: • *Supply flow temperature* • *Error Input*

Prerequisites for visibility

- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

7.4.82 Temperature offset

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

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

Option
-10.0 ... 0.0 ... +10.0 K

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.83 Temperature offset when monitoring time exceeded

This parameter is used to define a temperature offset if the monitoring time set is exceeded. The temperature offset set is valid until a new temperature offset is received via the bus (ABB i-bus® KNX).

Option
–50 … 0 … 50 K

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Temperature offset*
- Parameter window *Generator activation* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of "Setpoint temperature" group objects* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Monitoring and safety*.

7.4.84 Temperature sensor type

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

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

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.85 Send temperature value [return flow temperature]

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

- *Return flow temperature*

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

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.86 Send temperature value [supply flow temperature]

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

- *Supply flow temperature*

Note

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

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

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

7.4.87 Monitor receipt of "Setpoint power" group object

This parameter is used to define whether the monitoring of group object *Setpoint power* is activated.

Note

If no value is received on group object *Setpoint power* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:

- Group object *Error "Setpoint power" receipt* is set to "Error"
- Value in the parameter *Setpoint power on exceeding monitoring time* becomes valid

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

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Power specified*
- Parameter window *Generator activation* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Monitoring and safety*.

7.4.88 Monitor receipt of "Generator error status" group object

This parameter is used to define whether the monitoring of group object *Generator error* is activated.

Note
If no value is received on group object *Generator error* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Generator error" receipt* is set to "Error"
- The output voltage changes to the activation range for "Generator Off" until a new value is received in the group object *Generator error*

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

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator error* \ Option *Via group object*
- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Monitor receipt of "Generator error status" group object* \ Option *Activated*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.89 Monitor receipt of "Pump fault status" group object

This parameter is used to define whether the monitoring of group object *Pump fault* is activated.

Note
If no value is received on group object *Pump fault* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Pump fault" receipt* is set to "Error"
- The pump remains switched off and cannot be switched on until a new value is received in the group object *Pump fault*

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

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump error* \ Option *Via group object*
- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.90 Monitor receipt of "Pump repair switch status" group object

This parameter is used to define whether the monitoring of group object *Pump repair switch* is activated.

Note
If no value is received on group object *Pump repair switch* during the set time interval (→ parameter *Time interval for cyclical monitoring*), the following actions are carried out:
- Group object *Error "Pump repair switch" receipt* is set to "Error"
- The pump remains switched off and cannot be switched on until a new value is received in the group object *Pump repair switch*

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

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump repair switch* \ Option *Via group object*
- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Application* \ parameter window *Monitoring and safety*.

7.4.91 Monitor receipt of "Setpoint temperature" group objects

This parameter is used to define whether the monitoring is activated by one of the following group objects:
- *Absolute setpoint temperature*
- *Setpoint temperature offset*

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

Option	
Deactivated	Monitoring is deactivated.
Activated	Monitoring is activated. The following dependent parameters are shown: • *Time interval for cyclical monitoring* • *Setpoint temperature after exceeding monitoring time* • *Temperature offset when monitoring time exceeded* The following dependent group objects are displayed: • *Error "Setpoint temperature" receipt*

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Absolute temperature* / *Temperature offset*
- Parameter window *Generator activation* \ Parameter window *Monitoring and safety* \ Parameter *Cyclical monitoring* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Monitoring and safety*.

7.4.92 Monitor generator error

This parameter is used to define whether the generator error switch is monitored. The generator is switched off if there is an active generator error.

Note
Monitoring is possible only if a corresponding floating contact is available.

Option	
Deactivated	Monitoring is deactivated.
Via physical device input	The generator error switch is monitored via the input g. The input is set to the option *Generator error input* and cannot be changed. The following dependent group objects are displayed: • *Generator error alarm*
Via group object	The generator error switch is monitored via an external device. The error status is received via a group object. The following dependent group objects are displayed: • *Generator error*

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.93 Monitor generator status

This parameter is used to define whether the generator status is monitored.

Note
Monitoring is possible only if a corresponding floating contact is available.

Note
The monitoring has no influence on the control. Status detection can be used for function testing.

Option	
Deactivated	Monitoring is deactivated.
Via physical device input	The generator status is monitored via the input f. The input is set to the option *Generator status input* and cannot be changed. The following dependent group objects are displayed: • *Generator status*

Prerequisites for visibility

- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.94 Monitor pump error

This parameter is used to define whether the pump error switch is monitored. The pump is switched off if a pump error is active.

Note
Monitoring is possible only if a corresponding floating contact is available.

Option	
Deactivated	Monitoring is deactivated.
Via physical device input	The pump error switch is monitored via the input d. The input is set to the option *Pump error input* and cannot be changed. The following dependent group objects are displayed: • *Pump fault alarm*
Via group object	The pump error switch is monitored via an external device. The error status is received via a group object. The following dependent group objects are displayed: • *Pump fault*

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.95 Monitor pump repair switch

This parameter is used to define whether the pump repair switch is monitored. The pump is switched off when the pump repair switch is active.

Note
Monitoring is possible only if a corresponding floating contact is available.

Option	
Deactivated	Monitoring is deactivated.
Via physical device input	The pump repair switch is monitored via the input e. The input is set to the option *Pump repair status input* and cannot be changed. The following dependent group objects are displayed: • *Pump repair switch*
Via group object	The pump repair switch is monitored via an external device. The repair status is received via a group object. The following dependent group objects are displayed: • *Pump repair switch*

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.96 Monitor pump status

This parameter is used to define whether the pump status is monitored.

Note
Monitoring is possible only if a corresponding floating contact is available.

Note
The monitoring has no influence on the control. Status detection can be used for function testing.

Option	
Deactivated	Monitoring is deactivated.
Via physical device input	The pump status is monitored via the input c. The input is set to the option *Pump status input* and cannot be changed. The following dependent group objects are displayed: • *Status pump*

Prerequisites for visibility

- The parameter is in the parameter window *Pump*.

7.4.97 Lower temperature limit for generator activation

This parameter is used to define the lower temperature limit for the generator activation.

More information: → Generator activation, Page 19.

Note
The possible options and the standard option depend on the selection made in the parameter *Signal output (voltage to temperature/power)*.

Option
0.0 … 25.0 … 100.0 °C
0.0 … 7.0 … 100.0 °C

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Absolute temperature*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator signal*.

