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ABB i-bus® KNX

1 General

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

We reserve the right to make technical changes or modify the contents of this document without prior notice.

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

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1.3 Explanation of symbols

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

Table 1: Explanation of symbols
Notes and warnings are represented as follows in this manual:

<table>
<thead>
<tr>
<th>Label</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DANGER</strong> –</td>
<td>This symbol is a warning about electrical voltage and indicates high-risk hazards that will definitely result in death or serious injury unless avoided.</td>
</tr>
<tr>
<td><strong>DANGER</strong> –</td>
<td>Indicates high-risk hazards that will definitely result in death or serious injury unless avoided.</td>
</tr>
<tr>
<td><strong>WARNING</strong> –</td>
<td>Indicates medium-risk hazards that could result in death or serious injury unless avoided.</td>
</tr>
<tr>
<td><strong>CAUTION</strong> –</td>
<td>Indicates low-risk hazards that could result in slight or moderate injury unless avoided.</td>
</tr>
<tr>
<td><strong>ATTENTION</strong> –</td>
<td>Indicates a risk of malfunctions or damage to property and equipment, but with no risk to life and limb.</td>
</tr>
</tbody>
</table>

**Example:**
Used for application, installation and programming examples

**Note**
Used for tips on usage and operation
2 Safety

2.1 General safety instructions

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

2.2 Proper use

The product, the heating/cooling circuit controller, must be installed centrally in an electrical distribution board.

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

3.1 Product overview

The devices are modular DIN rail components (MDRC) in pro M design. The module width of the devices is eight space units. They are designed for installation in distribution boards on 35 mm mounting rails.

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

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

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Heating/</td>
</tr>
<tr>
<td>C</td>
<td>Cooling circuit</td>
</tr>
<tr>
<td>C</td>
<td>Controller</td>
</tr>
<tr>
<td>/S</td>
<td>MDRC</td>
</tr>
<tr>
<td>X</td>
<td>2 = 2-fold</td>
</tr>
<tr>
<td>X</td>
<td>1 = Mixing valve actuation, analog (0…10 V)</td>
</tr>
<tr>
<td>X</td>
<td>2 = Mixing valve actuation, 3-point</td>
</tr>
<tr>
<td>X</td>
<td>1 = Without manual operation</td>
</tr>
<tr>
<td>X</td>
<td>2 = With manual operation</td>
</tr>
<tr>
<td>X</td>
<td>X = Version number (x = 1, 2 etc.)</td>
</tr>
</tbody>
</table>

Table 2: Product name description

<table>
<thead>
<tr>
<th></th>
<th>HCC/S 2.1.1.1</th>
<th>HCC/S 2.1.2.1</th>
<th>HCC/S 2.2.1.1</th>
<th>HCC/S 2.2.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channels</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual operation</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
<tr>
<td>Inputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temperature sensor</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Contact scanning</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Outputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pump control (relay)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Mixing valve actuation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 … 10 V</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3-point</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 3: Product overview
### 3.2 Ordering details

<table>
<thead>
<tr>
<th>Description</th>
<th>MB</th>
<th>Type</th>
<th>Order No.</th>
<th>Packaging unit [pcs.]</th>
<th>Weight 1 pc. [g]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heating/cooling circuit controller</td>
<td>8</td>
<td>HCC/S 2.1.1.1</td>
<td>2CDG110218R0011</td>
<td>1</td>
<td>280</td>
</tr>
<tr>
<td>Heating/cooling circuit controller</td>
<td>8</td>
<td>HCC/S 2.1.2.1</td>
<td>2CDG110219R0011</td>
<td>1</td>
<td>285</td>
</tr>
<tr>
<td>Heating/cooling circuit controller</td>
<td>8</td>
<td>HCC/S 2.2.1.1</td>
<td>2CDG110220R0011</td>
<td>1</td>
<td>285</td>
</tr>
<tr>
<td>Heating/cooling circuit controller</td>
<td>8</td>
<td>HCC/S 2.2.2.1</td>
<td>2CDG110221R0011</td>
<td>1</td>
<td>290</td>
</tr>
</tbody>
</table>

*Table 4: Ordering details*
3.3 Heating/cooling circuit controller HCC/S 2.1.1.1, 0-10 V, MDRC

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

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

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

3.3.1 Dimension drawing

![Dimension drawing](image)
3.3.2 Connection diagram

Legend

1. Label carrier
2. KNX programming LED (red)
3. KNX programming button
4. KNX connection
5. Cover cap
6. Relay output pump channel A
7. Temperature inputs channel A
8. Binary inputs (pump) channel A
9. Valve output channel A
10. Relay output pump channel B
11. Temperature inputs channel B
12. Binary inputs (pump) channel B
13. Valve output channel B

Fig. 3: Connection diagram HCC/S 2.1.1.1
3.3.3 Operating and display elements

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assignment of the physical address</td>
<td>On: device is in programming mode</td>
</tr>
</tbody>
</table>

*Table 5: Operating and display elements HCC/S 2.1.1.1*
### 3.3.4 Technical data

#### 3.3.4.1 General technical data

<table>
<thead>
<tr>
<th>Supply</th>
<th>Bus voltage</th>
<th>21…32 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current consumption, bus</td>
<td>&lt; 12 mA</td>
<td></td>
</tr>
<tr>
<td>Power loss, bus</td>
<td>Maximum 250 mW</td>
<td></td>
</tr>
<tr>
<td>Power loss, device</td>
<td>Maximum 3 W</td>
<td></td>
</tr>
<tr>
<td>KNX connection</td>
<td>0.25 W</td>
<td></td>
</tr>
<tr>
<td>Relay 5 A</td>
<td>0.6 W</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connections</th>
<th>Via bus connection terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs/outputs</td>
<td>Via screw terminals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connection terminals</th>
<th>Screw terminal</th>
<th>Screw terminal with universal head (PZ1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screw terminal 1</td>
<td>0.2…2.5 mm² stranded, 2 x (0.2…2.5 mm²)</td>
<td></td>
</tr>
<tr>
<td>Screw terminal 2</td>
<td>0.2…4 mm² solid, 2 x (0.2…4 mm²)</td>
<td></td>
</tr>
</tbody>
</table>

| Wire end ferrule without plastic sleeve | 0.25…2.5 mm² |
| Wire end ferrule with plastic sleeve   | 0.25…4 mm²  |
| TWIN ferrules                          | 0.25…4 mm²  |

| Wire end ferrule contact pin length    | Min. 10 mm |
| Tightening torque                     | Max. 0.6 Nm |
| Spacing                              | 6.35       |

<table>
<thead>
<tr>
<th>Degree of protection and protection class</th>
<th>Degree of protection</th>
<th>IP 20 according to EN 60529</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>II according to EN 61140</td>
<td></td>
</tr>
<tr>
<td>Overvoltage category</td>
<td>III according to EN 60664-1</td>
<td></td>
</tr>
<tr>
<td>Pollution degree</td>
<td>II according to EN 60664-1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SELV</th>
<th>KNX safety extra low voltage</th>
<th>SELV 24 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>Operation</td>
<td>-5...+45 °C</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Transport</td>
<td>-25...+70 °C</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>-25...+55 °C</td>
<td></td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Maximum atmospheric humidity</td>
<td>95 %, no condensation allowed</td>
</tr>
<tr>
<td>Atmospheric pressure</td>
<td>Atmosphere up to 2,000 m</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Modular DIN rail component (MDRC)</td>
<td>Modular installation device</td>
</tr>
<tr>
<td>Design</td>
<td>Modular installation device</td>
<td></td>
</tr>
<tr>
<td>Housing/color</td>
<td>Plastic, gray</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>Dimensions</td>
<td>90 x 140 x 63.5 mm (H x W x D)</td>
</tr>
<tr>
<td></td>
<td>Mounting width in space units</td>
<td>8x modules of 17.5 mm</td>
</tr>
<tr>
<td></td>
<td>Mounting depth</td>
<td>63.5 mm</td>
</tr>
<tr>
<td>Mounting</td>
<td>35 mm mounting rail</td>
<td>According to EN 60715</td>
</tr>
<tr>
<td></td>
<td>Mounting position</td>
<td>Any</td>
</tr>
<tr>
<td></td>
<td>Weight</td>
<td>0.24 kg</td>
</tr>
<tr>
<td>Fire classification</td>
<td>Flammability V-0 as per UL94</td>
<td></td>
</tr>
<tr>
<td>Approvals</td>
<td>KNX certification</td>
<td>According to EN 50491</td>
</tr>
<tr>
<td></td>
<td>Certification</td>
<td>According to EN 60669</td>
</tr>
<tr>
<td></td>
<td>CE marking</td>
<td>In accordance with the EMC and Low Voltage Directives</td>
</tr>
</tbody>
</table>

Table 6: Technical data, HCC/S 2.1.1.1
### 3.3.4.2 Device type

<table>
<thead>
<tr>
<th>Device type</th>
<th>Heating/cooling circuit controller</th>
<th>HCC/S 2.1.1.1</th>
</tr>
</thead>
</table>

**Application** Heating/cooling circuit controller, 0-10 V, 2-f/…*

| Maximum number of group objects | 106 |
| Maximum number of group addresses | 255 |
| Maximum number of assignments | 255 |

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

**Table 7: Device type, HCC/S 2.1.1.1**

### 3.3.4.3 Valve outputs (analog)

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control signal</td>
<td>0…10 V DC</td>
</tr>
<tr>
<td>Signal type</td>
<td>Analog</td>
</tr>
<tr>
<td>Output load</td>
<td>&gt; 10 kOhm</td>
</tr>
<tr>
<td>Output tolerance</td>
<td>± 10 %</td>
</tr>
<tr>
<td>Current limitation</td>
<td>Up to 1.5 mA</td>
</tr>
</tbody>
</table>

**Table 8: Valve outputs (analog), HCC/S 2.1.1.1**

### 3.3.4.4 Pump outputs (RC 5 A)

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_n rated voltage</td>
<td>250 V AC (50/60 Hz)</td>
</tr>
<tr>
<td>Switching currents</td>
<td>5 A</td>
</tr>
<tr>
<td>AC3* operation (cos φ = 0.45)</td>
<td>According to EN 60947-4-1</td>
</tr>
<tr>
<td>AC1* operation (cos φ = 0.8)</td>
<td>According to EN 60947-4-1</td>
</tr>
<tr>
<td>Fluorescent lighting load AX</td>
<td>According to EN 60669-1</td>
</tr>
<tr>
<td>Minimum switching capacity at 20 mA</td>
<td>5 V AC</td>
</tr>
<tr>
<td>Minimum switching capacity at 10 mA</td>
<td>12 V AC</td>
</tr>
<tr>
<td>Minimum switching capacity at 7 mA</td>
<td>24 V AC</td>
</tr>
<tr>
<td>Service life</td>
<td></td>
</tr>
<tr>
<td>DC current switching capacity, resistive load, at 5 A</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>&gt;10^7 cycles</td>
</tr>
<tr>
<td>Electrical service life of switching contacts according to IEC 60947-4-1</td>
<td>&gt;10^6 cycles</td>
</tr>
<tr>
<td>Operating times</td>
<td>Maximum relay position changes per output and minute if only one relay is switched</td>
</tr>
<tr>
<td></td>
<td>&gt; 500</td>
</tr>
</tbody>
</table>

**Table 9: Pump outputs (RC 5 A), HCC/S 2.1.1.1**
### Inputs

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>For temperature measurement</td>
<td>10</td>
</tr>
<tr>
<td>For contact scanning</td>
<td>4</td>
</tr>
<tr>
<td>Contact scanning</td>
<td>6</td>
</tr>
<tr>
<td>Resistance</td>
<td>Selection</td>
</tr>
<tr>
<td>PT 1000</td>
<td>2-conductor technology</td>
</tr>
<tr>
<td>PT 100</td>
<td>2-conductor technology</td>
</tr>
<tr>
<td>KT</td>
<td>1 k</td>
</tr>
<tr>
<td>KTY</td>
<td>2 k</td>
</tr>
<tr>
<td>NI</td>
<td>1 k</td>
</tr>
<tr>
<td>NTC</td>
<td>10 k</td>
</tr>
<tr>
<td>NTC</td>
<td>20 k</td>
</tr>
<tr>
<td>Cable length</td>
<td>Between sensor and device input</td>
</tr>
<tr>
<td></td>
<td>Max. 100 m, one-way</td>
</tr>
</tbody>
</table>

*Table 10: Inputs, HCC/S 2.1.1.1*
3.4 Heating/cooling circuit controller HCC/S 2.1.2.1, 0-10 V, manual operation, MDRC

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

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

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

3.4.1 Dimension drawing

Fig. 4: Device illustration, HCC/S 2.1.2.1

Fig. 5: Dimension drawing
### 3.4.2 Connection diagram

**Legend**

1. Label carrier
2. KNX programming LED (red)
3. KNX programming button
4. KNX connection
5. Cover cap
6. Relay output pump channel A
7. Temperature inputs channel A
8. Binary inputs (pump) channel A
9. Valve output channel A
10. Relay output pump channel B
11. Temperature inputs channel B
12. Binary inputs (pump) channel B
13. Valve output channel B
14. Activate manual operation button/LED
15. Control valve output channel B button/LED
16. Control valve output channel A button/LED
17. Enable pump channel B button/LED
18. Display status inputs channel B LED
19. Display status inputs channel A LED
20. Enable pump channel A button/LED

**Fig. 6: Connection diagram, HCC/S 2.1.2.1**
### 3.4.3 Operating and display elements

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assignment of the physical</td>
<td>On: device is in programming mode</td>
</tr>
<tr>
<td></td>
<td>address</td>
<td></td>
</tr>
</tbody>
</table>

*Table 11: Operating and display elements, HCC/S 2.1.2.1*
### Manual operation

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Open valve output" /></td>
<td>Maximum valve control value (100 %) set. Reset the output: button must be pressed for at least 5 seconds.</td>
<td>On: Valve control value at 100 % Flashing: Indicates a fault, e.g. overload/short circuit</td>
</tr>
<tr>
<td><img src="image" alt="Close valve output" /></td>
<td>Minimum valve control value (0 %) is set.</td>
<td>On: Valve control value at 0 %</td>
</tr>
<tr>
<td><img src="image" alt="Pump" /></td>
<td>Relay for the pump output is switched over. Special feature, double pump mode: given corresponding parameterization, pressing one of the pump buttons causes the active pump to change</td>
<td>On: Contact closed Off: Contact open</td>
</tr>
<tr>
<td><img src="image" alt="Manual operation" /></td>
<td>Activate KNX mode with a short press of the button.</td>
<td>On: The device is in the manual mode Off: Device is in the KNX mode</td>
</tr>
<tr>
<td><img src="image" alt="Input a…x" /></td>
<td>LED indication depending on which inputs are in use</td>
<td>Binary sensor: LED on: Contact closed LED off: Contact open Temperature sensor: LED on: Temperature sensor connected LED flashing: Fault (cable break/short circuit)</td>
</tr>
</tbody>
</table>

*Table 12: Manual operation, HCC/S 2.1.2.1*
### KNX operation

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open valve output</td>
<td>Button without function</td>
<td>On: Valve control value at 100 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flashing: Indicates a fault, e.g. overload/short circuit</td>
</tr>
<tr>
<td>Close valve output</td>
<td>Button without function</td>
<td>On: Valve control value at 0 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Both LEDs on: Valve control value is between 1 and 99 %</td>
</tr>
<tr>
<td>Pump</td>
<td>Button without function</td>
<td>On: Contact closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off: Contact open</td>
</tr>
<tr>
<td>Switch over pump</td>
<td>Activate KNX mode with a short press of the button.</td>
<td>On: The device is in the manual mode</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Off: Device is in the KNX mode</td>
</tr>
<tr>
<td>Manual operation</td>
<td>LED indication depending on which inputs are in use</td>
<td>Binary sensor:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LED on: Contact closed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LED off: Contact open</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Temperature sensor:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LED on: Temperature sensor connected</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LED flashing: Fault (cable break/short circuit)</td>
</tr>
</tbody>
</table>

Table 13: KNX operation, HCC/S 2.1.2.1
### Technical data

#### 3.4.4.1 General technical data

<table>
<thead>
<tr>
<th>Supply</th>
<th>Bus voltage</th>
<th>21…32 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current consumption, bus</td>
<td>&lt; 12 mA</td>
<td></td>
</tr>
<tr>
<td>Power loss, bus</td>
<td>Maximum 250 mW</td>
<td></td>
</tr>
<tr>
<td>Power loss, device</td>
<td>Maximum 3 W</td>
<td></td>
</tr>
<tr>
<td>KNX connection</td>
<td>0.25 W</td>
<td></td>
</tr>
<tr>
<td>Relay 5 A</td>
<td>0.6 W</td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>KNX</td>
<td>Via bus connection terminal</td>
</tr>
<tr>
<td></td>
<td>Inputs/outputs</td>
<td>Via screw terminals</td>
</tr>
<tr>
<td>Connection terminals</td>
<td>Screw terminal</td>
<td>Screw terminal with universal head (PZ1)</td>
</tr>
<tr>
<td></td>
<td>Screw terminal 1</td>
<td>0.2…2.5 mm² stranded, 2 x (0.2…2.5 mm²)</td>
</tr>
<tr>
<td></td>
<td>Screw terminal 2</td>
<td>0.2…4 mm² solid, 2 x (0.2…4 mm²)</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule without plastic sleeve</td>
<td>0.25…2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule with plastic sleeve</td>
<td>0.25…4 mm²</td>
</tr>
<tr>
<td></td>
<td>TWIN ferrules</td>
<td>0.25…4 mm²</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule contact pin length</td>
<td>Min. 10 mm</td>
</tr>
<tr>
<td></td>
<td>Tightening torque</td>
<td>Max. 0.6 Nm</td>
</tr>
<tr>
<td></td>
<td>Spacing</td>
<td>6.35</td>
</tr>
<tr>
<td>Degree of protection and protection class</td>
<td>Degree of protection</td>
<td>IP 20 to EN 60529</td>
</tr>
<tr>
<td></td>
<td>Protection class</td>
<td>II to EN 61140</td>
</tr>
<tr>
<td>Isolation category</td>
<td>Overvoltage category</td>
<td>III to EN 60664-1</td>
</tr>
<tr>
<td></td>
<td>Pollution degree</td>
<td>II to EN 60664-1</td>
</tr>
<tr>
<td>SELV</td>
<td>KNX safety extra low voltage</td>
<td>SELV 24 V DC</td>
</tr>
</tbody>
</table>
Temperature range | Operation       | -5...+45 °C  
|------------------|----------------|
| Transport        | -25...+70 °C   
| Storage          | -25...+55 °C   

Ambient conditions

| Atmospheric pressure | Atmosphere up to 2,000 m |

| Maximum atmospheric humidity | 95 %, no condensation allowed |

Design

<table>
<thead>
<tr>
<th>Modular DIN rail component (MDRC)</th>
<th>Modular installation device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design pro M</td>
<td></td>
</tr>
<tr>
<td>Housing/color</td>
<td>Plastic, gray</td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>90 x 140 x 63.5 mm (H x W x D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting width in space units</td>
<td>8x modules of 17.5 mm</td>
</tr>
<tr>
<td>Mounting depth</td>
<td>63.5 mm</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mounting width in space units</th>
<th>8x modules of 17.5 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting depth</td>
<td>63.5 mm</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
</tr>
<tr>
<td>Weight</td>
<td>0.24 kg</td>
</tr>
</tbody>
</table>

Fire classification

| Flammability V-0 as per UL94 |

Approvals

<table>
<thead>
<tr>
<th>KNX certification</th>
<th>According to EN 50491</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification</td>
<td>According to EN 60669</td>
</tr>
<tr>
<td>CE marking</td>
<td>In accordance with the EMC and Low Voltage Directives</td>
</tr>
</tbody>
</table>

Table 14: Technical data, HCC/S 2.1.2.1
### 3.4.4.2 Device type

<table>
<thead>
<tr>
<th>Device type</th>
<th>Heating/cooling circuit controller</th>
<th>HCC/S 2.1.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Heating/cooling circuit controller, 0-10 V, manual Operation, 2-f...*</td>
<td></td>
</tr>
<tr>
<td>Maximum number of group objects</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Maximum number of group addresses</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>Maximum number of assignments</td>
<td>255</td>
<td></td>
</tr>
</tbody>
</table>

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

*Table 15: Device type, HCC/S 2.1.2.1*

### 3.4.4.3 Valve outputs (analog)

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control signal</td>
<td>0...10 V DC</td>
</tr>
<tr>
<td>Signal type</td>
<td>Analog</td>
</tr>
<tr>
<td>Output load</td>
<td>&gt; 10 kOhm</td>
</tr>
<tr>
<td>Output tolerance</td>
<td>± 10 %</td>
</tr>
<tr>
<td>Current limitation</td>
<td>Up to 1.5 mA</td>
</tr>
</tbody>
</table>

*Table 16: Valve outputs (analog), HCC/S 2.1.2.1*

### 3.4.4.4 Pump outputs (RC 5 A)

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_n, rated voltage</td>
<td>250 V AC (50/60 Hz)</td>
</tr>
<tr>
<td>I_r, rated current (per output pair)</td>
<td>5 A</td>
</tr>
<tr>
<td>Switching currents</td>
<td>AC3* operation (cos φ = 0.45) According to EN 60947-4-1</td>
</tr>
<tr>
<td></td>
<td>AC1* operation (cos φ = 0.8) According to EN 60947-4-1</td>
</tr>
<tr>
<td></td>
<td>Fluorescent lighting load AX According to EN 60669-1</td>
</tr>
<tr>
<td></td>
<td>Minimum switching capacity at 20 mA 5 V AC</td>
</tr>
<tr>
<td></td>
<td>Minimum switching capacity at 10 mA 12 V AC</td>
</tr>
<tr>
<td></td>
<td>Minimum switching capacity at 7 mA 24 V AC</td>
</tr>
<tr>
<td>Service life</td>
<td>DC current switching capacity, resistive load, at 5 A 24 V DC</td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>&gt;10^7 cycles</td>
</tr>
<tr>
<td>Electrical service life of switching contacts according to IEC 60947-4-1</td>
<td>&gt;10^6 cycles</td>
</tr>
<tr>
<td>Operating times</td>
<td>Maximum relay position changes per output and minute if only one relay is switched &gt; 500</td>
</tr>
</tbody>
</table>

*Table 17: Pump outputs (RC 5 A), HCC/S 2.1.2.1*
## Inputs

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>For temperature measurement</td>
<td>Quantity</td>
<td>4</td>
</tr>
<tr>
<td>For contact scanning</td>
<td>Quantity</td>
<td>6</td>
</tr>
<tr>
<td>Contact scanning</td>
<td>Scanning current</td>
<td>1 mA</td>
</tr>
<tr>
<td></td>
<td>Scanning voltage</td>
<td>12 V</td>
</tr>
<tr>
<td>Resistance</td>
<td>Selection</td>
<td>User-defined</td>
</tr>
<tr>
<td>PT 1000</td>
<td>2-conductor technology</td>
<td></td>
</tr>
<tr>
<td>PT 100</td>
<td>2-conductor technology</td>
<td></td>
</tr>
<tr>
<td>KT</td>
<td>1 k</td>
<td></td>
</tr>
<tr>
<td>KTY</td>
<td>2 k</td>
<td></td>
</tr>
<tr>
<td>NI</td>
<td>1 k</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>10 k</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>20 k</td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>Between sensor and device input</td>
<td>Max. 100 m, one-way</td>
</tr>
</tbody>
</table>

Table 18: Inputs, HCC/S 2.1.2.1
3.5 Heating/cooling circuit controller HCC/S 2.2.1.1, 3-point, MDRC

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

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

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

3.5.1 Dimension drawing

Fig. 7: Device illustration, HCC/S 2.2.1.1

Fig. 8: Dimension drawing
3.5.2 Connection diagram

Legend

1. Label carrier
2. KNX programming LED (red)
3. KNX programming button
4. KNX connection
5. Cover cap
6. Relay output pump channel A
7. Temperature inputs channel A
8. Binary inputs (pump) channel A
9. Valve output channel A
10. Relay output pump channel B
11. Temperature inputs channel B
12. Binary inputs (pump) channel B
13. Valve output channel B

Fig. 9: Connection diagram, HCC/S 2.2.1.1
### Operating and display elements

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assignment of the physical address</td>
<td>On: device is in programming mode</td>
</tr>
</tbody>
</table>

*Table 19: Operating and display elements, HCC/S 2.2.1.1*
### 3.5.4 Technical data

#### 3.5.4.1 General technical data

<table>
<thead>
<tr>
<th>Supply</th>
<th>Bus voltage</th>
<th>21…32 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current consumption, bus</td>
<td>&lt; 12 mA</td>
<td></td>
</tr>
<tr>
<td>Power loss, bus</td>
<td>Maximum 250 mW</td>
<td></td>
</tr>
<tr>
<td>Power loss, device</td>
<td>Maximum 3 W</td>
<td></td>
</tr>
<tr>
<td>KNX connection</td>
<td>0.25 W</td>
<td></td>
</tr>
<tr>
<td>Relay 5 A</td>
<td>0.6 W</td>
<td></td>
</tr>
<tr>
<td>Electronic outputs</td>
<td>1.2 W</td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>KNX</td>
<td>Via bus connection terminal</td>
</tr>
<tr>
<td></td>
<td>Inputs/outputs</td>
<td>Via screw terminals</td>
</tr>
<tr>
<td>Connection terminals</td>
<td>Screw terminal</td>
<td>Screw terminal with universal head (PZ1)</td>
</tr>
<tr>
<td></td>
<td>Screw terminal 1</td>
<td>0.2…2.5 mm² stranded, 2 x (0.2…2.5 mm²)</td>
</tr>
<tr>
<td></td>
<td>Screw terminal 2</td>
<td>0.2…4 mm² solid, 2 x (0.2…4 mm²)</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule without plastic sleeve</td>
<td>0.25…2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule with plastic sleeve</td>
<td>0.25…4 mm²</td>
</tr>
<tr>
<td></td>
<td>TWI/N ferrules</td>
<td>0.25…4 mm²</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule contact pin length</td>
<td>Min. 10 mm</td>
</tr>
<tr>
<td></td>
<td>Tightening torque</td>
<td>Max. 0.6 Nm</td>
</tr>
<tr>
<td></td>
<td>Spacing</td>
<td>6.35</td>
</tr>
<tr>
<td>Degree of protection and protection class</td>
<td>Degree of protection</td>
<td>IP 20 according to EN 60529</td>
</tr>
<tr>
<td></td>
<td>Protection class</td>
<td>II to EN 61140</td>
</tr>
<tr>
<td>Isolation category</td>
<td>Overvoltage category</td>
<td>III to EN 60664-1</td>
</tr>
<tr>
<td></td>
<td>Pollution degree</td>
<td>II to EN 60664-1</td>
</tr>
</tbody>
</table>
ABB i-bus® KNX
Product overview

