







	<h2>application software</h2>	
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<ul style="list-style-type: none"> ▲ Manufacturers ▲ Hager Electro ▲ Heating, Air Conditioning <li style="background-color: #e0ffe0; padding: 2px;">Heating actuators

Heating actuator

Electrical/Mechanical characteristics: See product user manual

	Product reference	Product designation	Application software ref	TP device  Radio device 
	TXM646T	Heating actuator 6 channels KNX 24/230V	STXM646T 1.1.x Version	
	TXM646R	Heating actuator 6 channels KNX, with regulation, 24/230V	STXM646R 1.1.x Version	

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1 General

1.1 About this guide

The purpose of this manual is to describe the operation and configuration of the KNX-devices using the ETS program.

It consists of 4 parts:

- General information.
- The parameters and KNX objects available.
- The Easy tool configurations are available.
- Technical characteristics.

1.2 About the program

1.2.1 ETS compatibility

The application programs are compatible with ETS5. They can be downloaded from our website under the order number.

ETS Version	File extension of compatible files
ETS5 (V5.7.0 or higher)	*.knxprod

1.2.2 Application descriptions

Application	Product reference
STXM646T	TXM646T
STXM646R	TXM646R

1.3 About the program

This product can also be configured using the TXA100 configuration tool. It is composed of a TJA665 configuration server.

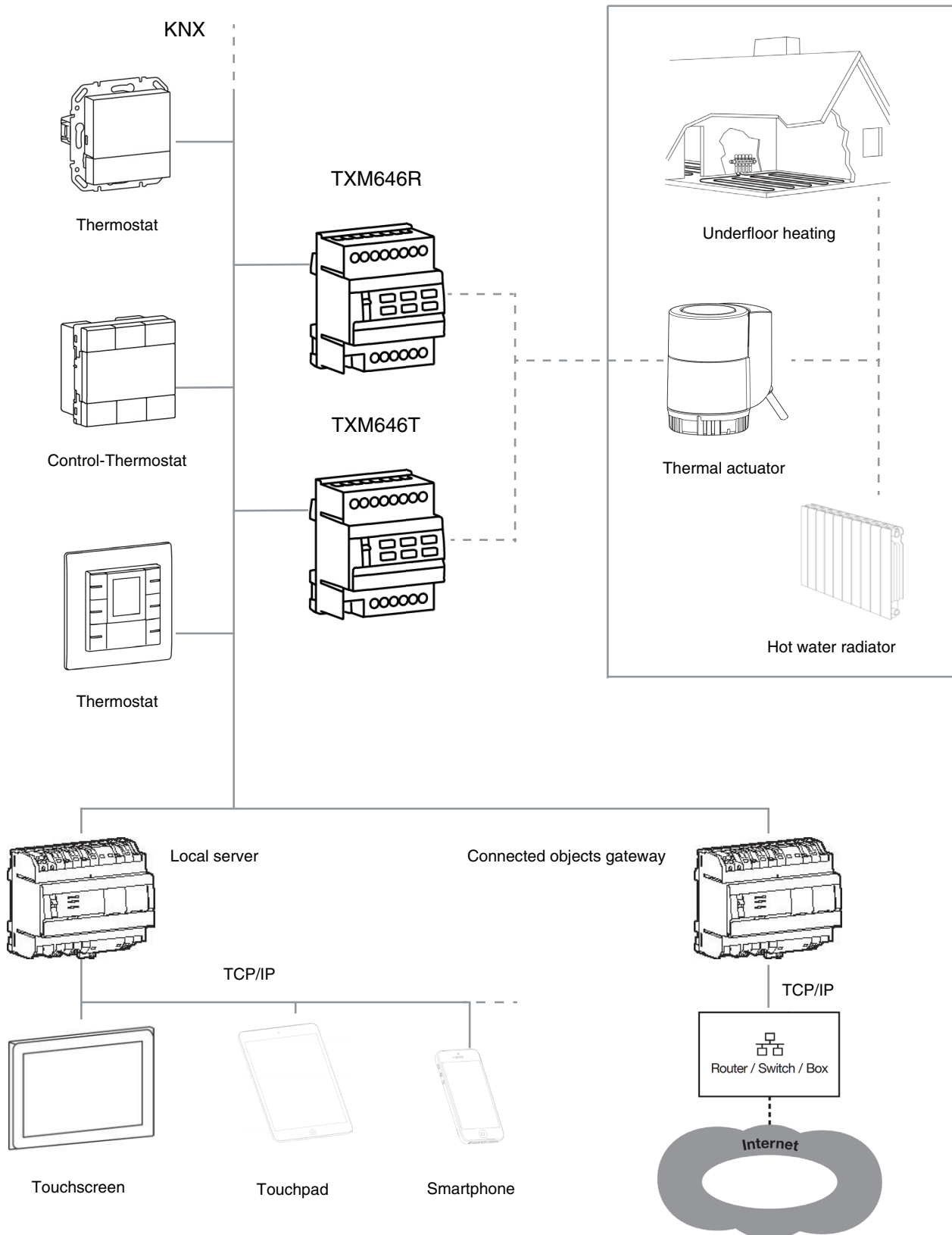
Compatible software version TXA100: V 1.4.5.0 or higher

It is essential to update the configuration server software version.
(Please refer to the TXA100 user manual).

2 General Description

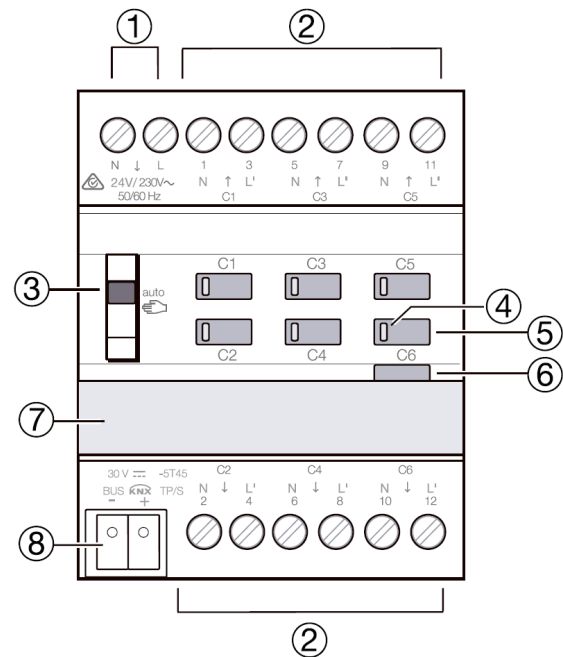
2.1 Installation of the device

2.1.1 Overview presentation



2.1.2 Description of the device

- ① Connection to the power supply (N, L)
- ② Connection of thermal actuators
 - upper group: outputs C1 + C3 + C5
 - lower group: outputs C2 + C4 + C6
- ③ Auto/Manu switch (☞)
- ④ Status LED
- ⑤ Local command buttons
- ⑥ Illuminated physical addressing button
- ⑦ Label holder
- ⑧ KNX bus connection terminals (-, +)



2.1.3 Physical addressing

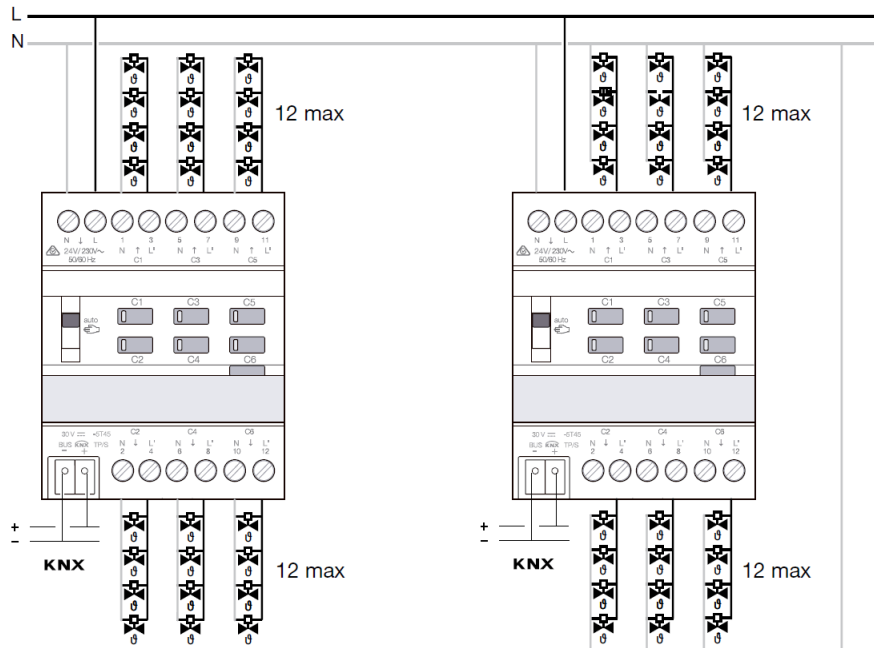
In order to perform the physical addressing or to check whether or not the bus is connected, press the lighted push button (6) on the right-hand side above the identification plates on the front of the device.

Light on = bus connected and ready for physical addressing.

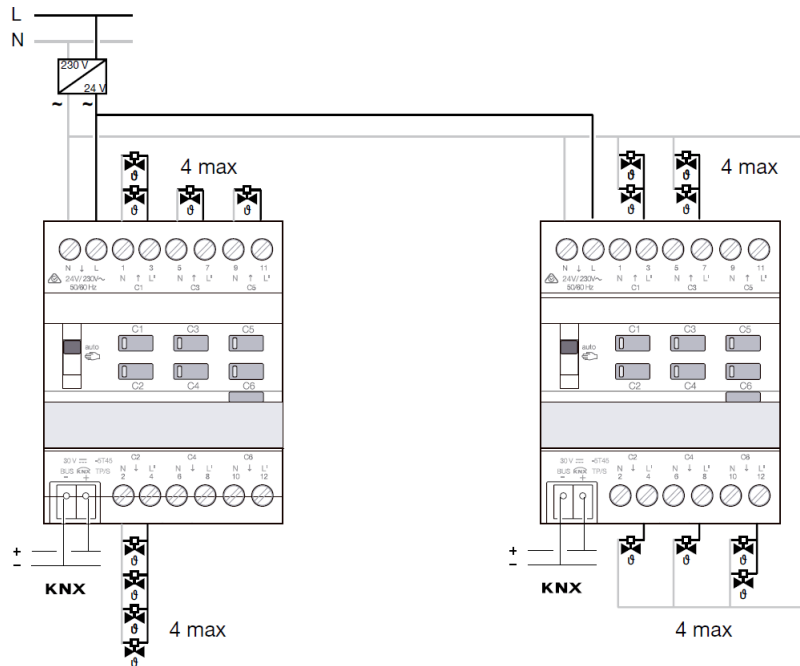
Programming mode is activated, until the physical address is transferred from ETS. Pressing the button again, exits programming mode. Physical addressing can be carried out in automatic or manual mode.

2.1.4 Connection

















- Valves equipped with thermal actuators with 230 V ~ power supply



- Valves equipped with thermal actuators with 24 V ~ power supply



2.1.5 LED meaning

LED	LED/Operation status
 Cx Red	 heating mode OK
	 heating in safety mode
 Cx Blue	 cooling mode OK
	 cooling in safety mode
 Cx Orange	 short-circuit detection in progress
	 short-circuit detected
 Cx White	 overload detected, load shedding in progress
 Cx Orange C1 → C6	 loss of power (lighting moved from C1 to C6 until main power returns)
 Cx Green C1 → C6	 manual mode, output 50%
	 manual mode, output 100%

2.2 Function modules of the application

2.2.1 Outputs

The applications allow individual configuration of the device outputs.

The most important functions are:

- Valve control

The product has 6 independent outputs. These outputs are used to control valves fitted with thermal actuators supplied with 24 V ~ or 230 V ~ to control heating or air conditioning systems using water distribution circuits. The default status of the valve is configurable for each output (normally open or normally closed).

- Priority

The Priority function is used to force the output into a defined state. Priority is activated through objects in 1 or 2 bit format.

Only a Priority OFF command authorizes the output for control.

Each valve output can be locked in forced position via the bus. Different parameter values can be configured for the summer and winter mode.

- Status indication

The behaviour of the status indication of each switching channel can be configured for the entire device. The Status indication function transmits the status of each valve output on the KNX bus.

- Manual mode

Manual mode allows the device to be disconnected from the bus. In this mode, each output can be priority controlled locally.

- Valve protection

A valve can jam if it is not activated for too long a time. To avoid this, the product incorporates a valve protection function. If the output has not been activated for a certain length of time, whatever the current mode, it will be automatically activated.

- Heat requirement

The product constantly assesses the output control values. Depending on the energy need, the product can be used to activate or deactivate a boiler or burner.

2.2.2 Thermostats

This chapter is only valid for reference TXM646R.

The applications are used to configure each regulator individually.

The most important functions are:

- Room temperature regulation for the heating and cooling systems

The Regulation function is used to control the following installations:

- Heating.
- Cooling.
- Heating / cooling.

The product has 12 independent room thermostats.

The switch between heating and cooling can be automatic or manual.

Regulation is based on measurement of the room temperature. This temperature is compared to the setpoint defined by the user.