7.4.98 Distinction between long and short operation

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

The following figure shows the distinction:

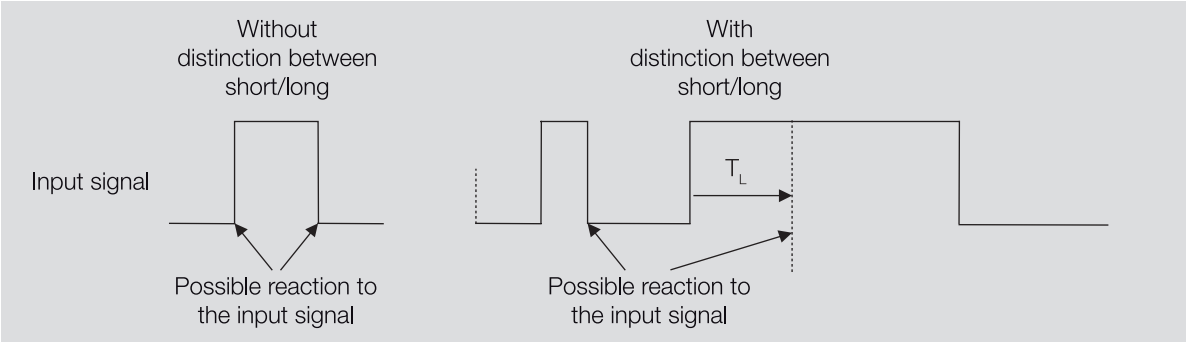

Fig. 14: Distinguishing between short/long operation

Note

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

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

Prerequisites for visibility

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

7.4.99 Reaction of output

This parameter is used to define how the output reacts on receipt of a switching telegram on the group object *Switch*.

Option
NC contact
NO contact

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator relay*.

7.4.100 Send value group object "In operation"

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

Option
Value 0
Value 1

Prerequisites for visibility

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

7.4.101 Value of group object "Status generator relay"

This parameter is used to define the value adopted by the group object *Status generator relay* depending on the position of the relay contact.

Option	
1: closed, 0: open	The group object has the value 1 when the relay contact is closed. The group object has the value 0 when the relay contact is open.
0: closed, 1: open	The group object has the value 0 when the relay contact is closed. The group object has the value 1 when the relay contact is open.

Prerequisites for visibility

- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*
- The parameter is in the parameter window *Generator activation* \ parameter window *Generator relay*.

7.4.102 Value after sending and switching delay has expired

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

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

Prerequisites for visibility

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

7.4.103 Value is sent from a change of

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

Option
0.2 … 1.0 … 10.0 K

Prerequisites for visibility

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

7.4.104 Resistance in ohms at x °C

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

Option
650 … 4,600 ohms

Prerequisites for visibility

- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature*
  - Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*
  - Parameter *Temperature sensor type* \ Option *KTY [-15…+110]*
  - Parameter *KTY type* \ Option *User-defined*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Supply flow temperature*.

or

- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature*
  - Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*
  - Parameter *Temperature sensor type* \ Option *KTY [-15…+110]*
  - Parameter *KTY type* \ Option *User-defined*
- The parameter is in the parameter window *Inputs* \ parameter window *Input x: Return flow temperature*.

7.4.105 I-bus® Tool access

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

More information: → Integration into i-bus® Tool, Page 23.

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

Prerequisites for visibility

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

7.4.106 Forced operation

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

More information: → Forced operation, Page 103.

Note
If forced operation is active, operation via group objects, manual operation and i-bus® Tool is blocked. Higher-priority functions continue to run → Priorities, Page 98.

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

Prerequisites for visibility

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

7.4.107 Send cyclically every

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

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

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

Prerequisites for visibility

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

7.4.108 Cyclical monitoring

The cyclical monitoring is activated/deactivated with this parameter.

More information: → Cyclical monitoring, Page 104.

Option	
Deactivated	The cyclical monitoring is deactivated.
Activated	The following dependent parameters are shown: • *Monitor receipt of "Setpoint temperature" group objects* • *Monitor receipt of "Setpoint power" group object* • *Monitor receipt of "Pump fault status" group object* • *Monitor receipt of "Pump repair switch status" group object* • *Monitor receipt of "Generator error status" group object*

Prerequisites for visibility

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

7.4.109 Time interval for cyclical monitoring

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

More information: → Cyclical monitoring, Page 104.

Note

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

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

Prerequisites for visibility

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

8 Group objects

8.1 Overview of group objects

Function	Group object name	Data point type	Length	Flags
Absolute setpoint temperature	Channel - Generator	DPT 9.001	2 byte	C W T U
Block input	Channel - Binary input x	DPT 1.003	1 bit	C W
Contact position binary input	Channel - Binary input x	DPT 1.001	1 bit	C R T
Enable/block manual generator override	Channel - Generator	DPT 1.003	1 bit	C W
Enable/block manual pump override	Channel - Pump	DPT 1.003	1 bit	C W
Error "Generator error" receipt	Channel - General	DPT 1.005	1 bit	C R T
Error "Pump fault" receipt	Channel - General	DPT 1.005	1 bit	C R T
Error "Pump repair switch" receipt	Channel - General	DPT 1.005	1 bit	C R T
Error "Setpoint power" receipt	Channel - General	DPT 1.005	1 bit	C R T
Error "Setpoint temperature" receipt	Channel - General	DPT 1.005	1 bit	C R T
Error Input	Channel – Input x	DPT 1.005	1 bit	C R T
Fault Generator output	Channel - Generator	DPT 1.005	1 bit	C R T
Forced operation, 1-bit	Channel – General	DPT 1.002	1 bit	C W
Forced operation, 2-bit	Channel – General	DPT 2.001	2 bit	C W
Generator activation status	Channel - Generator	DPT 9.020	2 byte	C R T
Generator error	Channel - Generator	DPT 1.005	1 bit	C W T U
Generator error alarm	Channel – Binary input x	DPT 1.005	1 bit	C R T
Generator On/Off	Channel - Generator	DPT 1.001	1 bit	C W
Generator relay override	Channel - Generator	DPT 1.001	1 bit	C W
Generator setpoint override	Channel - Generator	DPT 9.001	2 bytes	C W
Generator setpoint override	Channel - Generator	DPT 5.001	1 byte	C W
Generator setpoint override	Channel - Generator	DPT 9.002	2 bytes	C W
Generator status	Channel - Binary input x	DPT 1.011	1 bit	C R T
Generator status On/Off	Channel - Generator	DPT 1.001	1 bit	C R T
In operation	General	DPT 1.002	1 bit	C R T
Override pump	Channel - Pump	DPT 1.001	1 bit	C W
Pump fault	Channel – Pump	DPT 1.005	1 bit	C W T U
Pump fault alarm	Channel – Binary input x	DPT 1.005	1 bit	C R T
Pump On/Off	Channel - Pump	DPT 1.001	1 bit	C W
Pump repair switch	Channel – Binary input x	DPT 1.005	1 bit	C R T
Pump repair switch	Channel – Pump	DPT 1.011	1 bit	C W T U
Request status values	General	DPT 1.017	1 bit	C W
Return flow temperature	Channel – Input x	DPT 9.001	2 bytes	C R T
Setpoint power	Channel - Generator	DPT 5.001	1 byte	C W T U
Setpoint temperature offset	Channel - Generator	DPT 9.002	2 byte	C W T U
Status byte Device	General	Non DPT	1 byte	C R T
Status generator relay	Channel - Generator relay	DPT 1.009	1 bit	C R T
Status pump	Channel - Binary input x	DPT 1.011	1 bit	C R T
Status pump automatic mode	Channel - Pump	DPT 1.011	1 bit	C R T
Status pump relay	Channel - Pump	DPT 1.009	1 bit	C R T
Supply flow temperature	Channel – Input x	DPT 9.001	2 bytes	C R T
Switch	Channel – Generator relay	DPT 1.001	1 bit	C W

8.2 Group objects, general

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

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

- 1 = Device in operation
- 0 = Device in operation

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

Prerequisites for visibility

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

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

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

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

Prerequisites for visibility
- This group object is always visible.