<table>
<thead>
<tr>
<th>SELV</th>
<th>KNX safety extra low voltage</th>
<th>SELV 24 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>Operation</td>
<td>-5...+45 °C</td>
</tr>
<tr>
<td>Transport</td>
<td></td>
<td>-25...+70 °C</td>
</tr>
<tr>
<td>Storage</td>
<td></td>
<td>-25...+55 °C</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Maximum atmospheric humidity</td>
<td>95 %, no condensation allowed</td>
</tr>
<tr>
<td>Design</td>
<td>Modular DIN rail component (MDRC)</td>
<td>Modular installation device</td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td>pro M</td>
</tr>
<tr>
<td>Housing/color</td>
<td></td>
<td>Plastic, gray</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Dimensions</td>
<td>90 x 140 x 63.5 mm (H x W x D)</td>
</tr>
<tr>
<td>Mounting width in space units</td>
<td></td>
<td>8x modules of 17.5 mm</td>
</tr>
<tr>
<td>Mounting</td>
<td></td>
<td>63.5 mm</td>
</tr>
<tr>
<td>Mounting position</td>
<td></td>
<td>Any</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
<td>0.24 kg</td>
</tr>
<tr>
<td>Fire classification</td>
<td></td>
<td>Flammability V-0 as per UL94</td>
</tr>
<tr>
<td>Approvals</td>
<td>KNX certification</td>
<td>According to EN 50491</td>
</tr>
<tr>
<td>Certification</td>
<td></td>
<td>According to EN 60669</td>
</tr>
<tr>
<td>CE marking</td>
<td></td>
<td>In accordance with the EMC and Low Voltage Directives</td>
</tr>
</tbody>
</table>

Table 20: Technical data, HCC/S 2.2.1.1
### Device type

<table>
<thead>
<tr>
<th>Device type</th>
<th>Heating/cooling circuit controller</th>
<th>HCC/S 2.2.1.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Heating/Cooling Circuit Controller, 3-Point, 2-f/…*</td>
<td></td>
</tr>
<tr>
<td>Maximum number of group objects</td>
<td>106</td>
<td></td>
</tr>
<tr>
<td>Maximum number of group addresses</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>Maximum number of assignments</td>
<td>255</td>
<td></td>
</tr>
</tbody>
</table>

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

Table 21: Device type, HCC/S 2.2.1.1

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

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-floating</td>
<td>Yes</td>
</tr>
<tr>
<td>(U_n) rated voltage</td>
<td>24…230 V AC (50/60 Hz)</td>
</tr>
<tr>
<td>(I_n) rated current (per output pair)</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Continuous current at (T_u) up to 20 °C</td>
<td>0.25 A resistive load per channel</td>
</tr>
<tr>
<td>Continuous current at (T_u) up to 45 °C</td>
<td>0.15 A resistive load per channel</td>
</tr>
<tr>
<td>Starting current</td>
<td>Maximum 1.6 A, 10 s at (T_u) up to 45 °C</td>
</tr>
<tr>
<td>Minimum load</td>
<td>1.2 VA per PWM output</td>
</tr>
</tbody>
</table>

Table 22: Valve outputs (motor-driven, 3-point), HCC/S 2.2.1.1

### Pump outputs (RC 5 A)

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>(U_n) rated voltage</td>
<td>250 V AC (50/60 Hz)</td>
</tr>
<tr>
<td>(I_n) rated current (per output pair)</td>
<td>5 A</td>
</tr>
<tr>
<td>AC3* operation ((\cos \phi = 0.45))</td>
<td>According to EN 60947-4-1</td>
</tr>
<tr>
<td>AC1* operation ((\cos \phi = 0.8))</td>
<td>According to EN 60947-4-1</td>
</tr>
<tr>
<td>Fluorescent lighting load AX</td>
<td>According to EN 60669-1</td>
</tr>
<tr>
<td>Minimum switching capacity at 20 mA</td>
<td>5 V AC</td>
</tr>
<tr>
<td>Minimum switching capacity at 10 mA</td>
<td>12 V AC</td>
</tr>
<tr>
<td>Minimum switching capacity at 7 mA</td>
<td>24 V AC</td>
</tr>
<tr>
<td>DC current switching capacity, resistive load, at 5 A</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>(&gt;10^7) cycles</td>
</tr>
<tr>
<td>Electrical service life of switching contacts according to IEC 60947-4-1</td>
<td>(&gt;10^6) cycles</td>
</tr>
<tr>
<td>Operating times</td>
<td>Maximum relay position changes per output and minute if only one relay is switched</td>
</tr>
</tbody>
</table>

Table 23: Pump outputs (RC 5 A), HCC/S 2.2.1.1
### Inputs

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated values</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>For temperature measurement</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>For contact scanning</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Contact scanning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scanning current</td>
<td>1 mA</td>
<td></td>
</tr>
<tr>
<td>Scanning voltage</td>
<td>12 V</td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selection</td>
<td>User-defined</td>
<td></td>
</tr>
<tr>
<td>PT 1000</td>
<td></td>
<td>2-conductor technology</td>
</tr>
<tr>
<td>PT 100</td>
<td></td>
<td>2-conductor technology</td>
</tr>
<tr>
<td>KT</td>
<td>1 k</td>
<td></td>
</tr>
<tr>
<td>KTY</td>
<td>2 k</td>
<td></td>
</tr>
<tr>
<td>Ni</td>
<td>1 k</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>10 k</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>20 k</td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td></td>
<td>Between sensor and device input, Max. 100 m, one-way</td>
</tr>
</tbody>
</table>

*Table 24: Inputs, HCC/S 2.2.1.1*
3.6 Heating/cooling circuit controller HCC/S 2.2.2.1, 3-point, manual operation, MDRC

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

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

3.6.1 Dimension drawing

Fig. 10: Device illustration, HCC/S 2.2.2.1

Fig. 11: Dimension drawing
3.6.2 Connection diagram

Fig. 12: Connection diagram, HCC/S 2.2.2.1

Legend

1. Label carrier
2. KNX programming LED (red)
3. KNX programming button
4. KNX connection
5. Cover cap
6. Relay output pump channel A
7. Temperature inputs channel A
8. Binary inputs (pump) channel A
9. Valve output channel A
10. Relay output pump channel B
11. Temperature inputs channel B
12. Binary inputs (pump) channel B
13. Valve output channel B
14. Activate manual operation button/LED
15. Control valve output channel B button/LED
16. Control valve output channel A button/LED
17. Enable pump channel B button/LED
18. Display status inputs channel B LED
19. Display status inputs channel A LED
20. Enable pump channel A button/LED
### 3.6.3 Operating and display elements

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assignment of the physical address</td>
<td>On: device is in programming mode</td>
</tr>
</tbody>
</table>

*Table 25: Operating and display elements, HCC/S 2.2.2.1*
### Manual operation

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Open valve output" /></td>
<td>Maximum valve control value (100 %) set. Reset the output: button must be pressed for at least 5 seconds.</td>
<td>On: Valve control value at 100 % Flashing: Indicates a fault, e.g. overload/short circuit</td>
</tr>
<tr>
<td><img src="image" alt="Close valve output" /></td>
<td>Minimum valve control value (0 %) is set.</td>
<td>On: Valve control value at 0 %</td>
</tr>
<tr>
<td><img src="image" alt="Pump" /></td>
<td>Relay for the pump output is switched over. Special feature, double pump mode: given corresponding parameterization, pressing one of the pump buttons causes the active pump to change</td>
<td>On: Contact closed Off: Contact open</td>
</tr>
<tr>
<td><img src="image" alt="Manual operation" /></td>
<td>Activate KNX mode with a short press of the button.</td>
<td>On: The device is in the manual mode Off: Device is in the KNX mode</td>
</tr>
</tbody>
</table>

Input a...x

<table>
<thead>
<tr>
<th>Input a...x</th>
<th>LED indication depending on which inputs are in use</th>
<th>Binary sensor:</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="a b c d" /></td>
<td>LED on: Contact closed LED off: Contact open</td>
<td>LED on: Contact closed</td>
</tr>
<tr>
<td></td>
<td>Temperature sensor:</td>
<td>LED on: Temperature sensor connected</td>
</tr>
<tr>
<td></td>
<td>LED flashing: Fault (cable break/short circuit)</td>
<td></td>
</tr>
</tbody>
</table>

Table 26: Manual operation, HCC/S 2.2.2.1
### 3.6.3.2 KNX operation

<table>
<thead>
<tr>
<th>Button/LED</th>
<th>Description</th>
<th>LED indicator</th>
</tr>
</thead>
</table>
| ![Up](image) | Open valve output | Button without function | On: Valve control value at 100 %  
Flashing: Indicates a fault, e.g. overload/short circuit |
| ![Down](image) | Close valve output | Button without function | On: Valve control value at 0 % |
| ![Up](image) ![Down](image) | Both LEDs on: Valve control value is between 1 and 99 % |
| ![Pump](image) ![Pump](image) | Switch over pump | Button without function | On: Contact closed  
Off: Contact open |
| ![Manual](image) | Manual operation | Activate KNX mode with a short press of the button. | On: The device is in the manual mode  
Off: Device is in the KNX mode |
| ![Input](image) ![Input](image) ![Input](image) ![Input](image) | Input a…x | LED indication depending on which inputs are in use | Binary sensor:  
LED on: Contact closed  
LED off: Contact open  
Temperature sensor:  
LED on: Temperature sensor connected  
LED flashing: Fault (cable break/short circuit) |

*Table 27: KNX operation, HCC/S 2.2.2.1*
### Technical data

#### 3.6.4.1 General technical data

<table>
<thead>
<tr>
<th>Supply</th>
<th>Bus voltage</th>
<th>21…32 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current consumption, bus</td>
<td>&lt; 12 mA</td>
<td></td>
</tr>
<tr>
<td>Power loss, bus</td>
<td>Maximum 250 mW</td>
<td></td>
</tr>
<tr>
<td>Power loss, device</td>
<td>Maximum 3 W</td>
<td></td>
</tr>
<tr>
<td>KNX connection</td>
<td>0.25 W</td>
<td></td>
</tr>
<tr>
<td>Relay 5 A</td>
<td>0.6 W</td>
<td></td>
</tr>
<tr>
<td>Electronic outputs</td>
<td>1.2 W</td>
<td></td>
</tr>
<tr>
<td>Connections</td>
<td>KNX</td>
<td>Via bus connection terminal</td>
</tr>
<tr>
<td></td>
<td>Inputs/outputs</td>
<td>Via screw terminals</td>
</tr>
<tr>
<td>Connection terminals</td>
<td>Screw terminal</td>
<td>Screw terminal with universal head (PZ1)</td>
</tr>
<tr>
<td></td>
<td>Screw terminal 1</td>
<td>0.2…2.5 mm² stranded, 2 x (0.2…2.5 mm²)</td>
</tr>
<tr>
<td></td>
<td>Screw terminal 2</td>
<td>0.2…4 mm² solid, 2 x (0.2…4 mm²)</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule without plastic sleeve</td>
<td>0.25…2.5 mm²</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule with plastic sleeve</td>
<td>0.25…4 mm²</td>
</tr>
<tr>
<td></td>
<td>TWIN ferrules</td>
<td>0.25…4 mm²</td>
</tr>
<tr>
<td></td>
<td>Wire end ferrule contact pin length</td>
<td>Min. 10 mm</td>
</tr>
<tr>
<td></td>
<td>Tightening torque</td>
<td>Max. 0.6 Nm</td>
</tr>
<tr>
<td></td>
<td>Spacing</td>
<td>6.35</td>
</tr>
</tbody>
</table>

#### Degree of protection and protection class

- Degree of protection: IP 20 according to EN 60529
- Protection class: II to EN 61140

#### Isolation category

- Overvoltage category: III to EN 60664-1
- Pollution degree: II to EN 60664-1
## ABB i-bus® KNX
### Product overview

<table>
<thead>
<tr>
<th>SELV</th>
<th>KNX safety extra low voltage</th>
<th>SELV 24 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Temperature range</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>-5...+45 °C</td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>-25...+70 °C</td>
<td></td>
</tr>
<tr>
<td>Storage</td>
<td>-25...+55 °C</td>
<td></td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum atmospheric humidity</td>
<td>95 %, no condensation allowed</td>
<td></td>
</tr>
<tr>
<td>Atmospheric pressure</td>
<td>Atmosphere up to 2,000 m</td>
<td></td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modular DIN rail component (MDRC)</td>
<td>Modular installation device</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>90 x 140 x 63.5 mm (H x W x D)</td>
<td></td>
</tr>
<tr>
<td>Mounting width in space units</td>
<td>8x modules of 17.5 mm</td>
<td></td>
</tr>
<tr>
<td><strong>Mounting</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35 mm mounting rail</td>
<td>According to EN 60715</td>
<td></td>
</tr>
<tr>
<td>Mounting position</td>
<td>Any</td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.24 kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fire classification</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammability V-0 as per UL94</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KNX certification</td>
<td>According to EN 50491</td>
<td></td>
</tr>
<tr>
<td>Certification</td>
<td>According to EN 60669</td>
<td></td>
</tr>
<tr>
<td><strong>CE marking</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In accordance with the EMC and Low Voltage Directives</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 28: Technical data, HCC/S 2.2.2.1*
3.6.4.2 Device type

<table>
<thead>
<tr>
<th>Device type</th>
<th>Heating/cooling circuit controller</th>
<th>HCC/S 2.2.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td>Heating/Cooling Circuit Controller, 3-Point, manual Operation, 2-f/* ...</td>
<td></td>
</tr>
<tr>
<td>Maximum number of group objects</td>
<td>108</td>
<td></td>
</tr>
<tr>
<td>Maximum number of group addresses</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>Maximum number of assignments</td>
<td>255</td>
<td></td>
</tr>
</tbody>
</table>

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

Table 29: Device type, HCC/S 2.2.2.1

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

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-floating</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>U_{n} rated voltage</td>
<td>24...230 V AC (50/60 Hz)</td>
<td></td>
</tr>
<tr>
<td>I_{n} rated current (per output pair)</td>
<td>0.5 A</td>
<td></td>
</tr>
<tr>
<td>Continuous current at T_{u} up to 20 °C</td>
<td>0.25 A resistive load per channel</td>
<td></td>
</tr>
<tr>
<td>Continuous current at T_{u} up to 45 °C</td>
<td>0.15 A resistive load per channel</td>
<td></td>
</tr>
<tr>
<td>Starting current</td>
<td>Maximum 1.6 A, 10 s at T_{u} up to 45 °C</td>
<td></td>
</tr>
<tr>
<td>Minimum load</td>
<td>1.2 VA per PWM output</td>
<td></td>
</tr>
</tbody>
</table>

Table 30: Valve outputs (motor-driven, 3-point), HCC/S 2.2.2.1

3.6.4.4 Pump outputs (RC 5 A)

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>U_{n} rated voltage</td>
<td>250 V AC (50/60 Hz)</td>
<td></td>
</tr>
<tr>
<td>I_{n} rated current (per output pair)</td>
<td>5 A</td>
<td></td>
</tr>
<tr>
<td>AC3* operation (cos ( \varphi ) = 0.45)</td>
<td>According to EN 60947-4-1</td>
<td></td>
</tr>
<tr>
<td>AC1* operation (cos ( \varphi ) = 0.8)</td>
<td>According to EN 60947-4-1</td>
<td></td>
</tr>
<tr>
<td>Fluorescent lighting load AX</td>
<td>According to EN 60669-1</td>
<td></td>
</tr>
<tr>
<td>Minimum switching capacity at 20 mA</td>
<td>5 V AC</td>
<td></td>
</tr>
<tr>
<td>Minimum switching capacity at 10 mA</td>
<td>12 V AC</td>
<td></td>
</tr>
<tr>
<td>Minimum switching capacity at 7 mA</td>
<td>24 V AC</td>
<td></td>
</tr>
<tr>
<td>DC current switching capacity, resistive load, at 5 A</td>
<td>24 V DC</td>
<td></td>
</tr>
<tr>
<td>Mechanical service life</td>
<td>&gt;10^7 cycles</td>
<td></td>
</tr>
<tr>
<td>Electrical service life of switching contacts according to IEC 60947-4-1</td>
<td>&gt;10^6 cycles</td>
<td></td>
</tr>
<tr>
<td>Maximum relay position changes per output and minute if only one relay is switched</td>
<td>&gt; 500</td>
<td></td>
</tr>
</tbody>
</table>

Table 31: Pump outputs (RC 5 A), HCC/S 2.2.2.1
### Inputs

<table>
<thead>
<tr>
<th>Rated values</th>
<th>Quantity</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>For temperature measurement</td>
<td>Quantity</td>
<td>4</td>
</tr>
<tr>
<td>For contact scanning</td>
<td>Quantity</td>
<td>6</td>
</tr>
<tr>
<td>Contact scanning</td>
<td>Scanning current</td>
<td>1 mA</td>
</tr>
<tr>
<td></td>
<td>Scanning voltage</td>
<td>12 V</td>
</tr>
<tr>
<td>Resistance</td>
<td>Selection</td>
<td>User-defined</td>
</tr>
<tr>
<td>PT 1000</td>
<td>2-conductor technology</td>
<td></td>
</tr>
<tr>
<td>PT 100</td>
<td>2-conductor technology</td>
<td></td>
</tr>
<tr>
<td>KT</td>
<td>1 k</td>
<td></td>
</tr>
<tr>
<td>KTY</td>
<td>2 k</td>
<td></td>
</tr>
<tr>
<td>NI</td>
<td>1 k</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>10 k</td>
<td></td>
</tr>
<tr>
<td>NTC</td>
<td>20 k</td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>Between sensor and device input</td>
<td>Max. 100 m, one-way</td>
</tr>
</tbody>
</table>

**Table 32: Inputs, HCC/S 2.2.2.1**
4 Function

4.1 Overview of heating/cooling circuit

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

A heating/cooling circuit here consists of a feed flow (e.g. coming from the heat generator) that goes to the loads (e.g. radiators in the rooms) as the supply flow. There is also a return flow that returns the water from the rooms back to the generator.

The supply and return flow are connected together by a 3-way mixing valve. Here the water from the supply flow is mixed with the cooler (or warmer in the cooling circuit) water to achieve the required supply flow temperature. In addition, a circulating pump ensures that the water circulates in the heating/cooling circuit.

4.2 Functional overview

The HCC is used to control a heating/cooling circuit. It is a two-channel device. A heating circuit, a cooling circuit or a heating/cooling circuit can be controlled using each channel, independent of the other; each channel has a dedicated controller. To cover applications with double pumps (redundancy), the two channels can also be bundled to control two pumps.

A 3-way mixing valve and the pump are actuated for heating/cooling control. The 3-way mixing valve is actuated via 0-10 V or 3-point (two outputs, one for opening, the other for closing the valve). There is a separate variant for each control mode.

To switch the pump, the device has a relay output. The pump is switched on or off directly using this output, or it is used to enable the pump (depending on pump variant). Three binary inputs are available to monitor the pump status. The following pump status messages can be acquired using these inputs:

- Pump running (status of pump)
- Pump fault (pump faulty)
- Pump repair switch (pump shut down manually)
Not all pumps provide all this information, or indeed any of this information on a floating contact. While the information *Pump running* is only acquired for information purposes (e.g. visualization or building management systems), a signal on the other two inputs causes the immediate shutdown of the pump, and a change in the active pump in the double pump mode.

In addition to the monitoring of the pump, the supply flow and return flow temperatures are measured. The supply flow temperature is used for the control (actual temperature), the return flow temperature is only used for information.

The control is a pure PI control for which the P and I proportions must be defined in the parameters. The supply flow temperature setpoint is received via KNX. The control value calculated is passed to the valve and specifies the mixing ratio between supply flow and return flow (the more return flow, the colder, the more supply flow, the warmer).

Further functions included in the device are:

- Pump automatic function: automatic switching on/off of the pump depending on the valve control value
- Manual override of the pump via the bus
- Manual override of the valve via the bus
- Valve purge
- Automatic valve position adjustment (only 3-point)
- Reaction on bus voltage failure: pump
- Reaction on bus voltage recovery: heating/cooling mode, control value
- Reaction after ETS download & reset: heating/cooling mode, control value
- Forced operation: pump and control value
- Cyclical monitoring: setpoint, if received via bus: supply flow temperature, pump status, pump fault, pump repair mode
- Usage of the binary inputs as free binary inputs

The two channels are bundled in the double pump mode. The temperature inputs and the channel B valve output have no effect here. The binary inputs are still available for both pumps. In this situation there is only one heating/cooling circuit and therefore also only one controller. In addition to the functions available for the single channel, there are options and objects for controlling the double pump functionality:

- Automatic change between the pumps
- Changeover reaction on pump change
The following graphic shows an example heating circuit and the function of the heating/cooling circuit controller in this system.

**Fig. 13: Heating/cooling distribution circuit**
## Function

<table>
<thead>
<tr>
<th>Function/device</th>
<th>HCC/S 2.1.1.1</th>
<th>HCC/S 2.1.2.1</th>
<th>HCC/S 2.2.1.1</th>
<th>HCC/S 2.2.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated temperature controller for heating or</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>cooling mixing circuits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of channels</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Type of valve actuation</td>
<td>0-10 V</td>
<td>0-10 V</td>
<td>3-point (motor-driven)</td>
<td>3-point (motor-driven)</td>
</tr>
<tr>
<td>Inputs for sensors per channel</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Type of valve actuation</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Inputs for temperature measurement</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Pump output per channel</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Manual operation</td>
<td>-</td>
<td>x</td>
<td>-</td>
<td>x</td>
</tr>
</tbody>
</table>

*Table 33: Functional overview*
4.3 Input functions

4.3.1 Temperature inputs

<table>
<thead>
<tr>
<th>Temperature sensor</th>
<th>PT 100</th>
<th>PT 1000</th>
<th>KT/KTY</th>
<th>KT/KTY user-defined</th>
<th>NTC 10 k</th>
<th>NTC 20 k</th>
<th>NI-1000</th>
</tr>
</thead>
</table>

*Table 34: Temperature inputs*

4.3.2 Binary signal input (floating)

<table>
<thead>
<tr>
<th>Binary signal input</th>
<th>Acquisition of pump status</th>
<th>Acquisition of pump fault</th>
<th>Acquisition of pump repair switch</th>
<th>Free binary signal input</th>
</tr>
</thead>
</table>

*Table 35: Binary signal input (floating)*
4.4 Output functions

4.4.1 Valve outputs

4.4.1.1 HCC/S 2.1.1.1 and HCC/S 2.1.2.1

Function

<table>
<thead>
<tr>
<th>Analog valve drive</th>
<th>0…10 V</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1…10 V</td>
</tr>
<tr>
<td></td>
<td>2…10 V</td>
</tr>
<tr>
<td></td>
<td>10…0 V</td>
</tr>
</tbody>
</table>

Table 36: Valve outputs HCC/S 2.1.1.1 and HCC/S 2.1.2.1

4.4.1.2 HCC/S 2.2.1.1 and HCC/S 2.2.2.1

Function

<table>
<thead>
<tr>
<th>Motor-drive valve drive</th>
<th>Open/closed</th>
</tr>
</thead>
</table>

Table 37: Valve outputs HCC/S 2.2.1.1 and HCC/S 2.2.2.1

4.4.2 Pump output

Function

<table>
<thead>
<tr>
<th>Individual pump</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching the pump</td>
<td>X</td>
</tr>
<tr>
<td>Switching the pump depending on valve control value</td>
<td>X</td>
</tr>
<tr>
<td>Inclusion of pump status (fault + repair switch)</td>
<td>X</td>
</tr>
<tr>
<td>Double pump</td>
<td>X</td>
</tr>
<tr>
<td>Switching the pump</td>
<td>X</td>
</tr>
<tr>
<td>Switching the pump depending on valve control value</td>
<td>X</td>
</tr>
<tr>
<td>Inclusion of pump status (fault + repair switch)</td>
<td>X</td>
</tr>
<tr>
<td>Automatic weekly pump change</td>
<td>X</td>
</tr>
<tr>
<td>Pump change on fault</td>
<td>X</td>
</tr>
</tbody>
</table>

Table 38: Pump output
4.5 Integration in the i-bus® Tool

The device possesses an interface to the i-bus® Tool. The i-bus® Tool can be used to read out data and test functions on the device connected. In addition, values can be simulated for test purposes. If there is no communication, output values are no longer output on the bus, even if they are simulated using the i-bus® Tool.

The i-bus® Tool can be used to specify controller parameters to test the correct adjustment of the supply flow temperature controller.

The device’s physical inputs and outputs can be tested via the i-bus® Tool.

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

A description of the functions is provided in the i-bus® Tool online help.
4.6 Special operating states

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

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

4.6.1.1 Bus voltage failure

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

4.6.1.2 Bus voltage recovery

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

4.6.1.3 ETS reset

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

4.6.1.4 Download

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

Note

The device will no longer function after the application is uninstalled or after an interrupted download.
5 Mounting and installation

5.1 Information about mounting

The mounting position for the device can be selected as required.

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

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

Note

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

DANGER – Severe injuries due to touch voltage

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

The device is fitted and removed without auxiliary tools.

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

![Mounting on DIN rail](Fig. 14: Mounting on DIN rail)

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

5.3 Supplied state

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

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

6.1 Prerequisites for commissioning

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

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

6.2 Commissioning overview

The application *Heating/cooling circuit controller, 0-10 V, 2-f* is available for the heating/cooling circuit controller HCC/S 2.1.1.1

The application *Heating/cooling circuit controller, 0-10 V, manual operation, 2-f* is available for the heating/cooling circuit controller HCC/S 2.1.2.1

The application *Heating/cooling circuit controller, 3-point, 2-f* is available for the heating/cooling circuit controller HCC/S 2.2.1.1

The application *Heating/cooling circuit controller, 3-point, manual operation, 2-f* is available for the heating/cooling circuit controller HCC/S 2.2.2.1

ETS from version 4 is required to parameterize the device.

For information on how to use the i-bus® Tool, see chapter 4.5 [Integration in the i-bus® Tool](#).

The following functions are available:

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve output, analog</td>
<td>Actuation of the (3-way) mixing valve for supply flow temperature control</td>
</tr>
<tr>
<td></td>
<td>Valve purge</td>
</tr>
<tr>
<td></td>
<td>Manual valve override</td>
</tr>
<tr>
<td>Valve output, 3-point</td>
<td>Actuation of the (3-way) mixing valve for supply flow temperature control</td>
</tr>
<tr>
<td></td>
<td>Valve purge</td>
</tr>
<tr>
<td></td>
<td>Manual valve override</td>
</tr>
<tr>
<td>Pump output</td>
<td>Switching/enabling of the pump depending on the valve control value</td>
</tr>
<tr>
<td></td>
<td>Manual pump override</td>
</tr>
<tr>
<td></td>
<td>Double pump mode (by means of channel bundling)</td>
</tr>
<tr>
<td></td>
<td>- Weekly active pump change</td>
</tr>
<tr>
<td></td>
<td>- Backup function for the 2nd pump with automatic change</td>
</tr>
<tr>
<td></td>
<td>- If there is a fault</td>
</tr>
<tr>
<td>Inputs (per channel)</td>
<td>2 temperature inputs for the acquisition of supply flow and return flow temperature</td>
</tr>
<tr>
<td></td>
<td>3 binary signal inputs for the acquisition of the pump status</td>
</tr>
</tbody>
</table>

Table 39: Functions
6.3 Assignment of the physical address

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

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

The device performs an ETS reset during physical address programming. This resets all states.
6.4 Software/application

6.4.1 Download response

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

6.4.2 Copying, exchanging and converting

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

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

7.1 General

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

In ETS, the applications are in the Catalogs window under Manufacturers/ABB/Heating, ventilation, air conditioning/Primary systems.