The types of regulation available are as follows:

- Switching PI-control (PWM)
- Continuous PI-control
- Switching 2-point control

■ Setpoint selection

The thermostat can operate in the following modes:

- Auto.
- Comfort.
- Night setpoint.
- Standby.
- Heat protection / Frost protection.

The operating mode can be selected by push-button, priority, override, timer, clock or activation of a scene. A temperature setpoint is linked to each operating mode.

■ Timer

The Timer function is used to select a heating or cooling setpoint for a configurable duration. The timer may be interrupted before expiry of the delay time. The timer duration can be modified via the bus KNX.

When the timing function expires, return to the previous operating mode.

■ Priority

The Priority function is used to force the thermostat with a defined heating or cooling setpoint.

Priority is activated through objects in 1 or 2 bit format.

Only a Priority OFF command authorizes the output for control.

The setpoints used for thermostat priority are Frost protection / Heat protection and Comfort.

■ Automatic control

The Automatic control function is used to control a thermostat in parallel to the Setpoint selection function. The two functions have the same level of priority. The last control received will act on the thermostat status.

An additional command object is used to activate or deactivate the Automatic control.

■ Scene

The Scene function is used to switch groups of outputs into a configurable predefined state. A scene is activated by receipt of a 1-byte command. Each thermostat can be integrated into 64 different scenes.

When the scene is activated, the thermostat can switch to one of the following modes:

- Auto.
- Comfort.
- Standby.
- Night setpoint.
- Frost protection / Heat protection.

■ Status indication

The following information can be sent on the bus:

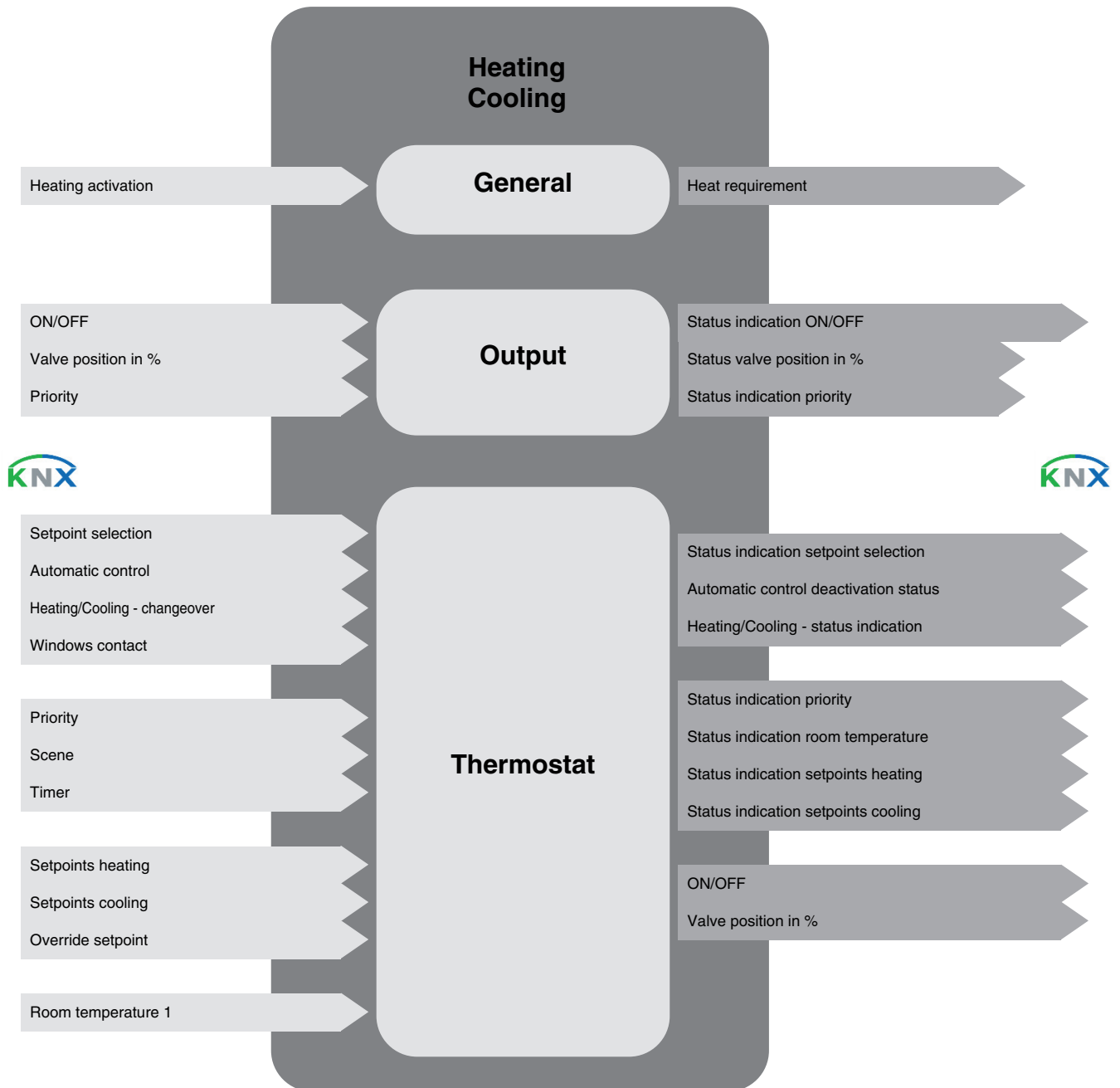
- Current mode (Comfort, ...).
- Room temperature.
- Choice of the type of installation (heating, air conditioning).
- Heating temperature setpoint.
- Air conditioning temperature setpoint.

■ Windows contact

The Frost protection / Heat protection setpoint can be activated by a windows contact integrated into the installation.

The setpoint on the thermostat is switched when the **Thermostat - windows contact** object is received.

Communication objects



3 Programming by ETS

3.1 Parameters

3.1.1 Definition of the general parameters

i Restore ETS-params objects: scenes, timer duration, timer setpoint selection, setpoints, hours counter setpoint, valve/pump protection and winter/summer dates

Restore ETS-params settings

Heat requirement

Heat requirement activation delay hh:mm:ss

Heat requirement deactivation delay hh:mm:ss

3.1.1.1 Specific management of some ETS parameters

There are 2 types of parameters in the device:

- Parameters that can only be changed via ETS.
- Parameters that can be changed via ETS or via the KNX bus.

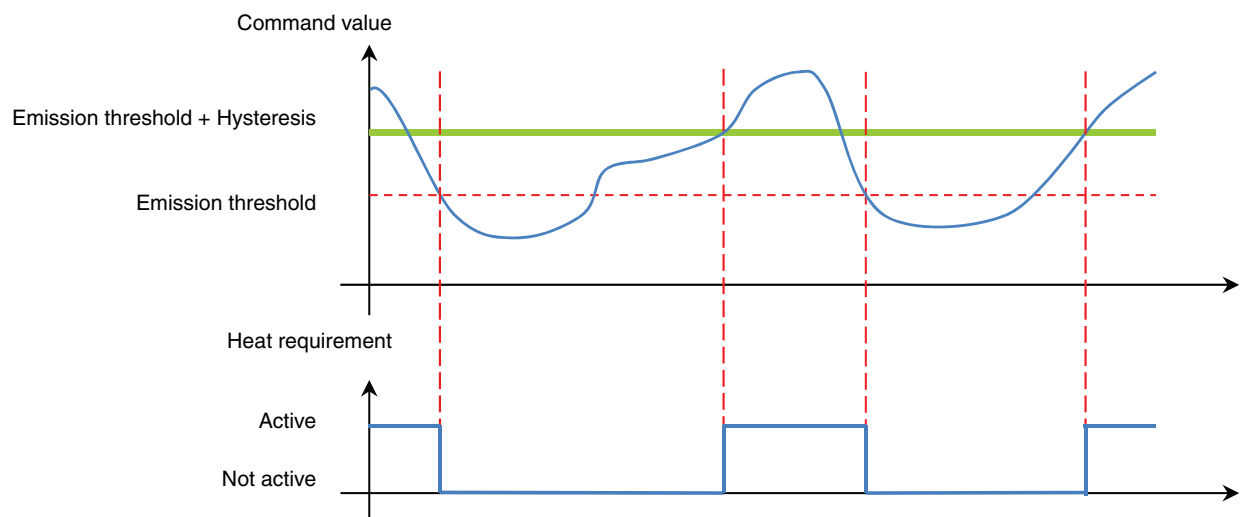
For parameters that can be changed via ETS and via the KNX bus, 2 values are stored in the device memory: The value corresponding to the ETS-parameter and the currently used value.

Parameter	Description	Value
Restore ETS-params settings	The parameter values stored in the device will remain in the device at the next download.	Not active*
	The parameter values stored in the device will be overwritten with the ETS configured values at the next download.	Active

* Default value

3.1.1.2 Heat requirement

The product itself can evaluate the parameters of its outputs and transmit a general heating requirement according to a monitoring limit value. With the help of an ON/OFF switch, it is therefore possible to create a heating control on boilers with adapted inputs.



A heat requirement is indicated by the product only if one of the configured values for the assigned outputs exceeds one of the limit values defined with added hysteresis. Cancellation of a heat requirement message occurs as soon as the value falls below the limit value.

The following values are predefined and fixed:

- Emission threshold: 1%
- Hysteresis: 1%

Parameter	Description	Value
Heat requirement activation delay	This parameter defines the time after which the heat requirement telegram is sent on the KNX bus.	00:05:00* (hh:mm:ss)
Heat requirement deactivation delay	This parameter defines the time after which the heat requirement cancellation is sent on the KNX bus.	00:00:00* (hh:mm:ss)

Note: The values for these parameters are fixed.

Communication object: **164 - General - Heat requirement (1 Bit - 1.002 DPT_Boolean)**

* Default value

3.1.2 Output functionalities

3.1.2.1 Overall parameters

Outputs naming

Output 1 name

Output 2 name

Output 3 name

Output 4 name

Output 5 name

Output 6 name

Load shedding priority

Priority between outputs in case of load shedding only if no short circuit/overload detection

Outputs C1/C3/C5 Output 1 < Output 3 < Output 5

Outputs C2/C4/C6 Output 2 < Output 4 < Output 6

- Outputs naming

Parameter	Description	Value
Output x name	This free text field is used to assign a name to the output in question. The group objects Name field will automatically be updated after input.	Output x*

x = 1 to 6

- Load shedding priority

If a short-term overconsumption is detected on one of the output groups (C1/C3/C5) or (C2/C4/C6), the product applies a load shedding cycle. The parameters below are used to define the order of priority of the outputs for load shedding.

Note: This priority between the outputs in case of load shedding is only valid if and only if no short circuit or overload has been detected.

Parameter	Description	Value
Outputs C1/C3/C5	This parameter defines the order of priority of the outputs (C1/C3/C5) for load shedding.	Output 1 < Output 3 < Output 5*
Outputs C2/C4/C6	This parameter defines the order of priority of the outputs (C2/C4/C6) for load shedding.	Output 2 < Output 4 < Output 6*

Note: The values for these parameters are fixed.

* Default value

3.1.2.2 Fixed parameters

The fixed parameters define the operating mode of the output relays.

Command value monitoring	
Monitoring time	01:00 hh:mm
Emergency mode	
Command value when emergency active	30 %
Priority position	
Command value when priority active	30 %
Valve protection	
Valve protection	Periodically
Periodicity	Every week
Valve protection duration	10 Minutes
Smart valve protection	Yes
Valve protection minimum commande value	80 %

■ Command value monitoring

The product authorises Command value monitoring. If no order is received during the monitoring time, emergency mode is activated for the output of the valve in question.

Parameter	Description	Value
Monitoring time	This parameter defines the maximum duration between 2 command values received.	01:00*

■ Emergency mode

Emergency mode is used to position the valve output when a fault appears. This fault may be an incorrect command value or a KNX bus is not connected. This mode can also be used for the return of the bus power or mains power.

Parameter	Description	Value
Command value when emergency active	This parameter defines the command value when the output switches to emergency mode.	30*

* Default value

■ Priority position

Priority position is used to position the valve output when priority is active. The valve outputs in question are then locked so that they can no longer be controlled by other lower level functions.

Parameter	Description	Value
Command value when priority active	This parameter defines the command value when priority is active for the valve output in question.	30*

■ Valve protection

To avoid a valve becoming clogged with limescale or seizing if it is not activated for a certain length of time, the product has an automatic valve protection function. Valve protection can be carried out cyclically, involving a full movement of the valve for a defined duration.

The product continuously activates a value of 100% for the valve output in question for half the configured duration. The valve thus fully opens. When half the duration has passed, the product switches to a value of 0%, leading to the complete closure of the valve.

Parameter	Description	Value
Valve protection activation	Activation of valve protection is triggered: - Periodically according to a configurable cycle duration.	Periodically*
Periodicity	This parameter determines the time between each valve protection activation.	Every week*
Valve protection duration	This parameter defines valve protection operating time.	10 min*

■ Smart valve protection

This function is used to activate valve protection, taking into account the number of activations and the operating time of the valve.

Example: Valve protection activation periodicity: Every week

Valve protection duration: 5 minutes

When smart valve protection is activated, valve protection is activated if the pump has not been activated for more than 5 minutes over a period of one week.