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: Fault Generator output
  - 1 = Active
  - 0 = Inactive
- Bit 4: Safety mode (Safety mode)
  - 1 = Active
  - 0 = Inactive
- Bit 3: Generator status
  - 1 = Active
  - 0 = Inactive
- Bit 2: Manual setpoint temperature/setpoint power override
  - 1 = Active
  - 0 = Inactive
- Bit 1: Forced operation
  - 1 = Active
  - 0 = Inactive
- Bit 0: Manual pump override
  - 1 = Active
  - 0 = Inactive

Note
The device is in the safety mode after starting, because the device has not yet received a valid setpoint.

Prerequisites for visibility
- This group object is always visible.

8.3 Group objects Channel – General

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/deactivate 1-bit forced operation via the bus (ABB i-bus® KNX).
If forced operation is active, the generator and pump cannot be controlled via KNX commands.
Telegram value:
- Depends on the setting in the parameter *Forced operation*

Prerequisites for visibility
- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 1 bit – 0 active* / *Activated 1 bit – 1 active*

Forced operation, 2-bit	Channel – General	DPT 2.001	2 bit	C W

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

Prerequisites for visibility
- Parameter window *Application* \ Parameter window *Monitoring and safety* \ Parameter *Forced operation* \ Option *Activated 2 bit*

Error "Generator error" receipt	Channel - General	DPT 1.005	1 bit	C R T

The group object sends the error status for the cyclical monitoring of the group object *Generator error* on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator error* \ Option *Via group object*
- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
- Parameter *Monitor receipt of "Generator error status" group object* \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Error "Pump repair switch" receipt	**Channel - General**	**DPT 1.005**	**1 bit**	**C R T**

The group object sends the error status for the cyclical monitoring of the group object *Pump repair switch* on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump repair switch* \ Option *Via group object*
- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
- Parameter *Monitor receipt of "Pump repair switch status" group object* \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Error "Pump fault" receipt	**Channel - General**	**DPT 1.005**	**1 bit**	**C R T**

The group object sends the error status for the cyclical monitoring of the group object *Pump fault* on the bus (ABB i-bus® KNX).
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump error* \ Option *Via group object*
- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of "Pump fault status" group object* \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Error "Setpoint power" receipt	**Channel - General**	**DPT 1.005**	**1 bit**	**C R T**

The group object sends the error status for the cyclical monitoring of the group object *Setpoint power* on the bus (ABB i-bus® KNX):
The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Power specified*
- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
  - Parameter *Monitor receipt of "Setpoint power" group object* \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Error "Setpoint temperature" receipt	**Channel - General**	**DPT 1.005**	**1 bit**	**C R T**

The group object sends the error status for the cyclical monitoring of the following group objects on the bus (ABB i-bus® KNX):
- *Absolute setpoint temperature*
- *Setpoint temperature offset*

The monitoring cycle is set in the parameter *Time interval for cyclical monitoring*.
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Options *Absolute temperature* / *Temperature offset*
- Parameter window *Application* \ Parameter window *Monitoring and safety*
  - Parameter *Cyclical monitoring* \ Option *Activated*
- Parameter *Monitor receipt of "Setpoint temperature" group objects* \ Option *Activated*

8.4 Group objects Channel – Pump

Function	Group object name	Data point type	Length	Flags
Override pump	**Channel - Pump**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to switch on or off the pump via the bus (ABB i-bus® KNX) if the manual pump override is enabled via the group object *Enable/block manual pump override*.
Telegram value:
- 1 = Switch on pump
- 0 = Switch off pump

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Enable manual pump override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Status pump relay	**Channel - Pump**	**DPT 1.009**	**1 bit**	**C R T**

This group object sends the status of the pump relay on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [pump]*.
Telegram value:
- 1 = Relay contact closed
- 0 = Relay contact open

Note
The status of the pump relay does not reliably indicate whether the pump is active or inactive.

Prerequisites for visibility
- This group object is always visible.

Function	Group object name	Data point type	Length	Flags
Pump fault	**Channel – Pump**	**DPT 1.005**	**1 bit**	**C W T U**

This group object is used to receive a pump fault via the bus (ABB i-bus® KNX).
If a pump fault is received with a pump switched on, the pump is switched off. If a pump fault is received with a pump switched off, the pump cannot be switched on.
Telegram value:
- 1 = Fault
- 0 = No fault

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump error* \ Option Via group object

Function	Group object name	Data point type	Length	Flags
Pump repair switch	**Channel – Pump**	**DPT 1.011**	**1 bit**	**C W T U**

This group object is used to receive the status of the pump repair switch via the bus (ABB i-bus® KNX).
If the "active" (pump repair switch open) status is received with a pump switched on, the pump is switched off. If the "active" (pump repair switch open) status is received with a pump switched off, the pump cannot be switched on.
Telegram value:
- 1 = Active
- 0 = Inactive

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump repair switch* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Enable/block manual pump override	**Channel - Pump**	**DPT 1.003**	**1 bit**	**C W**

This group object is used to enable/block the manual pump override via the bus (ABB i-bus® KNX).
If the manual pump override is enabled, the pump can be switched on or off via the group object *Override pump*.
Telegram value:
- 1 = Enable manual pump override
- 0 = Block manual pump override

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Enable manual pump override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Status pump automatic mode	**Channel - Pump**	**DPT 1.011**	**1 bit**	**C R T**

This group object sends the status of the pump automatic mode on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [pump]*.
Telegram value:
- 1 = Pump automatic mode active
- 0 = Pump automatic mode inactive / manual pump override active

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Enable manual pump override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Pump On/Off	**Channel - Pump**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to switch on or off the pumps via the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Switch on pump
- 0 = Switch off pump

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Switch on pump when generator is in activation range* \ Option *No*