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

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

Options: No

Note

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

Note

This is a 2-channel device. Because the two channels have the same function, the function is described based on channel A as an example.
7.2 General parameter window

**Sending and switching delay after bus voltage recovery**

Options: 2...255

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

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

If group objects are read out via the bus during the sending and switching delay, e.g. by a visual display system, these requests are stored and a response is sent once the delay time has expired.
An initialization time of about two seconds is included in the delay time. The initialization time is the time that the processor requires before it is ready to function.

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

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

**State after sending and switching delay has elapsed**

Options:  
- Last value received
- Ignore received values

- *Last value received*: During the sending and switching delay, the inputs continue reading and the outputs send the current value after the delay has elapsed.

- *Ignore received values*: No new values are accepted during the sending and switching delay. The first value received after the sending and switching delay has elapsed applies.
Limit number of telegrams
Options: No
Yes

The bus load generated by the device is limited using this parameter. This limit relates to all telegrams sent by the device.

---

Dependent parameter

Maximum number of telegrams
Options: 1…20…50

---

Dependent parameter

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

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

The device counts the number of telegrams sent within the parameterized period. As soon as the maximum number of sent telegrams is reached, no further telegrams are sent on the KNX bus until the end of the period. A new period commences at the end of the previous period. The telegram counter is reset to zero, and sending of telegrams is allowed again. The current group object value at the time of sending is always sent. The first period (break time) is not precisely predefined. It can be anywhere between zero seconds and the parameterized time. The subsequent sending times correspond to the parameterized time.

Example:

Maximum number of telegrams sent = 5, period = 5 s. 20 telegrams are ready to send. The device immediately sends 5 telegrams. The next 5 telegrams are sent after a maximum of 5 seconds. From this point, a further 5 telegrams are sent via the bus every 5 seconds. The telegrams are sent in the order in which they arise (first in – first out).
Enable group object "In operation", 1 bit
Options:  No
          Yes

- No: The group object is not enabled.
- Yes: The group object is enabled.

---

Dependent parameter

Send:
Options:  Value 0
          Value 1

---

Dependent parameter

Sending cycle time
Options:  00:00:01…00:01:00…18:12:15 hh:mm:ss

This parameter specifies the interval at which the group object In operation sends a telegram cyclically.

Note

After bus voltage recovery, the group object sends its value after the sending and switching delay set.
Access to i-bus® Tool
Options: Deactivated  Value display only  Full access

The access for the ABB i-bus® Tool is restricted or completely disabled using this parameter. If Deactivated is selected, access by the i-bus® Tool is completely disabled. If Value display only is selected, no values can be changed by the i-bus® Tool; only the status is displayed. If Full access is selected, the i-bus® Tool functions without restriction; values can be displayed and changed (see chapter 4.5 Integration into the i-bus® Tool).

Channel bundling for double pumps
Options: No  Yes

A heating/cooling system with double pump is actuated using this parameter by bundling the two channels in the device.

Double pumps are used for redundancy in the system so that if there is a failure such as a fault on the pump, a second pump can take over operation immediately.

- No: The system is not designed for double pumps. The device has two separate, independent channels.
- Yes: The channels in the system are bundled to make possible the actuation of the second pump. All parameter pages for channel B are deactivated except the Monitoring and safety and Input h/i/j parameter pages. Additional parameters are enabled in the Channel A – Pump parameter window, as well as the Master/slave changeover and Status pump master/slave (1=Master, 0=Slave) group objects for the pumps on channels A and B.

Note
On the usage of the double pump mode, the valve output and the temperature inputs for channel B cannot be used.
The pump on channel B is parameterized via the Channel A – Pump parameter page and the settings are identical to those for the pump on channel A.
7.3 Manual operation parameter window

Only devices HCC/S 2.1.2.1 and HCC/S 2.2.2.1 have manual operation, and therefore the following setting options.

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

- **Disabled**: Manual operation is generally disabled.

![Manual operation parameter window](image)

**Fig. 16: Manual operation parameter window**
ABB i-bus® KNX

Parameters

**Automatically reset from manual operation to KNX operation**
This parameter is only visible if the *Enabled* option has been selected for the *Manual operation* parameter.

Options:
- **No**
- **Yes**

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

- **Yes**: The device is reset to KNX operation depending on the parameterized time.
- **No**: There is no automatic reset to KNX operation.

---

**Dependent parameter**

**Time for automatic reset to KNX operation**

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

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

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

**Run-on time after pump shutdown via manual operation**
This parameter is only visible if the *Enabled* option has been selected for the *Manual operation* parameter.

Options:
- No
- Yes

This parameter specifies whether, on switching off the pump via manual operation, the run-on time is to be maintained or whether the pump is to be switched off immediately.

- **No**: The run-on time is not taken into account. The pump is switched off immediately.
- **Yes**: The run-on time is taken into account. If the pump is switched off via the manual operation, it is waited until the run-on time has elapsed before the pump is switched off.

Dependent parameter

**Permit pump changeover via manual operation**
This parameter is only visible if the *Enabled* option has been selected for the *Manual operation* parameter, and in the *General* parameter window the *Yes* option has been selected for the *Channel bundling for double pumps* parameter.

Options:
- No
- Yes

This parameter specifies whether, on the usage of the double pump mode, switching between the active and inactive pump is to take place via manual operation.

- **No**: It is not possible to change between the pumps using the manual operation.
- **Yes**: It is possible to change the active and inactive pump using the manual operation. This action is undertaken by pressing the button for the currently inactive pump.

**Note**
The changeover time set in the parameters is taken into account on changing the pumps.

**Note**
The pump active after the change is the only state that remains active after the end of manual operation. There is no automatic change back to the pump active before the manual operation.
7.4 Channel A parameter window

7.4.1 Application parameters

![Application parameters parameter window]

**Device function**

Options:  
- **Controller**
- **Actuator device**

This parameter specifies how the device is to be used.

- **Controller**: The device uses the internal controller to determine the control value for the mixing valve. It receives a pre-defined supply flow temperature setpoint via a group object and calculates from this temperature, as well as the actual supply flow temperature, the control value for the 3-way mixing valve.

- **Actuator device**: The device is used purely as actuator; the internal controller is deactivated. The device receives a control value directly via a group object and uses this as the control value for the 3-way mixing valve. The *Temperature controller* parameter page and all subordinate pages are hidden.
Controller setting heating
This parameter is only visible if the Controller option has been selected for the Device function parameter.

Options:
- Deactivated
- Free configuration
- Reduced temperature accuracy / few valve movements
- Medium temperature accuracy / medium number of valve movements
- High temperature accuracy / many valve movements

This parameter specifies whether the device is to be used for a heating application and how the control behavior is to be configured for this application. Depending on the option selected, the Temperature controller – Heating parameter page is pre-parameterized and the control parameters are enabled.

- **Deactivated**: On the selection of this option, the device is not used to control a heating application. The Temperature controller – Heating parameter page is deactivated and hidden.
- **Free configuration**: The device is used to control a heating circuit. The control parameters in the Temperature controller – Heating parameter window can be set as required.

**Note**
The person commissioning is responsible for the correct parameterization of the control parameters!
• **Reduced temperature accuracy / few valve movements:** The device is used to control a heating circuit. The control permits a somewhat greater fluctuation in the setpoint temperature with the consequence that the number of valve movements is reduced. The control parameters in the `Temperature controller – Heating` parameter window are set correspondingly and cannot be changed.

• **Medium temperature accuracy / medium number of valve movements:** The device is used to control a heating circuit. The controller attempts to find an equilibrium between maintaining the temperature exactly and the number of valve movements. This type of control is in the middle between the two other pre-defined types of control. The control parameters in the `Temperature controller – Heating` parameter window are set correspondingly and cannot be changed.

• **High temperature accuracy / many valve movements:** The device is used to control a heating circuit. The control attempts to maintain the setpoint temperature as accurately as possible and reacts quickly to fluctuations. This strategy results in an increased number of valve movements. The control parameters in the `Temperature controller – Heating` parameter window are set correspondingly and cannot be changed.

**Note**

It is not possible to make a definitive statement as to the number of valve movements and the accuracy with which the setpoint temperature is maintained. This issue depends on a large number of different factors in the system, e.g.: fluctuation in the supply flow temperature, size of the heating circuit, distance and number of loads, energy transfer in the heating circuit, etc.

The controller settings suggested are therefore only to be considered recommendations that, under normal conditions, will result in stable control temperature with the smallest possible number of valve movements at the same time.
Controller setting cooling

This parameter is only visible if the Controller option has been selected for the Device function parameter.

Options:
- Deactivated
- Free configuration
- Reduced temperature accuracy / few valve movements
- Medium temperature accuracy / medium number of valve movements
- High temperature accuracy / many valve movements

This parameter specifies whether the device is to be used for a cooling application and how the control behavior is to be configured for this application. Depending on the option selected, the Temperature controller – Cooling parameter page is pre-parameterized and the control parameters are enabled.

- **Deactivated**: On the selection of this option, the device is not used to control a cooling application. The Temperature controller – Cooling parameter page is deactivated and hidden.

- **Free configuration**: The device is used to control a cooling circuit. The control parameters in the Temperature controller – Cooling parameter window can be set as required.

**Note**

The person commissioning is responsible for the correct parameterization of the control parameters!
• **Reduced temperature accuracy / few valve movements**: The device is used to control a cooling circuit. The control permits a somewhat greater fluctuation in the setpoint temperature with the consequence that the number of valve movements is reduced. The control parameters in the Temperature controller – Cooling parameter window are set correspondingly and cannot be changed.

• **Medium temperature accuracy / medium number of valve movements**: The device is used to control a cooling circuit. Here the controller attempts to find an equilibrium between maintaining the temperature exactly and the number of valve movements. This type of control is in the middle between the two other pre-defined types of control. The control parameters in the Temperature controller – Cooling parameter window are set correspondingly and cannot be changed.

• **High temperature accuracy / many valve movements**: The device is used to control a cooling circuit. The control attempts to maintain the setpoint temperature as accurately as possible and reacts quickly to fluctuations. This strategy results in an increased number of valve movements. The control parameters in the Temperature controller – Cooling parameter window are set correspondingly and cannot be changed.

### Note
It is not possible to make a definitive statement as to the number of valve movements and the accuracy with which the setpoint temperature is maintained. This issue depends on a large number of different factors in the system, e.g.: Fluctuation in the supply flow temperature, size of the cooling circuit, distance and number of loads, energy transfer in the cooling circuit, etc.

The types of control suggested are therefore only to be considered recommendations that, under normal conditions, will result in stable control/temperature with the smallest possible number of valve movements at the same time.

### Note
If the same device channel is used for a heating application and a cooling application, this heating/cooling circuit is controlled by the same controller. It is therefore not possible to control a heating circuit and a cooling circuit at the same time. To change between heating and cooling it is necessary to changeover the control via the related Heating/cooling changeover group object.
Actuate heating via
This parameter is only visible if the Deactivated option has not been selected for the Heating parameter.
Options:  
- **Device output valve**: The 3-way mixing valve is actuated directly by the device-internal valve output; the device sends the control value calculated by the controller directly to the valve output.
- **Group object**: The control value is only output via the Status heating control value group object. The device-internal valve output is not actuated.

Note
In the controller mode, the control value calculated is output via the Status heating control value group object also on the selection of the Device output valve option.

Actuate cooling via
This parameter is only visible if the Deactivated option has not been selected for the Cooling parameter.
Options:  
- **Device output valve**: The 3-way mixing valve is actuated directly by the device-internal valve output; the device sends the control value calculated by the controller directly to the valve output.
- **Group object**: The control value is only output via the Status cooling control value group object. The device-internal valve output is not actuated.

Note
In the controller mode, the control value calculated is output via the Status cooling control value group object also on the selection of the Device output valve option.
### 7.4.2 Channel function

#### Reaction on bus voltage failure pump

Options:  
- Switch on pump  
- Switch off pump  
- Unchanged

This parameter specifies the reaction of the pump on bus voltage failure.

- **Unchanged:** The pump remains active in the current state if bus voltage failure occurs.
- **Switch on pump:** The pump is switched on if bus voltage failure occurs.
- **Switch off pump:** The pump is switched off if bus voltage failure occurs.
Heating/cooling type of operation after bus voltage recovery

If the Controller option has been selected for the Device function parameter in the Application parameters parameter window, the parameter can only be changed if the Deactivated option has not been selected in the Controller setting heating and Controller setting cooling parameters.

Options:
- As before bus voltage failure
- Heating
- Cooling

This parameter specifies the mode in which the device is to be after bus voltage recovery.

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

**Note**
For correct function, the controller always requires a valid setpoint temperature and a valid supply flow temperature.

Reaction after bus voltage recovery pump

This parameter specifies the reaction of the pump after bus voltage recovery. The parameter is set to the Follows valve control value option and cannot be changed.
Valve control value after bus voltage recovery

Options:  
- As before bus voltage failure
- Selection

The function of this parameter varies depending on whether the device is operated in the actuator or controller mode.

In the controller mode, this parameter specifies which control value is to apply after bus voltage recovery until a valid actual supply flow temperature value is received or a measurement has been made via an input on the device.

In the actuator mode, this parameter specifies which control value is to apply after bus voltage recovery until the external controller has calculated a new control value and sent it to the device via KNX.

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

**Note**

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

**Note**

On the usage of the safety shutdown (*Temperature controller – Heating/Cooling parameter window*), this function is automatically active after bus voltage recovery or download until it receives a valid temperature value. The controller can only check whether the shutdown must remain active or not based on this value.

---

Dependent parameter

**Control value**

Options: 0...100 %

This parameter is used to specify the control value that is to apply after bus voltage recovery until a new setpoint is received.
Temperature setpoint after bus voltage recovery
This parameter is only visible if the Controller option has been selected for the Device function parameter in the Application parameters parameter window.

Options:  
- As before bus voltage failure  
- Selection

This parameter specifies which supply flow temperature setpoint is to apply after bus voltage recovery until the controller has received a new setpoint.

- As before bus voltage failure: The same setpoint as before the bus voltage failure applies.
- Select: A setpoint can be specified. This setpoint applies until a new setpoint is received via the bus. The dependent parameters Heating and Cooling are enabled.

Dependent parameter

Heating
This parameter is only visible if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window.

Options:  
20…50…100 °C

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

Dependent parameter

Cooling
This parameter is only visible if the Deactivated option has not been selected for the Cooling parameter in the Application parameters parameter window.

Options:  
1…10…30 °C

This parameter is used to specify the setpoint that is to apply after bus voltage recovery until a new setpoint is received.
Heating/cooling mode after ETS download/reset
This parameter is only visible if the Controller option has been selected for the Device function parameter in the Application parameters parameter window, and the Deactivated option has not been selected for the Heating and Cooling parameters.

Options: Heating, Cooling

This parameter specifies the mode in which the device is to be after ETS download or ETS reset.

- **Heating**: The device is in the Heating mode after ETS download or ETS reset.
- **Cooling**: The device is in the Cooling mode after ETS download or ETS reset.

**Note**
For correct function, the controller always requires a valid setpoint temperature and a valid supply flow temperature.

Reaction after ETS reset pump
This parameter specifies the reaction of the pump after ETS download is specified using this parameter. The parameter is set to the Follows valve control value option and cannot be changed.
**Valve control value after ETS download**

Options: **Unchanged**
- **Selection**

The function of this parameter varies depending on whether the device is operated in the actuator or controller mode.

In the controller mode, this parameter specifies which control value is to apply after ETS download until a valid actual temperature value is received or a measurement has been made via an input on the device.

In the actuator mode, this parameter specifies which control value is to apply after ETS download until the external controller has calculated a new control value and sent it to the device via KNX.

- **Unchanged:** The same valve control value as before the ETS download applies
- **Select:** A valve control value can be specified. The dependent parameter *Control value* is enabled.

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

**Note**
On the usage of the safety shutdown (*Temperature controller – Heating/Cooling* parameter window), this function is automatically active after bus voltage recovery or download until it receives a valid temperature value. The controller can only check whether the shutdown must remain active or not based on this value.

---

**Dependent parameter**

**Control value**

Options: 0…100 %

This parameter is used to specify the control value that is to apply after ETS download until the calculation of a new setpoint or a new setpoint is received.
Temperature setpoint after ETS download
This parameter is only visible if the Controller option has been selected for the Device function parameter in the Application parameters parameter window.

Options:
- As before bus voltage failure
- Selection

This parameter specifies which temperature setpoint is to apply after ETS download until the controller has received a new setpoint.
- As before bus voltage failure: The same setpoint as before the bus voltage failure applies.
- Select: A setpoint can be specified. This setpoint applies until a new setpoint is received via the bus. The dependent parameters Heating and Cooling are enabled.

Dependent parameter
Heating
This parameter is only visible if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window.

Options: 20…50…100 °C

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

Dependent parameter
Cooling
This parameter is only visible if the Deactivated option has not been selected for the Cooling parameter in the Application parameters parameter window.

Options: 1…10…30 °C

This parameter is used to specify the setpoint that is to apply after bus voltage recovery until a new setpoint is received.
7.4.3 Monitoring and safety

Fig. 19: Monitoring and safety parameter window

Use forced operation
Options: No
- Forced operation 1 bit; 1 active
- Forced operation 1 bit; 0 active
- Forced operation 2 bit

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

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

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

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

- **Forced operation 2 bit**: Forced operation is enabled. The dependent group object *Forced operation 2 bit* is activated. The dependent parameters *Control value for forced operation ON*, *Pump state for forced operation ON*, *Control value for forced operation OFF* and *Pump state for forced operation OFF* are enabled.
Note

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

<table>
<thead>
<tr>
<th>Value</th>
<th>Bit 1</th>
<th>Bit 0</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Inactive</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Inactive</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>Forced OFF</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1</td>
<td>Forced ON</td>
</tr>
</tbody>
</table>

Table 40: Forced operation states

For information on the priority of the forced operation in comparison to the other properties of the device, see chapter 12.3, Priorities.

Note

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

Note

Forced operation is deactivated on an ETS reset. Forced operation overrides the outputs and places them in a defined state. However, this action has no effect on the control values sent by the controller via the bus or the master/slave communication; this communication continues to take place. So that an actuator actuated by the controller in this device behaves the same, forced operation must be correspondingly parameterized also on this device and it must be linked to the same group address.

Note

If forced operation has been changed from 2 bit to 1 bit (or vice versa), forced operation is deactivated after a download.
Forced operation dependent parameters

The following parameters are available with forced operation activated. The name of the related parameter is dependent on which selection has been made in the Use forced operation parameter:

- If the Forced operation 1 bit; 1 active option is selected, the dependent parameters Control value and Pump state are enabled.
- If the Forced operation 1 bit; 0 active option is selected, the dependent parameters Control value and Pump state are enabled.
- If the Forced operation 2 bit option is selected, the dependent parameters Control value for forced operation ON, Pump state for forced operation ON, Control value for forced operation OFF and Pump state for forced operation OFF are enabled.

If the Forced operation 2 bit option is selected, these parameters are available twice, once for the ON state and once for the OFF state.

Dependent parameter

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

Options: 0…100 %

The name of the parameter is dependent on which selection has been made in the Use forced operation parameter.

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

Pump state / Pump state for forced operation ON / Pump state for forced operation OFF

Options:
- Start pump
- Switch off pump
- Dependent on the valve control value (corresponds to pump automatic mode)

The name of the parameter is dependent on which selection has been made in the Use forced operation parameter.

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

**Note**
The Start pump option is not available for the pump state Forced operation OFF
The Switch off pump option is not available for the pump state Forced operation ON

- **Start pump**: The pump is switched on if forced operation is activated and remains on for the duration of the forced operation.
- **Switch off pump**: The pump is switched off if forced operation is activated and remains off for the duration of the forced operation.
- **Dependent on the valve control value (corresponds to pump automatic mode)**: The pump is switched on or off depending on the valve control value set, as a function of the parameterization in the Pump parameter window.

**Note**
The currently valid control values apply after the forced operation is disabled. The pump changes to the pump automatic mode on the deactivation of forced operation. During forced operation the device continues to receive group objects via the bus, however it does not react to them until forced operation is ended. The device therefore continues to work normally after forced operation is disabled.
Cyclical monitoring
Options:  Deactivated
          Activated

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

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

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

**Note**
For all cyclically monitored group objects it is important to set the behavior of the sending device correctly. The group objects must be sent cyclically and the cycle time must be less (= more frequent) than the receive time monitored. Recommendation: monitoring time = 2 \times \text{sending cycle time}.
Do not select times that are too low because this configuration can cause a high bus load and the probability of an error increases.
Dependent parameter

Monitor supply flow temperature

This parameter is only visible if the Controller option has been selected for the Device function parameter.

Options:

- Deactivated
- As input for supply flow temperature
- Via group object

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

- Deactivated: The monitoring of the supply flow temperature is deactivated.
- As input for supply flow temperature: The temperature sensor connected to the input is monitored. If the input does not deliver a valid temperature value for more than a minute, the fault value parameterized is used. The Control value on input fault dependent parameter and the Supply flow temperature malfunction group object are enabled.

Note

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

Monitoring of a physical input is not allowed if temperature acquisition via group object has been selected on the input side. This will result in the monitoring time being exceeded, because the device inputs are monitored using very short times.

- Via group object: The Supply flow temperature via KNX group object is monitored. As soon as a new value is received on the group object, the monitoring time starts again. The Time interval for cyclical monitoring and Control value after exceeding monitoring time dependent parameters as well as the Supply flow temperature malfunction group object are enabled.
Dependent parameter

**Time interval for cyclical monitoring**
This parameter is only visible if the *Via group object* option has been selected for the *Monitor supply flow temperature* parameter.

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

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

Dependent parameter

**Control value after exceeding monitoring time / Control value on input fault**
This parameter is only visible if the *Monitor supply flow temperature* parameter has not been deactivated.

The name of the parameter is dependent on which selection has been made in the *Monitor supply flow temperature* parameter.

Options: 0…25…100 %

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

The monitoring of the temperature value is important because the controller cannot calculate any control values for the outputs without a valid room temperature value. Using this parameter, it is possible to specify a certain control value to ensure a minimum flow to protect the system.

The control value set here remains active until the fault on the input has been rectified or a new temperature value has been received via the bus; unless there is an override with a higher priority.

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

**Monitor receipt of setpoint temperature group object**
This parameter is only visible if the Controller option has been selected for the Device function parameter, the device is therefore operated as a controller.

Options: Deactivated, Activated

With the monitoring of the Heating setpoint temperature and Cooling setpoint temperature group objects, the device can monitor the regular receipt of the setpoint temperature. If the setpoint is not received, a pre-defined setpoint temperature can be set that is then used in the currently active type of operation (heating or cooling). With this monitoring it is possible to use a pre-defined control value on the failure of the device that sets the setpoint, until a new value is received.

- **Deactivated:** The cyclic monitoring of the Heating setpoint temperature and Cooling setpoint temperature group objects is deactivated.
- **Activated:** The cyclic monitoring is activated, the following dependent parameters are also enabled.

![Note](image)

If the device has been parameterized only for heating or only for cooling, only the related Heating setpoint temperature or Cooling setpoint temperature group object is monitored.

Dependent parameter

**Time interval for cyclical monitoring**

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

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

**Heating setpoint temperature when monitoring time exceeded**
This parameter is only visible if the device has been parameterized for *heating*.

Options: $20 \cdots 50 \cdots 100 \, ^{\circ}C$

The value set here is valid if a setpoint has not been received by the device within the monitoring time parameterized and remains active until a setpoint is received.

Dependent parameter

**Cooling setpoint temperature when monitoring time exceeded**
This parameter is only visible if the device has been parameterized for *cooling*.

Options: $1 \cdots 10 \cdots 30 \, ^{\circ}C$

The value set here is valid if a setpoint has not been received by the device within the monitoring time parameterized and remains active until a setpoint is received.
Dependent parameter

Monitor receipt of group objects “Heating control value / Cooling control value”

This parameter is only visible if the Actuator device option has been selected for the Device function parameter, the device is therefore operated by a controller.

Options:  
- Deactivated
- Activated

With the monitoring of the Heating control value / Cooling control value group objects, the device can monitor the regular reception of the control value. If the control value is not received, a pre-defined control value can be set that is then used. With this monitoring it is possible to use a pre-defined control value on the failure of the device that sets the control value, until a new value is received.

- **Deactivated**: The cyclic monitoring of the Heating control value / Cooling control value group objects is deactivated.
- **Activated**: The cyclic monitoring is activated, the following dependent parameters are also enabled.

---

Dependent parameter

Time interval for cyclical monitoring

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

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

Control value after exceeding monitoring time
Options: 0…50…100 %

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

Dependent parameter

Monitor receipt of group object “Pump error input”
This parameter is only visible if the Via group object option has been selected for the Monitor pump error parameter in the Pump parameter window.
Options: Deactivated
       Activated

The monitoring of the Pump error input group object is activated using this parameter. The regular reception of the pump fault status can be monitored using this parameter.

- Deactivated: The monitoring of the Pump error input group object is deactivated.
- Activated: The monitoring of the group object is active. The dependent parameter Time interval for cyclical monitoring and the Error: pump error receipt group object are enabled.

Note
If the device is operated in the double pump mode, the monitoring must be activated separately for pump A and pump B.
Dependent parameter

**Time interval for cyclical monitoring**

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

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the *Error: pump error receipt* alarm object is changed to *Alarm* and the controller reacts as if the value 1 had been received in the *Pump error input* group object. This means the device switches off the pump or allows the pump to be switched off because it assumes the pump is faulty.

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

---

Dependent parameter

**Pump repair switch input**

This parameter is only visible if the *Via group object* option has been selected for the *Monitor pump repair switch* parameter in the *Pump* parameter window.

Options: Deactivated

Activated

The monitoring of the *Pump repair switch* group object is activated using this parameter. The regular reception of the pump repair switch can be monitored using this parameter.

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

⚠️ **Note**

If the device is operated in the double pump mode, the monitoring must be activated separately for pump A and pump B.
Dependent parameter

**Time interval for cyclical monitoring**

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

The monitoring time within which the group object must be received is specified using this parameter. Otherwise the Error: repair switch receipt alarm object is changed to Alarm and the controller reacts as if the value 1 had been received in the Pump repair switch input group object. This means the device switches off the switching contact for the pump or allows the contact to be switched off because it assumes the pump has been deactivated by the actuation of the repair switch.

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

Dependent parameter

**Monitor receipt of heating/cooling changeover group object**

In the controller mode, this parameter is only visible if the Deactivated option has not been selected for the Controller setting heating and Controller setting cooling parameters in the Application parameters parameter window.

This parameter is always visible in actuator mode.

Options: Deactivated

Activated

The monitoring of the Heating/cooling changeover group object is activated using this parameter. The change in the type of operation between heating and cooling can be monitored using this parameter.

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

**Time interval for cyclical monitoring**
Options: 00:00:30… 00:05:00… 18:12:15 hh:mm:ss

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

Dependent parameter

**Heating/cooling mode after exceeding monitoring time**
Options: Unchanged, Heating, Cooling

This parameter specifies which type of operation is to apply on the erroneous reception of the *Heating/cooling changeover* group object. This type of operation remains active until a new value is received in the group object monitored. If the *Unchanged* option is selected, the current type of operation remains active.
7.4.4 Pump

The settings for the behavior of the pump output and the monitoring of the status of the pump are made on this page.