Parameter	Description	Value
Smart valve protection	The smart pump protection function is activated.	Yes*
Valve protection minimum command value	This parameter defines the valve protection minimum command value. Smart valve protection is then only carried out on a regular basis if the minimum parameter limit value configured at this point is not exceeded.	80*

* Default value

3.1.2.3 Operation

This parameter window is used to set the device outputs. These parameters are available individually for each output.

Valve

Default valve status Normally closed Normally open

Command value

Cycle time for continuous control with PWM hh:mm:ss

■ Valve

There are 2 types of valves which can be connected to the outputs. The valves can be opened or closed when they are switched off. This parameter is used to configure the output thus determining the direction in which the valves are driven.

Parameter	Description	Value
Default valve status	The valves connected to the output are of the type: <ul style="list-style-type: none"> - The valves are opened when they are switched off - The valves are closed when they are switched off 	Normally open* Normally closed

■ Command value

The product receives information from the KNX bus in 1 bit or 1 byte format from a KNX room thermostat for example. In general, based on room temperature, the regulator determines the values to be sent to the output product. The latter controls its valve outputs according to the data configured in ETS.

The different formats of the control value for the valve outputs are:

- ON/OFF (1 bit)

Valve output is controlled using an object in 1 bit format (ON/OFF). The value of the object depends on the **Default valve status** parameter.

Normally open:

On reception of an OFF control, the valve is powered and closes.

On reception of an ON control, the valve is not powered and opens.

Normally closed:

On reception of an OFF control, the valve is not powered and closes.

On reception of an ON control, the valve is powered and opens.

Communication objects: [1](#), [28](#), [55](#), [82](#), [109](#), [136](#) - **Output x - ON/OFF (1 Bit - 1.001 DPT_Switch)**

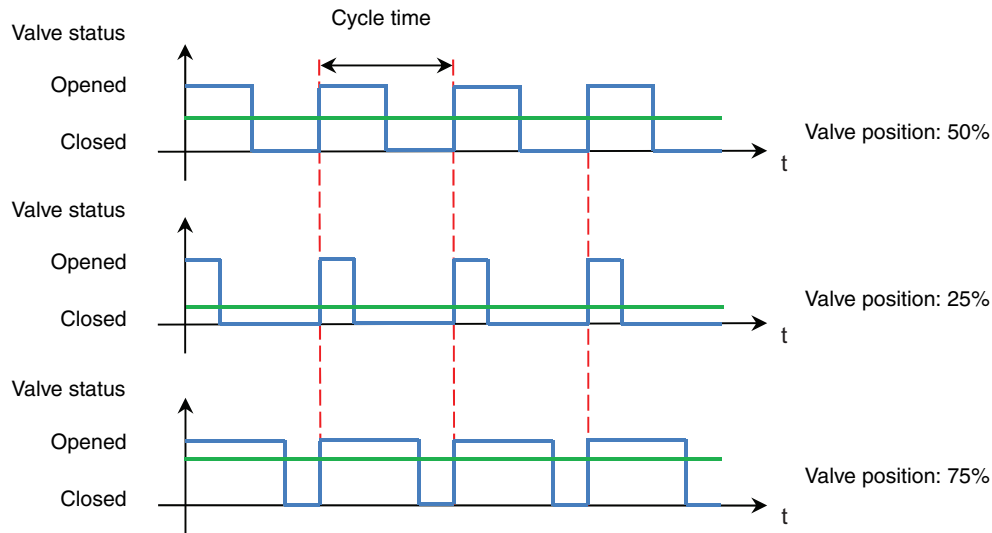
* Default value

- Continuous with PWM (1 byte)

The value of the valve output control is converted by the product into a pulse-width modulation switching signal. The behaviour of the output is constantly adapted according to the parameter received. The cycle time can also be configured using the **Cycle time for continuous control with PWM** parameter.

Taking into account the default valve status, the output is powered or not depending on the position the valve is to adopt.

Communication objects: **2, 29, 56, 83, 110, 137 - Output x - Valve position in % (8 - Bit - 5.001 DPT_Scaling)**



Parameter	Description	Value
Cycle time for continuous control with PWM	This parameter defines the switching frequency of the pulse-width modulation output signal of the valve output. It allows an adaptation of the operation of the different actuators having different cycle times (duration of movement between the valve's open and closed position).	00:00:01 ... 00:15:00* ... 23:59:59 (hh:mm:ss)

* Default value

3.1.3 Thermostat functions

This chapter is only valid for reference TXM646R.

The following chapter describes the settings for the thermostat functions. This is where the parameters of the heating system (fancoil, underfloor heating, etc.) and the temperature values requested for the heating and/or cooling are configured.

3.1.3.1 Thermostats naming

Thermostats naming	
Thermostat 1 name	<input type="text" value="Thermostat 1"/>
Thermostat 2 name	<input type="text" value="Thermostat 2"/>
Thermostat 3 name	<input type="text" value="Thermostat 3"/>
Thermostat 4 name	<input type="text" value="Thermostat 4"/>
Thermostat 5 name	<input type="text" value="Thermostat 5"/>
Thermostat 6 name	<input type="text" value="Thermostat 6"/>
Thermostat 7 name	<input type="text" value="Thermostat 7"/>
Thermostat 8 name	<input type="text" value="Thermostat 8"/>
Thermostat 9 name	<input type="text" value="Thermostat 9"/>
Thermostat 10 name	<input type="text" value="Thermostat 10"/>
Thermostat 11 name	<input type="text" value="Thermostat 11"/>
Thermostat 12 name	<input type="text" value="Thermostat 12"/>

Parameter	Description	Value
Thermostat x name	This free text field is used to assign a name to the regulator in question. The group objects Name field will automatically be updated after input.	Thermostat x*

x = 1 to 12

* Default value

3.1.3.2 Fixed parameters

The fixed parameters define the operating mode of the thermostats.

Reset	
Status after reset	Status before reset
Heat/cool mode after reset	Operating mode before reset
<hr/>	
Valve protection	
Valve protection	Periodically
Periodicity	Every week
Valve protection duration	10 <input type="text"/> Minutes
Smart valve protection	Yes
Valve protection minimum commande value	80 <input type="text"/> %
<hr/>	
Temperature	
Timeout of room temperature	00:45 <input type="text"/> hh:mm
Floor temperature detection	No
<hr/>	
Setpoint shift	
Maximum setpoint	3 <input type="text"/> K
Minimum setpoint	3 <input type="text"/> K

■ Reset

Parameter	Description	Value
Status after reset	If the product is reset, this parameter is used to determine the setpoint to take into account upon restart. Upon restart, the thermostat will have the setpoint. - Present before the reset	Status before reset*
Heat/cool mode after reset	If the product is reset, this parameter is used to determine the operating mode to be taken into account upon restart. Upon restart, the thermostat will be in the following mode. - Present before the reset	Operating mode before reset*

* Default value

■ Valve protection

To avoid a valve becoming clogged with limescale or seizing if it is not activated for a certain length of time, the product has an automatic valve protection function. Valve protection can be carried out cyclically, involving a full movement of the valve for a defined duration.

The product continuously activates a value of 100% for the valve output in question for half the configured duration. The valve thus fully opens. When half the duration has passed, the product switches to a value of 0%, leading to the complete closure of the valve.

Parameter	Description	Value
Valve protection	Activation of valve protection is triggered: - Periodically according to a configurable cycle duration.	Periodically*
Periodicity	This parameter determines the time between each valve protection activation.	Every week*
Valve protection duration	This parameter defines valve protection operating time.	10 min*

■ Smart valve protection

This function is used to activate valve protection, taking into account the number of activations and the operating time of the valve.

Example: Valve protection activation periodicity: Every week

Valve protection duration: 5 minutes

When smart valve protection is activated, valve protection is activated if the pump has not been activated for more than 5 minutes over a period of one week.

Parameter	Description	Value
Smart valve protection	The smart pump protection function is activated.	Yes*
Valve protection minimum commande value	This parameter defines the valve protection minimum commande value. Smart valve protection is then only carried out on a regular basis if the minimum parameter limit value configured at this point is not exceeded.	80*

■ Temperature

The room thermostat measures the real temperature and compares it to the requested temperature. The adjustment value is calculated based on the difference between the requested temperature and the real temperature using the defined regulation algorithm.

Communication objects:

[192](#), [291](#), [390](#), [489](#), [588](#), [687](#), [786](#), [885](#), [984](#), [1083](#), [1182](#), [1281](#) - [Thermostat x - Room temperature 1 \(2 - Byte - 9.001 DPT_Value_Temp\)](#)

* Default value

Parameter	Description	Value
Timeout of room temperature	If during temperature measurement no temperature values are received, a fault will be reported after this time has elapsed. The product then goes into emergency mode and transmits the command value when emergency active (Fixed value: 30%).	00:45* (hh:mm)

Parameter	Description	Value
Floor temperature detection	This parameter is used to indicate whether or not the floor temperature is used.	No*

■ Setpoint shift

The thermostat is used to modify the setpoint temperature per step using the setpoint shift object. The parameters below are used to save or not save this setpoint temperature and limit the setpoint temperature shift.

Parameter	Description	Value
Maximum setpoint	This parameter defines the upper limit of the setpoint temperature shift.	3* K
Minimum setpoint	This parameter defines the lower limit of the setpoint temperature shift.	3* K

Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.

Communication objects:

[225](#), [324](#), [423](#), [522](#), [621](#), [720](#), [819](#), [918](#), [1017](#), [1116](#), [1215](#), [1314](#) - Thermostat x - Setpoint shift (2 - Byte - 9.002 DPT_Value_Tempd)

3.1.3.3 General

This configuration window is used to adjust the settings of the product thermostats. These parameters are available for each thermostat individually.

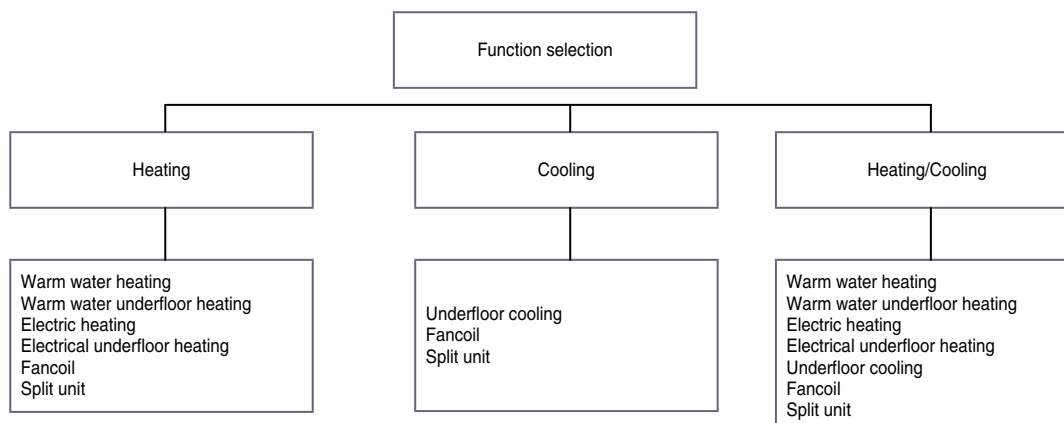
Function selection	Heating/Cooling	▼
<hr/>		
Heating		
Type of heating control	Switching PI-control (PWM)	▼
Type of heating equipment	Warm water heating	▼
Cycle time	15 min	
Emergency command value	30	▲ ▼ %
<hr/>		
Cooling		
Type of cooling control	Switching PI-control (PWM)	▼
Type of cooling equipment	Cooling ceiling	▼
Cycle time	15 min	
Emergency command value	70	▲ ▼ %

* Default value

■ Operation

The room thermostat mainly offers 2 operating modes: Heating and cooling modes. It is also possible to activate a mixed mode.

The following diagram illustrates the 3 selection modes.



Parameter	Description	Value
Function selection	The product operates in the following mode: Heating Cooling Mixed	Heating* Cooling Heating/Cooling

■ Heating

This menu is used to adjust the parameters (type of heating, regulation type, etc.) for the main heating. In heating mode, the thermostat activates the heating of the room temperature falls below the requested temperature plus a hysteresis. The regulation deactivates the heating as soon as the requested temperature corresponding to the heating mode is reached.

Parameter	Description	Value
Type of heating control	This parameter is used to select the heating regulation type.	Continuous PI-control Switching PI-control (PWM)* Switching 2-point control

The type of regulator is used to select the regulation valve control.

- Switching 2-point control

Switching 2-point control is the simplest type of regulation. This regulation algorithm cuts off the output as soon as the upper setpoint temperature is exceeded. It rearms it when the temperature falls again. The regulator has a built-in hysteresis to avoid it constantly switching the output value. The regulator then calculates the switching and tripping threshold according to the hysteresis and requested value. This type of regulator is used when the output value only accepts the two statuses (ON or OFF) and the real temperature does not need to be accurately controlled in relation to the setpoint value. Due to the inertia of the heating system, the real temperature oscillates slightly below the switching point and slightly exceeds the tripping point. The real temperature therefore always varies in a range slightly higher than the configured hysteresis.

* Default value

- Continuous PI-control

The regulation output is a value in percent ranging from 0% to 100%. The PI regulator adapts its calibrated output value between 0% and 100% to the difference between the real value and the setpoint value, thus allowing exact adjustment of the room temperature to the setpoint value. It supplies the calibrated value on the bus in the form of a 1 byte value (0 ... 100%). To reduce the workload on the bus, the calibrated value is only sent if it has changed by a previously defined percent in relation to the last value sent. The calibrated value can be sent periodically in addition.

