KNX eTR gl

Temperature Sensor with integrated PI Control

Item numbers 71300 (white), 71302 (black)

elsner elektronik

Installation and Adjustment

Installation, inspection, commissioning and troubleshooting of the device must only be carried out by a competent electrician.

This manual is amended periodically and will be brought into line with new software releases. The change status (software version and date) can be found in the contents footer. If you have a device with a later software version, please check **www.elsner-elektronik.de** in the menu area "Service" to find out whether a more up-to-date version of the manual is available.

Clarification of signs used in this manual

Safety advice.

Safety advice for working on electrical connections, components, etc.

DANGER! ... indicates an immediately hazardous situation which will lead to death or severe injuries if it is not avoided.

WARNING! ... indicates a potentially hazardous situation which may lead to death or severe injuries if it is not avoided.

CAUTION! ... indicates a potentially hazardous situation which may lead to trivial or minor injuries if it is not avoided.

ATTENTION! ... indicates a situation which may lead to damage to property if it is not avoided.

ETS In the ETS tables, the parameter default settings are marked by underlining.

1. Safety and operating instructions

1.1. Installation notes

Installation, testing, operational start-up and troubleshooting should only be performed by an authorised electrician.

CAUTION!
Live voltage!
There are unprotected live components inside the device.

- Comply with the locally applicable directives, regulations and provisions for electrical installation.
- De-energise all cables to be mounted and take safety precautions against unintentional switch-on.
- Inspect the device for damage before installation. Only put undamaged devices into operation.
- Immediately take the device or system out of service and secure it against unintentional switch-on if risk-free operation is no longer guaranteed.

Use the device exclusively for building automation and observe the operating instructions. Improper use, modifications to the device or failure to observe the operating instructions will invalidate any warranty or guarantee claims.
Operate the device only as a fixed-site installation, i.e. only in assembled condition and after conclusion of all installation and operational start-up tasks, and only in the surroundings designated for it.
Elsner Elektronik is not liable for any changes in norms and standards which may occur after publication of these operating instructions.

2. Description

The **Temperature Sensor KNX eTR gl** measures the room temperature. The indoor sensor can receive an external measured value via the bus and process it with own data to an overall temperature value (mixed value).

The **KNX eTR gl** has a integrated PI controller for a heating/cooling system.

Functions:

- Measurement of **temperature**
- **Mixed values** from own measured value and external values (proportions can be set in percentage)
- **PI controller for heating** (one or two step) and **cooling** (one or two step) depending on temperature. Control according to separate target values or basic target temperature

2.1. Scope of delivery

- Temperature Sensor with mounting
- 4 screw anchors 4 × 20 mm, 4 flat head screws 3 × 25 mm

2.2. Technical data

General:	
Casing	Genuine glass, plastic
Colours	• similar to RAL 9003 signal white • similar to RAL 9005 deep black
Installation	on the wall or on device socket according to DIN 49073
Dimensions	housing approx. 81.5 mm x 81.5 mm (W x H), mounting depth approx. 12 mm
Total weight	approx. 70 g
Ambient temperature	0…+55 °C
Ambient humidity	5...95 % RH, non-condensing
Storage temperature	-30…+85 °C
Overvoltage category	III
Degree of contamination	2
KNX bus:	
Medium	TP1-256
Configuration mode	S-Mode
Group addresses	max. 254
Assignments	max. 254
Communication objects	41
Nominal voltage	30 V ⎓ SELV
Power consumption	maximum 10 mA
Connection Conductor diameter Stripping length	KNX plug terminals 0.6…0.8 mm² s 5 mm
Connection Conductor diameter Stripping length	Spring-loaded terminals • rigid and flexible conductors 0.2...0.75 mm² • flexible conductors with ferrules 0.25...0.34 mm² 7...9 mm
Duration after bus voltage restoration until data is received	approx. 5 seconds
Sensor:	
Temperature measurement range	0…+55 °C
Temperature resolution	0.1 °C

The product conforms with the provisions of EU guidelines.

2.2.1. Accuracy of the measurement

When **measuring temperature**, the self-heating of the device is considered by the electronics. The heating is compensated for in the device.