![Pump parameter window](image)

**Pump switches on when valve control value is exceeded**

Options: 0...5...99 %

This parameter specifies the valve control value from which the pump is to be switched on. Frequent switching on of the pump at lower valve control values can be prevented using this parameter.

If the valve control value is greater than the value selected here, the pump is switched on; the relay output is closed.

**Note**

If 0 % is selected as the switch-on threshold, the pump is always switched on immediately if the valve receives a control value greater than 0 %.

**Note**

If a larger value is selected as the switch-on threshold, the pump may only switch on very late and the valve may already be wide open when this occurs. This situation can cause large temperature fluctuations in the heating/cooling circuit.
**Pump switches off when valve control value below (0 % = shutdown deactivated)**

Options: 0…2…100 %

This parameter specifies the valve control value from which the pump is to be switched off. This parameter can be used to switch off the pump at small valve control values before the valve is completely closed.

If the valve control value is smaller than the value selected here, the pump is switched off; the relay output is opened.

**CAUTION**

The selection of an excessively high switch-off threshold will cause the pump to shut down very early and may degrade the function of the pump. It must also be ensured that the shutdown threshold for the pump is lower than the switch-on threshold because otherwise there may be incorrect behavior on switching on and off the pump.

**Run-on time**

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

This parameter specifies the run-on time for the pump after the reception of a shutdown command, or shutdown based on the valve control value.

The pump remains switched on for the time set after the shutdown command.

**Note**

This parameter also applies if the pump is shut down via manual operation (only HCC/S 2.x.2.1).
Close valve when pump is shutdown
Options: No, Yes

This parameter specifies whether the valve is also to be closed on switching off the pump.

This feature is used, among reasons, so that water with a very different temperature is not pumped into the heating/cooling circuit on switching back on the pump because this situation can cause a large temperature increase/drop.

Note
If a valve is actuated via group object, the external valve is not closed. The control value calculated by the controller is still output.

Activate manual pump overdrive via group object
Options: No, Yes

The manual override of the pump via group object is enabled using this parameter.

- No: The manual override of the pump via group object is deactivated
- Yes: The manual override of the pump via group object is activated. The Override pump, Pump overdrive via KNX (deactivate/activate) and Status pump automatic group objects as well as the Return from manual pump control to automatic mode dependent parameter are enabled.

Using the group objects it is possible to activate the pump override and then to override the pump using the Override pump group object.

The manual pump override can be used to place the pump in a defined state for maintenance purposes or if there is a fault.

Note
It is only possible to override the active pump in the double channel mode. The override is always undertaken via the objects for pump A. The device then switches the active pump depending on the values received.
Dependent parameter

**Return from manual pump control to automatic mode**

Options:
- Via group object
- Via group object or automatic (time)

This parameter specifies how the pump override is to be cleared and the control specified by the device is to become active again.

- **Via group object:** On the selection of this option, the *Pump overdrive via KNX (deactivate/activate)* group object is enabled. It is possible to enable or disable the pump override using this object. If override is enabled, the pump reacts to the command in the *Override pump* group object. If override is disabled, the pump reacts again to the state specified by the device.

- **Via group object or automatic (time):** On the selection of this option, the *Pump overdrive via KNX (deactivate/activate)* group object is enabled. It is possible to activate or deactivate the pump override using this object. If override is activated, the pump reacts to the command in the *Override pump* group object. If override is disabled, the pump reacts again to the state specified by the device. In addition, the dependent parameter *Reset time* is enabled. If overridden, the pump is returned to control by the device after the time parameterized here.

Dependent parameter

**Reset time**

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

The time set here specifies when the pump is to change from overridden operation back to normal operation defined by the device.
Monitor pump status

Options:
- Deactivated
- Via physical device input

This parameter specifies whether the pump status is monitored. The status acquired is output on the bus as status information. There is no evaluation of the status in the device.

**Note**
This function can only be used for pumps with a floating contact that is closed with the pump running and open with the pump shutdown (or vice versa).

- **Deactivated**: The monitoring of the pump status is deactivated
- **Via physical device input**: The pump status is acquired via one of the inputs on the device (input c for channel A; input h for channel B). The *Pump operating state group* object is enabled. The input (c for channel A; h for channel B) is parameterized as the pump status input. The other settings on the opening/closing behavior as well as how the status is sent are made in the *c: Binary input (h: Binary input)* for channel B) parameter window.

**Note**
It is to be ensured that the corresponding pump status switch is actually connected to the input; if this is not the case, there will be an erroneous status message.
Monitor pump error
Options:  
- **Deactivated**
- Via physical device input
- Via group object

This parameter specifies whether and, if so, how a pump fault switch is monitored. The status acquired is used to check whether the pump is signaling a fault or it is running fault-free.

If the function is used and the device receives an error message via the input, the pump is switched off immediately.

Note
This function can only be used for pumps with a floating contact that reflects the fault status (e.g. no fault: contact closed; fault: contact opened).

- **Deactivated**: The monitoring of the pump fault is deactivated
- **Via physical device input**: The pump fault is acquired via one of the inputs on the device (input d for channel A; input i for channel B). The Pump fault alarm group object is enabled. The input (d for channel A; i for channel B) is parameterized as the pump error input. The other settings on the opening/closing behavior as well as how the status is sent are made in the d: Binary input (i: Binary input for channel B) parameter window.
  
  Note
  It is to be ensured that the corresponding pump status switch is actually connected to the input; if this is not the case, there will be an erroneous status message.

- **Via group object**: The pump fault switch is acquired via another device and sent via KNX. The Pump error input group object is enabled.
Monitor pump repair switch
Options:
- Deactivated
- Via physical device input
- Via group object

This parameter specifies whether and, if so, how a pump repair switch is monitored. The status acquired is used to check whether the pump can be switched on.

If the function is used and the device receives via the input the signal that the repair switch is open (the pump is therefore disconnected from the electrical supply or shutdown), the pump relay is opened.

Note
This function can only be used for pumps with a floating contact that reflects the status (e.g. repair switch closed: contact closed; repair switch open: contact opened).

- **Deactivated**: The monitoring of the repair switch is deactivated

- **Via physical device input**: The repair switch is acquired via one of the inputs on the device (input e for channel A; input j for channel B). The *Pump repair switch* group object is enabled. The input (e for channel A; j for channel B) is parameterized as the pump repair status input. The other settings on the opening/closing behavior as well as how the status is sent are made in the *e: Binary input (j: Binary input for channel B)* parameter window.

Note
It is to be ensured that the corresponding status output from the repair switch is actually connected to the input; if this is not the case, there will be an erroneous status message.

- **Via group object**: The pump repair switch is acquired via another device and sent via KNX. The *Pump repair switch input* group object is enabled.
Send status values

Options:
- After a change
- Cyclically
- On change and cyclically
- On request
- After a change or request
- On request and cyclically
- After a change or request and cyclically

This parameter specifies when the pump status values are to be sent. This parameter affects the following pump output group objects:

- Status pump relay
- Status pump master/slave (1=Master; 0=Slave)
- Status pump automatic

- After a change: The values are sent after a change in the object values (e.g. change from 0 to 1).
- Cyclically: If this option is selected, the status values are sent automatically after an adjustable time has elapsed. The Every dependent parameter is enabled.
- On change and cyclically: The values are sent after a change and cyclically. The Every dependent parameter is enabled.
- On request: All status values are sent on the receipt of a command via the Request status values group object.
- After a change or request: The values are sent on request and after a change.
- On request and cyclically: The values are sent on request and cyclically. The Every dependent parameter is enabled.
- After a change or request and cyclically: The values are sent on request and after a change and cyclically. The Every dependent parameter is enabled.

Dependent parameter

Every

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

This parameter specifies the interval at which the values are sent cyclically.
Operating mode pump channel A / Operating mode pump channel B

This parameter is only visible if the Yes option has been selected for the Channel bundling for double pumps parameter in the General parameter window.

The parameterization for Operating mode pump channel A automatically specifies the indication for Operating mode pump channel B.

Options:
- Main pump
- Backup pump
- Change weekly

This parameter specifies the operating mode in which the pump on channel A is to operate in the double pump mode.

- **Main pump**: The pump on channel A is the main pump. On switching on the pump, this pump remains active until a manual change is initiated or the pump must be changed due to a fault (e.g. via the monitoring for pump fault). In these cases, operation changes to the pump on channel B.
  - Operating mode pump channel B contains the setting **Backup pump**.

- **Backup pump**: The pump on channel A is the backup pump. If a fault occurs on the main pump (pump channel B) or a manual change is initiated, operation changes to this pump.
  - Operating mode pump channel B contains the setting **Main pump**.

- **Change weekly**: The pumps are operated alternately to reduce the wear. The change is made weekly at a specified time. In addition, the dependent parameters **Changeover point weekday** and **Changeover point time** are enabled. These parameters are used to specify when the change between the two pumps is to take place. In addition, the **Time** group object is enabled. The device synchronizes the time for the changeover via this group object.
  - Operating mode pump channel B contains the setting **Change weekly**.
  - Pump A starts operation after a download.
Dependent parameter

**Changeover point weekday**
This parameter is only visible if the *Change weekly* option has been selected for the *Operating mode pump channel A* parameter.

Options:
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

This parameter specifies the day of the week on which the changeover between the active and inactive pump is to be made.

---

Dependent parameter

**Changeover point time**
This parameter is only visible if the *Change weekly* option has been selected for the *Operating mode pump channel A* parameter.

Options: 1...24 h

This parameter specifies the time at which the changeover between the active and inactive pump is to be made. The change is always made on the hour.

---

**Note**

It is recommended to select the time for the changeover such that pump inactivity or low pump activity is likely, e.g. 1 o'clock in the morning.
Dependent parameter

**Changeover time**

This parameter is only visible if the Yes option has been selected for the *Channel bundling for double pumps* parameter in the *General* parameter window.

Options: - 60 … 0 … 60 s

This parameter specifies the duration of the changeover between the active and inactive pump. The time specified defines the overlap between the two pumps.

- If the option is configured with 0 s, the active pump is shut down and the inactive pump switched on at the same time.
- If a negative time is configured, the inactive pump is switched on already before the active pump is shut down. Both pumps remain active in parallel for the time set.
- If a positive time is configured, the active pump is shut down before the inactive pump is switched on. Only after the time set has elapsed is the previously inactive pump switched on.

**Note**

If the change is made because of a pump failure, a negative changeover time will cause the backup pump to be switched on immediately. With a positive changeover time, the backup pump is only switched on after this time has elapsed.
7.4.5  

a: Supply flow temperature

![Parameter Window]

Fig. 21: a: Supply flow temperature parameter window

Use temperature input

Options:  
- Activated
- External temperature input via KNX

This parameter determines how the supply flow temperature is acquired for the control.

- **Activated**: The supply flow temperature is measured via the physical input on the device (input a). The dependent parameters for specifying the temperature sensor and its detailed settings are enabled. The Input a – Supply flow temperature and Input a – Sensor error group objects are enabled.

- **External temperature input via KNX**: The supply flow temperature is received via KNX. The dependent group object Supply flow temperature via KNX is enabled.

On the selection of the Activated option, the input is used for the temperature measurement for the supply flow temperature.
If the Yes option has been selected for the Enable safety shutdown parameter and the Via physical device input option selected for the Temperature input for temperature limit sensor parameter in the Temperature controller – Heating or Temperature controller - Cooling parameter window, the value measured here from the temperature sensor is also used to determine the temperature for the safety shutdown.

The temperature value is output via the 2-byte group object Input x – Supply flow temperature. It is also possible to establish whether there is a fault on the input, e.g. a short circuit or cable break. A fault is reported if the resistance falls below 50 ohms or exceeds 100 kohms.

Faults are reported via the 1-bit group object Input a – Sensor error. If a fault occurs, this object changes state from 0 to 1. These two group objects are sent depending on the reaction parameterized in Send status values.

Note
Inputs are scanned after a bus voltage recovery, download or ETS reset. Their current status is sent on the bus when the sending and switching delay is complete.
Dependent parameter

**Temperature sensor type**

Options:  
- PT1000 [-30...+110 °C]  
- PT100 [-30...+110 °C]  
- NTC  
- KTY [-15...+110]  
- NI1000-01 [-30...+110 °C]  
- NI1000-02 [-30...+110 °C]

This parameter specifies which type of temperature sensor is connected. Please refer to the sensor's datasheet for technical information. The measurable range for each type of sensor appears in square brackets after the type.

- **NTC**: Selecting this type of sensor opens the dependent parameter window NTC type so that you can select an NTC subtype.
- **KTY**: Selecting this type of sensor opens the dependent parameter window KTY type so that you can select a KTY subtype.

---

Dependent parameter

**NTC type**

Options:  
- NTC10-01 [-15...+100°C]  
- NTC10-02 [-15...+100°C]  
- NTC10-03 [-15...+100°C]  
- NTC20 [0...+100°C]

This parameter allows you to choose the NTC sensor type that is connected. An NTC10 sensor has a resistance of 10 kohms at 25 °C. An NTC 20 has a resistance of 20 kohms. Individual types vary in terms of their resistance curves.
Dependent parameter

**KTY type**

**Options:**
- KT 100 / 110 / 130
- KT 210 / 230
- KT 10-6 / 10-62 / 11-6 / 13-6 / 16-6 / 19-6
- KT 10-7 / 11-7 / 13-7
- KT 21-5 / 23-5
- KT 21-6 / 23-6
- KT 21-7 / 23-7
- KT 81-110 / 81-120 / 81-150
- KT 82-110 / 82-120 / 82-150
- KT 81-121 / 82-121
- KT 81-122 / 82-122
- KT 81-151 / 82-151
- KT 81-152 / 82-152
- KT 81-210 / 81-220 / 81-250
- KT 82-210 / 82-220 / 82-250
- KT 81-221 / 82-221
- KT 81-222 / 82-222
- KT 81-251 / 82-251
- KT 81-252 / 82-252
- KT 83-110 / 83-120 / 83-150
- KT 83-121
- KT 83-122
- KT 83-151
- User-defined

This parameter specifies a pre-defined KTY sensor.

- **User-defined:** The dependent parameter **Resistance at -20...+120 °C** is enabled.

**Note**

If a KTY sensor is used that is not in the list, you can use the *User-defined* option to enter its characteristic. To ensure that the analog input works properly with respect to user-defined entries, the resistance values, like those in the preset values, must be in ascending order. An incorrect entry can result in unrealistic output values.
Dependent parameter

**Resistance in ohms at -20…+120 °C**
Options: 650…4,600

A resistance characteristic can be entered via these 8 parameters. Please refer to the sensor manufacturer's technical documentation for this data.

Dependent parameter

**Temperature offset**
Options: –10.0…00.0…+10.0 °C

A maximum offset of ±10 °C is added to the recorded temperature using this parameter.

Dependent parameter

**Cable error compensation**
Options: None, Via cable length, Via cable resistance

- **Via cable length**: Cable error is compensated by entering the cable length.

  **Note**
  Cable error compensation may only be used for copper cables.

- **Via cable resistance**: Cable error is compensated by entering the cable resistance value.
Dependent parameter

**Cable length, single distance**
Options: 01.0...10.0...100.0 m

This parameter specifies the one-way cable length of the temperature sensor connected.

Note
The maximum cable length permitted between the sensor and device input is 100 m.

Dependent parameter

**Cross-section of conductor, Value * 0.01 mm²**
Options: 1...100...150 mm²

This parameter specifies the conductor cross-section of the temperature sensor connected.

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

Dependent parameter

**Cable resistance [total of fwd and rtn conductor]**
Options: 0...500...10,000

This parameter specifies the magnitude of the cable resistance of the temperature sensor connected.

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

Filter
Options:
- **Inactive**: Filter is not active
- **Low**: floating mean value over 30 seconds
- **Medium**: floating mean value over 60 seconds
- **High**: floating mean value over 120 seconds

This parameter sets a filter (floating mean value filter). This can be used to set the output value as a mean value using three different options.

- **Inactive**: Filter is not active
- **Low**: floating mean value over 30 seconds
- **Medium**: floating mean value over 60 seconds
- **High**: floating mean value over 120 seconds

**Note**

Using the filter "smoothes" the output via the mean value so that it is available for further processing. The filter therefore has immediate effects on thresholds and calculation values. The higher the degree of filtering, the smoother the result. This means that changes to the output value become slower. Example: On an erratic change in the sensor signal on the *Medium* setting, it will take 30 seconds for the output value to propagate.
Dependent parameter

**Send temperature value**

Options: 
- **After a change**: Sends the output value after a change.
- **Cyclically**: Sends the output value cyclically.
- **On change and cyclically**: Sends the output value after a change, and cyclically.
- **On request**: Sends the output value on request.
- **After a change or request**: Sends the output value after a change and after a request
- **On request and cyclically**: Sends the output value on request, and cyclically
- **After a change or request and cyclically**: Sends the output value after a change, on request, and cyclically.

This parameter specifies how the output value is to be sent.

- **After a change**: Sends the output value after a change.
- **Cyclically**: Sends the output value cyclically.
- **On change and cyclically**: Sends the output value after a change, and cyclically.
- **On request**: Sends the output value on request.
- **After a change or request**: Sends the output value after a change and after a request
- **On request and cyclically**: Sends the output value on request, and cyclically
- **After a change or request and cyclically**: Sends the output value after a change, on request, and cyclically.

The value is sent on request if the **General – Request Status values** group object receives a value.
Dependent parameter

**Value is sent from a change of**
This parameter is enabled if an option containing *After a change* has been selected for the *Send temperature value* parameter.

Options: 00.2…01.0…10.0

This parameter specifies the temperature change from which the output value is to be sent.

Dependent parameter

**Every**
This parameter is enabled if an option containing *Cyclically* has been selected for the *Send temperature value* parameter.

Options: 00:00:30…18:12:15 hh:mm:ss

This parameter specifies the interval at which the values are sent cyclically.
7.4.6 b: Return flow temperature

**Use temperature input**

Options:  
- Activated
- Deactivated

The input for the measurement of the return flow temperature is enabled using this parameter. Because the measurement of the return flow temperature is not required for the control, but is only used as information or to check for correct function, this input can also be deactivated.

- **Activated:** The return flow temperature is measured via the physical input on the device (input b). The dependent parameters for specifying the temperature sensor and its detailed settings are enabled. The **Input b – Return flow temperature** and **Input b – Sensor error** group objects are enabled.

The temperature value is output via the 2-byte group object **Input x – Return flow temperature**. It is also possible to establish whether there is a fault on the input, e.g. a short circuit or cable break. A fault is reported if the resistance falls below 50 ohms or exceeds 100 kohms.

Faults are reported via the 1-bit group object **Input a – Sensor error**. If a fault occurs, this object changes state from 0 to 1. These two group objects are sent depending on the reaction parameterized in **Send status values** parameter.

**Note**

Inputs are scanned after a bus voltage recovery, download or ETS reset. Their current status is sent on the bus when the sending and switching delay is complete.
Dependent parameter

**Temperature sensor type**

Options:

- PT1000 [-30…+110 °C]
- PT100 [-30…+110 °C]
- NTC
- KTY [-15…+110]
- NI1000-01 [-30…+110 °C]
- NI1000-02 [-30…+110 °C]

In this parameter it is specified which type of temperature sensor is connected. Please refer to the sensor's datasheet for technical information. The measurable range for each type of sensor appears in square brackets after the type.

- **NTC**: Selecting this type of sensor opens the dependent parameter window NTC type so that you can select an NTC subtype.
- **KTY**: Selecting this type of sensor opens the dependent parameter window KTY type so that you can select a KTY subtype.

Dependent parameter

**NTC type**

Options:

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

The NTC sensor type is selected using this parameter. An NTC10 sensor has a resistance of 10 kohms at 25 °C. An NTC 20 has a resistance of 20 kohms. Individual types vary in terms of their resistance curves.
Dependent parameter

**KTY type**

Options:  
- KT 100 / 110 / 130
- KT 210 / 230
- KT 10-6 / 10-62 / 11-6 / 13-6 / 16-6 / 19-6
- KT 10-7 / 11-7 / 13-7
- KT 21-5 / 23-5
- KT 21-6 / 23-6
- KT 21-7 / 23-7
- KT 81-110 / 81-120 / 81-150
- KT 82-110 / 82-120 / 82-150
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- KT 81-251 / 82-251
- KT 81-252 / 82-252
- KT 83-110 / 83-120 / 83-150
- KT 83-121
- KT 83-122
- KT 83-151
- User-defined

A pre-defined KTY sensor is selected using this parameter.

- **User-defined**: This dependent parameter *Resistance at -20...+120 °C* is enabled.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a KTY sensor is used that is not in the list, you can use the <em>User-defined</em> option to enter its characteristic. To ensure that the analog input works properly with respect to user-defined entries, the resistance values as visible for the preset values must be in ascending order. An incorrect entry can result in unrealistic output values.</td>
</tr>
</tbody>
</table>
Dependent parameter

**Resistance in ohms at -20...+120 °C**
Options: 650...4,600

A resistance characteristic can be entered via these 8 parameters. Please refer to the sensor manufacturer's technical documentation for this data.

Dependent parameter

**Temperature offset**
Options: -10.0...+10.0 °C

A maximum offset of ±10 °C is added to the recorded temperature using this parameter.

Dependent parameter

**Cable error compensation**
Options: None
Via cable length
Via cable resistance

- **Via cable length**: Cable error is compensated by entering the cable length.

  **Note**
  Cable error compensation may only be used for copper cables.

- **Via cable resistance**: Cable error is compensated by entering the cable resistance value.
Dependent parameter

**Cable length, single distance**
Options: 01.0... 10.0... 100.0 m

This parameter specifies the one-way cable length of the temperature sensor connected.

⚠️ **Note**
The maximum cable length permitted between the sensor and device input is 100 m.

---

Dependent parameter

**Cross-section of conductor, Value * 0.01 mm²**
Options: 1...100...150 mm²

This parameter specifies the conductor cross-section of the temperature sensor connected.

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

---

Dependent parameter

**Cable resistance [total of fwd and rtn conductor]**
Options: 0...500...10,000

This parameter specifies the magnitude of the cable resistance of the temperature sensor connected.

⚠️ **Note**
To measure the cable resistance correctly, the conductors must be shorted together at the end of the cable and should not be connected to the analog input.
Dependent parameter

Filter

Options:

- **Inactive**: Filter is not active
- **Low**: floating mean value over 30 seconds
- **Medium**: floating mean value over 60 seconds
- **High**: floating mean value over 120 seconds

This parameter sets a filter (floating mean value filter). This can be used to set the output value as a mean value using three different options.

- **Inactive**: Filter is not active
- **Low**: floating mean value over 30 seconds
- **Medium**: floating mean value over 60 seconds
- **High**: floating mean value over 120 seconds

**Note**

Using the filter "smoothes" the output via the mean value so that it is available for further processing. The filter therefore has immediate effects on thresholds and calculation values. The higher the degree of filtering, the smoother the result. This means that changes to the output value become slower.

Example: On an erratic change in the sensor signal with the **Medium** setting, it will take 30 seconds for the output value to propagate.
Dependent parameter

**Send temperature value**

Options:  *After a change*
  - Cyclically
  - On change and cyclically
  - On request
  - After a change or on request
  - On request and cyclically
  - After a change or request and cyclically

This parameter specifies how the output value is to be sent.

- **After a change**: Sends the output value after a change.
- **Cyclically**: Sends the output value cyclically.
- **On change and cyclically**: Sends the output value after a change, and cyclically.
- **On request**: Sends the output value on request.
- **After a change or request**: Sends the output value after a change and after a request
- **On request and cyclically**: Sends the output value on request, and cyclically
- **After a change or request and cyclically**: Sends the output value after a change, on request, and cyclically.

The value is sent on request if the *General – Request Status values* group object receives a value.
Dependent parameter

**Value is sent from a change of**

This parameter is enabled if an option containing *After a change* has been selected for the *Send temperature value* parameter.

Options: 00.2…01.0…10.0

This parameter specifies the temperature change from which the output value is to be sent.

---

Dependent parameter

**Every**

This parameter is enabled if an option containing *Cyclically* has been selected for the *Send temperature value* parameter.

Options: 00:00:30…18:12:15 hh:mm:ss

This parameter specifies the interval at which the values are sent cyclically.
7.4.7 c: Binary input

Use input
Options:  
- Deactivated
- As pump status input
- As binary signal input

This parameter specifies the type of usage of the input.

**Note**
The *As pump status input* option is dependent on the settings on the *Pump* parameter page and is not available as an option that can be selected freely.

If the *Via physical device input* option is selected for the *Monitor pump status* parameter on the *Pump* parameter page, this parameter has the fixed setting *As pump status input*. This setting can also only be changed on the *Pump* parameter page. In this case the status of the input is included in the control of the pump.
**Deactivated**: The input is deactivated and is not used.

**As pump status input**: The input is used to acquire the operational state (On/Off) of the pump. This correct function of the pump can be monitored using this information. The *Actively detected if* and *Send status value* dependent parameters as well as the *Pump operating state* group object are enabled.

**As binary signal input**: The input is used as an arbitrary binary signal input, any binary sensor can be connected. The dependent parameters for setting the input (see chapter 7.6.6, x: Binary signal input), as well as the group object Switch are enabled.

---

Dependent parameter

**Actively detected if**

Options: Contact open  
Contact closed

This parameter specifies when the sensor connected to the physical input is to be evaluated as having the state *Pump active*:

- **Contact open**: The pump is active if the contact is open, inactive if the contact is closed.
- **Contact closed**: The pump is active if the contact is closed, inactive if the contact is open.
Dependent parameter

**Send status value**
Options:  
- **After a change**: The state of the input is sent after every change.
- **On change and cyclically**: the state of the input is sent after every change and cyclically after a specific interval; the dependent parameter *Send input status cyclically* is enabled.

---

Dependent parameter

**Send input status cyclically**
Options:  
- 00:00:30,...00:05:00,...18:12:15 hh:mm:ss

This parameter specifies the interval at which the values are sent cyclically.
7.4.8  d: Binary input

![Parameter window for d: Binary input](image)

**Use input**

Options:
- Deactivated
- As pump error input
- As binary signal input

This parameter specifies the type of usage of the input.

**Note**

The As pump error input option is dependent on the settings on the Pump parameter page and is not available as an option that can be selected freely.

If the Via physical device input option is selected for the Monitor pump status parameter on the Pump parameter page, this parameter has the fixed setting As pump error input. This setting can also only be changed on the Pump parameter page. In this case the status of the input is included in the control of the pump.
• **Deactivated**: The input is deactivated and is not used

• **As pump error input**: The input is used to acquire a floating contact on the pump via which the pump can output an internal fault. This correct function of the pump can be monitored using this information. The *Actively detected if* and *Send status value* dependent parameters as well as the *Pump fault alarm* group object are enabled.

• **As binary signal input**: The input is used as an arbitrary binary signal input, any binary sensor can be connected. The dependent parameters for setting the input (see chapter 7.6.6, *x: Binary signal input*), as well as the group object *Switch* are enabled.

---

**Dependent parameter**

**Actively detected if**

Options: Contact open  
Contact closed

This parameter specifies when the sensor connected to the physical input is to be evaluated as having the state *Pump active*:

• **Contact open**: There is a pump fault if the contact is open, no fault if the contact is closed.

• **Contact closed**: There is a pump fault if the contact is closed, no fault if the contact is open.
—

Dependent parameter

**Send status value**

Options: 
- After a change
- On change and cyclically

This parameter defines when the state of the input is to be sent.