8.5 Group objects Channel - Generator relay

Function	Group object name	Data point type	Length	Flags
Status generator relay	**Channel - Generator relay**	**DPT 1.009**	**1 bit**	**C R T**

This group object sends the status of the generator relay on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [generator relay output]*.
Telegram value:
- Depends on the setting in the parameter *Value of group object "Status generator relay"*

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*

Function	Group object name	Data point type	Length	Flags
Switch	**Channel – Generator relay**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to receive, via the bus (ABB i-bus® KNX), a switching command.
The switching behavior depends on the setting in the parameter *Reaction of output*.
NO contact telegram value:
- 1 = Close relay contact
- 0 = Open relay contact

NC contact telegram value:
- 1 = Open relay contact
- 0 = Close relay contact

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator relay* \ Parameter *Relay output [generator]* \ Option *Activated*

8.6 Group objects Channel - Inputs

Function	Group object name	Data point type	Length	Flags
Supply flow temperature	**Channel – Input x**	**DPT 9.001**	**2 bytes**	**C R T**

This group object sends the temperature value measured at the input on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send temperature value [supply flow temperature]*.
Telegram value:
- -30 … 110 °C

Prerequisites for visibility
- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*

Return flow temperature	Channel – Input x	DPT 9.001	2 bytes	C R T

This group object sends the temperature value measured at the input on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send temperature value [return flow temperature]*.
Telegram value:
- -30 … 110 °C

Prerequisites for visibility
- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*

Error Input	Channel – Input x	DPT 1.005	1 bit	C R T

This group object monitors receipt of a temperature value at the input and sends a message on the bus (ABB i-bus® KNX).
Telegram value:
- 1 = Error
- 0 = No error

Prerequisites for visibility
- Parameter window *Inputs* \ Parameter window *Input x: Supply flow temperature* \ Parameter *Temperature input [supply flow temperature]* \ Option *Via physical device input*

or
- Parameter window *Inputs* \ Parameter window *Input x: Return flow temperature* \ Parameter *Temperature input [return flow temperature]* \ Option *Via physical device input*

Status pump	Channel - Binary input x	DPT 1.011	1 bit	C R T

This group object sends the status of the pump on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [pump status input]*.
Telegram value:
- 1 = Pump on
- 0 = Pump off

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump status* \ Option *Via physical device input*

Contact position binary input	Channel - Binary input x	DPT 1.001	1 bit	C R T

This group object sends the contact position of the sensor connected to the binary input on the bus (ABB i-bus® KNX).
Telegram value:
- Depends on the setting in the following parameters:
  - *Distinction between long and short operation*
  - *Input on operation*

Prerequisites for visibility
- Parameter window *Inputs* \ Parameter window Input x \ Parameter *Input* \ Option *Binary input*

Block input	Channel - Binary input x	DPT 1.003	1 bit	C W

This group object is used to block the physical input x.
Telegram value:
- 1 = Block input
- 0 = Enable input

Note
The block on the input is canceled after ETS reset, bus voltage recovery or download.

Prerequisites for visibility
- Parameter window *Inputs* \ Parameter window *Input x: Binary input*
  - Parameter *Input* \ Option *Binary input*
  - Parameter *Enable group object "Block input"* \ Option *Yes*

Pump fault alarm	Channel – Binary input x	DPT 1.005	1 bit	C R T

This group object sends an alarm on the bus (ABB i-bus® KNX) if there is a pump fault.
The send behavior depends on the setting in the parameter *Send status values [pump fault output]*.
Telegram value:
- 1 = Pump fault alarm
- 0 = No pump fault alarm

Prerequisites for visibility
- Parameter window *Pump* \ Parameter *Monitor pump error* \ Option *Via physical device input*

Function	Group object name	Data point type	Length	Flags
Pump repair switch	**Channel – Binary input x**	**DPT 1.005**	**1 bit**	**C R T**
This group object sends the contact position of the pump repair switch on the bus (ABB i-bus® KNX). The send behavior depends on the setting in the parameter *Send status values [pump repair status input]* Telegram value: • 1 = Pump repair switch open • 0 = Pump repair switch closed **Prerequisites for visibility** • Parameter window *Pump* \ Parameter *Monitor pump repair switch* \ Option *Via physical device input*				
Generator status	**Channel - Binary input x**	**DPT 1.011**	**1 bit**	**C R T**
This group object sends the status of the generator on the bus (ABB i-bus® KNX). The send behavior depends on the setting in the parameter *Send status values [generator status input]*. Telegram value: • 1 = Generator On • 0 = Generator Off **Prerequisites for visibility** • Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator status* \ Option *Via physical device input*				
Generator error alarm	**Channel – Binary input x**	**DPT 1.005**	**1 bit**	**C R T**
This group object sends an alarm on the bus (ABB i-bus® KNX) if there is a generator error. The send behavior depends on the setting in the parameter *Send status values [generator error]*. Telegram value: • 1 = Generator error alarm • 0 = No generator error alarm Prerequisites for visibility • Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator error* \ Option *Via physical device input*				

8.7 Group objects Channel - Generator

Function	Group object name	Data point type	Length	Flags
Setpoint power	**Channel - Generator**	**DPT 5.001**	**1 byte**	**C W T U**
This group object is used to receive the setpoint power for generator activation via the bus (ABB i-bus® KNX). Telegram value: • 0 … 100 % **Prerequisites for visibility** • Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Power specified*				
Absolute setpoint temperature	**Channel - Generator**	**DPT 9.001**	**2 byte**	**C W T U**
This group object is used to receive the setpoint temperature for generator activation via the bus (ABB i-bus® KNX). Telegram value: • 0 … 100 °C **Prerequisites for visibility** • Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Absolute temperature*				
Setpoint temperature offset	**Channel - Generator**	**DPT 9.002**	**2 byte**	**C W T U**
This group object is used to receive the setpoint temperature for generator activation via the bus (ABB i-bus® KNX). Telegram value: • -50 … 50 K **Prerequisites for visibility** • Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Type of generator activation* \ Option *Temperature offset*				
Generator On/Off	**Channel - Generator**	**DPT 1.001**	**1 bit**	**C W**
This group object is used to change over the voltage ranges for "Generator off" and "Generator activation" via the bus (ABB i-bus® KNX). More information: → Group object "Generator On/Off", Page 22. Telegram value: • 1 = Voltage range "Generator activation" • 0 = Voltage range "Generator Off" **Prerequisites for visibility** • This group object is always visible.				
Generator status On/Off	**Channel - Generator**	**DPT 1.001**	**1 bit**	**C R T**
This group object sends the status of the generator depending on the output voltage on the bus (ABB i-bus® KNX). The send behavior depends on the setting in the parameter *Send status values [generator signal]*. Telegram value: • 1 = Output voltage in the voltage range "Generator activation" • 0 = Output voltage in the voltage range "Generator Off" **Prerequisites for visibility** • This group object is always visible.				