2.2.2. Device structure

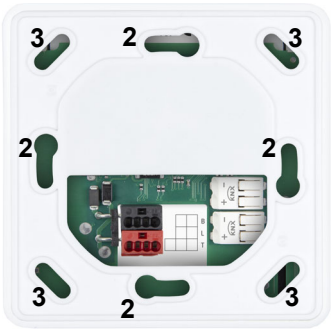


Fig. 1
Back view with mounting
2/3 Screw holes for different sockets. Fastening with 2 screws is sufficient. For wall mounting, use a fixing material suitable for the ground!

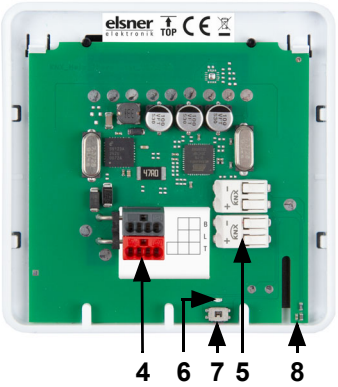


Fig. 2
Back view without mounting
4 KNX bus terminal +/- for connection when mounted on a socket
5 Spring-loaded terminals KNX bus for mounting directly on the wall
6 Programming LED
7 Programming button (recessed) for teaching device
8 Temperature sensor

PRG key is accessible from below/outside when the device is mounted (see chapter Addressing the device).

3. Installation

3.1. Installation location and preparation

The **Temperature Sensor KNX eTR gl** is made for wall mounting. The device can be mounted directly on plaster or on device socket according to DIN 49073 and other sockets, e.g. Swiss device socket.

May be installed and operated in dry interior rooms only.

When selecting an installation location, ensure that the measurement results are affected as little as possible by external influences. Possible sources of interference include:

- Direct sunlight
- Drafts from windows and doors
- Draft from ducts which lead from other rooms or from the outside to the junction box in which the sensor is mounted
- Warming or cooling of the building structure on which the sensor is mounted, e.g. due to sunlight, heating or cold water pipes
- Connection lines and ducts which lead from warmer or colder areas to the sensor

Measurement variations from permanent sources of interference can be corrected in the ETS in order to ensure the specified accuracy of the sensor (offset).

3.2. Mounting

DANGER!
Danger due to electrical voltage (mains voltage)!

- The socket, in which the device is installed, must not contain cabling with 230 V.
- Observe the regulations and standards applicable to SELV circuits during installation and wiring of the KNX connection and inputs.

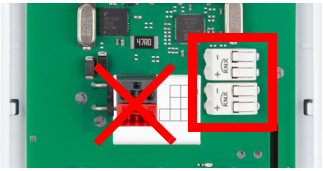
Prepare the device

Remove the front panel from the mounting. Release the lock by moving the front panel a few millimetres upwards. The two parts can then be easily separated (Fig. 3).

Fig. 3 Locking of front panel and mounting

Screw the mounting onto the wall or socket. The connecting wires (bus line +/-) are led through the opening in the mounting.

Installation directly on the wall



Remove the red-black KNX bus terminal, it is not required.

Connect the bus +/- connecting wires to the spring-loaded terminals on the front panel.

The wires are pushed into the connection openings.

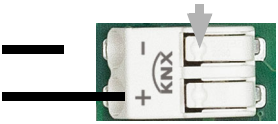
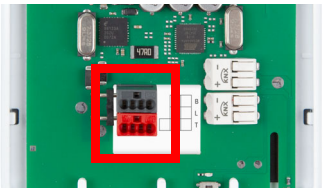


Fig. 4 Spring-loaded terminals

To pull it out, press the spring down, e.g. with a screwdriver.

Installation on a socket



If there is a cavity behind the device, e.g. when using a socket, you can use the red/black KNX bus terminal for connection.

To avoid falsifying the temperature value, use a wind-proof socket and also seal the inlet pipes against draughts.

Finish mounting

Snap the front panel into place on the mounting (see Fig. 3): Place it slightly above the centre position, hook it in and slide it downwards.

The mounting must be installed so that the large opening faces downwards (see Fig. 4). This is necessary for a correct temperature measurement.

4. Notes on mounting and commissioning

Configuration is made using the KNX software as of ETS 5. The **product file** can be downloaded from the ETS online catalogue and the Elsner Elektronik website on **www.elsner-elektronik.de** in the "Service" menu. There you will also find the product manual.

After the bus voltage has been applied, the unit will enter an initialisation phase lasting approx. 5 seconds. During this period, no information can be received or transmitted via the bus.