- **After a change**: The state of the input is sent after every change.
- **On change and cyclically**: the state of the input is sent after every change and cyclically after a specific interval; the dependent parameter *Send input status cyclically* is enabled.

—

Dependent parameter

**Send input status cyclically**

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

This parameter specifies the interval at which the values are sent cyclically.
### 7.4.9 e: Binary input

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<tr>
<td></td>
<td>d: Binary input</td>
</tr>
<tr>
<td></td>
<td>e: Binary input</td>
</tr>
</tbody>
</table>

**Fig. 25: e: Binary input parameter window**

#### Use input

**Options:**
- Deactivated
- As pump repair status input
- As binary signal input

This parameter specifies the type of usage of the input.

**Note**

The *As pump repair status input* option is dependent on the settings on the *Pump* parameter page and is not available as an option that can be selected freely.

If the *Via physical device input* option is selected for the *Monitor pump repair switch* parameter on the *Pump* parameter page, this parameter has the fixed setting *As pump repair status input*. This setting can also only be changed on the *Pump* parameter page. In this case the status of the input is included in the control of the pump.
• **Deactivated**: The input is deactivated and is not used

• **As pump repair status input**: The input is used to acquire the state of the pump's repair switch. The repair switch is used to disconnect the pump from the electrical supply during maintenance work etc. If the repair switch has been actuated, it is not possible to use the pump. The **Actively detected if** and **Send status value** dependent parameters as well as the **Pump repair switch** group object are enabled.

• **As binary signal input**: The input is used as an arbitrary binary signal input, any binary sensor can be connected. The dependent parameters for setting the input (see chapter 7.6.6, x: Binary signal input), as well as the group object **Switch** are enabled.

---

Dependent parameter

**Actively detected if**

Options:  Contact open

Contact closed

This parameter specifies when the sensor connected to the physical input is to be evaluated as having the state **repair switch active** (= repair switch actuated):

• **Contact open**: The repair switch has been actuated if the contact is open, the repair switch has not been actuated if the contact is closed.

• **Contact closed**: The repair switch has been actuated if the contact is closed, the repair switch has not been actuated if the contact is open.
Dependent parameter

**Send status value**

Options:  
- *After a change*: The state of the input is sent after every change.
- *On change and cyclically*: The state of the input is sent after every change and cyclically after a specific interval; the dependent parameter *Send input status cyclically* is enabled.

Dependent parameter

**Send input status cyclically**

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

This parameter specifies the interval at which the values are sent cyclically.
**7.4.10 x: Binary signal input**

The following parameters are enabled if the *As binary signal input* option has been selected for one of the binary inputs (c...e).

---

Dependent parameter

**Maximum dead time**

The maximum dead time is 200 ms.

The maximum dead time prevents unwanted multiple actuation of the input, e.g. due to contact bounce.

What is the maximum dead time?

An edge change on the input is evaluated with a maximum dead time (delay) of 200 ms. This time may vary from 0 ms to 200 ms.

**Note**

No further debouncing is possible.

Example: Maximum dead time of the input signal for a detected edge

![Diagram showing input signal with maximum dead time](image)

*Fig. 26: Maximum dead time of the input signal for a detected edge*

After detection of an edge on the input, further edges are ignored for the maximum dead time TD.
Dependent parameter

**Distinction between long and short operation**

Options:  
- **No**
- **Yes**

This parameter specifies whether the input differentiates between short and long operation.

- **Yes**: After opening/closing the contact, it must first of all be ascertained if a short or long operation has occurred. Then a possible reaction will be triggered.

The following diagram shows the function in detail:

![Fig. 27: Distinguishing between a short/long operation](image)

**Note**

TL is the time from which a long operation is detected.
No

If the No option has been selected for the Distinction between long and short operation parameter, the following parameters appear:

**Note**
Opening the contact -> event 0  
Closing the contact -> event 1

---

Dependent parameter

**Activate minimum signal duration**
Options:  No  Yes

---

Dependent parameter

**When contact opens**
Options:  00.0…01.0…100.0
Dependent parameter

**When closing the contact**

Options: 00.0…01.0…100.0

What is the minimum signal duration?

In contrast to the maximum dead time, a telegram only sent once the minimum signal duration has elapsed.

In more detail:

If an edge is detected on the input, the minimum signal duration starts to elapse. No telegrams are sent on the bus at this time. The signal on the input is monitored for the minimum signal duration. If a further edge appears on the input during the minimum signal duration, it is interpreted as a new operation, and the minimum signal duration restarts. If no further edges occur on the input after the minimum signal duration starts, a telegram is sent on the bus after it has elapsed.

Example: Minimum signal duration of the input signal for a detected edge

![Diagram](image)

Fig. 28: Minimum signal duration of the input signal for a detected edge

There are only two cases where no further edge changes occur within the minimum signal duration TM after a change of edge. For this reason, only these two cases are detected as valid.

**Note**

The minimum signal duration is not considered after a download and/or ETS reset.

**Note**

After a bus voltage recovery, the minimum signal duration starts once the inputs can be scanned. When the sending and switching delay has elapsed, the current state at that point is sent on the bus.
Yes
If the Yes option has been selected for the Distinction between long and short operation parameter, the following parameters appear:

Note
Opening the contact -> event 0
Closing the contact -> event 1

Dependent parameter

Input on operation
Options: Contact open
Contact closed

- Open: The input is open on operation.
- Closed: The input is closed on operation.

If a normally open contact is connected to the input, select the Closed option; for a normally closed contact, select the Open option.
Dependent parameter

**Long operation after**
Options: 01.0…10.0

The time period TL after which an operation is considered long is defined here.

---

Dependent parameter

**1-bit group object "Disable input"**
Options: No
Yes

- Yes: The 1-bit group object "Disable input" is enabled. This can be used to disable the input.

If the input is disabled and the *Send cyclically* option is set, the last state is still sent regardless of the disabling. The *Disable* option disables the physical input; sending continues internally.

When the input is disabled there is essentially no reaction to a signal change on the input, but:

- Waiting for a long button push or a minimum signal duration is suspended
- Parameterized cyclic sending is not interrupted
- The *Switch* group object can still be written

If the input state changes during the disabled phase, the new group object value is sent immediately after the block is released. If the input state remains the same during the disabled phase, the group object value is not sent. The minimum signal duration does not start until the Block has finished.

Block is deactivated after an ETS reset, a bus voltage recovery or a download.
Dependent parameter

Reaction on event X

The following explanations apply to the Reaction on event 0 and Reaction on event 1 parameters.

Options:
- No edge evaluation
- On
- Off
- Toggle
- End cyclic transmission

The standard value for Reaction on event 1 is On. The standard value for Reaction on event 0 is Off.

This determines how the group object reacts. If the Yes option has been selected for the Distinction between long and short operation parameter, the reaction occurs with a short or long operation. If the No option has been selected, it occurs with each edge change.

Note

If the End cyclic transmission option is set, it is important to note that it is only effective if the Send status value parameter is set to On change and cyclically.
Dependent parameter

Send status value
Options: After a change
On change and cyclically

- After a change: Sends the value only after a change
- On change and cyclically: Sends the value after a change, and cyclically. The Telegram is repeated every and On object value dependent parameters are enabled.

Note

Cyclic sending
Cyclic sending enables the Switch group object to send automatically at a fixed interval. If cyclic sending applies to a specific object value only (ON or OFF), this condition refers to the value of the group object. It is therefore possible in principle to start cyclic sending by sending a value to the Switch group object.
As this behavior is unwanted, the Write and Update flags of the group object are deleted in the preliminary setting so that they cannot be changed via the bus. If this functionality is required irrespectively, set these flags accordingly. If the Switch group object changes and after bus voltage recovery (after the sending delay time has elapsed), the group object value is sent immediately on the bus, and the sending cycle time restarts.

Dependent parameter

Telegram is repeated every
Options: 00:00:30...18:12:15 hh:mm:ss

This parameter specifies the interval at which the values are sent cyclically.
Dependent parameter

**On object value**

Options:  
- 0  
- 1  
- 0 or 1  

- 0: Sends the group object value cyclically if 0.  
- 1: Sends the group object value cyclically if 1.  
- 0 or 1: Sends the group object values 0 or 1 cyclically.

Dependent parameter

**Scan input after download, ETS reset and bus voltage recovery**

Options:  
- No  
- Yes

- No: The object value is not scanned after a download, ETS reset or bus voltage recovery.  
- Yes: The object value is scanned after a download, ETS reset or bus voltage recovery.

**Note**

Scanning starts once the device is ready for normal operation again after the download, ETS reset or bus voltage recovery. This can take up to 2 seconds.
ABB i-bus® KNX
Parameters

7.5 Valve output parameter window

7.5.1 HCC/S 2.2.x.1

The explanations below only apply to:

- HCC/S 2.2.1.1
- HCC/S 2.2.2.1

![Fig. 29: Valve output parameter window HCC/S 2.2.x.1](image)

Valve output Motor-driven (3-point)

This parameter describes the type of valve drive that is connected to the output. This is a motor-driven valve drive with 3-point control; this means that the valve is actuated via a separate open & close signal.

The open signal is output via one output, the close signal is output via a second output.

**Note**

For channel A, the open signal is output via output B, the close signal via output C.
For channel B, the open signal is output via output E, the close signal via output F.
Reversing time
Options: 50…500…1000

This parameter specifies the reversing time for the valve drive.

Note
The technical data for the valve drive must be observed.

Switch on time for valve drive from 0 to 100 %
Options: 10…120…6000

This parameter specifies the time that the output switches on to move the valve drive or the valve from 0 % (closed) to position 100 % (fully opened).

Note
The time required should be taken from the technical data of the valve.

Automatic adjustment of valve drive
Options: No Yes

If the control value 0% is only rarely achieved in ongoing operation, this can lead to inaccuracies in positioning control. This parameter activates automatic adjustment to move the valve drive in a defined manner to the 0% position. This serves as the basis for position adjustment.

- No: Automatic adjustment is deactivated.
- Yes: Automatic adjustment is activated. The Number of changes until adjustment dependent parameter is enabled.
Dependent parameter

Number of changes until adjustment
Options: 30…500…65535

This parameter specifies the number of actuations after which automatic adjustment is to be triggered. The adjustment counter is incremented by 1 after an actuation. If the parameterized number of actuations is reached, the reference adjustment is started. The closed position is then moved past by 5% of the parameterized switch on time based on the last control value for the valve drive (at least 1 second, not more than 60 seconds). This function cannot be interrupted. Thereafter, the currently calculated control value is approached, and the adjustment counter is set to zero.

Example:
Switch on time for valve drive from 0 to 100%: 100 s
Current control value: 50%
Reference adjustment to 0%: 50 s + 5 s
50 s = normal movement time from 50% to 0% + 5 s = 5% of 100 s

The following events trigger a reference adjustment:
- Bus voltage recovery
- ETS reset
- Download
- Reset of a rectified fault (via Reset button or via Reset fault on valve output X group object)

The output is only actuated if the calculated change in the valve position (based on the opening time for the drive and the change in the control value) is greater than one second.

This condition prevents small position changes and protects the drive against unnecessary movements. The wear on the drive is reduced.
Send status values
Options: After a change
       Cyclically
       On request
       After a change or on request
       After a change or request and cyclically

This parameter specifies when the valve output status values are to be sent. It affects the Status byte valve A, Fault: valve output and Status valve B control value group objects.

- **After a change**: The values are sent after a change in the object values (e.g. change from 0 to 1). With the Status control value group object, the values are only sent if the change in the control value is at least 1 %.
- **Cyclically**: If this option is selected, the status values are sent automatically after an adjustable time has elapsed. The Every dependent parameter is enabled.
- **On request**: The valve output status values are sent on the receipt of a command via the Request status values group object.
- **After a change or request**: The values are sent on request and after a change.
- **After a change or request and cyclically**: The values are sent on request and after a change and cyclically. The Every dependent parameter is enabled.

---

Dependent parameter

**Every**
Options: 00.00:30…00.05:00…18.12:15 hh:mm:ss

This parameter specifies the interval at which the values are sent cyclically.
Enable manual valve override

Options:  
- No
- Yes

Manual valve override is enabled using this parameter. This feature is used to specify valve control values directly; the control value from the controller is overridden. This action may be necessary during the commissioning phase, for example, to test the function of the system. A further possible application is the specific overriding of the controller.

- No: The manual valve override is deactivated
- Yes: The manual override is enabled. The two group objects Enable/disable manual override valve and Override valve control value are enabled. The former is used to activate or deactivate the manual override. The manual valve control value is specified using the second group object. Only if the manual override has been activated via the first group object is the value in the second group object sent to the valve. As soon as the manual override is ended using the Enable/disable manual override valve group object, the valve output reacts again to the controller (controller mode) or the control values received via the bus (actuator mode). As soon as the manual override is activated via the Enable/disable manual override valve group object, the value currently in the Override valve control value group object is written to the valve.
Valve purge
Options: Deactivated
Automatic or triggered by object
Triggered by object

Valve purging by the device is enabled using this parameter. This parameter is used to trigger a device opening and closing cycle during times when the valve is not in use to prevent the valve from seizing.

- **Deactivated**: Valve purging is deactivated.
- **Automatic or triggered by object**: Valve purging can be triggered via a group object or it occurs automatically after an adjustable time has elapsed. The Status valve purge and Activate valve purge group objects as well as the Purge cycle in weeks, Reset purge cycle from control value greater than or equal to and Send group object “Status Valve purge” parameters are enabled.
- **Triggered by object**: The valve purging can be triggered via a group object. The Status valve purge and Activate valve purge group objects as well as the Reset purge cycle from control value greater than or equal to and Send group object “Status Valve purge” parameters are enabled.

During the valve purging, the valve is opened completely once and closed again, corresponding to the values set in the Valve drive opening/closing time or Valve drive opening time parameter.

The purging cycle time is restarted if automatic valve purging has been activated at start-up of the device.

The purging cycle time will be restarted at the end of the actual purging period. The parameterized duration for the valve purging is included here.

The purging cycle with an active automatic valve purge is reset and restarted if:

- A manual valve purge is triggered via the Activate valve purge group object.
- The parameterized value (in Reset purge cycle from...) is exceeded. The purging cycle is only restarted once the parameterized value is reached or dropped below.
Dependent parameter

Purge cycle in weeks
This parameter is only visible if the Automatic or triggered by object option has been selected for the Valve purge parameter.
Options: 1…4…12

This parameter specifies the cycle for the automatic valve purge. The internal automatic purge timer starts immediately after the download. The time is reset with each download. The time is reset as soon as purging is completed. This can occur either through automatic purging or via the Activate valve purge group object.

Note
After bus voltage recovery and download, the automatic purging cycle is restarted. The time before bus voltage failure is not considered. If the purge cycle is triggered simultaneously for two valves, the purging is undertaken sequentially and not at the same time.

Dependent parameter

Reset purge cycle from control value greater than or equal to
Options: 1…99 %

The purge cycle is reset if the control value set using this parameter is exceeded.
—

Dependent parameter

**Send group object “Status valve purge”**

Options:  
- **No, update only**: With this option only the object value for the group object is updated, however this value is not sent over the bus.
- **On request**: The valve purging status value is sent on the receipt of a command via the Request status values group object.
- **After a change**: The value is sent after a change in the object value (e.g. change from 0 to 1).
- **Cyclically**: If this option is selected, the status value is sent automatically after an adjustable time has elapsed. The **Every** dependent parameter is enabled.
- **After a change or request**: The status is sent on request and after a change.
- **After a change or request and cyclically**: The status is sent on request and after a change and cyclically. The **Every** dependent parameter is enabled.

—

Dependent parameter

**Every**

Options:  
- 00:00:00…00:05:00…18:12:15 hh:mm:ss

This parameter specifies the interval at which the values are sent cyclically.
### 7.5.2 HCC/S 2.1.x.1

The explanations below only apply to:

- HCC/S 2.1.2.1
- HCC/S 2.1.1.1

![Valve output parameter window HCC/S 2.1.x.1](image)

**Valve output**

Options:  
- **Activated**  
- **Deactivated**

- **Activated:** The output is used as a control value output for a 0-10 V valve drive. The *Status byte valve B (B/C)*, *Status valve B (B/C) control value*, *Fault: valve output B (B/C)* and *Reset fault on valve output B (B/C)* group objects as well as the dependent parameters are enabled.
Dependent parameter

**Voltage range valve control value**

Options:

- 0 – 10 V
- 1 – 10 V
- 2 – 10 V
- 10 – 0 V

The function of the valve output is specified using this parameter. Depending on the selection, the control value is converted to the corresponding voltage range.

**Note**

Valve drives closed if de-energized (0…10 V; 1…10 V; 2…10 V):
If no current flows in the valve drive, the valve is closed. If current flows in the valve drive, the valve opens.

Valve drives opened if de-energized (10…0 V):
If no current flows in the valve drive, the valve opens. If current flows in the valve drive, the valve then closes.

**Note**

The technical data for the valve drive must be observed.

On the selection of the 1 – 10 V and 2 – 10 V options, the output voltage is limited to this range. To make sure that the valve is always closed completely, on the actuation of the valve with 0 % (= closed), the control value 0 V is output nevertheless. If the control value is greater than 0 %, the lower limit (1 V or 2 V) is used directly for the actuation.

If the DPT 5.001 (percent) is used for actuation, the value of the group object may be displayed as 0 %, but the actual value of the group object may be slightly above that and a 0 is only displayed due to the rounding to integer values.

This situation can be detected by viewing the hexadecimal value (this is then e.g. 0x0001) or changing to a different DPT (e.g. 5.005).
Dependent parameter

Valve drive opening/closing time
Options: 10...180...900 s

With this parameter, a time is set in seconds that the connected valve requires to move from position 0 % (valve closed) to position 100 % (valve fully open), or the valve requires to move from 100 % to 0 %.

Note
The time should be taken from the technical data of the valve, and it corresponds with the total runtime.

Send status values
Options: On request
After a change
Cyclically
After a change or on request
After a change or request and cyclically

This parameter specifies when the valve output status values are to be sent. It affects the Status byte valve B (B/C), Fault: valve output and Status valve B control value group objects.

- **On request**: The valve output status values are sent on the receipt of a command via the Request status values group object.
- **After a change**: The values are sent after a change in the object values (e.g. change from 0 to 1). With the Status control value group object the values are only sent if the change in the control value is at least 1 %.
- **Cyclically**: If this option is selected, the status values are sent automatically after an adjustable time has elapsed. The Every dependent parameter is enabled.
- **After a change or request**: The values are sent on request and after a change.
- **After a change or request and cyclically**: The values are sent on request and after a change and cyclically. The Every dependent parameter is enabled.
Dependent parameter

**Every**

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

This parameter specifies the interval at which the values are sent cyclically.

**Enable manual valve override**

Options: No

Yes

Manual valve override is enabled using this parameter. This feature is used to specify valve control values directly; the control value from the controller is overridden. This action may be necessary during the commissioning phase, for example, to test the function of the system. A further possible application is the specific overriding of the controller.

- **No:** The manual valve override is deactivated
  
  Yes: The manual override is enabled. The two group objects *Enable/disable manual override valve* and *Override valve control value* are enabled. The former is used to activate or deactivate the manual override. The manual valve control value is specified using the second group object. Only if the manual override has been activated via the first group object is the value in the second group object sent to the valve. As soon as the manual override is ended using the *Enable/disable manual override valve* group object, the valve output reacts again to the controller (controller mode) or the control values received via the bus (actuator mode). As soon as the manual override is activated via the *Enable/disable manual override valve* group object, the value currently in the *Override valve control value* group object is written to the valve. If, while the override was disabled, a value was written to this group object, this value will become active as soon as the override is enabled.
Valve purge
Options:  Deactivated
          Automatic or triggered by object
          Triggered by object

Valve purging by the device is enabled using this parameter. This parameter is used to trigger a device opening and closing cycle during times when the valve is not in use to prevent the valve from seizing.

- **Deactivated**: Valve purging is deactivated.
- **Automatic or triggered by object**: Valve purging can be triggered via a group object or it occurs automatically after an adjustable time has elapsed. The Status valve purge and Activate valve purge group objects as well as the Purge cycle in weeks, Reset purge cycle from control value greater than or equal to and Send group object “Status Valve purge” parameters are enabled.
- **Triggered by object**: The valve purging can be triggered via a group object. The Status valve purge and Activate valve purge group objects as well as the Reset purge cycle from control value greater than or equal to and Send group object “Status Valve purge” parameters are enabled.

During the valve purging, the valve is opened completely once and closed again, corresponding to the values set in the Valve drive opening/closing time or Valve drive opening time parameter.

The purging cycle time is restarted if automatic valve purging has been activated at start-up of the device.

The purging cycle time will be restarted at the end of the actual purging period. The parameterized duration for the valve purging is included here.

The purging cycle with an active automatic valve purge is reset and restarted if:

- A manual valve purge is triggered via the Activate valve purge group object.
- The parameterized value (in Reset purge cycle from...) is exceeded. The purging cycle is only restarted once the parameterized value is reached or dropped below.
Dependent parameter

**Purge cycle in weeks**
This parameter is only visible if the *Automatic or triggered by object* option has been selected.

Options: 1…4…12

This parameter specifies the cycle for the automatic valve purge. The internal automatic purge timer starts immediately after the download. The time is reset with each download. The time is reset as soon as purging is completed. This can occur either through automatic purging or via the group object *Activate valve purge*.

**Note**

After bus voltage recovery and download, the automatic purging cycle is restarted. The time before bus voltage failure is not considered. If the purge cycle is triggered simultaneously for two valves, the purging is undertaken sequentially and not at the same time.

Dependent parameter

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

Options: 1…99 %

The purge cycle is reset if the control value set using this parameter is exceeded.
Dependent parameter

**Send group object “Status valve purge”**

**Options:**
- **No, update only**
- **After a change**
- **Cyclically**
- **On request**
- **After a change or on request**
- **After a change or request and cyclically**

This parameter defines when the *Status valve purge* group object is to be sent.

- **No, update only**: With this option only the object value for the group object is updated, however this value is not sent over the bus.
- **On request**: The valve purging status value is sent on the receipt of a command via the *Request status values* group object.
- **After a change**: The value is sent after a change in the object value (e.g. change from 0 to 1).
- **Cyclically**: Selecting this option automatically sends the value after a user-definable time period. The *Every* dependent parameter is enabled.
- **After a change or request**: The status is sent on request and after a change.
- **After a change or request and cyclically**: The status is sent on request and after a change and cyclically. The *Every* dependent parameter is enabled.

---

Dependent parameter

**Every**

**Options:**

00:00:30…00:05:00…18:12:15

This parameter specifies the interval at which the values are sent cyclically.
7.6 Temperature controller parameter window

This parameter window is only visible in the controller mode.

Fig. 31: Temperature controller parameter window

Minimum control value for basic load > 0
Options: Activate via object
         Always active

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

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

- **Always active**: On the selection of this option, the basic load is always active
Note

The settings for the basic load can be specified independently for each stage. These settings are specified in the Temperature controller – Heating/Cooling parameter window. Here the minimum control value for the basic load that is not allowed to be dropped below is specified.

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

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

Basic load active when controller off

Options: No Yes

This parameter specifies whether the basic load is to be active if the controller has been switched off via the Control On/Off group object.

- No: The basic load is also switched off if the controller is switched off.
- Yes: The basic load remains active even if the controller is switched off.
Dependent parameter

**Send inactive control values cyclically**

Options:  
- No
- Yes

This parameter is enabled if the device has been parameterized for both heating and cooling. For this purpose, the **Deactivated** option is not allowed to be selected for the **Controller setting heating** and **Controller setting cooling** parameters in the Application parameters parameter window.

- **No**: The cyclic sending of the inactive control values is inhibited. Only the control values for the type of operation (heating or cooling) active are sent.
- **Yes**: The cyclic sending of the inactive control values remains active. All control values are always sent corresponding to the cycle time selected.

This parameter is used to influence the behavior on sending the controller control value output. This parameter specifies whether the control values for the type of operation not currently active (heating or cooling) are to be sent. This setting is necessary for systems that have only one control value input for heating and cooling. In this situation, both output objects for the control value (*Status heating control value* and *Status cooling control value*) must be linked to the same input object. The cyclic sending of both control values in this situation means that the active and inactive value continuously overwrite each other. To prevent this action from arising, the cyclic sending of the inactive control value can be inhibited.

The following example makes the behavior clear:

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

The cycle times for the individual control values can be set in the related parameter window (e.g. *Temperature controller - Heating*) in Extended settings in the Send control value cyclically parameter.
7.6.1 Heating

This window is only visible if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window.

In actuator mode, this window is deactivated and hidden.

You can parameterize the temperature controller for the heating circuit on this page. The settings for the PI control, limitation of the temperature range, the behavior on sending the control value and the safety shutdown are made.

![Fig. 31: Heating parameter window](image)

**Fig. 31: Heating parameter window**
Type of heating control value

Type of heating control value PI continuous (0…100%)

This parameter indicates, together with the next two parameters, how the control is realized. The control is always via a PI controller with fixed P and I proportion. The only exception is the selection of the Free configuration option for the Heating parameter in the Application parameters parameter window. The only exception that allows you to set the parameters as required is the Free configuration option.

<table>
<thead>
<tr>
<th>Option selected: Heating</th>
<th>P and I proportion</th>
<th>P and I proportion can be changed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free configuration</td>
<td>xP-proportion: 60 K</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>I-proportion: 60 s</td>
<td></td>
</tr>
<tr>
<td>Reduced temperature accuracy / few valve movements</td>
<td>xP-proportion: 40 K</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>I-proportion: 120 s</td>
<td></td>
</tr>
<tr>
<td>Medium temperature accuracy / medium number of valve movements</td>
<td>xP-proportion: 60 K</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>I-proportion: 60 s</td>
<td></td>
</tr>
<tr>
<td>High temperature accuracy / many valve movements</td>
<td>xP-proportion: 80 K</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>I-proportion: 30 s</td>
<td></td>
</tr>
</tbody>
</table>

Table 41: Type of heating control value

Note

For a description of the individual options for the control, see Application parameters parameter window – Controller setting heating parameter.
Dependent parameter

**xP-proportion**

Options: 01…60…100 K

The standard value depends on the option selected for the *Controller setting heating* parameter in the *Application parameters* parameter window.

**Note**

This value can only be changed if the *Free configuration* option is selected for the *Controller setting heating* parameter.

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

Dependent parameter

**I-proportion**

Options: 0…60…600 s

The standard value depends on the option selected for the *Controller setting heating* parameter in the *Application parameters* parameter window.

**Note**

This value can only be changed if the *Free configuration* option is selected for the *Controller setting heating* parameter.

The I-proportion stands for the integral time in a control. The integral proportion causes the supply flow temperature to approach the setpoint slowly and also to reach it finally. Depending on the system type used, the integral time may need to have different values. In principle the following applies: the more sluggish the overall system, the larger the integral time is.
Permissible temperature band lower limit
Options: 10…20…100 °C

This parameter specifies a minimum temperature in the heating circuit. The controller will always set this temperature as the minimum temperature even if the setpoint temperature is lower. This feature can be used, e.g., to maintain always a minimum temperature in a heating circuit to achieve a quicker response to the heating requirements.

Note
The temperature is only maintained if the type of operation Heating is active and the control is switched on.