- Switching PI-control (PWM)*

This regulation also has a continuous PI-control. However, for this type of regulation, the output signal (0 to 100%) for the PID regulation is not sent but only processed internally. Based on the PID regulation output signal, the regulation then converts the output signal to an ON and OFF pulse. This pulse does not have a fixed ON/OFF point as with the 2 point control, but the pulse length is determined using the output value calculated by the PID regulation (cycle time). The higher the calculated output value, the higher the time ratio between ON and OFF.

A short cycle time causes ON pulses at relatively short intervals. This avoids too great a temperature drop and the real value remains largely stable. However, this may also lead to the switching frequency being too high, which may affect the system or overload the KNX communication bus.

Example:

Value 100%: Always ON

Value 0%: Always OFF

30% value with cycle duration of 10 minutes: 3 min ON and 7 min OFF

Parameter	Description	Value
Type of heating equipment	This parameter is used to select the type of heating.	Warm water heating* Warm water underfloor heating Electric heating Electrical underfloor heating Fancoil Split unit Through control parameter

Note: A fancoil is an air treatment device designed to heat or cool the air. The thermal energy is provided by a fluid (water or refrigerant fluid) or by Joule effect (electricity).

Note: A Split unit is an air conditioner in which the cool air blower is separated into two parts connected by a refrigerant link transporting the calories from the inside unit to the external unit.

Communication objects:

[219](#), [318](#), [417](#), [516](#), [615](#), [714](#), [813](#), [912](#), [1011](#), [1110](#), [1209](#), [1308](#) - **Thermostat x - Setpoints heating** (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

[233](#), [332](#), [431](#), [530](#), [629](#), [728](#), [827](#), [926](#), [1025](#), [1124](#), [1223](#), [1322](#) - **Thermostat x - Status indication setpoints heating** (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

* Default value

- Switching PI-control (PWM)

Parameter	Description	Value
Cycle time	This parameter is used to adapt the regulation to the types of valves used. It defines the pulse-width modulation signal switching frequency and allows the valves used to be adapted to the changeover cycle times (time required for the valve to switch from closed position to open position).	15 min*

Note: The values for these parameters are fixed.

- Switching 2-point control

Parameter	Description	Value
Hysteresis	This parameter defines the hysteresis value for the value to be regulated. The hysteresis of the 2-point regulator indicates the regulator fluctuation width around the setpoint value.	+/- 0.5 K*
Hysteresis duration	This parameter defines the hysteresis duration for the value to be regulated.	5 min*

Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.

Note: The values for these parameters are fixed.

Parameter	Description	Value
Command value when emergency active	This parameter defines the command value when the regulator switches to emergency mode.	30%*

Note: The values for these parameters are fixed.

■ Cooling

This menu is used to adjust the (type of cooling, regulation type, etc.) parameters for the main cooling.

In cooling mode, the thermostat activates cooling if the room temperature rises above the requested value plus a hysteresis. The regulation deactivates cooling as soon as the requested temperature corresponding to the cooling mode is reached.

Parameter	Description	Value
Type of cooling control	This parameter is used to select the cooling regulation type.	Continuous PI-control Switching PI-control (PWM)* Switching 2-point control

Note: For the operation of the different types of regulation, please refer to chapter [Heating](#).

* Default value

Parameter	Description	Value
Type of cooling equipment	This parameter is used to select the cooling type.	Cooling ceiling* Fancoil Split unit

Note: A fancoil is an air treatment device designed to heat or cool the air. The thermal energy is provided by a fluid (water or refrigerant fluid) or by Joule effect (electricity).

Note: A Split unit is an air conditioner in which the cool air blower is separated into two parts connected by a refrigerant link transporting the calories from the inside unit to the external unit.

Communication objects:

[224, 323, 422, 521, 620, 719, 818, 917, 1016, 1115, 1214, 1313](#) - Thermostat x - Setpoints cooling (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

[238, 337, 436, 535, 634, 733, 832, 931, 1030, 1129, 1228, 1327](#) - Thermostat x - Status indication setpoints cooling (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

■ Switching PI-control (PWM)

Parameter	Description	Value
Cycle time	This parameter is used to adapt the regulation to the types of valves used. It defines the pulse-width modulation signal switching frequency and allows the valves used to be adapted to the changeover cycle times (time required for the valve to switch from closed position to open position).	15 min*

Note: The values for these parameters are fixed.

■ Switching 2-point control

Parameter	Description	Value
Hysteresis	This parameter defines the hysteresis value for the value to be regulated. The hysteresis of the 2-point regulator indicates the regulator fluctuation width around the setpoint value.	+/- 0.3 K*
Hysteresis duration	This parameter defines the hysteresis duration for the value to be regulated.	5 min*

Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.

Note: The values for these parameters are fixed.

Parameter	Description	Value
Command value when emergency active	This parameter defines the command value when the regulator switches to emergency mode.	70%*

Note: The values for these parameters are fixed.

* Default value

3.1.3.4 Function selection

Timer	<input type="checkbox"/>
Priority	<input type="checkbox"/>
Automatic control	<input type="checkbox"/>
Scene	<input type="checkbox"/>

■ Timer

The Timer function is used to select a heating or cooling setpoint for a configurable duration. The timer may be interrupted before expiry of the delay time. The timer duration can be modified via the bus KNX. When the timing function expires, return to the previous operating mode.

Timer	<input checked="" type="checkbox"/>
<div style="border: 1px solid #ccc; padding: 5px; margin: 5px 0;"> <i>i</i> Activate the parameter "Restore ETS-params settings" in General / General so that the parameter value is taken into account after next download. </div>	
Timer operation	Comfort
Timer duration	<input type="text" value="04:00:00"/> hh:mm:ss

Parameter	Description	Value
Timer operation	When the timer is activated and for an established duration, the thermostat status: Switches to Comfort mode	Comfort*

Note: The values for these parameters are fixed.

Parameter	Description	Value
Timer duration	This parameter determines the timer duration.	00:00:01 ... 04:00:00* ... 23:59:59 (hh:mm:ss)

Communication objects:

239, 338, 437, 536, 635, 734, 831, 930, 1031, 1130, 1229, 1328 - Thermostat x - Timer (1 - Bit - 1.010 DPT_Start)

* Default value

■ Priority

The Priority function is used to force the thermostat with a defined heating or cooling setpoint. Only a Priority OFF command authorizes the output for control.

Priority	<input checked="" type="checkbox"/>
Status after priority	Theoretical status without priority

Parameter	Description	Value
Status after priority	At the end of the priority, the thermostat status: Switched to the status which would be active according to other communication objects if the priority had not taken place.	Theoretical status without priority*

Note: The values for these parameters are fixed.

Communication objects:

173, 272, 371, 470, 569, 668, 767, 866, 965, 1064, 1163, 1262 - Thermostat x - Priority (2 - Bit - 2.002 DPT_Bool_Control)

183, 282, 381, 480, 579, 678, 777, 876, 975, 1074, 1173, 1272 - Thermostat x - Status indication priority (1 - bit - 1.011 DPT_State)

■ Automatic control

The Automatic control function is used to control a thermostat in parallel to the Setpoint selection function. The two functions have the same level of priority. The last control received will act on the thermostat status. An additional command object is used to activate or deactivate the Automatic control.

Example: When a thermostat is controlled by a push-button and in parallel by an automatic control (timer, twilight switch, weather station, etc.) the automatic control can be deactivated for reasons of comfort (vacations, public holidays, etc.).

Automatic control	<input checked="" type="checkbox"/>
Automatic control deactivation	<input checked="" type="checkbox"/>

Communication objects:

170, 269, 368, 467, 566, 665, 764, 863, 962, 1061, 1160, 1259 - Thermostat x - Setpoint selection automatic control (1 - Byte - 20.102 DPT_HVACMode)

Parameter	Description	Value
Automatic control deactivation	The objects and the associated parameters are displayed.	Active
	The objects and the associated parameters are hidden.	Not active*

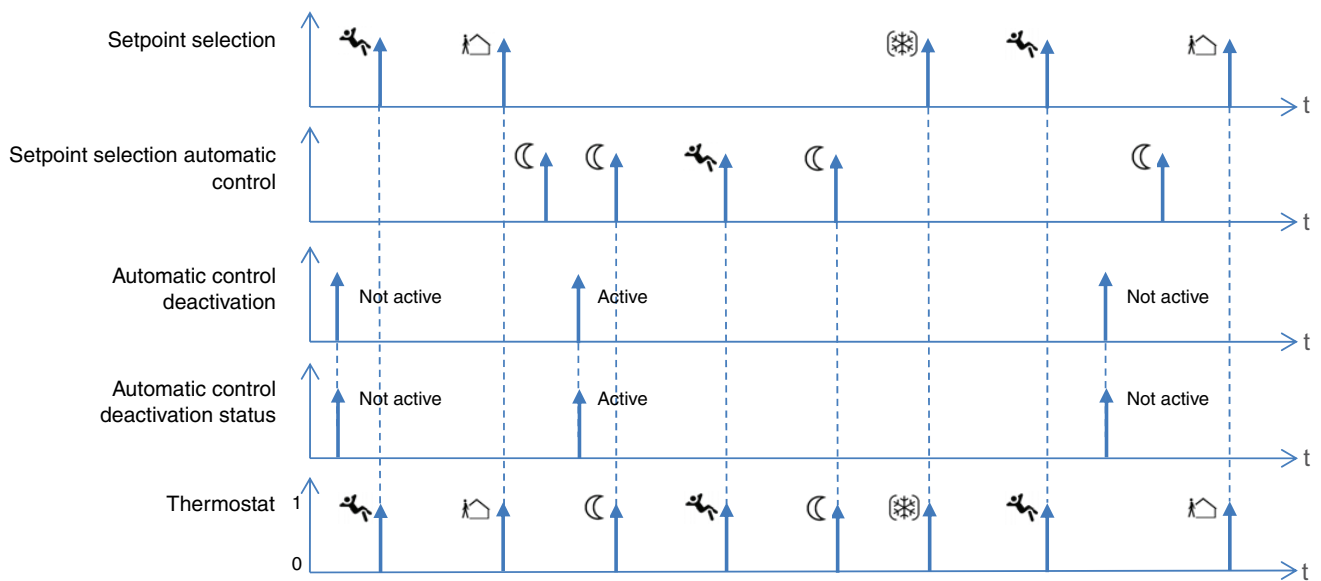
Communication objects:

171, 270, 369, 468, 567, 666, 765, 864, 963, 1062, 1161, 1260 - Thermostat x - Automatic control deactivation (1 - Bit - 1.003 DPT_Enable)

179, 278, 377, 476, 575, 674, 773, 872, 971, 1070, 1169, 1268 - Thermostat x - Automatic control deactivation status (1 - Bit - 1.003 DPT_Enable)

* Default value

Operating principle



Mode	Symbols
Comfort	
Night setpoint	
Standby	
Frost/heat protection	

■ Scene

The Scene function is used to switch groups of outputs into a configurable predefined state. A scene is activated by receipt of a 1-byte command. Each thermostat can be integrated into 64 different scenes.

When the scene is activated, the thermostat can switch to one of the following modes:

- Auto
- Comfort
- Standby
- Night setpoint
- Frost/heat protection

Scene

i Activate the parameter "Restore ETS-params settings" in General / General so that the parameter value is taken into account after next download.

Number of scenes used

Scene 1

Scene 1 setpoint

Scene 2

Scene 2 setpoint

Scene 3

Scene 3 setpoint

Scene 4

Scene 4 setpoint

Scene 5

Scene 5 setpoint

Scene 6

Scene 6 setpoint

Scene 7

Scene 7 setpoint

Scene 8

Scene 8 setpoint

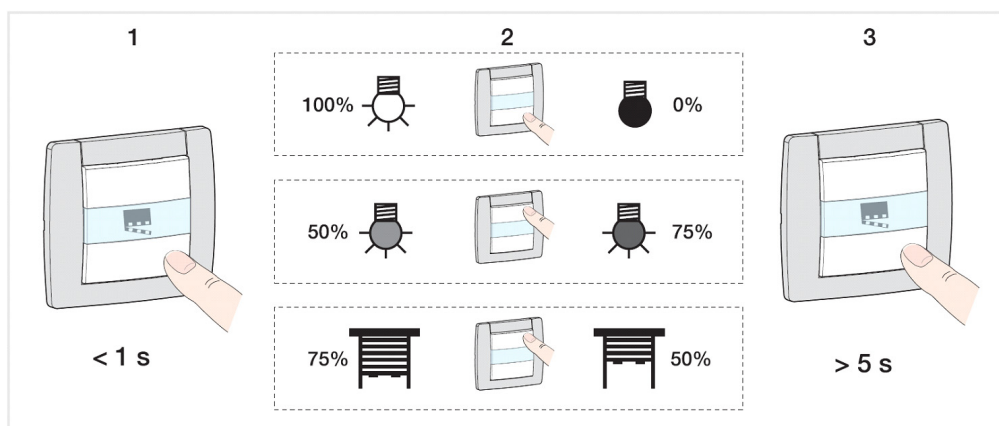
Learning and storing scenes

This process is used to change and store a scene. For example, by locally pressing the key in the room or by emission of the values from a visualization.