4.1. Addressing of the device at the bus

The individual address is assigned via the ETS. A button and a control LED are located on the unit for this purpose (Fig. 2, No. 6+7).
The programming button is located at the bottom outer side of the front panel of the device and is recessed. Use a thin object to reach the button, e. g. a 1.5 mm² wire.

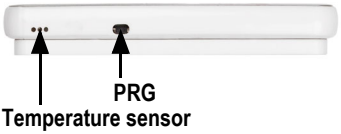


Fig. 5
View from bottom

The equipment is delivered with the bus address 15.15.255. Another address can be programmed using the ETS.

5. Maintenance and care

Fingerprints on the glass panel are best removed with a cloth moistened with water or a microfiber cloth. Do not use an abrasive cleaning agent or aggressive cleansing agents.

6. Disposal

After use, the device must be disposed of or recycled in accordance with the legal regulations. Do not dispose of it with the household waste!

7. Transmission protocol

Units:

Temperatures in degrees Celsius

7.1. List of all communication objects

Abbreviations Flags:

C Communication
R Read
W Write
T Transmit
U Update

No	Text	Function	Flags	DPT type	Size
0	Software version	Output	R-CT	[217.1] DPT_Version	2 Bytes
5	LED brightness in %	Input	-WC-	[5.1] DPT_Scaling	1 Byte
6	Switch LED	Input	-WC-	[1.1] DPT_Switch	1 Bit
7	Temperature sensor: malfunction	Output	R-CT	[1.1] DPT_Switch	1 Bit
8	Temperature sensor: measured value external	Input	-WCT	[9.1] DPT_Value_Temp	2 Bytes
9	Temperature sensor: measured value	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
10	Temperature sensor: measured value total	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
11	Temperature sensor: measured value min./max. query	Input	-WC-	[1.17] DPT_Trigger	1 Bit
12	Temperature sensor: measured value minimum	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
13	Temperature sensor: measured value maximum	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes
14	Temperature sensor: measured value min./max. reset	Input	-WC-	[1.17] DPT_Trigger	1 Bit
15	Temp.control: HVAC mode (priority 1)	Input / Output	-WC-	[20.102] DPT_HVACMode	1 Byte
16	Temp.control: HVAC mode (priority 2)	Input	RWCT	[20.102] DPT_HVACMode	1 Byte
17	Temp.control: Mode frost/heat protection activt.	Input	RWCT	[1.1] DPT_Switch	1 Bit
18	Temp.control: Block (1 = Blocking)	Input	-WC-	[1.1] DPT_Switch	1 Bit
19	Temp.control: Current setpoint	Output	R-CT	[9.1] DPT_Value_Temp	2 Bytes

No	Text	Function	Flags	DPT type	Size
20	Temp.control: Switch. (0: Heating | 1: Cooling)	Input	-WC-	[1.1] DPT_Switch	1 Bit
21	Temp.control: Setpoint Comfort heating	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
22	Temp.control: Setpoint Comfort heat.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
23	Temp.control: Setpoint Comfort cooling	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
24	Temp.control: Setpoint Comfort cool.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
25	Temp.control: Basic 16-bit setpoint shift	Input / Output	RWCT	[9.2] DPT_Value_Tempd	2 Bytes
26	Temp.control: Setpoint Standby heating	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
27	Temp.control: Setpoint Standby heat.(1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
28	Temp.control: Setpoint Standby cooling	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
29	Temp.control: Setpoint Standby cool. (1:+ | 0:-)	Input / Output	-WC-	[1.1] DPT_Switch	1 Bit
30	Temp.control: Setpoint Eco heating	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
31	Temp.control: Setpoint Eco heating (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
32	Temp.control: Setpoint Eco cooling	Input / Output	RWCT	[9.1] DPT_Value_Temp	2 Bytes
33	Temp.control: Setpoint Eco cooling (1:+ | 0:-)	Input	-WC-	[1.1] DPT_Switch	1 Bit
34	Temp.control: Control variable heating (level 1)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
35	Temp.control: Control variable heating (level 2)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
36	Temp.control: Control variable cooling (level 1)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
37	Temp.control: Control variable cooling (level 2)	Output	R-CT	[5.1] DPT_Scaling	1 Byte
38	Temperature control: Variable for 4/6-way valve	Output	R-CT	[5.1] DPT_Scaling	1 Byte
39	Temp.control: Status Heat. level 1 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
40	Temp.control: Status Heat. level 2 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
41	Temp.control: Status Cool. level 1 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit

No	Text	Function	Flags	DPT type	Size
42	Temp.control: Status Cool. level 2 (1=ON|0=OFF)	Output	R-CT	[1.1] DPT_Switch	1 Bit
43	Temp.control: Comfort extension status	Input / Output	RWCT	[1.1] DPT_Switch	1 Bit
44	Temp.control: Comfort Extension time	Input	RWCT	[7.5] DPT_Time-PeriodSec	2 Bytes

8. Setting the parameters

8.1. Behaviour on power failure/ restoration of power

Behaviour following a failure of the bus power supply:

The device sends nothing.

Behaviour on bus restoration of power and following programming or reset:

The device sends all outputs according to their send behaviour set in the parameters with the delays established in the "General settings" parameter block.

8.2. General settings

Set the basic properties of the data transmission.

Transmission delay after reset/bus restoration	5 s • ... • 7200 s
Maximum message rate	• 1 message per second • ... • 10 messages per second • ... • 50 messages per second

8.3. Temperature measured value

Select, whether a **malfunction object** is to be sent if the sensor is faulty.

Use malfunction object	No • Yes

Use **Offsets** to adjust the readings to be sent.

Offset in 0.1°C	-50…50; 0

The unit can calculate a **mixed value** from its own reading and an external value. Set the mixed value calculation if desired. If an external portion is used, all of the following settings (threshold values, etc.) are related to the overall reading.

Use external measured value	No • Yes
Ext. Reading proportion of the total reading	5% • 10% • ... • 50% • ... • 100%
Sending pattern for internal and total measured value	• never • periodically • on change • on change and periodically
At and above change of *(if sent on change)*	0.1°C • 0.2°C • 0.5°C • ... • 5.0°C
Send cycle *(if sent periodically)*	5 s • 10 s • ... • 2 h

The **minimum and maximum readings** can be saved and sent to the bus. Use the "Reset temperature min/max. value" objects to reset the values to the current readings. The values are not retained after a reset.

Use minimum and maximum value	No • Yes

8.4. Temperature PI controller

Activate the controller if you want to use it.

Use controller	No • Yes

General rules

Decide in which cases **nominal values and delay times** received per object are to be kept. The parameter is only taken into consideration if the setting by object is activated further down. Please note that the setting "After power restoration and programming" should not be used for the initial start-up, as the factory settings are always used until the first call (setting via objects is ignored).

For an adequate regulation of the indoor temperature, comfort, standby, eco and building protection modes may be used.
Comfort when present,
Standby when absent,
Eco as a night-time mode and
Frost / heat protection (building protection) e.g. when the window is open.

The settings for the temperature control include the setpoint temperatures for the individual modes. Objects are used to determine which mode is to be selected. A change of mode may be triggered manually or automatically (e.g. by a timer, window contact).

The **mode** may be switched with two 8 bit objects of different priority. Objects
„... HVAC mode (Prio 2)“ for switching in everyday operation and
„... HVAC mode (Prio 1)“ for central switching with higher priority.
The objects are coded as follows:
0 = Auto

1 = Comfort
2 = Standby
3 = Eco
4 = Building protection

Alternatively, you can use three objects, with one object switching between eco and standby mode and the two others are used to activate comfort mode or frost/heat protection mode. The comfort object then blocks the eco/standby object, and frost/heat protection objects have the highest priority. Objects
„... Mode (1: Eco, 0: Standby)“,
„... comfort activation mode" and
„... frost/heat protection activation mode"

Switch mode via	• two 8-bit objects (HVAC modes) • three 1-bit objects

Select the **mode to be activated after reset** (e.g. power failure, reset of the line via the bus). (Default).
Then configure a temperature control **block** using the blocking object.

Mode after reset	• Comfort • Standby • Eco • Building protection
Behaviour of the blocking object with value	• 1 = Block | 0 = release • 0 = block | 1 = release
Value of the blocking object after reset	0 • 1

Specify when the current **control variables** are to be **sent** to the bus. Periodic transmission is safer if a message does not reach a recipient. You may also set up periodical monitoring by the actuator with this setting.