Permissible temperature band upper limit
Options: 10…80…100 °C

This parameter specifies a maximum temperature in the heating circuit. The controller will not actively exceed this temperature, instead it will always set this temperature as the maximum temperature, even if the setpoint temperature is higher. In this way, e.g., an excessively high supply flow temperature can be prevented.

Note
The temperature is only maintained if the type of operation Heating is active and the control is switched on.
Dependent parameter

Extended settings
Options:  
- No
- Yes

The selection of the Yes option enables other settings.

Dependent parameter

Control value direction
This parameter is only visible if the Via group object option has been selected for the Actuate heating via parameter in the Application parameters parameter window.

Options:  
- Normal
- Inverted

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

If the valve output on the device is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

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

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

Dependent parameter

Control value difference for sending control value
Options:  
- 2%
- 5%
- 10%
- Only send cyclically

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

**Send control value cyclically (0 = cyclical sending disabled)**

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

This parameter specifies the interval at which the values are sent cyclically. On the selection of the value 0, cyclic sending is deactivated.

**Note**

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

Dependent parameter

**Max. control value**

Options: 0...100 %

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

**Min. control value (basic load)**
Options: \( 0 \ldots 100 \% \)

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

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

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

Dependent parameter

**Enable safety shutdown**
Options: No, Yes

This parameter activates a safety shutdown of the controller. Using the safety shutdown, the controller's control value can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

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

- **No**: The safety shutdown is deactivated.
- **Yes**: The safety shutdown is activated. The following dependent parameters are enabled.

**Note**

On the usage of the safety shutdown this function is automatically active after bus voltage recovery or download until it receives a valid temperature value. It is only based on this value that the controller can check whether the shutdown must remain active.
Dependent parameter

**Safety shutdown temperature**

Options: 25…80…100 °C

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

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

Dependent parameter

**Temperature hysteresis safety shutdown**

Options: 0.5…0.0…0.5

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

Dependent parameter

**I-proportion with safety shutdown**

Options: Freeze

Reset

This parameter specified what is to happen to the I-proportion on reaching the safety shutdown temperature.

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

**Temperature input for temperature limit sensor**

Options:
- **Via group object**
- **Via physical device input**

- **Via group object**: The temperature value is received via a dedicated group object. The dependent group object *Temperature input safety shutdown heating* is enabled.

- **Via physical device input**: The temperature value is acquired via a temperature sensor connected to the input a.

⚠️ **Note**

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the safety shutdown function does not work.
7.6.2 Cooling

This window is only visible if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window.

In actuator mode, this window is deactivated and hidden.

You can parameterize the temperature controller for the cooling circuit on this page. The settings for the PI control, limitation of the temperature range, the behavior on sending the control value and the safety shutdown are made.

Fig. 32: Cooling parameter window
Type of cooling control value

Type of cooling control value PI continuous (0…100 %)

This parameter indicates, together with the next two parameters, how the control is realized. The control is always via a PI controller with fixed P and I proportion. The only exception is the selection of the Free configuration option for the Cooling parameter in the Application parameters parameter window. The only exception that allows you to set the parameters as required is the Free configuration option.

<table>
<thead>
<tr>
<th>Option selected: Cooling</th>
<th>P and I proportion</th>
<th>P and I proportion can be changed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free configuration</td>
<td>xP-proportion: 60 K</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>l-proportion: 60 s</td>
<td></td>
</tr>
<tr>
<td>Reduced temperature accuracy/</td>
<td>xP-proportion: 40 K</td>
<td>No</td>
</tr>
<tr>
<td>few valve movements</td>
<td>l-proportion: 120 s</td>
<td></td>
</tr>
<tr>
<td>Medium temperature accuracy/</td>
<td>xP-proportion: 60 K</td>
<td>No</td>
</tr>
<tr>
<td>medium number of valve movements</td>
<td>l-proportion: 60 s</td>
<td></td>
</tr>
<tr>
<td>High temperature accuracy/</td>
<td>xP-proportion: 80 K</td>
<td>No</td>
</tr>
<tr>
<td>many valve movements</td>
<td>l-proportion: 30 s</td>
<td></td>
</tr>
</tbody>
</table>

Table 42: Type of cooling control value

Note

For a description of the individual options for the control, see Application parameters parameter window – Controller setting cooling parameter.
Dependent parameter

**xP-proportion**

Options: 01.0…01.5…100 K

The standard value depends on the option selected for the `Controller setting cooling` parameter in the `Application parameters` parameter window.

**Note**

This value can only be changed if the `Free configuration` option is selected for the `Controller setting cooling` parameter.

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

Dependent parameter

**I-proportion**

Options: 0…100…600 s

The standard value depends on the option selected for the `Controller setting cooling` parameter in the `Application parameters` parameter window.

**Note**

This value can only be changed if the `Free configuration` option is selected for the `Controller setting cooling` parameter.

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

Options: 1…8…45 °C

This parameter specifies a minimum temperature in the cooling circuit. The controller will always set this temperature as the minimum temperature even if the setpoint temperature is lower. This feature can be used, e.g., to prevent dropping below a minimum temperature in a cooling circuit to counteract condensation.

**Note**

The temperature is only maintained if the type of operation *Cooling* is active and the control is switched on.

---

**Permissible temperature band upper limit**

Options: 1…12…45 °C

This parameter specifies a maximum temperature in the cooling circuit. The controller will not actively exceed this temperature, instead it will always set this temperature as the maximum temperature, even if the setpoint temperature is higher. In this way the supply flow temperature can be maintained at a correspondingly low value to ensure a quick reaction to setpoint changes.

**Note**

The temperature is only maintained if the type of operation *Cooling* is active and the control is switched on.
Dependent parameter

Extended settings
Options: No
Yes

The selection of the Yes option enables other settings.

Dependent parameter

Control value direction
This parameter is only visible if the Via group object option has been selected for the Actuate cooling via parameter in the Application parameters parameter window.

Options: Normal
Inverted

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

If the valve output on the device is used to output the control value, this parameter is not displayed because this setting is then made in the related output stage.

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

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

**Control value difference for sending control value**

Options:
- 2%
- 5%
- 10%
- Only send cyclically

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

Dependent parameter

**Send control value cyclically (0 = cyclical sending disabled)**

Options: 0…15…60 min

This parameter is used to specify the cycle time with which the control value is to be sent. On the selection of the value 0, cyclic sending is deactivated.

**Note**

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

**Max. control value**
Options: 0…100 %

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

---

Dependent parameter

**Min. control value (basic load)**
Options: 0…100 %

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

This parameter sets a basic load, e.g. for the operation of a cooling circuit for cooling ceiling.

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

**Enable safety shutdown**

Options:  
- No
- Yes

This parameter activates a safety shutdown of the controller. Using the safety shutdown, the controller's control value can be set to 0 on reaching a parameterized temperature. In this way, exceeding (heating) or dropping below (cooling) this temperature can be prevented.

An example of the usage of the limit temperature is a cooling ceiling, where dropping below a specific temperature must be prevented to prevent the formation of moisture under/on the ceiling.

- **No**: The limit temperature is deactivated.
- **Yes**: The limit temperature is activated. The following dependent parameters are enabled.

Dependent parameter

**Safety shutdown temperature**

Options:  
1…12…30 °C

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

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

**Temperature hysteresis safety shutdown**

Options: 00.5…01.0…05.0

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

Dependent parameter

**I-proportion with safety shutdown**

Options: Freeze Reset

This parameter specified what is to happen to the I-proportion on reaching the safety shutdown temperature.

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

- **Reset**: The I-proportion is reset to 0. Once the controller becomes active again, the I-proportion starts at 0.
Dependent parameter

**Temperature input for temperature limit sensor**

Options:
- **Via group object**
  The temperature value is received via a dedicated group object. The dependent group object *Temperature input safety shutdown cooling* is enabled.
- **Via physical device input**
  The temperature value is acquired via a temperature sensor connected to the input a.

⚠️ **Note**

A temperature sensor must be actually connected to the temperature input selected and the input for the sensor must have been correctly parameterized, otherwise the safety shutdown function does not work.
## 8 Group objects

### 8.1 Summary of group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>DPT</th>
<th>Length</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In operation</td>
<td>General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Request status values</td>
<td>General</td>
<td>1.017</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Status manual operation</td>
<td>General</td>
<td>1.011</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>Enable/disable manual operation</td>
<td>General</td>
<td>1.003</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Forced operation 2 bit</td>
<td>Channel A - General</td>
<td>2.001</td>
<td>2 bit</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Forced operation 1 bit</td>
<td>Channel A - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>7</td>
<td>Error: heating/cooling receipt</td>
<td>Channel A - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>Error: setpoint receipt</td>
<td>Channel A - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>Error: control value receipt</td>
<td>Channel A - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>Error: pump error receipt</td>
<td>Channel A - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>11</td>
<td>Error: repair switch receipt</td>
<td>Channel A - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Status byte channel</td>
<td>Channel A - General</td>
<td>Non DPT</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>Status byte valve B/C</td>
<td>Channel A - Valve B/C</td>
<td>Non DPT</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>14</td>
<td>Status byte valve B</td>
<td>Channel A - Valve B</td>
<td>Non DPT</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>15</td>
<td>Status valve B/C control value</td>
<td>Channel A - Valve B/C</td>
<td>5.001</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>16</td>
<td>Status valve B control value</td>
<td>Channel A - Valve B</td>
<td>5.001</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>17</td>
<td>Status valve B/C control value</td>
<td>Channel A - Valve B/C</td>
<td>5.001</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>18</td>
<td>Fault: valve output B/C</td>
<td>Channel A - Valve B/C</td>
<td>1.002</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>19</td>
<td>Fault: valve output B</td>
<td>Channel A - Valve B</td>
<td>1.002</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>20</td>
<td>Status valve purge B/C</td>
<td>Channel A - Valve B/C</td>
<td>1.011</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>21</td>
<td>Status valve purge B</td>
<td>Channel A - Valve B</td>
<td>1.011</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>22</td>
<td>Reset fault on valve output B/C</td>
<td>Channel A - Valve B/C</td>
<td>1.015</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>23</td>
<td>Activate valve purge B/C</td>
<td>Channel A - Valve B/C</td>
<td>1.017</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>24</td>
<td>Activate valve purge B</td>
<td>Channel A - Valve B</td>
<td>1.017</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>25</td>
<td>Enable/disable manual override valve B/C</td>
<td>Channel A - Valve B/C</td>
<td>1.003</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>26</td>
<td>Enable/disable manual override valve B</td>
<td>Channel A - Valve B</td>
<td>1.003</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>27</td>
<td>Override valve control value B/C</td>
<td>Channel A - Valve B/C</td>
<td>5.001</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>28</td>
<td>Override valve control value B</td>
<td>Channel A - Valve B</td>
<td>5.001</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>No.</td>
<td>Object function</td>
<td>Name</td>
<td>DPT</td>
<td>Length</td>
<td>Flags</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>-----</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>27</td>
<td>Override pump</td>
<td>Channel A - Pump</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>28</td>
<td>Status pump relay</td>
<td>Channel A - Pump</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>29</td>
<td>Pump error input</td>
<td>Channel A - Pump</td>
<td>1.005</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Pump repair switch input</td>
<td>Channel A - Pump</td>
<td>1.011</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Status pump master/slave (1=Master; 0=Slave)</td>
<td>Channel A - Pump</td>
<td>1.011</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Pump overdrive via KNX (deactivate/activate)</td>
<td>Channel A - Pump</td>
<td>1.003</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Status pump automatic</td>
<td>Channel A - Pump</td>
<td>1.011</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Time</td>
<td>Channel A - Pump</td>
<td>10.001</td>
<td>3 bytes</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Master/slave changeover</td>
<td>Channel A - Pump</td>
<td>1.017</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Supply flow temperature</td>
<td>Channel A - Input a</td>
<td>9.001</td>
<td>2 bytes</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Sensor error</td>
<td>Channel A - Input a</td>
<td>1.005</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>Return flow temperature</td>
<td>Channel A - Input b</td>
<td>9.001</td>
<td>2 bytes</td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>Sensor error</td>
<td>Channel A - Input b</td>
<td>1.005</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>Pump operating state</td>
<td>Channel A - Binary input c</td>
<td>1.011</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Switch</td>
<td>Channel A - Binary input c</td>
<td>1.001</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Disable input</td>
<td>Channel A - Binary input c</td>
<td>1.003</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Pump fault alarm</td>
<td>Channel A - Binary input d</td>
<td>1.005</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Switch</td>
<td>Channel A - Binary input d</td>
<td>1.001</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Disable input</td>
<td>Channel A - Binary input d</td>
<td>1.003</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Switch</td>
<td>Channel A - Binary input e</td>
<td>1.011</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Disable input</td>
<td>Channel A - Binary input e</td>
<td>1.001</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Status heating/cooling</td>
<td>Channel A - Controller</td>
<td>1.100</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Status heating control value</td>
<td>Channel A - Controller</td>
<td>5.001</td>
<td>1 byte</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Status cooling control value</td>
<td>Channel A - Controller</td>
<td>5.001</td>
<td>1 byte</td>
<td></td>
</tr>
<tr>
<td>51</td>
<td>Supply flow temperature via KNX</td>
<td>Channel A - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Supply flow temperature malfunction</td>
<td>Channel A - Controller</td>
<td>1.002</td>
<td>1 bit</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Object function</td>
<td>Name</td>
<td>DPT</td>
<td>Length</td>
<td>Flags</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------------------</td>
<td>-------------------------------------------</td>
<td>-----</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>57</td>
<td>Current setpoint</td>
<td>Channel A - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X</td>
</tr>
<tr>
<td>62</td>
<td>Status heating</td>
<td>Channel A - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>63</td>
<td>Status cooling</td>
<td>Channel A - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>64</td>
<td>Activate minimum control value (basic load)</td>
<td>Channel A - Controller</td>
<td>1.003</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>65</td>
<td>Heating/cooling changeover</td>
<td>Channel A - Controller</td>
<td>1.100</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>73</td>
<td>Control On/Off</td>
<td>Channel A - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>74</td>
<td>Status control On/Off</td>
<td>Channel A - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>86</td>
<td>Heating setpoint temperature</td>
<td>Channel A - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X</td>
</tr>
<tr>
<td>87</td>
<td>Cooling setpoint temperature</td>
<td>Channel A - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X</td>
</tr>
<tr>
<td>94</td>
<td>Heating control value</td>
<td>Channel A - Actuator</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>95</td>
<td>Cooling control value</td>
<td>Channel A - Actuator</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>96</td>
<td>Temperature input safety shutdown heating</td>
<td>Channel A - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X X</td>
</tr>
<tr>
<td>98</td>
<td>Temperature input safety shutdown cooling</td>
<td>Channel A - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X X</td>
</tr>
<tr>
<td>100</td>
<td>Safety shutdown (temperature reached)</td>
<td>Channel A - Controller</td>
<td>1.005</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>101</td>
<td>Forced operation 2 bit</td>
<td>Channel B - General</td>
<td>2.001</td>
<td>2 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>102</td>
<td>Forced operation 1 bit</td>
<td>Channel B - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>103</td>
<td>Error: heating/cooling receipt</td>
<td>Channel B - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>104</td>
<td>Error: setpoint receipt</td>
<td>Channel B - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>105</td>
<td>Error: control value receipt</td>
<td>Channel B - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>106</td>
<td>Error: pump error receipt</td>
<td>Channel B - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>107</td>
<td>Error: repair switch receipt</td>
<td>Channel B - General</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>108</td>
<td>Status byte channel</td>
<td>Channel B - General</td>
<td>Non DPT</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>109</td>
<td>Status byte valve E/F</td>
<td>Channel B - Valve E/F</td>
<td>Non DPT</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>110</td>
<td>Status valve E/F control value</td>
<td>Channel B - Valve E/F</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>111</td>
<td>Fault: valve output E/F</td>
<td>Channel B - Valve E/F</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>112</td>
<td>Status valve purge E/F</td>
<td>Channel B - Valve E/F</td>
<td>1.011</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>113</td>
<td>Reset fault on valve output E/F</td>
<td>Channel B - Valve E/F</td>
<td>1.015</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>No.</td>
<td>Object function</td>
<td>Name</td>
<td>DPT</td>
<td>Length</td>
<td>Flags</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------</td>
<td>-----------------------------</td>
<td>---------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>114</td>
<td>Activate valve purge E/F</td>
<td>Channel B - Valve E/F</td>
<td>1.017</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>115</td>
<td>Enable/disable manual override valve E/F</td>
<td>Channel B - Valve E/F</td>
<td>1.003</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>116</td>
<td>Override valve control value E/F</td>
<td>Channel B - Valve E/F</td>
<td>5.001</td>
<td>1 byte</td>
<td>X</td>
</tr>
<tr>
<td>118</td>
<td>Override pump</td>
<td>Channel B - Pump</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>119</td>
<td>Status pump relay</td>
<td>Channel B - Pump</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>121</td>
<td>Pump error input</td>
<td>Channel B - Pump</td>
<td>1.005</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>122</td>
<td>Pump repair switch input</td>
<td>Channel B - Pump</td>
<td>1.011</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>123</td>
<td>Status pump master/slave (1=Master; 0=Slave)</td>
<td>Channel B - Pump</td>
<td>1.011</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>124</td>
<td>Pump overdrive via KNX (deactivate/activate)</td>
<td>Channel B - Pump</td>
<td>1.003</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>125</td>
<td>Status pump automatic</td>
<td>Channel B - Pump</td>
<td>1.011</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>128</td>
<td>Supply flow temperature</td>
<td>Channel B - Input f</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X</td>
</tr>
<tr>
<td>129</td>
<td>Sensor error</td>
<td>Channel B - Input f</td>
<td>1.005</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>130</td>
<td>Return flow temperature</td>
<td>Channel B - Input g</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X</td>
</tr>
<tr>
<td>131</td>
<td>Sensor error</td>
<td>Channel B - Input g</td>
<td>1.005</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>132</td>
<td>Pump operating state</td>
<td>Channel B - Binary input h</td>
<td>1.011</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>132</td>
<td>Switch</td>
<td>Channel B - Binary input h</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>133</td>
<td>Disable input</td>
<td>Channel B - Binary input h</td>
<td>1.003</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>134</td>
<td>Pump fault alarm</td>
<td>Channel B - Binary input i</td>
<td>1.005</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>134</td>
<td>Switch</td>
<td>Channel B - Binary input i</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>135</td>
<td>Disable input</td>
<td>Channel B - Binary input h</td>
<td>1.003</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>136</td>
<td>Pump repair switch input</td>
<td>Channel B - Binary input j</td>
<td>1.011</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>136</td>
<td>Switch</td>
<td>Channel B - Binary input j</td>
<td>1.001</td>
<td>1 bit</td>
<td>X</td>
</tr>
<tr>
<td>137</td>
<td>Disable input</td>
<td>Channel B - Binary input h</td>
<td>1.003</td>
<td>1 bit</td>
<td>X</td>
</tr>
</tbody>
</table>
## ABB i-bus® KNX
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>DPT</th>
<th>Length</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>Status heating/cooling</td>
<td>Channel B - Controller</td>
<td>1.100</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>139</td>
<td>Status heating control value</td>
<td>Channel B - Controller</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>141</td>
<td>Status cooling control value</td>
<td>Channel B - Controller</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X X</td>
</tr>
<tr>
<td>145</td>
<td>Supply flow temperature via KNX</td>
<td>Channel B - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X</td>
</tr>
<tr>
<td>147</td>
<td>Supply flow temperature malfunction</td>
<td>Channel B - Controller</td>
<td>1.002</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>148</td>
<td>Current setpoint</td>
<td>Channel B - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X</td>
</tr>
<tr>
<td>153</td>
<td>Status heating</td>
<td>Channel B - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>154</td>
<td>Status cooling</td>
<td>Channel B - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>155</td>
<td>Activate minimum control value (basic load)</td>
<td>Channel B - Controller</td>
<td>1.003</td>
<td>1 bit</td>
<td>X X</td>
</tr>
<tr>
<td>156</td>
<td>Heating/cooling changeover</td>
<td>Channel B - Controller</td>
<td>1.100</td>
<td>1 bit</td>
<td>X X</td>
</tr>
<tr>
<td>164</td>
<td>Control On/Off</td>
<td>Channel B - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X</td>
</tr>
<tr>
<td>165</td>
<td>Status control On/Off</td>
<td>Channel B - Controller</td>
<td>1.001</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
<tr>
<td>177</td>
<td>Heating setpoint temperature</td>
<td>Channel B - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X</td>
</tr>
<tr>
<td>178</td>
<td>Cooling setpoint temperature</td>
<td>Channel B - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X</td>
</tr>
<tr>
<td>185</td>
<td>Heating control value</td>
<td>Channel B - Actuator</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X</td>
</tr>
<tr>
<td>186</td>
<td>Cooling control value</td>
<td>Channel B - Actuator</td>
<td>5.001</td>
<td>1 byte</td>
<td>X X</td>
</tr>
<tr>
<td>187</td>
<td>Temperature input safety shutdown heating</td>
<td>Channel B - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X</td>
</tr>
<tr>
<td>189</td>
<td>Temperature input safety shutdown cooling</td>
<td>Channel B - Controller</td>
<td>9.001</td>
<td>2 bytes</td>
<td>X X X</td>
</tr>
<tr>
<td>191</td>
<td>Safety shutdown (temperature reached)</td>
<td>Channel B - Controller</td>
<td>1.005</td>
<td>1 bit</td>
<td>X X X</td>
</tr>
</tbody>
</table>

*Table 43: Summary of group objects*
### 8.2 Group objects, General

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>In operation</td>
<td>General</td>
<td>1 bit DPT 1.002</td>
<td>C, R, T</td>
</tr>
<tr>
<td>3</td>
<td>Request status values</td>
<td>General</td>
<td>1 bit DPT 1.017</td>
<td>C, W</td>
</tr>
<tr>
<td>4</td>
<td>Status manual operation</td>
<td>General</td>
<td>1 bit DPT 1.011</td>
<td>C, R, T</td>
</tr>
<tr>
<td>5</td>
<td>Enable/disable manual operation</td>
<td>General</td>
<td>1 bit DPT 1.003</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Enable group object "In operation" 1 bit parameter in the General parameter window.

To monitor regularly the presence of the device on the KNX bus, an In operation telegram is sent cyclically on the bus.

As long as the group object is activated, it sends a parameterizable In operation telegram.

The telegram value depends on the option selected in Parameter Send.

This group object is always enabled.

If a telegram with the value 0 or 1 is received in this group object, all Status group objects are sent on the bus if they were parameterized with the On request option.

This group object is enabled if the Enabled option has been selected for the Manual operation parameter in the Manual operation parameter window.

This group object indicates whether manual operation is activated on the device.

This group object is enabled if the Enabled option has been selected for the Manual operation parameter in the Manual operation parameter window.

This group object activates or deactivates manual operation.

If the device is in the manual mode, manual operation is deactivated again as soon as the value 0 is received.

Table 44: Group objects, General
### 8.3 Group objects, Channel - General

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Forced operation 2 bit</td>
<td>Channel A - General</td>
<td>2 bit</td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Forced operation 2 bit option has been selected for the Use forced operation parameter in the Monitoring and safety parameter window. This group object activates and deactivates forced operation.

Telegram value:

- Bit 1 | Bit 0: Status of forced operation:
  - 0 | 0: Forced operation inactive
  - 0 | 1: Forced operation inactive
  - 1 | 0: Forced operation active; state OFF
  - 1 | 1: Forced operation active; state ON

| 11   | Forced operation 1 bit        | Channel A - General| 1 bit     |       |

This group object is enabled if the Forced operation 1 bit; 0 active or Forced operation 1 bit; 1 active option has been selected for the parameter Use forced operation in the Monitoring and safety parameter window. This group object activates and deactivates forced operation. Depending on the selected option, forced operation is activated with a 1 or 0 and deactivated with a 0 or 1.

| 12   | Error: heating/cooling receipt| Channel A - General| 1 bit     |       |

This group object is enabled if the Activated option has been selected for the Monitor receipt of heating/cooling changeover group object parameter in the Monitoring and safety parameter window. This group object changes to the value 1 if the parameterized monitoring time has elapsed without the receipt of a value via the group object. The status changes back to 0 when the group object is received again. The group object is sent on each state change (0 > 1 or 1 > 0).

| 13   | Error: setpoint receipt       | Channel A - General| 1 bit     |       |

This group object is enabled if the Activated option has been selected for the Monitor receipt of setpoint temperature group object parameter in the Monitoring and safety parameter window. If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled.

Telegram value:

- 1: Error/object not received
- 0: No error/object received
<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Error: control value receipt</td>
<td>Channel A - General</td>
<td>1 bit DPT 1.002</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Activated option has been selected for the Monitor receipt of group object &quot;Control value&quot; parameter in the Monitoring and safety parameter window. If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled. Telegram value: 1: Error/object not received 0: No error/object received</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Error: pump error receipt</td>
<td>Channel A - General</td>
<td>1 bit DPT 1.002</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Activated option has been selected for the Monitor receipt of pump error group object parameter in the Monitoring and safety parameter window. If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled. Telegram value: 1: Error/object not received 0: No error/object received</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Error: repair switch receipt</td>
<td>Channel A - General</td>
<td>1 bit DPT 1.002</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Activated option has been selected for the Monitor receipt of pump repair mode group object parameter in the Monitoring and safety parameter window. If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled. Telegram value: 1: Error/object not received 0: No error/object received</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ABB i-bus® KNX

**Group objects**

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Status byte channel</td>
<td>Channel A - General</td>
<td>1 byte</td>
<td>Non DPT</td>
</tr>
</tbody>
</table>

This group object is always enabled and indicates the current device state. It indicates whether the device is working normally or whether manual override is in effect.

This group object maps the following information:

- **Bit 0: Manual pump override**
  - The pump has been overridden manually via a group object
  - 0: Manual override inactive
  - 1: Manual override active

- **Bit 1: Forced operation**
  - Forced operation has been activated.
  - 0: Forced operation inactive
  - 1: Forced operation active

- **Bit 2: Manual override**
  - The valve has been overridden manually via a group object.
  - 0: Manual override inactive
  - 1: Manual override active

- **Bit 3: Direct operation/membrane keypad**
  - Manual operation via the device's membrane keypad is active
  - This option is available only for devices with membrane keypad
  - 0: Manual operation inactive
  - 1: Manual operation active

- **Bit 4: Safety mode**
  - The device is in the safety mode, e.g. due to temperature value or control value failure;
  - a pre-defined control value (see [Cyclical monitoring](#)) applies.

### Note

The device is also in safety mode after booting up if it is in the controller mode because the controller has not yet received a valid temperature value.

This aspect does not depend on whether cyclic monitoring was activated for the temperature.

The device is operating normally when the group object value is 0 (= all individual bits = 0).
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>Forced operation 2 bit</td>
<td>Channel B - General</td>
<td>2 bit DPT 2.001</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is enabled if the Forced operation 2 bit option has been selected for the Use forced operation parameter in the Monitoring and safety parameter window. This group object activates and deactivates forced operation. 