Scene number	Access scene (Object value: 1 byte)	Store scene (Object value: 1 byte)
1-64	= Scene number -1	= Scene number +128
Examples		
1	0	128
2	1	129
3	2	130
...	...	
64	63	191

Here is the scene memorisation for local switches, for example.

- Activate scene by briefly pressing the transmitter that starts it.
- The outputs (lights, shutters, etc.) are set in the desired state using the usual local control devices (buttons, remote control, etc.).
- Memorise the status of the outputs with a press greater than 5 seconds long on the transmitter that starts the scene. The memorisation can be displayed by short-term activation of the outputs.



Parameter	Description	Value
Number of scenes used	This parameter determines the number of scenes used.	0 ... 8* ... 64

Note: If the Scene number received on the Scene object is greater than the maximum number of scenes, the status of the output remains unchanged.

Parameter	Description	Value
Scene X	On activation of Scene X, the output is: Applies a configurable setpoint. Not changed.	Active* Not active

X = 1 to 64

Note: Each output has up to 64 scenes available, in accordance with the **Number of scenes used** parameter.

Parameter	Description	Value
Scene X setpoint	When scene X is activated, the output applies one of the 5 setpoints.	Auto Comfort* Standby Night setpoint Frost/heat protection

X = 1 to 64

Communication objects:

[177](#), [276](#), [375](#), [474](#), [573](#), [672](#), [771](#), [870](#), [969](#), [1068](#), [1167](#), [1266](#) - **Thermostat x - Scene** (1 - Byte - 18.001 DPT_SceneControl)

* Default value

3.1.3.5 Setpoints

The product allows setpoint temperatures to be configured which can be preset in the ETS for each operating mode. It is possible to configure absolute setpoint values (independent setpoints) or relative setpoint values (offset from basic setpoint). The setpoint temperatures can also be adjusted during operation using the KNX bus.

i Activate the parameter "Restore ETS-params settings" in General / General so that the parameter value is taken into account after next download.

Setpoints preset
 Relative (offset from basic setpoint)
 Absolute (independent setpoint)

Setpoints heating

Comfort setpoint heating °C

Standby setpoint heating °C

Night setpoint heating °C

Frost protection setpoint heating °C

Setpoints cooling

Comfort setpoint cooling °C

Standby setpoint cooling °C

Night setpoint cooling °C

Heat protection setpoint cooling °C

Setpoint objects Combined ▾

Fahrenheit

Celsius

$Celsius = (Fahrenheit - 32) \cdot \frac{5}{9}$

Parameter	Description	Value
Setpoints preset	<p>The setpoint temperature is adjusted from a basic setpoint value (Comfort mode). The other setpoint values for the other modes result from this basic setpoint.</p> <p>The setpoint temperatures for the different modes are independent from each other. Different temperature values can be entered in a range from + 7.0 °C to + 40.0 °C depending on the operating mode and the service mode.</p>	<p>Relative (offset from basic setpoint)</p> <p>Absolute (independent setpoint)*</p>

* Default value

- The absolute setpoint values (independent setpoints)

The setpoint temperatures for the different modes are independent from each other. Different temperature values can be entered in a range from + 7.0 °C to + 40.0 °C depending on the operating mode and the service mode.

Setpoints heating	
Comfort setpoint heating	21 °C
Standby setpoint heating	19 °C
Night setpoint heating	16 °C
Frost protection setpoint heating	7 °C

Setpoints cooling	
Comfort setpoint cooling	21 °C
Standby setpoint cooling	23 °C
Night setpoint cooling	26 °C
Heat protection setpoint cooling	35 °C

Parameter	Description	Value
Comfort setpoint heating	This parameter defines the setpoint value for the heating comfort mode	7 ... 21* ... 40 °C
Standby setpoint heating	This parameter defines the setpoint temperature for the heating standby mode	7 ... 19* ... 40 °C
Night setpoint heating	This parameter defines the setpoint temperature for the heating night setpoint mode	7 ... 16* ... 40 °C
Frost protection setpoint heating	This parameter defines the setpoint temperature for the heating frost protection mode	7* ... 40 °C

Parameter	Description	Value
Comfort setpoint cooling	This parameter defines the setpoint temperature for the cooling comfort mode	7 ... 21* ... 40 °C
Standby setpoint cooling	This parameter defines the setpoint temperature for the cooling standby mode	7 ... 23* ... 40 °C
Night setpoint cooling	This parameter defines the setpoint temperature for the cooling night setpoint mode	7 ... 26* ... 40 °C
Heat protection setpoint cooling	This parameter defines the setpoint temperature for the heat protection mode for cooling.	7 ... 35* ... 40 °C

* Default value

- The relative setpoint values (offset from basic setpoint)

Comfort setpoint	21	°C
Standby offset	2	K
Night offset	5	K
Frost protection setpoint heating	7	°C
Heat protection setpoint cooling	35	°C
Difference between heating and cooling	0	K

Parameter	Description	Value
Comfort setpoint	This parameter defines the temperature taken into account as the basic setpoint value (Comfort mode).	7 ... 21* ... 40 °C
Standby offset	The setpoint temperature in standby mode must be lowered by this value in relation to the heating comfort mode temperature.	1 ... 2* ... 20 K
Night offset	The setpoint temperature in Night setpoint mode must be lowered by this value in relation to the heating comfort mode temperature.	1 ... 5* ... 20 K

Note: In case of cooling, the offset value is added to the comfort mode temperature.

Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.

Parameter	Description	Value
Frost protection setpoint heating	This parameter defines the setpoint temperature for the heating frost protection mode.	7* ... 40 °C

Note: This parameter is only visible if the **Function selection** parameter has the value **Heating** or **Heating/Cooling**.

Parameter	Description	Value
Heat protection setpoint cooling	This parameter defines the setpoint temperature for the heat protection mode for cooling.	7 ... 35* ... 40 °C

Note: This parameter is only visible if the **Function selection** parameter has the value **Cooling** or **Heating/Cooling**.

* Default value

Parameter	Description	Value
Difference between heating and cooling	The comfort mode setpoint temperatures for heating and cooling result from the basic setpoint value, taking into account a neutral zone to be defined. This parameter defines the value of the neutral zone (temperature zone in which neither the heating or cooling are active) corresponding to the difference between the comfort mode setpoint temperatures for heating and cooling.	0* ... 40 K

Note: This parameter is only visible if the **Function selection** parameter has the value **Heating/Cooling**.

Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.

■ Setpoint objects

The setpoint temperatures can also be adjusted during operation using the KNX bus. The list of different objects available to modify the setpoint is shown below.

Parameter	Description	Value
Setpoint objects	The setpoint temperatures are modified using: Several communication objects in 2 byte format corresponding to each setpoint mode. A single communication object in 8 byte format grouping the 4 setpoint modes. The two available formats (2 bytes and 8 bytes)	Simple Combined* Both

Note: The communication objects are available for heating and cooling. These objects are transmitted on status change.

Communication objects: Heating (2 Bytes)

215, 314, 413, 512, 611, 710, 809, 908, 1007, 1106, 1205, 1304 - Thermostat x - Comfort setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

216, 315, 414, 513, 612, 711, 810, 909, 1008, 1107, 1206, 1305 - Thermostat x - Standby setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

217, 316, 415, 514, 613, 712, 811, 910, 1009, 1108, 1207, 1306 - Thermostat x - Night setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

218, 317, 416, 515, 614, 713, 812, 911, 1010, 1109, 1208, 1307 - Thermostat x - Frost protection setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

Communication objects: Heating (8 Bytes)

219, 318, 417, 516, 615, 714, 813, 912, 1011, 1110, 1209, 1308 - Thermostat x - Setpoints heating (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

Communication objects: Cooling (2 Bytes)

220, 319, 418, 517, 616, 715, 814, 913, 1012, 1111, 1210, 1309 - Thermostat x - Comfort setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

221, 320, 419, 518, 617, 716, 815, 914, 1013, 1112, 1211, 1310 - Thermostat x - Standby setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

222, 321, 420, 519, 618, 717, 816, 915, 1014, 1113, 1212, 1311 - Thermostat x - Night setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

223, 322, 421, 520, 619, 718, 817, 916, 1015, 1114, 1213, 1312 - Thermostat x - Heat protection setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

* Default value

Communication objects: Cooling (8 Bytes)

224, 323, 422, 521, 620, 719, 818, 917, 1016, 1115, 1214, 1313 - Thermostat x - Setpoints cooling (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

Each communication object has a status indication object used to send the setpoint temperature value.

Communication objects: Heating status indication (2 Bytes)

229, 328, 427, 526, 625, 724, 823, 922, 1021, 1120, 1219, 1318 - Thermostat x - Status indication comfort setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

230, 329, 428, 527, 626, 725, 824, 923, 1022, 1121, 1220, 1319 - Thermostat x - Status indication standby setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

231, 330, 429, 528, 627, 726, 825, 924, 1023, 1122, 1221, 1320 - Thermostat x - Status indication night setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

232, 331, 430, 529, 628, 727, 826, 925, 1024, 1123, 1222, 1321 - Thermostat x - Status indication frost protection setpoint heating (2 - Byte - 9.001 DPT_Value_Temp)

Communication objects: Heating status indication (8 Bytes)

233, 332, 431, 530, 629, 728, 827, 926, 1025, 1124, 1223, 1322 - Thermostat x - Status indication setpoints heating (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

Communication objects: Cooling status indication (2 Bytes)

234, 333, 432, 531, 630, 729, 828, 927, 1026, 1125, 1224, 1323 - Thermostat x - Status indication comfort setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

235, 334, 433, 532, 631, 730, 829, 928, 1027, 1126, 1225, 1324 - Thermostat x - Status indication standby setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

236, 335, 434, 533, 632, 731, 830, 929, 1028, 1127, 1226, 1325 - Thermostat x - Status indication night setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)



237, 336, 435, 534, 633, 732, 831, 930, 1029, 1128, 1227, 1326 - Thermostat x - Status indication heat protection setpoint cooling (2 - Byte - 9.001 DPT_Value_Temp)

Communication objects: Cooling status indication (8 Bytes)

238, 337, 436, 535, 634, 733, 832, 931, 1030, 1129, 1228, 1327 - Thermostat x - Status indication setpoints cooling (8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4])

3.2 Communication objects

3.2.1 Communication objects General

	Number	Name	Function of the object	Length	C	R	W	T
	163	General	Heating activation	1 bit	C	R	W	-
	164	General	Heat requirement	1 bit	C	R	-	T

No.	Name	Function of the object	Data type	Flags
163	General	Heating activation	1 - Bit - 1.001 DPT_Switch	C, R, W

These objects are always activated.

This object is used to control the activation and deactivation of all the valve outputs at the same time by the KNX bus.

Object value:

1 = Heating activ., 0 = Heating deactiv.

- If the object receives the value 1, all the valve outputs are active. The outputs operate normally.
- If the object receives the value 0, all the valve outputs are deactivated. The value of the outputs switches to 0%.

No.	Name	Function of the object	Data type	Flags
164	General	Heat requirement	1 - Bit - 1.002 DPT_Bool	C, R, T

These objects are always activated.

This object is used to send a heat requirement from the device on the KNX bus. A heat requirement is indicated by the product only if one of the configured values for the assigned outputs exceeds one of the limit values defined with added hysteresis. Cancellation of a heat requirement message occurs as soon as the value falls below the limit value.

Object value:

1 = Heat requirement, 0 = No heat requirement

- If the heat requirement is inactive, a telegram with a logic value 0 is sent.
- If the heat requirement is active, a telegram with a logic value 1 is sent.

This object is sent periodically and/or on status change.

Periodicity: 10 min.

For further information, see: [Heat requirement](#).

3.2.2 Output communication objects

	Number	Name	Function of the object	Length	C	R	W	T
	1	Output 1	ON/OFF	1 bit	C	R	W	-
	2	Output 1	Valve position in %	1 byte	C	R	W	-
	3	Output 1	Status indication ON/OFF	1 bit	C	R	-	T
	4	Output 1	Status valve position in %	1 byte	C	R	-	T
	7	Output 1	Priority	2 bit	C	R	W	-
	9	Output 1	Status indication priority	1 bit	C	R	-	T
	10	Output 1	Heating/Cooling - changeover	1 bit	C	R	W	-

Note: The designation of the objects is identical for the other outputs. Only the object number differs.

No.	Name	Function of the object	Data type	Flags
1, 28, 55, 82, 109, 136	Output x	ON/OFF	1 - Bit - 1.001 DPT_Switch	C, R, W

These objects are always activated.

This object is used to switch the valve output contact according to the value sent on the KNX bus. This value can come from a KNX room thermostat for example.

Object value: It depends on the **Default valve status** parameter.

Normally open

On reception of an OFF control, the valve is powered and closes.

On reception of an ON control, the valve is not powered and opens.

Normally closed

On reception of an OFF control, the valve is not powered and closes.

On reception of an ON control, the valve is powered and opens.

For further information, see: [Operation](#).

No.	Name	Function of the object	Data type	Flags
2, 29, 56, 83, 110, 137	Output x	Valve position in %	8 - Bit - 5.001 DPT_Scaling	C, R, W

These objects are always activated.