Function	Group object name	Data point type	Length	Flags
Generator error	**Channel - Generator**	**DPT 1.005**	**1 bit**	**C W T U**

This group object is used to receive a generator error via the bus (ABB i-bus® KNX).
If a generator error is received while the generator is switched on, the generator is switched off. If a generator error is received while the generator is switched off, the generator cannot be switched on.
Telegram value:
- 1 = Fault
- 0 = No fault

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Monitor generator error* \ Option *Via group object*

Function	Group object name	Data point type	Length	Flags
Enable/block manual generator override	**Channel - Generator**	**DPT 1.003**	**1 bit**	**C W**

This group object is used to enable/block the manual generator override via the bus (ABB i-bus® KNX).
If the manual generator override is enabled, the generator relay can be switched on or off via the group object *Generator relay override* and the generator setpoint overridden via the following group objects:
- *Generator setpoint override* (DPT 9.001)
- *Generator setpoint override* (DPT 9.002)
- *Generator setpoint override* (DPT 5.001)

Telegram value:
- 1= Enable manual generator override
- 0 = Block manual generator override

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Enable manual generator override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Generator relay override	**Channel - Generator**	**DPT 1.001**	**1 bit**	**C W**

This group object is used to switch on or off the generator relay via the bus (ABB i-bus® KNX) if the manual generator override is enabled via the group object *Enable/block manual generator override*.
Telegram value:
- 1 = Switch on generator relay
- 0 = Switch off generator relay

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal* \ Parameter *Enable manual generator override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Generator setpoint override	**Channel - Generator**	**DPT 9.001**	**2 bytes**	**C W**

This group object is used to receive the setpoint for the manual generator override via the bus (ABB i-bus® KNX).
The value in this group object becomes active only if the override has been enabled by the *Enable/block manual generator override* group object.
Telegram value:
- 0 … 100 °C

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal*
  - Parameter *Type of generator activation* \ Option *Absolute temperature*
  - Parameter *Enable manual generator override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Generator activation status	**Channel - Generator**	**DPT 9.020**	**2 byte**	**C R T**

This group object sends the value of the output voltage for the generator activation on the bus (ABB i-bus® KNX).
The send behavior depends on the setting in the parameter *Send status values [generator signal]*.
Telegram value:
- 0 … 10,000 mV

Prerequisites for visibility
- This group object is always visible.

Function	Group object name	Data point type	Length	Flags
Fault Generator output	**Channel - Generator**	**DPT 1.005**	**1 bit**	**C R T**

This group object sends a generator output fault message on the bus (ABB i-bus® KNX).
It there is a fault, the generator output is switched off.
Telegram value:
- 1 = Fault
- 0 = No fault

Prerequisites for visibility
- This group object is always visible.

Function	Group object name	Data point type	Length	Flags
Generator setpoint override	**Channel - Generator**	**DPT 5.001**	**1 byte**	**C W**

This group object is used to receive the setpoint for the manual generator override via the bus (ABB i-bus® KNX).
The value in this group object becomes active only if the override has been enabled by the *Enable/block manual generator override* group object.
Telegram value:
- 0 … 100 %

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal*
  - Parameter *Type of generator activation* \ Option *Power specified*
  - Parameter *Enable manual generator override* \ Option *Yes*

Function	Group object name	Data point type	Length	Flags
Generator setpoint override	**Channel - Generator**	**DPT 9.002**	**2 bytes**	**C W**

This group object is used to receive the setpoint for the manual generator override via the bus (ABB i-bus® KNX).
The value in this group object becomes active only if the override has been enabled by the *Enable/block manual generator override* group object.
Telegram value:
- -50 … 50 K

Prerequisites for visibility
- Parameter window *Generator activation* \ Parameter window *Generator signal*
  - Parameter *Type of generator activation* \ Option *Power specified*
  - Parameter *Enable manual generator override* \ Option *Yes*

9 Operation

Note
The device cannot be operated manually.

10 Maintenance and cleaning

10.1 Maintenance

The device is maintenance-free if used properly. In the event of damage, e.g. during transport and/or storage, repairs are not allowed to be made.

10.2 Cleaning

1. Disconnect the device from the electrical power supply before cleaning.
2. Clean dirty devices using a dry cloth or a slightly damp cloth.

11 Removal and disposal

11.1 Removal

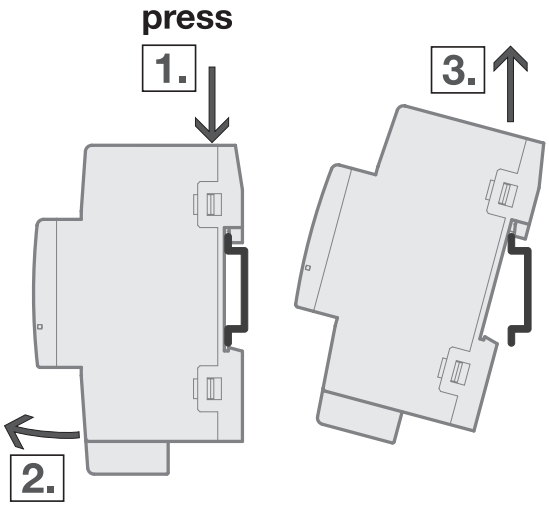

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Fig. 15: Removing from the mounting rail

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 generators

a) Generator safety mode → Safety mode, Page 18
b) Bus voltage failure
c) Forced operation
d) i-bus® Tool
e) Direct operation (manual generator override)
f) Automatic generator operation
g) Bus voltage recovery

12.1.2 Priorities for pump

a) Pump safety mode → Safety mode, Page 18
b) Bus voltage failure
c) Forced operation
d) i-bus® Tool
e) Direct pump operation (manual pump override)
f) Automatic pump operation (based on the generator activation)
g) Bus voltage recovery

12.2 Basic knowledge

12.2.1 2-pipe and 4-pipe systems

2-pipe system

In a 2-pipe system, one pipe is used to supply the heating/cooling devices with warm or cold water. Only one operating mode (*Heating*/ *Cooling*) can be active in the complete system. Switching between *Heating* and *Cooling* is performed centrally in this system. The device receives information about the current operating mode via the bus (ABB i-bus® KNX).

4-pipe system

In a 4-pipe system, two separate pipes are used to supply the heating/cooling devices with warm or cold water. The separate pipes permit switching between heating mode and cooling mode. Switching between *Heating* and *Cooling* is performed centrally via the bus (ABB i-bus® KNX) or is controlled by the controller.

12.2.2 Heating/cooling circuit

A heating/cooling circuit is used to supply the rooms connected with warm or cold water for heating or cooling. The temperature in the heating/cooling circuit (supply flow temperature) can be adjusted depending on the requirements in the rooms.