Telegram value:
(Bit 1 | Bit 0: Status of forced operation):
- 0 | 0: Forced operation inactive
- 0 | 1: Forced operation inactive
- 1 | 0: Forced operation active; state OFF
- 1 | 1: Forced operation active; state ON

| 102 | Forced operation 1 bit | Channel B - General | 1 bit DPT 1.002 | C, W |

This group object is enabled if the Forced operation 1 bit; 0 active or Forced operation 1 bit; 1 active option has been selected for the parameter Use forced operation in the Monitoring and safety parameter window. This group object activates and deactivates forced operation. Depending on the selected option, forced operation is activated with a 1 or 0 and deactivated with a 0 or 1.

| 103 | Error: heating/cooling receipt | Channel B - General | 1 bit DPT 1.002 | C, R, T |

This group object is enabled if the Activated option has been selected for the Monitor receipt of heating/cooling changeover group object parameter in the Monitoring and safety parameter window. This group object changes to the value 1 if the parameterized monitoring time has elapsed without the receipt of a value via the group object. The status changes back to 0 when the group object is received again. The group object is sent on each state change (0 > 1 or 1 > 0).

| 104 | Error: setpoint receipt | Channel B - General | 1 bit DPT 1.002 | C, R, T |

This group object is enabled if the Activated option has been selected for the Monitor receipt of setpoint temperature group object parameter in the Monitoring and safety parameter window. If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled. 

Telegram value:
1: Error/object not received
0: No error/object received
<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>Error: control value receipt</td>
<td>Channel B - General</td>
<td>1 bit DPT 1.002</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Activated option has been selected for the Monitor receipt of group object "Control value" parameter in the Monitoring and safety parameter window.

If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled.

Telegram value:
1: Error/object not received
0: No error/object received

| 106 | Error: pump error receipt        | Channel B - General   | 1 bit DPT 1.002 | C, R, T |

This group object is enabled if the Activated option has been selected for the Monitor receipt of pump error group object parameter in the Monitoring and safety parameter window.

If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled.

Telegram value:
1: Error/object not received
0: No error/object received

| 107 | Error: repair switch receipt     | Channel B - General   | 1 bit DPT 1.002 | C, R, T |

This group object is enabled if the Activated option has been selected for the Monitor receipt of pump repair mode group object parameter in the Monitoring and safety parameter window.

If the group object is not received in the time parameterized there, a change is made to the error state and in this way the failure to receive the group object signaled.

Telegram value:
1: Error/object not received
0: No error/object received
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>108</td>
<td>Status byte channel</td>
<td>Channel A - General</td>
<td>1 byte</td>
<td>Non DPT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bit 0: Manual pump override</th>
<th>The pump has been overridden manually via a group object</th>
</tr>
</thead>
<tbody>
<tr>
<td>0: Manual override inactive</td>
<td>- 1: Manual override active</td>
</tr>
<tr>
<td>Bit 1: Forced operation</td>
<td>Forced operation has been activated.</td>
</tr>
<tr>
<td>0: Forced operation inactive</td>
<td>- 1: Forced operation active</td>
</tr>
<tr>
<td>Bit 2: Manual override</td>
<td>The valve has been overridden manually via a group object.</td>
</tr>
<tr>
<td>0: Manual override inactive</td>
<td>- 1: Manual override active</td>
</tr>
<tr>
<td>Bit 3: Direct operation/membrane keypad</td>
<td>Manual operation via the device's membrane keypad is active</td>
</tr>
<tr>
<td>0: Manual operation inactive</td>
<td>- 1: Manual operation active</td>
</tr>
<tr>
<td>Bit 4: Safety mode</td>
<td>The device is in the safety mode, e.g. due to temperature value or control value failure; a pre-defined control value (see Cyclical monitoring parameter) applies.</td>
</tr>
</tbody>
</table>

### Note

The device is also in safety mode after booting up if it is in the controller mode because the controller has not yet received a valid temperature value. This aspect does not depend on whether cyclic monitoring was activated for the temperature.

The device is operating normally when the group object value is 0 (= all individual bits = 0).

---

Table 45: Group objects, Channel - General
# Group objects, Valve

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Status byte valve B/C</td>
<td>Channel A - Valve B/C</td>
<td>1 byte</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>Status byte valve B</td>
<td>Channel A - Valve B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the valve output.

This group object indicates the current valve status.

- **Bit 0:** Setpoint received/control value received
  - This bit indicates whether or not the valve has received a valid control value.
  - 0: Setpoint/control value received
  - 1: Setpoint/control value not received

**Note**

This bit retains the value 0 during the entire run time if cyclical monitoring is not used (for the heating setpoint temperature/cooling setpoint temperature in controller mode or for the control value in actuator mode), because no cycle time has been defined during which a new value must be received.

- **Bit 1:** Output error
  - The bit indicates whether there is an error on the valve output. This may be a short circuit or overload.
  - 0: No error
  - 1: Error at output

- **Bit 2:** Forced operation
  - Indicates whether forced operation is active or not.
  - 0: Forced operation inactive
  - 1: Forced operation active

- **Bit 3:** Valve purge
  - The bit indicates whether or not valve purge is active.
  - 0: Valve purge inactive
  - 1: Valve purge active

| 19  | Status control value B/C       | Channel A - Valve B/C       | 1 byte            | C, R, T |
|     | Status control value B         | Channel A - Valve B         | DPT 5.001         |       |

This group object is enabled if the Deactivated option has not been selected for the valve output.

This group object indicates the current valve control value as a value from 0…100 %.
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
</table>
| 20  | Fault: valve output B/C  
Fault: valve output B | Channel A - Valve B/C  
Channel A - Valve B | 1 bit  
DPT 1.002 | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the valve output. If there is a fault on the output, e.g. due to short circuit or overload, the “Open” LED for the valve output flashes. At the same time the group object sends a telegram with the value 1. The output is switched off in the event of a fault. The group object has the value 0 after the fault has been rectified.

**Note**

Indication by LED only on devices with manual operation.

| 21  | Status valve purge B/C  
Status valve purge B | Channel A - Valve B/C  
Channel A - Valve B | 1 bit  
DPT 1.011 | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the Valve purge parameter in the Valve output B/C parameter window. The status of the valve purge is displayed via this group object. The status is sent depending on the option selected in the Send group object “Status valve purge” parameter.

Telegram value:
- 1: Valve purge active
- 0: Valve purge inactive

| 22  | Reset fault on valve output B/C  
Reset fault on valve output B | Channel A - Valve B/C  
Channel A - Valve B | 1 bit  
DPT 1.015 | C, W |

If there is an active fault on the valve output, a reset can be performed with the telegram value 1 via this group object. A reset is only successful if the fault has been repaired and is no longer present. The LED turns off after it is successfully reset. The fault can also be reset by restarting, ETS download, or by an ETS reset. The device can be restarted by disconnecting and reconnecting the bus voltage.

**Note**

Indication by LED only on devices with manual operation.
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td><strong>Activate valve purge B/C</strong>&lt;br&gt;<strong>Activate valve purge B</strong></td>
<td>Channel A - Valve B/C&lt;br&gt;Channel A - Valve B</td>
<td>1 bit&lt;br&gt;DPT 1.017</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is enabled if the **Deactivated** option has not been selected for the **Valve purge parameter** in the **Valve output B/C parameter window**.

A valve purge can be initiated using this group object.

**Note**

A valve purge not undertaken due to a higher priority will no longer be undertaken.

| 24  | **Enable/disable manual valve override B/C**<br>**Enable/disable manual override valve B** | Channel A - Valve B/C<br>Channel A - Valve B | 1 bit<br>DPT 1.003 | C, W |

This group object is enabled if the **Yes** option has been selected for the **Enable manual valve override parameter**.

If manual valve override is enabled, the value in the **Override valve control value** group object is written directly to the valve output. The value specified by the controller, or specified via a **Control value group object** in actuator mode, is overridden.

**Telegram value:**
- 1: Manual override enabled
- 0: Manual override disabled

When a 0 is received via this group object, manual override is immediately disabled and the value specified by the controller, or specified via the **Control value group object** in actuator mode, applies again.

| 25  | **Override valve control value B/C**<br>**Override valve control value B** | Channel A - Valve B/C<br>Channel A - Valve B | 1 byte<br>DPT 5.001 | C, W |

This group object is enabled if the **Yes** option has been selected for the **Enable manual valve override parameter**.

This group object can send a manual valve control value for overriding the valve, e.g. for test purposes.

The value of this group object becomes active only if the override has been enabled by the **Enable/disable manual override valve group object**. A disable via this group object immediately cancels the value overridden.
<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>109</td>
<td>Status byte valve E/F</td>
<td>Channel B - Valve E/F</td>
<td>1 byte</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the valve output. This group object indicates the current valve status.

- Bit 0: Setpoint received/control value received
  - 0: Setpoint/control value received
  - 1: Setpoint/control value not received

**Note**
This bit retains the value 0 during the entire run time if cyclical monitoring is not used (for the heating setpoint temperature/cooling setpoint temperature in controller mode or for the control value in actuator mode), because no cycle time has been defined during which a new value must be received.

- Bit 1: Output error
  - 0: No error
  - 1: Error at output

- Bit 2: Forced operation
  - 0: Forced operation inactive
  - 1: Forced operation active

- Bit 3: Valve purge
  - 0: Valve purge inactive
  - 1: Valve purge active

<table>
<thead>
<tr>
<th>110</th>
<th>Status valve E/F control value</th>
<th>Channel B - Valve E/F</th>
<th>1 byte</th>
<th>C, R, T</th>
</tr>
</thead>
</table>

This group object is enabled if the Deactivated option has not been selected for the valve output. This group object indicates the current valve control value as a value from 0…100 %.
### ABB i-bus® KNX

**Group objects**

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Fault: valve output E/F</td>
<td>Channel B - Valve E/F</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the valve output.

If there is a fault on the output, e.g. due to short circuit or overload, the "Open" LED for the valve output flashes. At the same time the group object sends a telegram with the value 1.

The output is switched off in the event of a fault.

The group object has the value 0 after the fault has been rectified.

**Note**

Indication by LED only on devices with manual operation.

| 112 | Status valve purge E/F | Channel B - Valve E/F | 1 bit | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the Valve purge parameter in the Valve output E/F parameter window.

The status of the valve purge is displayed via this group object.

The status is sent depending on the option selected in the Send group object "Status valve purge" parameter.

Telegram value:

- **1**: Valve purge active
- **0**: Valve purge inactive

| 113 | Reset fault on valve output E/F | Channel B - Valve E/F | 1 bit | C, W |

If there is an active fault on the valve output, a reset can be performed with the telegram value 1 via this group object.

A reset is only successful if the fault has been repaired and is no longer present.

The LED turns off after it is successfully reset.

The fault can also be reset by restarting, ETS download, or by an ETS reset.

The device can be restarted by disconnecting and reconnecting the bus voltage.

**Note**

Indication by LED only on devices with manual operation.
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>114</td>
<td>Activate valve purge E/F</td>
<td>Channel B - Valve E/F</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>DPT 1.017</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the Valve purge parameter in the Valve output E/F parameter window.

A valve purge can be initiated using this group object.

**Note**

A valve purge not undertaken due to a higher priority will no longer be undertaken.

<table>
<thead>
<tr>
<th>115</th>
<th>Enable/disable manual override valve E/F</th>
<th>Channel B - Valve E/F</th>
<th>1 bit</th>
<th>C, W</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DPT 1.003</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Enable manual valve override parameter.

If manual valve override is enabled, the value in the Override valve control value group object is written directly to the valve output. The value specified by the controller, or specified via a Control value group object in actuator mode, is overridden.

**Telegram value:**

1: Manual override enabled
0: Manual override disabled

When a 0 is received via this group object, manual override is immediately disabled and the value specified by the controller, or specified via the Control value group object in actuator mode, applies again.

<table>
<thead>
<tr>
<th>116</th>
<th>Override valve control value E/F</th>
<th>Channel B - Valve E/F</th>
<th>1 byte</th>
<th>C, W</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DPT 5.001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Enable manual valve override parameter.

This group object can send a manual valve control value for overriding the valve, e.g. for test purposes.

The value of this group object becomes active only if the override has been enabled by the Enable/disable manual override valve group object. A disable via this group object immediately cancels the value overridden.

*Table 46: Group objects, Valve*
## Group objects, Pump

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>Override pump</td>
<td>Channel A – Pump</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DPT 1.001</td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Activate manual pump override via group object parameter in the Pump parameter window.

The pump can be switched on and off using this group object if override is active. The device only reacts to this object if the override has been enabled via the Pump overdrive via KNX (deactivate/activate) group object.

Telegram value:
1: Switches on the pump
0: Switches off the pump

| 28  | Status pump relay   | Channel A – Pump      | 1 bit     | C, R, T|
|-----|---------------------|                       | DPT 1.001 |       |

This group object indicates the status of the pump relay. This status provides information on whether the device has switched on or off the pump.

**Note**

Caution! The status of this group object does not reliably indicate whether the pump is active or inactive, instead only whether it has been switched on or off. To acquire the state of the pump reliably, the pump must be polled, e.g. using a floating contact.

Telegram value:
1: Pump relay closed
0: Pump relay open

| 30  | Pump error input    | Channel A – Pump      | 1 bit     | C, W  |
|-----|---------------------|                       | DPT 1.005 |       |

This group object is enabled if the Via group object option has been selected for the Monitor pump error parameter in the Pump parameter window.

The fault state of the pump can be received via this group object and evaluated by the device. If the pump is switched on and the fault status of the pump changes to active, the pump is shut down immediately. If the pump is switched off, but the fault status is active, the pump cannot be switched on.

Telegram value:
1: Pump fault active
0: Pump fault inactive
ABB i-bus® KNX
Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>31</td>
<td>Pump repair switch input</td>
<td>Channel A – Pump</td>
<td>1 bit</td>
<td>DPT 1.011</td>
</tr>
<tr>
<td>32</td>
<td>Status pump master/slave (1=Master; 0=Slave)</td>
<td>Channel A – Pump</td>
<td>1 bit</td>
<td>DPT 1.011</td>
</tr>
<tr>
<td>33</td>
<td>Pump overdrive via KNX (deactivate/activate)</td>
<td>Channel A – Pump</td>
<td>1 bit</td>
<td>DPT 1.003</td>
</tr>
</tbody>
</table>

This group object is enabled if the Via group object option has been selected for the Monitor pump repair switch parameter in the Pump parameter window.

The status of the repair switch for the pump can be received via this group object and evaluated by the device. If the pump is switched on and the status of the repair switch does not change to the operational state active, the pump is shut down again because the repair switch shuts down the supply to the pump. If the pump is switched off, but the repair switch is active, the pump cannot be switched on.

Telegram value:
1: Repair switch active
0: Repair switch inactive

This group object is enabled if the Yes option has been selected for the Channel bundling for double pumps parameter in the General parameter window.

This group object indicates whether the pump is currently the active pump (main pump), or the inactive pump (backup pump).

Telegram value:
1: Pump is the active pump (main pump/master)
0: Pump is the inactive pump (backup pump/slave)

This group object is enabled if the Yes option has been selected for the Activate manual pump override via group object parameter in the Pump parameter window.

This group object can be used to enable or deactivate pump override via KNX.

Telegram value:
1: Pump override is enabled
0: Pump override is disabled/ended
## ABB i-bus® KNX
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>Status pump automatic</td>
<td>Channel A – Pump</td>
<td>1 bit DPT 1.011</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the *Activate manual pump override via group object* parameter in the *Pump parameter window*.

This group object indicated whether the pump has been overridden, or whether it is in the automatic mode.

Telegram value:
- 1: Pump is in the automatic mode
- 0: Pump is overridden

**Note**

The status of this group object is dependent on whether the pump has been overridden via the *Override pump* group object; not whether the override has been enabled or disabled via *Pump overdrive via KNX (deactivate/activate)*.

<table>
<thead>
<tr>
<th>35</th>
<th>Time</th>
<th>Channel A – Pump</th>
<th>3 bytes DPT 10.001</th>
<th>C, W</th>
</tr>
</thead>
</table>

This group object is enabled if the Yes option has been selected for the *Channel bundling for double pumps* parameter in the *General parameter window*, and the *Change weekly* option has been selected for the *Operating mode pump channel A* parameter in the *Pump parameter window*.

This group object is used to receive the time to determine the correct time for changing over between the active and inactive pump.

<table>
<thead>
<tr>
<th>36</th>
<th>Master/slave changeover</th>
<th>Channel A – Pump</th>
<th>1 bit DPT 1.017</th>
<th>C, W</th>
</tr>
</thead>
</table>

This group object is enabled if the Yes option has been selected for the *Channel bundling for double pumps* parameter in the *General parameter window*.

A change between the master/main pump and the slave/backup pump can be triggered using this group object. Master pump and slave pump change roles on triggering.

Telegram value:
- 1: A change between master and slave is triggered
- 0: A change between master and slave is triggered
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>118</td>
<td>Override pump</td>
<td>Channel B – Pump</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DPT 1.001</td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Activate manual pump override via group object parameter in the Pump parameter window.

The pump can be switched on and off using this group object if override is active. The device only reacts to this group object if the override has been enabled via the Pump overdrive via KNX (deactivate/activate) group object.

Telegram value:
- 1: Switches on the pump
- 0: Switches off the pump

<table>
<thead>
<tr>
<th>119</th>
<th>Status pump relay</th>
<th>Channel B – Pump</th>
<th>1 bit</th>
<th>C, R, T</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>DPT 1.001</td>
<td></td>
</tr>
</tbody>
</table>

This group object indicates the status of the pump relay. This status provides information on whether the device has switched on or off the pump.

**Note**

Caution! The status of this group object does not reliably indicate whether the pump is active or inactive, instead only whether it has been switched on or off. To acquire the state of the pump reliably, the pump must be polled, e.g. using a floating contact.

Telegram value:
- 1: Pump relay closed
- 0: Pump relay open

<table>
<thead>
<tr>
<th>121</th>
<th>Pump error input</th>
<th>Channel B – Pump</th>
<th>1 bit</th>
<th>C, W</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>DPT 1.005</td>
<td></td>
</tr>
</tbody>
</table>

This group object is enabled if the Via group object option has been selected for the Monitor pump error parameter in the Pump parameter window.

The fault state of the pump can be received via this group object and evaluated by the device. If the pump is switched on and the fault status of the pump changes to active, the pump is shut down immediately. If the pump is switched off, but the fault status is active, the pump cannot be switched on.

Telegram value:
- 1: Pump fault active
- 0: Pump fault inactive
## Table 47: Group objects, Pump

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>Pump repair switch input</td>
<td>Channel B – Pump</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Via group object option has been selected for the Monitor pump repair switch parameter in the Pump parameter window. The status of the repair switch for the pump can be received via this group object and evaluated by the device. If the pump is switched on and the status of the repair switch does not change to the operational state active, the pump is shut down again because the repair switch shuts down the supply to the pump. If the pump is switched off, but the repair switch is active, the pump cannot be switched on. Telegram value: 1: Repair switch active 0: Repair switch inactive.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>123</td>
<td>Status pump master/slave (1=Master; 0=Slave)</td>
<td>Channel B – Pump</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Yes option has been selected for the Channel bundling for double pumps parameter in the General parameter window. This group object indicates whether the pump is currently the active pump (main pump), or the inactive pump (backup pump). Telegram value: 1: Pump is the active pump (main pump/master) 0: Pump is the inactive pump (backup pump/slave)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>124</td>
<td>Pump overdrive via KNX (deactivate/activate)</td>
<td>Channel B – Pump</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Yes option has been selected for the Activate manual pump override via group object parameter in the Pump parameter window. This group object can be used to enable or deactivate pump override via KNX. Telegram value: 1: Pump override is enabled 0: Pump override is disabled/ended</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>Status pump automatic</td>
<td>Channel B – Pump</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Yes option has been selected for the Activate manual pump override via group object parameter in the Pump parameter window. This group object indicated whether the pump has been overridden, or whether it is in the automatic mode. Telegram value: 1: Pump is in the automatic mode 0: Pump is overridden</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The status of this group object is dependent on whether the pump has been overridden via the Override pump group object; not whether the override has been enabled or disabled via Pump overdrive via KNX (deactivate/activate).
### 8.6 Group objects, Inputs

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>37</td>
<td>Supply flow temperature</td>
<td>Channel A – Input a</td>
<td>2 bytes</td>
<td>DPT 9.001</td>
</tr>
<tr>
<td>38</td>
<td>Sensor error</td>
<td>Channel A – Input a</td>
<td>1 bit</td>
<td>DPT 1.005</td>
</tr>
<tr>
<td>39</td>
<td>Return flow temperature</td>
<td>Channel A – Input b</td>
<td>2 bytes</td>
<td>DPT 9.001</td>
</tr>
<tr>
<td>40</td>
<td>Sensor error</td>
<td>Channel A – Input b</td>
<td>1 bit</td>
<td>DPT 1.005</td>
</tr>
<tr>
<td>41</td>
<td>Pump operating state</td>
<td>Channel A – Input c</td>
<td>1 bit</td>
<td>DPT 1.011</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the a: Supply flow temperature parameter window, the Temperature sensor option has been selected for the Use temperature input parameter.

This group object changes its status to 1 if a fault (open circuit or short circuit) is found on the input and it is therefore no longer possible to send measured values.

This group object indicates the pump operating status polled on a floating contact on the pump.

**Telegram value:**
- 1: Pump operating contact closed/pump is running
- 0: Pump operating contact open/pump is not running

This group object is enabled if, in the c: Binary input parameter window, the As binary signal input option has been selected for the Use input parameter.

Depending on the selected parametrization, this group object indicates the contact position on the binary sensor connected to the input.
## ABB i-bus® KNX

### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>Disable input</td>
<td>Channel A – Binary input C</td>
<td>1 bit</td>
<td>DPT 1.003</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the c: Binary input parameter window, the As binary signal input option has been selected for the Use input parameter.

The physical input is enabled or disabled via this group object.

**Note**

If the input is disabled, there is fundamentally no reaction to a signal change on the input, but:

- Waiting for a long button push or a minimum signal duration is terminated.
- Parameterized cyclic transmission is not interrupted.
- The Switch group object can still be written.

If the input state changed during the disabled phase, the new group object value is sent immediately after enabling. If the input state remains the same during the disabled phase, the group object value is not sent.

Telegram value:

1: Disable input a
0: Enable input a

<table>
<thead>
<tr>
<th>43</th>
<th>Pump fault alarm</th>
<th>Channel A – Binary input D</th>
<th>1 bit</th>
<th>DPT 1.005</th>
<th>C, R, T</th>
</tr>
</thead>
</table>

This group object is enabled if the Via physical device input option has been selected for the Monitor pump error parameter in the Pump parameter window.

This group object indicates the pump fault status polled on a floating contact on the pump.

Telegram value:

1: Pump fault contact closed/fault
0: Pump fault contact open/no fault

<table>
<thead>
<tr>
<th>43</th>
<th>Switch</th>
<th>Channel A – Binary input D</th>
<th>1 bit</th>
<th>DPT 1.001</th>
<th>C, R, T</th>
</tr>
</thead>
</table>

This group object is enabled if, in the d: Binary input parameter window, the As binary signal input option has been selected for the Use input parameter.

Depending on the selected parametrization, this group object indicates the contact position on the binary sensor connected to the input.
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>Disable input</td>
<td>Channel A – Binary input d</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td>45</td>
<td>Pump repair switch</td>
<td>Channel A – Binary input e</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td>45</td>
<td>Switch</td>
<td>Channel A – Binary input e</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the *d: Binary input* parameter window, the *As binary signal input* option has been selected for the *Use input* parameter.

The physical input is enabled or disabled via this group object.

**Note**

If the input is disabled, there is fundamentally no reaction to a signal change on the input, but:
- Waiting for a long button push or a minimum signal duration is terminated.
- Parameterized cyclic transmission is not interrupted.
- The Switch group object can still be written.

If the input state changed during the disabled phase, the new group object value is sent immediately after enabling. If the input state remains the same during the disabled phase, the group object value is not sent.

Telegram value:
1: Disable input
0: Enable input

This group object is enabled if the *Via physical device input* option has been selected for the *Monitor pump repair switch* parameter in the *Pump* parameter window.

This group object indicates the repair switch status polled on a floating contact on the repair switch.

Telegram value:
1: Pump repair switch open/pump disconnected
0: Pump repair switch closed/pump in operation

This group object is enabled if, in the *e: Binary input* parameter window, the *As binary signal input* option has been selected for the *Use input* parameter.

Depending on the selected parametrization, this group object indicates the contact position on the binary sensor connected to the input.
ABB i-bus® KNX

Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>Disable input</td>
<td>Channel A – Binary input e</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td>128</td>
<td>Supply flow temperature</td>
<td>Channel B – Input f</td>
<td>2 bytes</td>
<td>C, R, T</td>
</tr>
<tr>
<td>129</td>
<td>Sensor error</td>
<td>Channel B – Input f</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td>130</td>
<td>Return flow temperature</td>
<td>Channel B – Input g</td>
<td>2 bytes</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the e: Binary input parameter window, the As binary signal input option has been selected for the Use input parameter.

The physical input is enabled or disabled via this group object.

**Note**

If the input is disabled, there is fundamentally no reaction to a signal change on the input, but:
- Waiting for a long button push or a minimum signal duration is terminated.
- Parameterized cyclic transmission is not interrupted.
- The Switch group object can still be written.

If the input state changed during the disabled phase, the new group object value is sent immediately after enabling. If the input state remains the same during the disabled phase, the group object value is not sent.

Telegram value:
1: Disable input
0: Enable input

This group object is enabled if, in the f: Supply flow temperature parameter window, the Temperature sensor option has been selected for the Use temperature input parameter.

The temperature value measured on the input is sent on the bus using this group object depending on the reaction parameterized in the Send temperature value parameter.

This group object is enabled if, in the f: Supply flow temperature parameter window, the Temperature sensor option has been selected for the Use temperature input parameter.

This group object changes its status to 1 if a fault (open circuit or short circuit) is found on the input and it is therefore no longer possible to send measured values.

If there is no fault on the input, this group object value is 0.

This group object is enabled if, in the g: Return flow temperature parameter window, the Temperature sensor option has been selected for the Use temperature input parameter.