This object is used to control the valve outputs according to the value in % sent on the KNX bus. This value can come from a KNX room thermostat for example.

Object value: 0 (0%) to 255 (100%).

Note: This object is only available if the **Command value format** parameter has the value **Continuous with PWM (1 byte)** or **ON/OFF with command value (1 byte)**. The valve output will be controlled according to the value received.

For further information, see: [Operation](#).

No.	Name	Function of the object	Data type	Flags
3, 30, 57, 84, 111, 138	Output x	Status indication ON/OFF	1 - Bit - 1.001 DPT_Switch	C, R, T

These objects are always activated.

This object is used to send the valve output contact status for the device on the KNX bus.

Object value:

0 = valve closed, 1 = valve open

- If the valve is open, a telegram with the logic value 1 is sent on the KNX bus.
- If the valve is closed, a telegram with the logic value 0 is sent on the KNX bus.

This object is sent periodically and/or on status change.

Periodicity: 10 min.

No.	Name	Function of the object	Data type	Flags
4, 31, 58, 85, 112, 139	Output x	Status valve position in %	8 - Bit - 5.001 DPT_Scaling	C, R, T

These objects are always activated. This object is used to send the value in % of the device valve output on the KNX bus.

Object value: 0 (0%) to 255 (100%).

This object is sent periodically and/or on status change.

Periodicity: 10 min.

No.	Name	Function of the object	Data type	Flags
7, 34, 61, 88, 115, 142	Output x	Priority	2 - Bit - 2.002 DPT_Bool_Control	C, R, W

These objects are always activated.

The status of the valve outputs is directly determined by this object.

Details on the format of the object are given below.

Telegram received by the priority operation object			Output behaviour
Hexadecimal Value	Binary Value		
	BIT1 (MSB)	BIT0 (LSB)	
00	0	0	End of the priority
01	0	1	End of the priority
02	1	0	Priority, valves closed
03	1	1	Priority, valves open

Bit 1 of the telegram activates priority with the value 1. The valve outputs assigned are then locked in the status predefined by bit 0 (0 = closed and 1 = open). The value 0 in bit 1 deactivates priority again.

No.	Name	Function of the object	Data type	Flags
9, 36, 63, 90, 117, 144	Output x	Status indication priority	1 - Bit - 1.003 DPT_Enable	C, R, T

These objects are always activated.

This object allows the status of the Priority to be sent from the device on the KNX bus.

Object value:

1 = Priority active, 0 = Priority not active

- If Priority is deactivated, a telegram is sent with logic value 0.
- If Priority is activated, a telegram is sent with logic value 1.

This object is sent when there is a status change.

No.	Name	Function of the object	Data type	Flags
10, 37, 64, 91, 118, 145	Output x	Heating/Cooling - changeover	1 - Bit - 1.100 DPT_Heat_Cool	C, R, W

These objects are always activated.


































This object is used to switch the heating mode to cooling and the reverse according to the value sent on the KNX bus. This value can come from a KNX room thermostat for example.








Object value:

- If the object receives the value 1, heating mode is active.
- If the object receives the value 0, cooling mode is active.

3.2.3 Communications objects per thermostat

This chapter is only valid for reference TXM646R.

	Number	Name	Function of the object	Length	C	R	W	T
	165	Thermostat 1	Setpoint selection	1 byte	C	R	W	-
	170	Thermostat 1	Setpoint selection automatic control	1 byte	C	R	W	-
	171	Thermostat 1	Automatic control deactivation	1 bit	C	R	W	-
	172	Thermostat 1	Heating/Cooling - changeover	1 bit	C	R	W	-
	173	Thermostat 1	Priority	2 bit	C	R	W	-
	176	Thermostat 1	Windows contact	1 bit	C	R	W	-
	177	Thermostat 1	Scene	1 byte	C	R	W	-
	178	Thermostat 1	Status indication setpoint selection	1 byte	C	R	-	T
	179	Thermostat 1	Automatic control deactivation status	1 bit	C	R	-	T
	180	Thermostat 1	Heating/Cooling - status indication	1 bit	C	R	-	T
	183	Thermostat 1	Status indication priority	1 bit	C	R	-	T
	184	Thermostat 1	ON/OFF	1 bit	C	R	-	T
	185	Thermostat 1	Valve position in %	1 byte	C	R	-	T
	192	Thermostat 1	Room temperature 1	2 byte	C	R	W	-
	196	Thermostat 1	Status indication room temperature	2 byte	C	R	-	T
	215	Thermostat 1	Comfort setpoint heating	2 byte	C	R	W	-
	216	Thermostat 1	Standby setpoint heating	2 byte	C	R	W	-
	217	Thermostat 1	Night setpoint heating	2 byte	C	R	W	-
	218	Thermostat 1	Frost protection setpoint heating	2 byte	C	R	W	-
	219	Thermostat 1	Setpoints heating	8 byte	C	R	W	-
	220	Thermostat 1	Standby setpoint cooling	2 byte	C	R	W	-
	221	Thermostat 1	Comfort setpoint cooling	2 byte	C	R	W	-
	222	Thermostat 1	Night setpoint cooling	2 byte	C	R	W	-
	223	Thermostat 1	Heat protection setpoint cooling	2 byte	C	R	W	-
	224	Thermostat 1	Setpoints cooling	8 byte	C	R	W	-
	225	Thermostat 1	Setpoint shift	2 byte	C	R	W	-
	226	Thermostat 1	Current setpoint	2 byte	C	R	W	-
	227	Thermostat 1	Status indication setpoint shift	2 byte	C	R	-	T
	228	Thermostat 1	Status indication reference setpoint	2 byte	C	R	-	T
	229	Thermostat 1	Status indication comfort setpoint heating	2 byte	C	R	-	T
	230	Thermostat 1	Status indication standby setpoint heating	2 byte	C	R	-	T
	231	Thermostat 1	Status indication night setpoint heating	2 byte	C	R	-	T
	232	Thermostat 1	Status indication frost protection setpoint heating	2 byte	C	R	-	T

	Number	Name	Function of the object	Length	C	R	W	T
	233	Thermostat 1	Status indication setpoints heating	8 byte	C	R	-	T
	234	Thermostat 1	Status indication comfort setpoint cooling	2 byte	C	R	-	T
	235	Thermostat 1	Status indication standby setpoint cooling	2 byte	C	R	-	T
	236	Thermostat 1	Status indication night setpoint cooling	2 byte	C	R	-	T
	237	Thermostat 1	Status indication heat protection setpoint cooling	2 byte	C	R	-	T
	238	Thermostat 1	Status indication setpoints cooling	8 byte	C	R	-	T
	239	Thermostat 1	Timer	1 bit	C	R	W	-

Note: The object designation is identical for the other thermostats. Only the object number differs.

No.	Name	Function of the object	Data type	Flags
165, 264, 363, 462, 561, 660, 759, 858, 957, 1056, 1155, 1254	Thermostat x	Setpoint selection	1 - Byte - 20.102 DPT_HVACMode	C, R, W

These objects are always activated.

This object is used to define the temperature setpoint for heating and cooling by the KNX bus.

Object value:

Heating mode	Value
Comfort	1
Standby	2
Night setpoint	3
Frost/heat protection	4

For further information, see: [Setpoint shift](#).

No.	Name	Function of the object	Data type	Flags
170, 269, 368, 467, 566, 665, 764, 863, 962, 1061, 1160, 1259	Thermostat x	Setpoint selection automatic control	1 - Byte - 20.102 DPT_HVACMode	C, R, W

This object is activated when the **Automatic control** parameter is active.

This object is used to define the temperature setpoint for heating and cooling by the KNX bus. This object is used to have an additional control operating in parallel to the standard control.

Object value:

Heating mode	Value
Comfort	1
Standby	2
Night setpoint	3
Frost/heat protection	4

For further information, see: [Automatic control](#).

No.	Name	Function of the object	Data type	Flags
171, 270, 369, 468, 567, 666, 765, 864, 963, 1062, 1161, 1260	Thermostat x	Automatic control deactivation	1 - Bit - 1.003 DPT_Enable	C, R, W
<p>This object is activated when the Automatic control deactivation parameter is active. This object is used to activate the automatic control function.</p> <p>Object value:</p> <ul style="list-style-type: none"> - If the object receives the value 0, the automatic control function is active. - If the object receives the value 1, the automatic control function is inactive. <p>For further information, see: Automatic control.</p>				

No.	Name	Function of the object	Data type	Flags
172, 271, 370, 469, 568, 667, 766, 865, 964, 1063, 1162, 1261	Thermostat x	Heating/Cooling - changeover	1 - Bit - 1.100 DPT_Heat_Cool	C, R, W
<p>This object is activated if the Function selection parameter has the value Heating/Cooling. This object is used to define the device's thermostat operating mode by the KNX bus.</p> <p>Object value:</p> <ul style="list-style-type: none"> - If the object receives the value 0, cooling mode is active. - If the object receives the value 1, heating mode is active. <p>For further information, see: General.</p>				

No.	Name	Function of the object	Data type	Flags
173, 272, 371, 470, 569, 668, 767, 866, 965, 1064, 1163, 1262	Thermostat x	Priority	2 - Bit - 2.002 DPT_Bool_Control	C, R, W

This object is activated if the **Priority** parameter is active.
The heating setpoint is directly determined by this object.

Details on the format of the object are given below.

Telegram received by the priority operation object			Output behaviour
Hexadecimal Value	Binary Value		
	Bit1 (MSB)	Bit0 (LSB)	
00	0	0	End of the priority
01	0	1	End of the priority
02	1	0	Priority Frost protection
03	1	1	Priority Comfort

Bit 1 of the telegram activates priority with the value 1. The heating setpoint is then locked in the status predefined by the 0 bit (0 = Frost protection, 1 = Comfort). The value 0 in bit 1 deactivates priority again.

For further information, see: [Priority](#).

No.	Name	Function of the object	Data type	Flags
176, 275, 374, 473, 572, 671, 770, 869, 968, 1067, 1166, 1265	Thermostat x	Windows contact	1 - Bit - 1.019 DPT_Window_Door	C, R, W

These objects are always activated.

This object is used to stop the heating or cooling system when a window is opened from the KNX bus.

Object value:

- If the object receives the value 1, the window is open. The setpoint switches to frost/heat protection mode.
- If the object receives the value 0, the window is closed. The setpoint returns to the mode present before the window was opened.

No.	Name	Function of the object	Data type	Flags
177, 276, 375, 474, 573, 672, 771, 870, 969, 1068, 1167, 1266	Thermostat x	Scene	1 - Byte - 18.001 DPT_SceneControl	C, R, W

This object is activated when the **Scene** parameter is active.
This object is used to recall or save a scene.

Details on the format of the object are given below:

7	6	5	4	3	2	1	0
Learning	Not used	Scene number					

Bit 7: 0: The scene is called / 1: The scene is saved.

Bit 6: Not used.

Bit 5 to Bit 0: Scene numbers from 0 (Scene 1) to 63 (Scene 64).

For further information, see: [Scene](#).

No.	Name	Function of the object	Data type	Flags
178, 277, 376, 475, 574, 673, 772, 871, 970, 1069, 1168, 1267	Thermostat x	Status indication setpoint selection	1 - Byte - 20.102 DPT_HVACMode	C, R, T

These objects are always activated.

This object is used to send the setpoint status for heating and cooling by the KNX bus.

Object value:

Heating mode	Value
Comfort	1
Standby	2
Night setpoint	3
Frost/heat protection	4

For further information, see: [Setpoints](#).

No.	Name	Function of the object	Data type	Flags
179, 278, 377, 476, 575, 674, 773, 872, 971, 1070, 1169, 1268	Thermostat x	Automatic control deactivation status	1 - Bit - 1.003 DPT_Enable	C, R, T

This object is activated when the **Automatic control deactivation** parameter is active.
This object is used to send the status of the Automatic control deactivation function of the device on the KNX bus.

Object value:

- If the Automatic control deactivation function is deactivated, a telegram with a logical value 0 is sent.
- If the Automatic control deactivation function is activated, a telegram with a logical value 1 is sent.

This object is sent when there is a status change.

For further information, see: [Automatic control](#).

No.	Name	Function of the object	Data type	Flags
180, 279, 378, 477, 576, 675, 774, 873, 972, 1071, 1170, 1269	Thermostat x	Heating/Cooling - status indication	1 - Bit - 1.100 DPT_Heat_Cool	C, R, T

These objects are always activated.
This object is used to send the operating mode status for the device's thermostat on the KNX bus.

Object value:

- If the thermostat is in heating mode, a telegram with a logic value 0 is sent.
- If the thermostat is in cooling mode, a telegram with a logic value 1 is sent.

This object is sent when there is a status change.

For further information, see: [General](#).

No.	Name	Function of the object	Data type	Flags
183, 282, 381, 480, 579, 678, 777, 876, 975, 1074, 1173, 1272	Thermostat x	Status indication priority	1 - Bit - 1.011 DPT_State	C, R, T

This object is activated if the **Priority** parameter is active.
This object allows the status of the Priority to be sent from the device on the KNX bus.

Object value:
0 = Not forced, 1 = Forced

- If Priority is deactivated, a telegram is sent with logic value 0.
- If Priority is activated, a telegram is sent with logic value 1.

This object is sent periodically and/or on status change.
Periodicity: 10 min

For further information, see: [Priority](#).