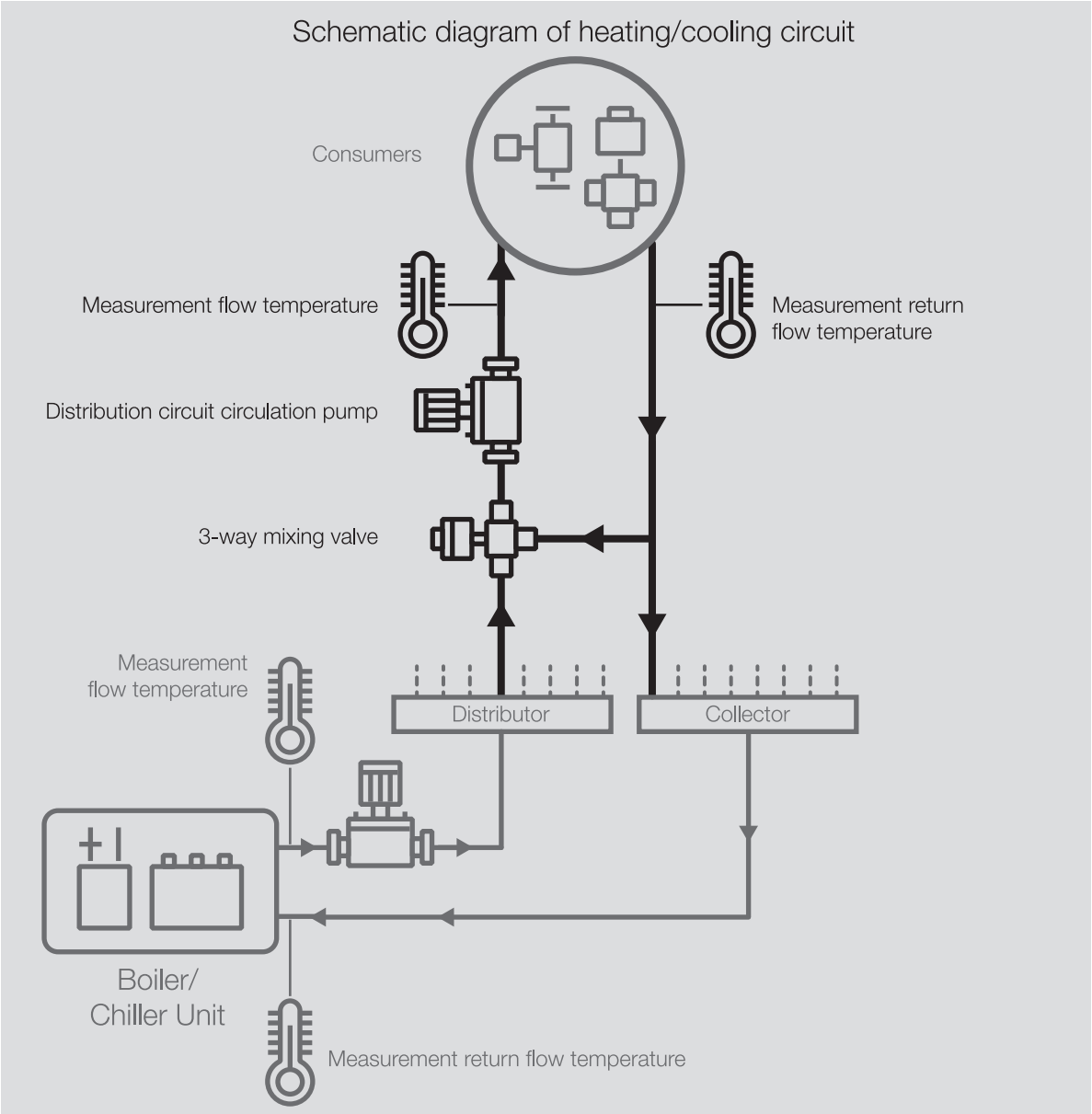

Fig. 16: Heating/cooling circuit

A heating/cooling circuit consists of the following components:

- Supply flow (from the distributor to the load)
- Loads (e.g. radiators in the room)
- Return flow (from the load to the manifold)

The supply and return flow are normally connected together by a 3-way mixing valve. The water from the supply flow is mixed with the water from the return flow to achieve the required supply flow temperature. A circulating pump ensures that the water circulates in the heating/cooling circuit.

12.2.3 Sending and switching delay

No telegrams are sent on the bus during the sending and switching delay (ABB i-bus® KNX).

Telegrams received (e.g. requests from a visualization system) are sent to the outputs after the sending and switching delay expires. The state of the outputs is set according to the settings in the ETS application or the telegram values of the group objects.

Time sequences (e.g. staircase lighting time) are started immediately during the sending and switching delay. If, at the time of reception, the staircase lighting time is smaller than the remaining sending and switching delay, the staircase lighting time elapses during the sending and switching delay. After the sending and switching delay has elapsed there is no switching command, the staircase lighting is not switched on.

Note
The sending and switching delay includes the device initialization time.

12.2.4 Setpoint generator signal

The following table shows the dependence of the options in the parameter *Setpoint generator signal* on the settings in the following parameters:

- *Type of generator activation*
- *Signal output (voltage to temperature/power)*

Setting, parameter *Type of generator activation*	Setting, parameter *Signal output (voltage to temperature/power)*	
	Normal	*Inverted*
Absolute temperature	*0 ... 50 ... 100 °C*	*0 ... 15 ... 100 °C*
Temperature offset	*-50 ... 0 ... 50 K*	*-50 ... 0 ... 50 K*
Power specified	*0 ... 50 ... 100 %*	*0 ... 50 ... 100 %*

Tab. 18: Setpoint generator signal

12.2.5 Telegram rate limit

The bus load generated by the device can be limited using the telegram rate limit. This limit relates to all telegrams sent by the device.

The device counts the number of telegrams sent within the parameterized period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the bus (ABB i-bus® KNX) until the end of the period. A new period commences automatically at the end of the previous period. The telegram counter is reset to zero. Telegrams can be sent again. The group object always sends the current telegram value.

The first period (break time) is not precisely predefined. The break time can be anywhere between 0 seconds and the parameterized period. The subsequent periods correspond to the parameterized time → parameter *In period (0 = deactivated)*.

Example

- Number of telegrams = 20
- Maximum number of telegrams per period = 5
- Period = 5 s

The device immediately sends 5 telegrams. The next 5 telegrams are sent after a maximum of 5 seconds. From this point, a further 5 telegrams are sent via the bus (ABB i-bus® KNX) every 5 seconds.

12.2.6 Temperature sensor types

PT100

This sensor type is precise and interchangeable, however it is susceptible to cable errors (e.g. cable resistance or heating of the cable). A terminal resistance as low as 200 milliohms causes a temperature error of 0.5 °C.