The temperature value measured on the input is sent on the bus using this group object depending on the reaction parameterized in the Send temperature value parameter.
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>131</td>
<td>Sensor error</td>
<td>Channel B – Input g</td>
<td>1 bit DPT 1.005</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This group object is enabled if, in the ( g ): Return flow temperature parameter window, the Temperature sensor option has been selected for the Use temperature input parameter. This group object changes its status to 1 if a fault (open circuit or short circuit) is found on the input and it is therefore no longer possible to send measured values. If there is no fault on the input, this group object value is 0.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>Pump operating state</td>
<td>Channel B – Binary input h</td>
<td>1 bit DPT 1.011</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This group object is enabled if the Via physical device input option has been selected for the Monitor pump status parameter in the Pump parameter window. This group object indicates the pump operating status polled on a floating contact on the pump. Telegram value: 1: Pump operating contact closed/pump is running 0: Pump operating contact open/pump is not running</td>
<td></td>
<td></td>
</tr>
<tr>
<td>132</td>
<td>Switch</td>
<td>Channel B – Binary input h</td>
<td>1 bit DPT 1.001</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This group object is enabled if, in the ( h ): Binary input parameter window, the As binary signal input option has been selected for the Use input parameter. Depending on the selected parametrization, this group object indicates the contact position on the binary sensor connected to the input.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>Disable input</td>
<td>Channel B – Binary input h</td>
<td>1 bit DPT 1.003</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This group object is enabled if, in the ( h ): Binary input parameter window, the As binary signal input option has been selected for the Use input parameter. The physical input is enabled or disabled via this group object. Note: If the input is disabled, there is fundamentally no reaction to a signal change on the input, but: • Waiting for a long button push or a minimum signal duration is terminated. • Parameterized cyclic transmission is not interrupted. • The Switch group object can still be written. If the input state changed during the disabled phase, the new group object value is sent immediately after enabling. If the input state remains the same during the disabled phase, the group object value is not sent.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Telegram value: 1: Disable input a 0: Enable input a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>134</td>
<td>Pump fault alarm</td>
<td>Channel B – Binary input i</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the <em>Via physical device input</em> option has been selected for the <em>Monitor pump error</em> parameter in the <em>Pump</em> parameter window. This group object indicates the pump fault status polled on a floating contact on the pump. Telegram value: 1: Pump fault contact closed/fault 0: Pump fault contact open/no fault</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>134</td>
<td>Switch</td>
<td>Channel B – Binary input i</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if, in the <em>i: Binary input</em> parameter window, the <em>As binary signal input</em> option has been selected for the <em>Use input</em> parameter. Depending on the selected parametrization, this group object indicates the contact position on the binary sensor connected to the input.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>Disable input</td>
<td>Channel B – Binary input i</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if, in the <em>i: Binary input</em> parameter window, the <em>As binary signal input</em> option has been selected for the <em>Use input</em> parameter. The physical input is enabled or disabled via this group object. <strong>Note</strong> If the input is disabled, there is fundamentally no reaction to a signal change on the input, but: • Waiting for a long button push or a minimum signal duration is terminated. • Parameterized cyclic transmission is not interrupted. • The Switch group object can still be written. If the input state changed during the disabled phase, the new group object value is sent immediately after enabling. If the input state remains the same during the disabled phase, the group object value is not sent. Telegram value: 1: Disable input a 0: Enable input a</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>136</td>
<td>Pump repair switch</td>
<td>Channel B – Binary input j</td>
<td>1 bit DPT 1.011</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Via physical device input option has been selected for the Monitor pump repair switch parameter in the Pump parameter window.

This group object indicates the repair switch status polled on a floating contact on the repair switch.

Telegram value:
- 1: Pump repair switch open/pump disconnected
- 0: Pump repair switch closed/pump in operation

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>136</td>
<td>Switch</td>
<td>Channel B – Binary input j</td>
<td>1 bit DPT 1.001</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the j: Binary input parameter window, the As binary signal input option has been selected for the Use input parameter.

Depending on the selected parametrization, this group object indicates the contact position on the binary sensor connected to the input.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>137</td>
<td>Disable input</td>
<td>Channel B – Binary input j</td>
<td>1 bit DPT 1.003</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the j: Binary input parameter window, the As binary signal input option has been selected for the Use input parameter.

The physical input is enabled or disabled via this group object.

**Note**

If the input is disabled, there is fundamentally no reaction to a signal change on the input, but:
- Waiting for a long button push or a minimum signal duration is terminated.
- Parameterized cyclic transmission is not interrupted.
- The Switch group object can still be written.

If the input state changed during the disabled phase, the new group object value is sent immediately after enabling. If the input state remains the same during the disabled phase, the group object value is not sent.

Telegram value:
- 1: Disable input a
- 0: Enable input a

---

Table 48: Group objects, Inputs
8.7 Group objects, Controller

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>Status heating/cooling</td>
<td>Channel A - Controller</td>
<td>1 bit DPT 1.100</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the Controller setting heating and Controller setting cooling parameters in the Application parameters parameter window.

This group object is hidden in actuator mode.

This group object indicates whether the system is currently heating or cooling. Heating/cooling switchover takes place for controlled devices depending on this group object.

Telegram value:
1: Heating
0: Cooling

| 48  | Status heating control value | Channel A - Controller | 1 byte DPT 5.001 | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window.

This group object is hidden in actuator mode.

This group object outputs the control value for heating.

Use of a physical device output for heating:
- The group object contains the control value that the controller uses to actuate the output.
- Actuation of heating only via group object (no internal use):
  - The control value for controlling a different actuator is sent using this group object.

| 50  | Status cooling control value | Channel A - Controller | 1 byte DPT 5.001 | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window.

This group object is hidden in actuator mode.

This group object outputs the control value for cooling.

Use of a physical device output for cooling:
- The group object contains the control value that the controller uses to actuate the output.
- Actuation of the cooling only via group object (no internal use):
  - The control value for controlling a different actuator is sent using this group object.
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>54</td>
<td>Supply flow temperature via KNX</td>
<td>Channel A - Controller</td>
<td>2 bytes DPT 9.001</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if, in the &quot;Supply flow temperature&quot; parameter window, the &quot;Via group object&quot; option has been selected for the &quot;Use temperature input&quot; parameter. This group object cannot be activated in actuator mode. The supply flow actual temperature is received via the KNX bus using this group object; this value is then used as the basis for the control of the supply flow temperature.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note</td>
<td>This group object value is evaluated after the device is restarted.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 56  | Supply flow temperature malfunction         | Channel A - Controller | 1 bit DPT 1.002 | C, R, T |
|     | This group object is enabled if the Deactivated option has not been selected for the Monitor supply flow temperature parameter in the Monitoring and safety parameter window. This group object cannot be activated in actuator mode. If the temperature monitoring time for the input is exceeded, or if a fault is detected on the monitored input, the group object changes the status to 1 to indicate the fault. This group object is sent on every status change. Telegram value: 1: Fault: actual temperature 0: No fault |

| 57  | Current setpoint                             | Channel A - Controller | 2 bytes DPT 9.001 | C, R, T |
|     | This group object is always visible in controller mode. This group object is hidden in actuator mode. This group object outputs the current setpoint temperature. |

| 62  | Status heating                               | Channel A - Controller | 1 bit DPT 1.001 | C, R, T |
|     | This group object is enabled if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window. This group object is hidden in actuator mode. The device indicates via this group object whether it is currently in the "active" type of operation, i.e. whether the control value is greater than 0. Telegram value: 1: Heating control value > 0 0: Heating control value = 0 |
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>63</td>
<td>Status cooling</td>
<td>Channel A - Controller</td>
<td>1 bit DPT 1.001</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window.

This group object is hidden in actuator mode.

The device indicates via this group object whether it is currently in the "active" type of operation, i.e. whether the control value is greater than 0.

Telegram value:
1: Cooling control value > 0
0: Cooling control value = 0

<table>
<thead>
<tr>
<th>64</th>
<th>Activate minimum control value (basic load)</th>
<th>Channel A - Controller</th>
<th>1 bit DPT 1.003</th>
<th>C, W</th>
</tr>
</thead>
</table>

This group object is enabled if the Activate via object option has been selected for the Minimum control value for basic load > 0 parameter in the Temperature controller parameter window.

This group object is hidden in actuator mode.

Sending the value 1 via this group objects activates the basic load.

The basic load is a minimum control value that must not be dropped below. The basic load value can be specified separately for the heating circuit and cooling circuit control.

The basic load is always activated jointly for all stages, but it is active only for the active type of operation heating or cooling in each case.

The control value can decrease to 0 % again when the basic load is inactive.

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

Telegram value:
1: Basic load active
0: Basic load inactive

<table>
<thead>
<tr>
<th>65</th>
<th>Heating/cooling changeover</th>
<th>Channel A - Controller</th>
<th>1 bit DPT 1.100</th>
<th>C, W</th>
</tr>
</thead>
</table>

This group object is enabled if the controller has been parameterized for both heating and for cooling. For this purpose, Deactivated must not be selected for the Controller setting heating and Controller setting cooling parameters in the Application parameters parameter window.

This group object changes between heating and cooling types of operation.

Telegram value:
1: Heating
0: Cooling
<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>73</td>
<td>Control On/Off</td>
<td>Channel A - Controller</td>
<td>1 bit DPT 1.001</td>
<td>C, W</td>
</tr>
<tr>
<td>74</td>
<td>Status control On/Off</td>
<td>Channel A - Controller</td>
<td>1 bit DPT 1.001</td>
<td>C, R, T</td>
</tr>
<tr>
<td>86</td>
<td>Heating setpoint temperature</td>
<td>Channel A - Controller</td>
<td>2 bytes DPT 9.001</td>
<td>C, W</td>
</tr>
<tr>
<td>87</td>
<td>Cooling setpoint temperature</td>
<td>Channel A - Controller</td>
<td>2 bytes DPT 9.001</td>
<td>C, W</td>
</tr>
<tr>
<td>94</td>
<td>Heating control value</td>
<td>Channel A - Actuator</td>
<td>1 byte DPT 5.001</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is always visible in controller mode.
This group object is hidden in actuator mode.

This group object can be switched off using this group object. On the reception of the value 0, the controller changes to the "Inactive mode". This situation causes control to switch off. All control values are set to 0.

Control can be reactivated by sending the value 1 via this group object.

Telegram value:
1: Activate control (On)
0: Deactivate control (Off)

Using this group object the device signals whether control is currently active (On) or inactive (Off).

Telegram value:
1: Control inactive (Off)
0: Control active (On)

This group object is enabled if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window.

Via this group object the controller receives the setpoint temperature for the heating circuit that is then used for control.

This group object is enabled if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window.

Via this group object the controller receives the setpoint temperature for the cooling circuit that is then used for control.

This group object is enabled if the Actuator device option has been selected for the Device function parameter in the Application parameters parameter window.

Via this group object the device receives, if it is operated as an actuator, the control value that is to be used to actuate the valve.
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>Cooling control value</td>
<td>Channel A - Actuator</td>
<td>1 byte DPT 5.001</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is enabled if the Actuator device option has been selected for the Device function parameter in the Application parameters parameter window.

Via this group object the device receives, if it is operated as an actuator, the control value that is to be used to actuate the valve.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>Temperature input safety shutdown heating</td>
<td>Channel A - Controller</td>
<td>2 bytes DPT 9.001</td>
<td>C, W, T, U</td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Enable safety shutdown parameter in the Temperature controller – Heating parameter window, and the Via group object option has been selected for the Temperature input for temperature limit sensor parameter.

This group object is hidden in controller mode.

The limit temperature for heating is received via this group object. The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the Limit temperature parameter is exceeded.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>Temperature input safety shutdown cooling</td>
<td>Channel A - Controller</td>
<td>2 bytes DPT 9.001</td>
<td>C, W, T, U</td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Enable safety shutdown parameter in the Temperature controller – Cooling parameter window, and the Via group object option has been selected for the Temperature input for temperature limit sensor parameter.

This group object is hidden in controller mode.

The limit temperature for cooling is received via this group object. The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the Limit temperature parameter is dropped below.

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Safety shutdown (temperature reached)</td>
<td>Channel A - Controller</td>
<td>1 bit DPT 1.005</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Yes option has been selected for the Enable safety shutdown parameter in the Temperature controller – Heating parameter window or in the Temperature controller – Cooling parameter window.

This group object indicates whether the safety temperature parameterized has been exceeded or dropped below in the currently active type of operation (heating or cooling) and therefore the safety shutdown has been triggered.

Telegram value:
1: Safety shutdown active/triggered
0: Safety shutdown inactive/ not triggered
### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>138</td>
<td>Status heating/cooling</td>
<td>Channel B - Controller</td>
<td>1 bit DPT 1.100</td>
<td>C, R, T</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Deactivated option has not been selected for the Controller setting heating and Controller setting cooling parameters in the Application parameters parameter window. This group object is hidden in actuator mode. This group object indicates whether the system is currently heating or cooling. Heating/cooling switchover takes place for controlled devices depending on this group object. Telegram value: 1: Heating 0: Cooling</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 139 | Status heating control value              | Channel B - Controller | 1 byte DPT 5.001 | C, R, T |
|     | This group object is enabled if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window. This group object is hidden in actuator mode. This group object outputs the control value for heating. Use of a physical device output for heating:  
  - The group object contains the control value that the controller uses to actuate the output. Actuation of heating only via group object (no internal use): The control value for controlling a different actuator is sent using this group object. |

| 141 | Status cooling control value              | Channel B - Controller | 1 byte DPT 5.001 | C, R, T |
|     | This group object is enabled if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window. This group object is hidden in actuator mode. This group object outputs the control value for cooling. Use of a physical device output for cooling:  
  - The group object contains the control value that the controller uses to actuate the output. Actuation of the cooling only via group object (no internal use): The control value for controlling a different actuator is sent using this group object. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>Supply flow temperature via KNX</td>
<td>Channel B - Controller</td>
<td>2 bytes DPT 9.001</td>
<td>C, W</td>
</tr>
</tbody>
</table>

This group object is enabled if, in the a: Supply flow temperature parameter window, the Via group object option has been selected for the Use temperature input parameter. 
This group object cannot be activated in actuator mode. 
The supply flow actual temperature is received via the KNX bus using this group object; this value is then used as the basis for the control of the supply flow temperature.

**Note**
This group object value is evaluated after the device is restarted.

| 147 | Supply flow temperature malfunction | Channel B - Controller | 1 bit DPT 1.002 | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the Monitor supply flow temperature parameter in the Monitoring and safety parameter window. 
This group object cannot be activated in actuator mode. 
If the temperature monitoring time for the input is exceeded, or if a fault is detected on the monitored input, the group object changes the status to 1 to indicate the fault. 
This group object is sent on every status change. 
Telegram value: 1: Fault: actual temperature 
0: No fault

| 148 | Current setpoint | Channel B - Controller | 2 bytes DPT 9.001 | C, R, T |

This group object is always visible in controller mode. 
This group object is hidden in actuator mode. 
This group object outputs the current setpoint temperature.

| 153 | Status heating | Channel B - Controller | 1 bit DPT 1.001 | C, R, T |

This group object is enabled if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window. 
This group object is hidden in actuator mode. 
The device indicates via this group object whether it is currently in the "active" type of operation, i.e. whether the control value is greater than 0. 
Telegram value: 1: Heating control value > 0 
0: Heating control value = 0
### ABB i-bus® KNX
#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>154</td>
<td>Status cooling</td>
<td>Channel B - Controller</td>
<td>1 bit DPT 1.001</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>

This group object is enabled if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window.

This group object is hidden in actuator mode.

The device indicates via this group object whether it is currently in the "active" type of operation, i.e. whether the control value is greater than 0.

Telegram value:
1: Cooling control value > 0
0: Cooling control value = 0

<table>
<thead>
<tr>
<th>155</th>
<th>Activate minimum control value (basic load)</th>
<th>Channel B - Controller</th>
<th>1 bit DPT 1.003</th>
<th>C, W</th>
</tr>
</thead>
</table>

This group object is enabled if the Activate via object option has been selected for the Minimum control value for basic load > 0 parameter in the Temperature controller parameter window.

This group object is hidden in actuator mode.

Sending the value 1 via this group objects activates the basic load.

The basic load is a minimum control value that must not be dropped below. The basic load value can be specified separately for the heating circuit and cooling circuit control.

The basic load is always activated jointly for all stages, but it is active only for the active type of operation heating or cooling in each case.

The control value can decrease to 0 % again when the basic load is inactive.

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

Telegram value:
1: Basic load active
0: Basic load inactive

<table>
<thead>
<tr>
<th>156</th>
<th>Heating/cooling changeover</th>
<th>Channel B - Controller</th>
<th>1 bit DPT 1.100</th>
<th>C, W</th>
</tr>
</thead>
</table>

This group object is enabled if the controller has been parameterized for both heating and for cooling. For this purpose, Deactivated must not be selected for the Controller setting heating and Controller setting cooling parameters in the Application parameters parameter window.

This group object changes between heating and cooling types of operation.

Telegram value:
1: Heating
0: Cooling
### ABB i-bus® KNX

#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>164</td>
<td>Control On/Off</td>
<td>Channel B - Controller</td>
<td>1 bit</td>
<td>C, W</td>
</tr>
<tr>
<td>165</td>
<td>Status control On/Off</td>
<td>Channel B - Controller</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
<tr>
<td>177</td>
<td>Heating setpoint temperature</td>
<td>Channel B - Controller</td>
<td>2 bytes</td>
<td>C, W</td>
</tr>
<tr>
<td>178</td>
<td>Cooling setpoint temperature</td>
<td>Channel B - Controller</td>
<td>2 bytes</td>
<td>C, W</td>
</tr>
<tr>
<td>185</td>
<td>Heating control value</td>
<td>Channel B - Actuator</td>
<td>1 byte</td>
<td>C, W</td>
</tr>
</tbody>
</table>

**164 Control On/Off**
- Channel B - Controller
- Data type: 1 bit
- Flags: C, W

This group object is always visible in controller mode.
- This group object is hidden in actuator mode.
- This controller can be switched off using this group object. On the reception of the value 0, the controller changes to the "Inactive mode". This situation causes control to switch off. All control values are set to 0.
- Control can be reactivated by sending the value 1 via this group object.
- Telegram value:
  - 1: Activate control (On)
  - 0: Deactivate control (Off)

**165 Status control On/Off**
- Channel B - Controller
- Data type: 1 bit
- Flags: C, R, T

This group object is always visible in controller mode.
- This group object is hidden in actuator mode.
- Using this group object the device signals whether control is currently active (On) or inactive (Off).
- Telegram value:
  - 1: Control inactive (Off)
  - 0: Control active (On)

**177 Heating setpoint temperature**
- Channel B - Controller
- Data type: 2 bytes
- Flags: C, W

This group object is enabled if the Deactivated option has not been selected for the Controller setting heating parameter in the Application parameters parameter window.
- Via this group object the controller receives the setpoint temperature for the heating circuit that is then used for control.

**178 Cooling setpoint temperature**
- Channel B - Controller
- Data type: 2 bytes
- Flags: C, W

This group object is enabled if the Deactivated option has not been selected for the Controller setting cooling parameter in the Application parameters parameter window.
- Via this group object the controller receives the setpoint temperature for the cooling circuit that is then used for control.

**185 Heating control value**
- Channel B - Actuator
- Data type: 1 byte
- Flags: C, W

This group object is enabled if the Actuator device option has been selected for the Device function parameter in the Application parameters parameter window.
- Via this group object the device receives, if it is operated as an actuator, the control value that is to be used to actuate the valve.
### ABB i-bus® KNX
#### Group objects

<table>
<thead>
<tr>
<th>No.</th>
<th>Object function</th>
<th>Name</th>
<th>Data type</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>186</td>
<td>Cooling control value</td>
<td>Channel B - Actuator</td>
<td>1 byte</td>
<td>C, W</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Actuator device option has been selected for the Device function parameter in the Application parameters parameter window. Via this group object the device receives, if it is operated as an actuator, the control value that is to be used to actuate the valve.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>187</td>
<td>Temperature input safety shutdown heating</td>
<td>Channel B - Controller</td>
<td>2 bytes</td>
<td>C, W, T, U</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Yes option has been selected for the Enable safety shutdown parameter in the Temperature controller – Heating parameter window, and the Via group object option has been selected for the Temperature input for temperature limit sensor parameter. This group object is hidden in controller mode. The limit temperature for heating is received via this group object. The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the Limit temperature parameter is exceeded.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>189</td>
<td>Temperature input safety shutdown cooling</td>
<td>Channel B - Controller</td>
<td>2 bytes</td>
<td>C, W, T, U</td>
</tr>
<tr>
<td></td>
<td>This group object is enabled if the Yes option has been selected for the Enable safety shutdown parameter in the Temperature controller – Cooling parameter window, and the Via group object option has been selected for the Temperature input for temperature limit sensor parameter. This group object is hidden in controller mode. The limit temperature for cooling is received via this group object. The temperature value received here is used to evaluate the limit temperature. The limit becomes active when the temperature set in the Limit temperature parameter is dropped below.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>191</td>
<td>Safety shutdown (temperature reached)</td>
<td>Channel B - Controller</td>
<td>1 bit</td>
<td>C, R, T</td>
</tr>
</tbody>
</table>
|     | This group object is enabled if the Yes option has been selected for the Enable safety shutdown parameter in the Temperature controller – Heating parameter window or in the Temperature controller – Cooling parameter window. This group object indicates whether the safety temperature parameterized has been exceeded or dropped below in the currently active type of operation (heating or cooling) and therefore the safety shutdown has been triggered. Telegram value:
1: Safety shutdown active/triggered
0: Safety shutdown inactive/ not triggered |

*Table 49: Group objects, Controller*
9 Operation

9.1 Manual operation

Special device functions can be undertaken using the operating keys on the membrane keypad. Operation via the membrane keypad is available and functions identically for all devices HCC/S 2.x.2.1.

For a complete overview of the control elements, see chapter 3.1, Product overview.

Manual operation facilitates on-site operation of the device. Manual operation is enabled as standard and can be switched on and off using the Manual operation button.

Manual operation can be permanently deactivated in ETS. The Status manual operation group object indicates whether manual operation is enabled/disabled.

**Switching on manual operation:**
► Press and hold the Manual operation button for 5 seconds until the yellow LED illuminates continuously.

**Switching off manual operation:**
► Briefly press the Manual operation button.

The yellow LED goes off.

The device is in KNX operation after connection to the KNX, bus voltage recovery, ETS download or ETS reset. The LED is off.

**Note**

If manual operation is generally disabled or disabled via the Enable/disable manual operation group object, the LED remains off. A switchover from KNX operation to the Manual operation type of operation does not occur.

**Note**

The control values calculated by the controller or received via KNX are overridden and ignored during manual operation. Changes due to manual operation are valid only while manual operation is active. The only exception here is the change in the active pump in the double pump mode. If such a change is made via the manual operation, the change remains even after the deactivation of the manual operation. Manual operation cannot override forced operation or a safety state of the device. Any override of the individual functions becomes effective only when they are changed for the first time by pressing a button. Until then, the outputs continue to react to values received from the controller or via KNX.
10  Maintenance and cleaning

10.1  Maintenance

The device is maintenance-free. In the event of damage (e.g. during transport and/or storage), do not carry out any repairs.

10.2  Cleaning

The supply of electrical power to the device must be switched off before cleaning. If devices become dirty, they can be cleaned using a dry cloth or a cloth dampened with a soapy solution. Corrosive agents or solutions must never be used.
11 Disassembly and disposal

11.1 Removal

1. Press on the top of the device.
2. Release the bottom of the device from the DIN rail.
3. Lift the device up and off the DIN rail.

Fig. 33: Removal from the DIN rail
11.2 Environment

Give consideration to the protection of the environment.

Used electrical and electronic devices must not be disposed of as domestic waste.

The device contains valuable raw materials 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 Introduction

In this chapter you will find some tips and application examples for practical use of the device. Application examples and practical tips on the topic of temperature control, valve drives, characteristic curve adjustment etc., can be found in the Application manual Heating/Ventilation/Air-Conditioning at www.abb.com/knx.

12.2 Electromotor valve drives

Electromotor valve drives open and close valves via a small electric motor. Electromotor valve drives are offered as proportional or as 2 or 3-way valve drives.

Proportional valve drives are controlled via an analog signal, e.g. 0…10 V. 2 or 3-point valve drives are controlled via switching of the supply voltage.

3-point valve drives are connected via three connecting cables. The opening and closing wires are connected to terminals A and B. Using 3-point valve drives, the valve can be opened by any desired percentage and this position can be retained without the application of any further energy. If the valve does not move, there is no voltage applied to the motor.
12.3  

Priorities

12.3.1  
Controller mode

Valve
a) Bus voltage failure  
b) Forced operation  
c) i-bus Tool  
d) Direct operation via membrane keypad (only HCC/S 2.x.2.1)  
e) Manual valve override  
f) Normal operation of control  
g) Bus voltage recovery

Pump
a) Safety mode of pump on fault and repair  
b) Bus voltage failure  
c) Forced operation  
d) i-bus Tool  
e) Direct operation via membrane keypad (only HCC/S 2.x.2.1)  
f) Manual pump override  
g) Pump automatic mode (depending on the valve control value)  
h) Bus voltage recovery

12.3.2  
Actuator mode

Valve
a) Bus voltage failure  
b) Forced operation  
c) i-bus Tool  
d) Direct operation via membrane keypad (only HCC/S 2.x.2.1)  
e) Manual valve override  
f) Control value normal mode  
g) Bus voltage recovery

Pump
a) Safety mode of pump on fault and repair  
b) Bus voltage failure  
c) Forced operation  
d) i-bus Tool  
e) Direct operation via membrane keypad (only HCC/S 2.x.2.1)  
f) Manual pump override  
g) Pump automatic mode (depending on the valve control value)  
h) Bus voltage recovery
12.4 PI controller (continuous)

12.4.1 Continuous control

With continuous control, a control value is calculated based on the setpoint temperature and the actual temperature, and is used to set the temperature optimally. The valve is brought to a position corresponding to the calculated control value. With this method the valve can be fully opened, fully closed and even positioned in every intermediate position.

Fig. 34: Continuous control

Continuous control is the most precise form of temperature control. At the same time, the positioning frequency of the valve drive can be kept low. Continuous control can be implemented with the device for electromotor 3-point valve drives. It is implemented via 1-byte actuation.

Note

What is 1-byte actuation?
For 1-byte actuation, a value of 0…255 (corresponds to 0…100 %) is preset by the room thermostat. The valve is fully closed at 0 % and fully open at 100 %, for example.
12.4.2 PI controller (PWM)

The PI controller (PWM) basically operates exactly like the PI controller (continuous). The only difference is that the control value of a PI controller (PWM) is converted into a 1-bit PWM on/off ratio before it is output.

If a control value of 70 % is output and the preset cycle time is 10 minutes, the switch-on time will be 7 minutes and the switch-off time will be 3 minutes.

Using the PI controller (PWM) transfers the advantages offered by continuous control (precise attainment of the setpoint temperature) to drives that are designed only for on/off signals (e.g. electrothermal drives).

The “PWM control value cycle time” is adjustable to optimize the control characteristics of the heating or cooling system. The type of heating or cooling and the valve drive used must be taken into account.

- Electrothermal valve drive:
  Depending on the manufacturer, it takes around 2 to 3 minutes to open a control valve with electrothermal drive. A cycle time of 15 minutes has proven appropriate in practice. Other times must be correspondingly adapted to the heating/cooling system.

- Floor heating:
  The time constant of a floor heater is very large (sluggish). A cycle time of 20 minutes is sufficient.

- Water heating:
  A cycle time of 15 minutes produces excellent control results.

- Electric convector heating:
  Depending on the electric heating and the room situation, cycle times between 10 and 15 minutes are recommended.

12.4.3 PI controller (continuous) for fan coil unit

This controller works the same way as the PI controller (continuous). Additionally however, depending on the control value, the fan output integrated into the device is controlled to be able to control a fan coil unit.
13 Appendix

13.1 Scope of delivery

The heating/cooling circuit controller is supplied together with the following components. The items delivered should be checked against the list below:

- 1 Heating/cooling circuit controller, alternatively:
  - HCC/S 2.1.1.1: Heating/cooling circuit controller, 0…10 V, MDRC
  - HCC/S 2.1.2.1: Heating/cooling circuit controller, 0…10 V, manual operation, MDRC
  - HCC/S 2.2.1.1: Heating/cooling circuit controller, 3-point, MDRC
  - HCC/S 2.2.2.1: Heating/cooling circuit controller, 3-point, manual operation, MDRC
- 1 x installation and operating instructions
- 1 x bus connection terminal (red/black)
- 1 x KNX connection cover cap
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Table 51: Status byte channel
13.4 Notes