Send control variable	• on change • on change and periodically
from change of (in % absolute)	1...10; 2
Cycle *(if sent periodically)*	5 s • ... • 5 min • ... • 2 h

The **status object** reports the current status of the output (0 = OFF, 0 = ON) and may for example be used for visualisation, or to switch off the heating pump as soon as the heating is switched off.

Send status objects	• on change • on change to 1 • on change to 0 • on change and periodically • on change to 1 and periodically • on change to 0 and periodically
Cycle *(if sent periodically)*	5 s • ... • 5 min • ... • 2 h

Then define the **type of setting**. Heating and/or cooling may be controlled in two stages.

Type of control	• Single stage heating • Dual-stage heating • Single-stage cooling • Single-stage heating + single-stage cooling • Dual-stage heating + single-stage cooling • Dual-stage heating + dual-stage cooling

General setpoint values

You may enter separate setpoint values for each mode or use the comfort setpoint as a basic value.
If you are using the controls for both heating *and* cooling, you may also select the setting "separately with switching object". Systems used for cooling in the summer and for heating in the winter can thus be switched from one to the other.
If you are using the basic value, only the deviation from the comfort setpoint value is listed for the other modes (e. g., 2°C less for standby mode).

Keep modified setpoints after mode change	No • Yes
Setting the nominal values	• separate with switching object • separate without switching object • with comfort setpoint as a basis with switching object • with comfort setpoint as a basis without switching object
Analysis of the status object / Behaviour of the switching object at value	• 0 = Heating | 1 = Cooling • 1 = Heating | 0 = Cooling
Switching object value before first Communication (*only if switching object is used*)	0 • 1

The **grades** for the setpoint changes is predefined. Whether the change remains active only temporarily (do not store) or remains stored even after restoration of power (and programming) is determined in the first section of "General controller". This also applies to a comfort extension.

Grading for setpoint changes (in 0.1 °C)	1... 50; 10
Storage of setpoint(s)	• not be retained • after power restoration • after restoration of power and programming

The controller can be switched from eco mode, i.e. night mode, to comfort mode via the comfort extension. This means that the comfort setpoint can be maintained for longer, for example when having guests. The duration of this comfort extension period

is set. After the comfort extension period is terminated, the system returns to eco mode.

Comfort extension time in seconds (can only be activated from eco mode)	1…36000; 3600

Setpoint Comfort

Comfort mode is usually used for daytime mode when people are present. A starting value is defined for the comfort setpoint as well as a temperature range in which the nominal value may be modified.

Initial heating/cooling setpoint (in 0.1 °C) valid until first Communication *(not upon saving the target value after programming)*	-300…800; 210

If setpoint values are entered separately:

Min. object value heating/cooling (in 0.1 °C)	-300…800; 160
Max. object value heating/cooling (in 0.1 °C)	-300…800; 280

If the comfort setpoint value is used as a basis:

If the comfort setpoint is used as the basis, the increase/decrease of this value is indicated.

Minimum base setpoint (in 0.1°C)	-300…800; 160
Maximum base setpoint (in 0.1°C)	-300…800; 280
Reduction by up to (in 0.1°C)	1…100; 50
Increase by up to (in 0.1°C)	1…100; 50

If the comfort setpoint is used as the basis, a dead zone is determined for the control mode "heating *and* cooling" to avoid direct switching from heating to cooling.

Dead zone between heating and cooling *(only if both heating AND cooling are used)*	1…100; 50

Setpoint for standby

Standby mode is usually used for daytime mode when people are absent.

If setpoint values are entered separately:

A starting setpoint value is defined as well as a temperature range in which the setpoint value may be changed.

Heating initial setpoint (in 0.1 °C) valid until first Communication	-300…800; 180
Cooling initial setpoint (in 0.1 °C) valid until first Communication	-300…800; 240
Min. object value heating/cooling (in 0.1 °C)	-300…800; 160

Max. object value heating/cooling (in 0.1 °C)	-300…800; 280

If the comfort setpoint value is used as a basis:

If the comfort setpoint is used as the basis, the increase/decrease of this value is indicated.

Reduce heating setpoint (in 0.1°C) *(for heating)*	0…200; 30
Increase cooling setpoint (in 0.1°C) *(for cooling)*	0…200; 30

Eco setpoint

Eco mode is usually used for night mode.