PT1000/NI

These sensor types respond just like the PT100, but the influences of cable errors are lower by a factor of 10. These sensor types should be preferred.

KT/KTY/NTC

These sensor types have a low level of accuracy, are interchangeable only under certain circumstances and can be used only for very simple applications.

Characteristic resistances of the most common temperature sensors

Temperature [°C]	PT100 Resistance [Ω]	PT1000 Resistance [Ω]	NTC10-01 Resistance [Ω]	NTC10-02 Resistance [Ω]	NTC10-03 Resistance [Ω]	NTC20 Resistance [Ω]	NI1000-01 Resistance [Ω]	NI1000-02 Resistance [Ω]
110	142.3	1423	511	758	624	818	1557	1688
100	138.5	1385	679	973	817	1114	1500	1618
90	134.7	1347	916	1266	1084	1541	1444	1549
80	130.9	1309	1255	1668	1457	2166	1390	1483
70	127.1	1271	1752	2228	1990	3098	1337	1417
65	125.2	1252	2083	2588	2338	3732	1311	1385
60	123.2	1232	2488	3020	2760	4518	1285	1353
55	121.3	1213	2986	3536	3270	5494	1260	1322
50	119.4	1194	3602	4160	3893	6718	1235	1291
45	117.5	1175	4368	4911	4655	8260	1210	1260
40	115.5	1155	5324	5827	5594	10212	1186	1230
35	113.6	1136	6532	6940	6754	12698	1162	1200
30	111.7	1117	8055	8313	8196	15886	1138	1171
29	111.3	1113	8406	8622	8525	16627	1132	1165
28	111.0	1110	8779	8944	8869	17407	1128	1159
27	110.5	1105	9165	9281	9229	18227	1123	1153
26	110.1	1101	9574	9632	9606	19090	1119	1147
25	109.7	1097	10000	10000	10000	20000	1114	1141
24	109.3	1093	10448	10380	10413	20958	1109	1136
23	109.0	1090	10924	10780	10845	21968	1105	1130
22	108.6	1086	11421	11200	11298	23033	1100	1124
21	108.2	1082	11940	11630	11773	24156	1095	1118
20	107.8	1078	12491	12090	12270	25340	1091	1112
19	107.4	1074	13073	12560	12791	26491	1086	1107
18	107.0	1070	13681	13060	13337	27912	1081	1101
17	106.6	1066	14325	13580	13910	29307	1077	1095
16	106.2	1062	15000	14120	14510	30782	1072	1089
15	105.9	1059	15710	14690	15140	32340	1068	1084
14	105.5	1055	16461	15280	15801	33982	1063	1078
13	105.1	1051	17256	15900	16494	35716	1058	1072
12	104.7	1047	18091	16560	17222	37550	1054	1067
11	104.3	1043	18970	17240	17987	39489	1049	1061
10	103.9	1039	19902	17960	18790	41540	1045	1056
9	103.5	1035	20884	18700	19633	43715	1040	1050
8	103.1	1031	21918	19480	20519	46018	1036	1044
7	102.7	1027	23015	20300	21451	48457	1031	1039
6	102.3	1023	24170	21150	22430	51041	1027	1033
5	101.9	1019	25391	22050	23460	53780	1022	1028
4	101.6	1016	26683	23000	24545	56678	1018	1022
3	101.2	1012	28051	23990	25687	59751	1013	1016
2	100.8	1008	29498	25030	26890	63011	1009	1011
1	100.4	1004	31030	26130	28156	66469	1004	1005
0	100.0	1000	32650	27280	29490	70140	1000	1000
-5	98.0	980	42327	33900	37310	92220	978	973
-10	96.1	961	55329	42470	47540	122260	956	946
-15	94.1	941	72957	53410	61020	163480	935	919
-20	92.2	922	97083	67770	78910	220600	914	893
-25	90.2	902	130422	86430	102900	300400	893	867
-30	88.2	882	176976	111300	135200	413400	872	842

Tab. 19: Characteristic resistances of the most common temperature sensors

Tolerance classes

The tolerance classes for sensor versions PT100 and PT1000 differ. The following table illustrates the individual classes to the standard IEC 60751 (status: 2008):

Designation	Tolerance
Class AA	0.10 °C + (0.0017 x t)
Class A	0.15 °C + (0.002 x t)
Class B	0.30 °C + (0.005 x t)
Class C	0.60 °C + (0.01 x t)
t = Temperature	

Tab. 20: Tolerance classes

Example
Class B:
Measured-value deviations of ± 0.8 °C at 100 °C are permissible.

12.2.7 Boiler/chiller

A boiler or chiller is used to generate hot or cold water for heating/cooling the building. The heated or cooled water can be adjusted to suit the demand or the outside temperature.

The boiler/chiller is the link in the building's heating/cooling circuit. It heats or cools the water arriving via the return flow from the rooms and feeds it back to the heating/cooling circuits via the supply flow.

A circulation pump directly after the boiler/chiller ensures that the heated or cooled water is transported to the distributor for the heating/cooling circuits. From there the water is distributed to the individual rooms.