No.	Name	Function of the object	Data type	Flags
184, 283, 382, 481, 580, 679, 778, 877, 976, 1075, 1174, 1273	Thermostat x	ON/OFF	1 - Bit - 1.001 DPT_Switch	C, R, T
<p>This object is always activated except when the Type of heating control and Type of cooling control parameter has the value Continuous PI-control.</p> <p>This object is used for valve control in heating mode according to the value sent on the KNX bus in 1 bit format.</p> <p>Object value:</p> <ul style="list-style-type: none"> - When an ON control is sent, a telegram with the logic value 1 is sent on the KNX bus. This means that an energy demand is necessary for the heating. - When an OFF control is sent, a telegram with the logic value 0 is sent on the KNX bus. This means that the energy demand for heating is no longer necessary. <p>For further information, see: General.</p>				

No.	Name	Function of the object	Data type	Flags
185, 284, 383, 482, 581, 680, 779, 878, 977, 1076, 1175, 1274	Thermostat x	Valve position in %	8 - Bit - 5.001 DPT_Scaling	C, R, T
<p>These objects are always activated.</p> <p>This object is used for valve control in heating mode according to the value sent on the KNX bus in 1 byte format.</p> <p>Object value: 0 to 255: 0 = 0%, 255 = 100%</p> <p>For further information, see: General.</p>				

No.	Name	Function of the object	Data type	Flags
192, 291, 390, 489, 588, 687, 786, 885, 984, 1083, 1182, 1281	Thermostat x	Room temperature 1	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>These objects are always activated. This object is used to read a room temperature using an external sensor.</p> <p>Object value: -273 to +670760 in °C.</p> <p>For further information, see: Temperature.</p>				

No.	Name	Function of the object	Data type	Flags
196, 295, 394, 493, 592, 691, 790, 889, 988, 1087, 1186, 1285	Thermostat x	Status indication room temperature	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>These objects are always activated. This object is used to indicate the real temperature value taken into account by the regulator.</p> <p>Object value: -273 to +670760 in °C. This object is sent when there is a status change.</p> <p>For further information, see: Temperature.</p>				

No.	Name	Function of the object	Data type	Flags
215, 314, 413, 512, 611, 710, 809, 908, 1007, 1106, 1205, 1304	Thermostat x	Comfort setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of comfort mode for heating by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
216, 315, 414, 513, 612, 711, 810, 909, 1008, 1107, 1206, 1305	Thermostat x	Standby setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of standby mode for heating by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
217, 316, 415, 514, 613, 712, 811, 910, 1009, 1108, 1207, 1306	Thermostat x	Night setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of night setpoint mode for heating by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
218, 317, 416, 515, 614, 713, 812, 911, 1010, 1109, 1208, 1307	Thermostat x	Frost protection setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of frost protection for heating by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
219, 318, 417, 516, 615, 714, 813, 912, 1011, 1110, 1209, 1308	Thermostat x	Setpoints heating	8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4]	C, R, W

This object is activated if the **Function selection** parameter has the value **Heating** or **Heating/Cooling**.
This object is used to define the temperature setpoint value of comfort, standby, night setpoint and frost protection mode for heating by the KNX bus.

Object value:

Comfort setpoint														Standby setpoint																							
Byte 8 (MSB)							Byte 7 (LSB)							Byte 6 (MSB)							Byte 5 (LSB)																
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Night setpoint														Frost protection setpoint																							
Byte 4 (MSB)							Byte 3 (LSB)							Byte 2 (MSB)							Byte 1 (LSB)																
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Fields	Description	Value	Units
Comfort setpoint	Comfort mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Standby setpoint	Standby mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Night setpoint	Night setpoint mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Frost protection setpoint	Frost protection mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C

For further information, see: [Heating](#).

No.	Name	Function of the object	Data type	Flags
220, 319, 418, 517, 616, 715, 814, 913, 1012, 1111, 1210, 1309	Thermostat x	Comfort setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, W

This object is only visible if the **Setpoint objects** parameter has the following value **Simple** or **Both**.
This object is used to define the temperature setpoint value of comfort mode for cooling by the KNX bus.

Object value: -273 to +670760 in °C.

The temperature range taken into account: -5 to 40 in °C.

For further information, see: [Setpoints](#).

No.	Name	Function of the object	Data type	Flags
221, 320, 419, 518, 617, 716, 815, 914, 1013, 1112, 1211, 1310	Thermostat x	Standby setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of standby mode for cooling by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
222, 321, 420, 519, 618, 717, 816, 915, 1014, 1113, 1212, 1311	Thermostat x	Night setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of night setpoint mode for cooling by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
223, 322, 421, 520, 619, 718, 817, 916, 1015, 1114, 1213, 1312	Thermostat x	Heat protection setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, W
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to define the temperature setpoint value of heat protection mode for cooling by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
224, 323, 422, 521, 620, 719, 818, 917, 1016, 1115, 1214, 1313	Thermostat x	Setpoints cooling	8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4]	C, R, W

This object is activated if the **Function selection** parameter has the value **Cooling** or **Heating/Cooling**.
This object is used to define the temperature setpoint value of comfort, standby, night setpoint and heat protection mode for cooling by the KNX bus.

Object value:

Comfort setpoint																Standby setpoint															
Byte 8 (MSB)								Byte 7 (LSB)								Byte 6 (MSB)								Byte 5 (LSB)							
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Night setpoint																Heat protection setpoint															
Byte 4 (MSB)								Byte 3 (LSB)								Byte 2 (MSB)								Byte 1 (LSB)							
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Fields	Description	Value	Units
Comfort setpoint	Comfort mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Standby setpoint	Standby mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Night setpoint	Night setpoint mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Heat protection setpoint	Heat protection mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C

For further information, see: [Cooling](#).

No.	Name	Function of the object	Data type	Flags
225, 324, 423, 522, 621, 720, 819, 918, 1017, 1116, 1215, 1314	Thermostat x	Setpoint shift	2 - Byte - 9.002 DPT_Value_Temp	C, R, W

These objects are always activated.
This object is used to define the setpoint override value for heating and cooling by the KNX bus.

Object value: -670 760 to +670 760 in K.
The temperature range taken into account: 1 to 20 in K.

Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.

For further information, see: [Setpoint shift](#).

No.	Name	Function of the object	Data type	Flags
226, 325, 424, 523, 622, 721, 820, 919, 1018, 1117, 1216, 1315	Thermostat x	Current setpoint	2 - Byte - 9.002 DPT_Value_Temp	C, R, W
<p>These objects are always activated. This object is used to define the temperature value for heating and cooling directly by the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
227, 326, 425, 524, 623, 722, 821, 920, 1019, 1118, 1217, 1316	Thermostat x	Status indication setpoint shift	2 - Byte - 9.002 DPT_Value_Temp	C, R, T
<p>These objects are always activated. This object is used to send the setpoint override value for heating and cooling on the KNX bus.</p> <p>Object value: -670 760 to +670 760 in K. The temperature range taken into account: 1 to 20 in K. This object is sent when there is a status change.</p> <p><i>Note: A temperature offset is expressed in Kelvin. 1K of temperature offset corresponds to 1°C.</i></p> <p>For further information, see: Setpoint shift.</p>				

No.	Name	Function of the object	Data type	Flags
228, 327, 426, 525, 624, 723, 822, 921, 1020, 1119, 1218, 1317	Thermostat x	Status indication reference setpoint	2 - Byte - 9.002 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoints preset parameter has the following value Relative (offset from basic setpoint).</p> <p>This object is used to send the temperature value for heating and cooling on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoint shift.</p>				

No.	Name	Function of the object	Data type	Flags
229, 328, 427, 526, 625, 724, 823, 922, 1021, 1120, 1219, 1318	Thermostat x	Status indication comfort setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to send the temperature setpoint value of comfort mode for heating on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
230, 329, 428, 527, 626, 725, 824, 923, 1022, 1121, 1220, 1319	Thermostat x	Status indication standby setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to send the temperature setpoint value of standby mode for heating on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
231, 330, 429, 528, 627, 726, 825, 924, 1023, 1122, 1221, 1320	Thermostat x	Status indication night setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to send the temperature setpoint value of night setpoint mode for heating on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
232, 331, 430, 529, 628, 727, 826, 925, 1024, 1123, 1222, 1321	Thermostat x	Status indication frost protection setpoint heating	2 - Byte - 9.001 DPT_Value_Temp	C, R, T

This object is only visible if the **Setpoint objects** parameter has the following value **Simple** or **Both**.
This object is used to send the temperature setpoint value of frost protection mode for heating on the KNX bus.

Object value: -273 to +670760 in °C.
The temperature range taken into account: -5 to 40 in °C.
This object is sent periodically and/or on status change.

For further information, see: [Setpoints](#).

No.	Name	Function of the object	Data type	Flags
233, 332, 431, 530, 629, 728, 827, 926, 1025, 1124, 1223, 1322	Thermostat x	Status indication setpoints heating	8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4]	C, R, T

This object is activated if the **Function selection** parameter has the value **Heating** or **Heating/Cooling**.
This object is used to send the temperature setpoint value of comfort, standby, night setpoint and frost protection mode for heating on the KNX bus.

Object value:

Comfort setpoint																Standby setpoint																							
Byte 8 (MSB)								Byte 7 (LSB)								Byte 6 (MSB)								Byte 5 (LSB)															
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Night setpoint																Frost protection setpoint																							
Byte 4 (MSB)								Byte 3 (LSB)								Byte 2 (MSB)								Byte 1 (LSB)															
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Fields	Description	Value	Units
Comfort setpoint	Comfort mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Standby setpoint	Standby mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Night setpoint	Night setpoint mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Frost protection setpoint	Frost protection mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C

This object is sent when there is a status change.

For further information, see: [Heating](#).

No.	Name	Function of the object	Data type	Flags
234, 333, 432, 531, 630, 729, 828, 927, 1026, 1125, 1224, 1323	Thermostat x	Status indication comfort setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to send the temperature setpoint value of comfort mode for cooling on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
235, 334, 433, 532, 631, 730, 829, 928, 1027, 1126, 1225, 1324	Thermostat x	Status indication standby setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to send the temperature setpoint value of standby mode for cooling on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
236, 335, 434, 533, 632, 731, 830, 929, 1028, 1127, 1226, 1325	Thermostat x	Status indication night setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, T
<p>This object is only visible if the Setpoint objects parameter has the following value Simple or Both. This object is used to send the temperature setpoint value of night setpoint mode for cooling on the KNX bus.</p> <p>Object value: -273 to +670760 in °C. The temperature range taken into account: -5 to 40 in °C. This object is sent periodically and/or on status change.</p> <p>For further information, see: Setpoints.</p>				

No.	Name	Function of the object	Data type	Flags
237, 336, 435, 534, 633, 732, 831, 930, 1029, 1128, 1227, 1326	Thermostat x	Status indication heat protection setpoint cooling	2 - Byte - 9.001 DPT_Value_Temp	C, R, T

This object is only visible if the **Setpoint objects** parameter has the following value **Simple** or **Both**.
This object is used to send the temperature setpoint value of heat protection mode for cooling on the KNX bus.

Object value: -273 to +670760 in °C.
The temperature range taken into account: -5 to 40 in °C.
This object is sent periodically and/or on status change.

For further information, see: [Setpoints](#).

No.	Name	Function of the object	Data type	Flags
238, 337, 436, 535, 634, 733, 832, 931, 1030, 1129, 1228, 1327	Thermostat x	Status indication setpoints cooling	8 - Byte - 275.100 DPT_TempRoomSetpSetF16 [4]	C, R, T

This object is activated if the **Function selection** parameter has the value **Cooling** or **Heating/Cooling**.
This object is used to send the temperature setpoint value of comfort, standby, night setpoint and heat protection mode for cooling on the KNX bus.

Object value:

Comfort setpoint																Standby setpoint																							
Byte 8 (MSB)								Byte 7 (LSB)								Byte 6 (MSB)								Byte 5 (LSB)															
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F
Night setpoint																Heat protection setpoint																							
Byte 4 (MSB)								Byte 3 (LSB)								Byte 2 (MSB)								Byte 1 (LSB)															
F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F

Fields	Description	Value	Units
Comfort setpoint	Comfort mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Standby setpoint	Standby mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Night setpoint	Night setpoint mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C
Heat protection setpoint	Heat protection mode temperature setpoint	- 273 to 655.34 Resolution 0,01	°C

This object is sent periodically and/or on status change.

For further information, see: [Cooling](#).