If setpoint values are entered separately:

A starting setpoint value is defined as well as a temperature range in which the setpoint value may be changed.

Heating initial setpoint (in 0.1 °C) valid until first Communication	-300…800; 160
Cooling initial setpoint (in 0.1 °C) valid until first Communication	-300…800; 280
Min. object value heating/cooling (in 0.1 °C)	-300…800; 160
Max. object value heating/cooling (in 0.1 °C)	-300…800; 280

If the comfort setpoint value is used as a basis:

If the comfort setpoint is used as the basis, the increase/decrease of this value is indicated.

Reduce heating setpoint (in 0.1°C) *(for heating)*	0…200; 50
Increase cooling setpoint (in 0.1°C) *(for cooling)*	0…200; 60

Setpoint values for frost/heat protection (building protection)

The building protection mode is used, for example, as long as windows are open for ventilation. Setpoints for frost protection (heating) and heat protection (cooling) are determined which may not be modified from outside (no access via operating devices etc.). The building protection mode may be activated with delay, which allows you to leave the building before the controls switch to frost/heat protection mode.

Nominal value frost protection\r\n(in 0,1°C)	-300…800; 70
Activation delay	no • 5 s • ... • 5 min • ... • 2 h
Nominal value heat protection (in 0,1°C)	-300…800; 350
Activation delay	no • 5 s • ... • 5 min • ... • 2 h

General variables

This setting appears for the control types "Heating *and* Cooling" only. This is where you can decide whether to use a common variable for heating and cooling. If the 2nd stage has a common variable, this is also where you determine the control mode of the 2nd stage.

For heating and cooling	• separate variables are used • common variables are used for Stage 1 • common variables are used for Stage 2 • common variables are used for Stage 1+2
Use variable for 4/6-way valve *(only with common variable at stage1)*	No • Yes
Control type *(for stage 2 only)*	• 2-point-control • PI control
Regulating variable of the 2nd Stage is on *(only for stage 2 with 2-point control)*	• 1-bit object • 8-bit object

When using the variable for a 4/6 way valve:
0%...100% Heating = 66%...100% variable
OFF = 50% variable
0%...100% Cooling = 33%...0% variable

8.4.1. Heating control stage 1/2

If a heating control mode is configured, one or two setting sections for the heating stages are displayed.

In the first stage, heating is controlled by a PI controller which allows to either enter control parameters or select predetermined applications.

In the second stage (therefore only in case of 2-stage heating), heating is controlled via a PI or a 2-point-control.
In stage 2, the setpoint deviation between the two stages must also be specified, i.e. beyond which setpoint undershoot the second stage is then added.

Setpoint difference between stages 1 and 2 stages (in 0.1°C) *(At stage 2)*	0...100; 40
Control type *(at stage 2, no common variables)*	• 2-point-control • PI control
Control variable is on *(for stage 2 with 2-point control, no common variables)*	• 1-bit object • 8-bit object

PI controller with control parameters:

This setting allows individual input of the parameters for PI control.

Control type	• **PI control**
Setting of the controller by	• **Controller parameter** • specified applications

Specify the deviation from the setpoint value at which the maximum control variable value is reached, i.e. the point at which maximum heating power is activated.
The reset time shows how quickly the controller responds to deviations from the setpoint. In case of a short reset time, the control responds with a fast increase of the control variable. In case of a long reset time, the control responds somewhat less urgently and needs longer until the necessary control variable for the setpoint deviation is reached.
You should set the time appropriate to the heating system at this point (observe manufacturer's instructions).

Maximum control variable is reached at setpoint/actual difference of (in °C)	1...5
Reset time (in min.)	1...255; 30

Now specify what should be sent when the control is blocked. Set a value greater 0 (=OFF) to receive a basic heating stage, e.g. for floor heating.
On release, the control variable follows the rule again.

When blocked, the control variable should	• not be sent • send a specific value
Value (in %) *(only if a value is sent)*	0...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

PI control with predetermined application:

This setting provides fixed parameters for frequent applications.

Control type	• **PI control**
Setting of the controller by	• Controller parameter • **specified applications**
Application	• Warm water heating • Floor heating • Convection unit • Electric heating
Maximum control variable is reached at setpoint/actual difference of (in °C)	Warm water heating: 5 Floor heating: 5 Convection unit: 4 Electric heating: 4
Reset time (in min.)	Warm water heating: 150 Floor heating: 240 Convection unit: 90 Electric heating: 100

Now specify what should be sent when the control is blocked. Set a value greater 0 (=OFF) to receive a basic heating stage, e.g. for floor heating.
On release, the control variable follows the rule again.