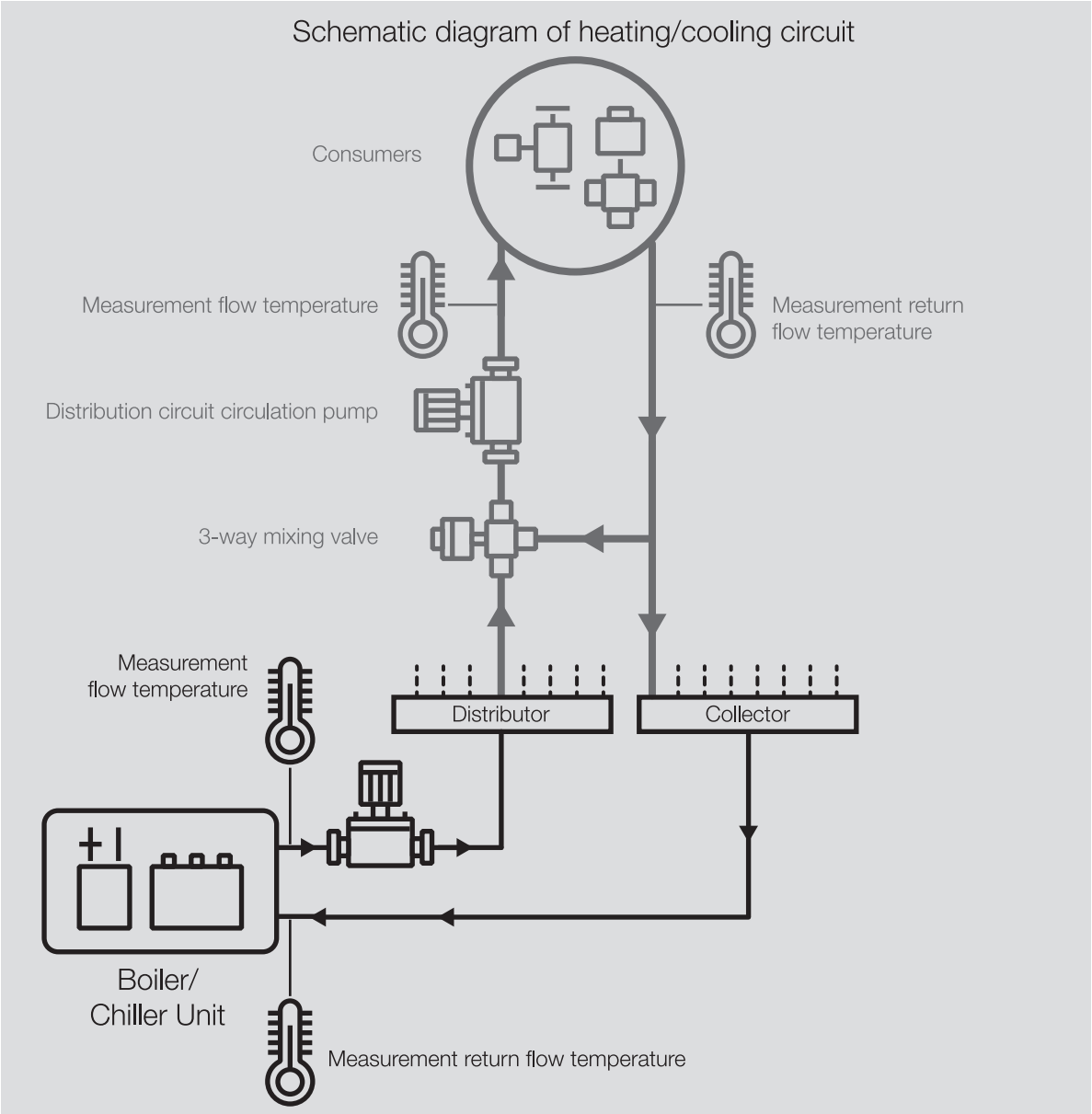

Fig. 17: Boiler/chiller in a heating/cooling circuit

12.2.8 Forced operation

The function *Forced operation* can be used to set the device outputs to a defined state and block them. Forced operation is triggered by the switching of a 1- or 2-bit group object.

Note
If forced operation is active, operation via group objects, manual operation and i-bus® Tool is blocked. Higher-priority functions continue to run → Priorities, Page 98.

Note
The same forced operation state as for bus voltage failure applies after bus voltage recovery. Forced operation is deactivated on an ETS reset.

Forced operation, 1-bit

A state that is set if forced operation is activated can be parameterized with 1-bit forced operation. It can additionally be defined whether activation is to take place via the value 1 or 0.

Control values and the state of the outputs can be defined in the device-specific parameters → parameter *Forced operation*.

Forced operation, 2-bit

With 2-bit forced operation, two states are specified that are set if forced operation is activated. The states are activated via the 2-bit group object. The first bit indicates whether forced operation is active (bit 1 (High) = 1) or inactive (bit 1 (High) = 0). The second bit determines the state *Forced operation active "OFF"* (bit 0 (Low) = 0) or *Forced operation active "ON"* (bit 0 (Low) = 1).

State	Bit 1	Bit 0	Value
Inactive	0	0	0
Inactive	0	1	1
Active "OFF"	1	0	2
Active "ON"	1	1	3

Tab. 21: Forced operation states

Control values and the state of the outputs can be defined in the device-specific parameters → parameter *Forced operation*.

12.2.9 Cyclical monitoring

The reception of a telegram on a group object can be monitored using the cyclical monitoring. If a telegram is not received on the group object within a parameterizable time (monitoring cycle), the sending device may be faulty or the bus cable to the sending device may be interrupted. The reaction to the loss of a telegram can be set in the application-specific parameters for the device.

After the receipt of a telegram, ETS download or bus voltage recovery, the monitoring cycle is restarted.

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

13 Appendix

13.1 Scope of delivery

The device is supplied together with the following components:

- 1 x boiler/chiller interface
- 1 x installation and operating instructions
- 1 x bus connection terminal (red/black)
- 1x KNX connection cover cap

13.2 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	Unused	Unused	Fault Generator output	Safety mode	Generator status	Manual setpoint temperature/setpoint power override	Forced operation	Manual pump override
0	0								
1	1								x
2	2							x	
3	3							x	x
4	4						x		
5	5						x		x
6	6						x	x	
7	7						x	x	x
8	8					x			
9	9					x			x
10	0A					x		x	
11	0B					x		x	x
12	0C					x	x		
13	0D					x	x		x
14	0E					x	x	x	
15	0F					x	x	x	x
16	10				x				
17	11				x				x
18	12				x			x	
19	13				x			x	x
20	14				x		x		
21	15				x		x		x
22	16				x		x	x	
23	17				x		x	x	x
24	18				x	x			
25	19				x	x			x
26	1A				x	x		x	
27	1B				x	x		x	x
28	1C				x	x	x		
29	1D				x	x	x		x
30	1E				x	x	x	x	
31	1F				x	x	x	x	x
32	20			x					
33	21			x					x
34	22			x				x	
35	23			x				x	x
36	24			x			x		
37	25			x			x		x
38	26			x			x	x	
39	27			x			x	x	x
40	28			x		x			
41	29			x		x			x
42	2A			x		x		x	
43	2B			x		x		x	x
44	2C			x		x	x		
45	2D			x		x	x		x
46	2E			x		x	x	x	
47	2F			x		x	x	x	x
48	30			x	x				
49	31			x	x				x
50	32			x	x			x	
51	33			x	x			x	x
52	34			x	x		x		
53	35			x	x		x		x
54	36			x	x		x	x	
55	37			x	x		x	x	x
56	38			x	x	x			
57	39			x	x	x			x
58	3A			x	x	x		x	
59	3B			x	x	x		x	x
60	3C			x	x	x	x		
61	3D			x	x	x	x		x
62	3E			x	x	x	x	x	
63	3F			x	x	x	x	x	x
64	40		x						

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Fault Generator output	Safety mode	Generator status	Manual setpoint temperature/setpoint power override	Forced operation	Manual pump override
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
128	80	x							
129	81	x							x

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Fault Generator output	Safety mode	Generator status	Manual setpoint temperature/setpoint power override	Forced operation	Manual pump override
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						

Bit no.		7	6	5	4	3	2	1	0
8-bit value	Hexadecimal	Unused	Unused	Fault Generator output	Safety mode	Generator status	Manual setpoint temperature/setpoint power override	Forced operation	Manual pump override
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. 22: 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

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