When blocked, the control variable should	• not be sent • send a specific value
Value (in %) *(only if a value is sent)*	0...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

2-point-control (only stage 2):

2-point-control is used for systems which are only set to ON or OFF.

Control type *(is determined at a higher stage for common variables)*	• **2-point-control**

Enter the hysteresis that prevents frequent on/off switching of temperatures in the threshold range.

Hysteresis (in 0.1°C)	0...100; 20

If separate variables are used, select whether the variable of the 2nd stage is a 1-bit object (on/off) or an 8-bit object (on with percentage value/off).

Control variable is on	• 1-bit object • 8-bit object
Value (in %) *(for 8-bit object)*	0...100

Now specify what should be sent when the control is blocked. Set a value greater 0 (=OFF) to receive a basic heating stage, e.g. for floor heating. On release, the control variable follows the rule again.

When blocked, the control variable should	• not be sent • send a specific value
Value (in %) *only if a value is sent*	0...100

8.4.2. Cooling control stage 1/2

If a cooling control mode is configured, one or two setting sections for the cooling levels are displayed.

In the first stage, cooling is controlled by a PI controller in which either control parameters or predetermined applications can be selected.

In the second stage (therefore only ifor 2-stage cooling), cooling is controlled via a PI or a 2-point-control.

In stage 2, the setpoint deviation between the two stages must also be specified, i.e. beyond which setpoint value undershoot the second stage is then added.

Setpoint difference between stages 1 and 2 stages (in 0.1°C) *(At stage 2)*	0...100; 40
Control type *(at stage 2, no common variables)*	• 2-point-control • PI control
Control variable is on *(for stage 2 with 2-point control, no common variables)*	• 1-bit object • 8-bit object

PI controller with control parameters:

This setting allows individual input of the parameters for PI control.

Control type	**• PI control**
Setting of the controller by	**• Controller parameter** • specified applications

Specify the deviation from the setpoint value which reaches maximum variable value, i.e. the point at which maximum cooling power is activated.
The reset time shows how quickly the controller responds to deviations from the setpoint. In case of a short reset time, the control responds with a fast increase of the control variable. In case of a long reset time, the control responds somewhat less urgently and needs longer until the necessary control variable for the setpoint deviation is reached. You should set the time appropriate to the cooling system at this point (observe manufacturer's instructions).

Maximum control variable is reached at setpoint/actual difference of (in °C)	1...5
Reset time (in min.)	1...255; 30

Now specify what should be sent when the control is blocked.
On release, the control variable follows the rule again.

When blocked, the control variable should	• not be sent • send a specific value
Value (in %) *(only if a value is sent)*	0...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

PI control with predetermined application:

This setting provides fixed parameters for a cooling ceiling

Control type	**• PI control**
Setting of the controller by	• Controller parameter **• specified applications**
Application	• Cooling ceiling

Maximum control variable is reached at setpoint/actual difference of (in °C)	Cooling ceiling: 5
Reset time (in min.)	Cooling ceiling: 30

Now specify what should be sent when the control is blocked.
On release, the control variable follows the rule again.

When blocked, the control variable should	• not be sent • send a specific value
Value (in %) *(only if a value is sent)*	0...100

2-point-control (only stage 2):

2-point-control is used for systems which are only set to ON or OFF.

Control type *is determined at a higher stage for common variables*	• **2-point-control**

Enter the hysteresis that prevents frequent on/off switching of temperatures in the threshold range.

Hysteresis (in 0.1°C)	0...100; 20

If separate variables are used, select whether the variable of the 2nd stage is a 1-bit object (on/off) or an 8-bit object (on with percentage value/off).

Control variable is on	• 1-bit object • 8-bit object
Value (in %) *(for 8-bit object)*	0...100

Now specify what should be sent when the control is blocked.
On release, the control variable follows the rule again.

When blocked, the control variable should	• not be sent • send a specific value
Value (in %) *(only if a value is sent)*	0...100

In case of a common control variable for heating and cooling, 0 is always transmitted as a fixed value.

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