No.	Name	Function of the object	Data type	Flags
239, 338, 437, 536, 635, 734, 831, 930, 1031, 1130, 1229, 1328	Thermostat x	Timer	1 - Bit - 1.010 DPT_Start	C, R, W
<p>This object is activated when the Timer parameter is active. This object is used to activate the Timer function of the device via the KNX bus.</p> <p>Object value:</p> <ul style="list-style-type: none"> - If a rising edge (0 to 1) arrives at this object, the heating or cooling mode is activated for a given period. - If a falling edge (1 to 0) arrives at this object, the heating or cooling mode remains in its current status. <p><i>Note: The timer duration can be interrupted by a long press on the button controlling the timer.</i> <i>Note: When a start command is received during the timer, the timer duration is reset.</i></p> <p>For further information, see: Timer.</p>				

4 Programming by Easy Tool

4.1 Product overview

- TXM646T: Heating actuator 6 channels KNX 24/230V

Product view:

Product		1 Input	7 Outputs
Name:	TXM646T - Heating actuator 6 channels KNX, 24/230V	1	TXM646T - 1 - 1 House - Heating/Cooling
Use:	Heating/Cooling	2	TXM646T - 1 - 2 House - Heating/Cooling
Place:	House	3	TXM646T - 1 - 3 House - Heating/Cooling
Electrical tracking:	TXM646T - 1	4	TXM646T - 1 - 4 House - Heating/Cooling
Product : TXM646T Heating actuator 6 channels KNX, 24/230V		5	TXM646T - 1 - 5 House - Heating/Cooling
Actions		6	TXM646T - 1 - 6 House - Heating/Cooling
		7	TXM646T - 1 - 7 House - Heating/Cooling

View of channels:

1 Input	
	TXM646T - 1 - 1 Housing

7-fold output	
	TXM646T - 1 - 1 Housing
	TXM646T - 1 - 2 Housing
	TXM646T - 1 - 3 Housing
	TXM646T - 1 - 4 Housing
	TXM646T - 1 - 5 Housing
	TXM646T - 1 - 6 Housing
	TXM646T - 1 - 7 Housing

■ TXM646R: Heating actuator 6 channels KNX, with regulation, 24/230V

Product view:

Product
13 Inputs
7 Outputs

Name: TXM646R - Heating actuator 6 channels KNX, with regulation, 2

Use: Heating/Cooling

Place: House

Electrical tracking: TXM646R - 1






Product: TXM646R Heating actuator 6 channels KNX, with regulation, 24/230V

1		TXM646R - 1 - 1	House		
2		TXM646R - 1 - 2	House		
3		TXM646R - 1 - 3	House		
4		TXM646R - 1 - 4	House		
5		TXM646R - 1 - 5	House		
6		TXM646R - 1 - 6	House		
7		TXM646R - 1 - 7	House		
8		TXM646R - 1 - 8	House		
9		TXM646R - 1 - 9	House		
10		TXM646R - 1 - 10	House		
11		TXM646R - 1 - 11	House		
12		TXM646R - 1 - 12	House		
13		TXM646R - 1 - 13	House		

View of channels:

13 inputs	
	TXM646R - 1 - 1 Housing
	TXM646R - 1 - 2 Housing
	TXM646R - 1 - 3 Housing
	TXM646R - 1 - 4 Housing
	TXM646R - 1 - 5 Housing
	TXM646R - 1 - 6 Housing
	TXM646R - 1 - 7 Housing
	TXM646R - 1 - 8 Housing

7-fold output	
	TXM646R - 1 - 1 Housing
	TXM646R - 1 - 2 Housing
	TXM646R - 1 - 3 Housing
	TXM646R - 1 - 4 Housing
	TXM646R - 1 - 5 Housing
	TXM646R - 1 - 6 Housing
	TXM646R - 1 - 7 Housing

13 inputs	
	TXM646R - 1 - 9 Housing
	TXM646R - 1 - 10 Housing
	TXM646R - 1 - 11 Housing
	TXM646R - 1 - 12 Housing
	TXM646R - 1 - 13 Housing

7-fold output

- Pathway parameters
 - Input (Only for TXM646R)
This parameter window is used to set the device inputs. These parameters are available for each input individually.

Settings ▲

Function selection: Heating ▼

Type of basic heating: warm water heating ▼

Type of basic heating control: Switching PI-control (PWM) ▼

Type of basic cooling: ceiling cooling ▼

Type of basic cooling control: Switching PI-control (PWM) ▼

Comfort setpoint: 21

- Output
This parameter window is used to set the device outputs. These parameters are available individually for each output.

Settings ▲

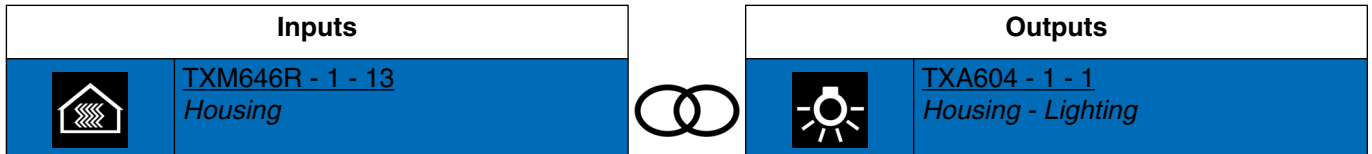
Valve type: Normally closed ▼

Cycle time (s): 900

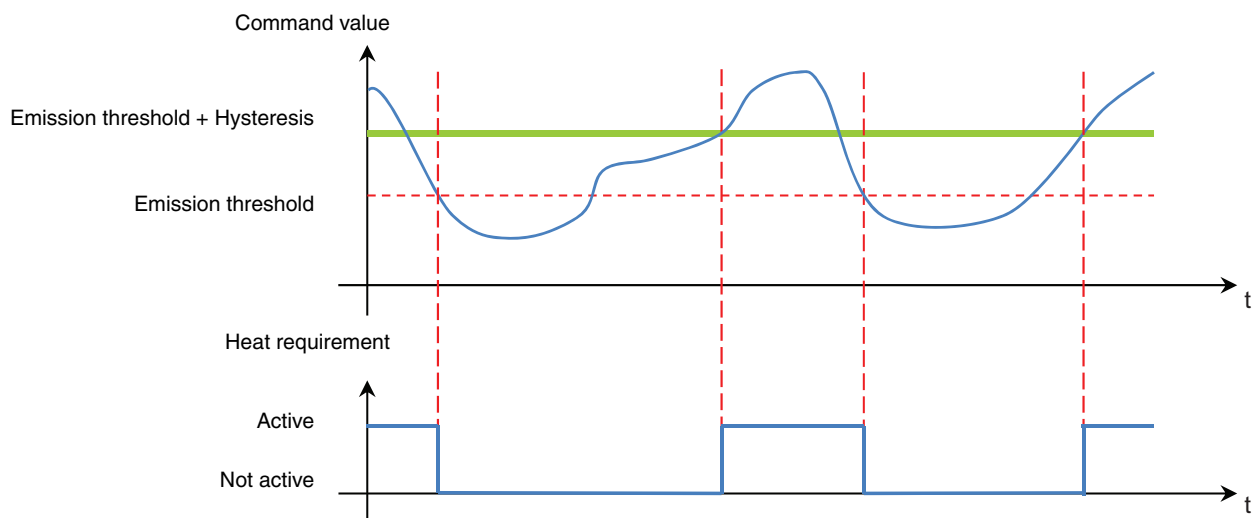
4.2 Input operation mode

4.2.1 Heat requirement

The product itself can evaluate the parameters of its outputs and transmit a general heating requirement according to a monitoring limit value. With the help of an ON/OFF switch, it is therefore possible to create a heating control on boilers with adapted inputs.



The input controls the switching output for the boiler heat requirement control.



A heat requirement is indicated by the product only if one of the configured values for the assigned outputs exceeds one of the limit values defined with added hysteresis. Cancellation of a heat requirement message occurs as soon as the value falls below the limit value.

The following values are predefined and fixed:

- Emission threshold: 1%
- Hysteresis: 1%
- Heat requirement activation delay: 5 min

4.3 Input operating mode for the thermostat

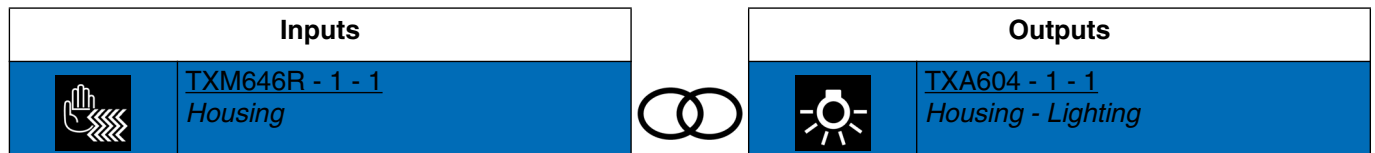
This chapter is only valid for reference TXM646R.

These inputs are used to regulate the room temperature of the heating and air conditioning systems. Regulation is based on measurement of the room temperature. This temperature is compared to the setpoint defined by the user. Either heating outputs or lighting outputs can be used to control the radiator valves.

4.3.1 Heating control

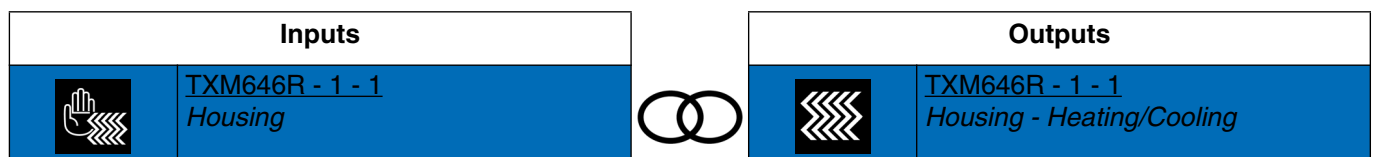
The thermostat is used to regulate the room temperature for the heating systems.

- Heating control ON/OFF (0/1)



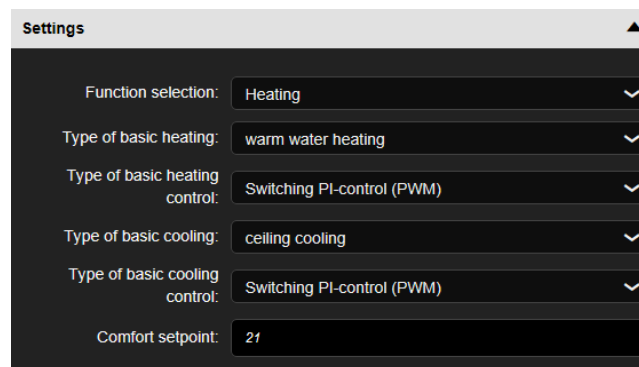
The input controls the switching heating output.

- Heating control in % (0-100%)



The input controls the heating output by a value in %.

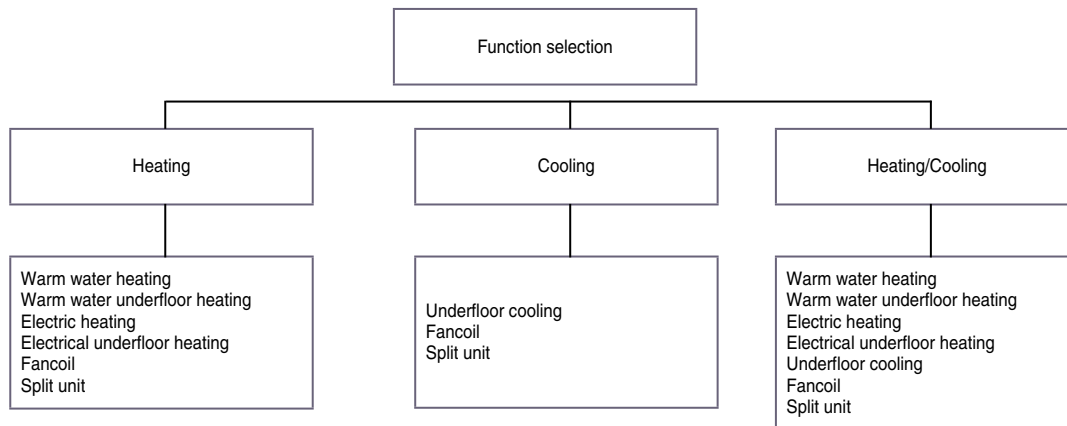
These parameters are available for each input individually.



- Operation

The room thermostat mainly offers 2 operating modes: Heating and cooling modes. It is also possible to activate a mixed mode.

The following diagram illustrates the 3 selection modes.



Parameter	Description	Value
Function selection	The product operates in the following mode: Heating Cooling Mixed	Heating* Cooling Heating/Cooling

■ Heating

In heating mode, the thermostat activates the heating of the room temperature falls below the requested temperature plus a hysteresis. The regulation deactivates the heating as soon as the requested temperature corresponding to the heating mode is reached.

Parameter	Description	Value
Type of heating control	This parameter is used to select the heating regulation type.	Switching PI-control (PWM)* Switching 2-point control

The type of regulator is used to select the regulation valve control.

- Switching 2-point control

Switching 2-point control is the simplest type of regulation. This regulation algorithm cuts off the output as soon as the upper setpoint temperature is exceeded. It rearms it when the temperature falls again. The regulator has a built-in hysteresis to avoid it constantly switching the output value. The regulator then calculates the switching and tripping threshold according to the hysteresis and requested value. This type of regulator is used when the output value only accepts the two statuses (ON or OFF) and the real temperature does not need to be accurately controlled in relation to the setpoint value. Due to the inertia of the heating system, the real temperature oscillates slightly below the switching point and slightly exceeds the tripping point. The real temperature therefore always varies in a range slightly higher than the configured hysteresis.

The following values are predefined and fixed:

- Hysteresis: +/-0.5K
- Hysteresis duration: 5 min

- Switching PI-control (PWM)

This regulation is based on the principle of continuous PI-control. However, for this type of regulation, the output signal (0 to 100%) for the PID regulation is not sent but only processed internally. Based on the PID regulation output signal, the regulation then converts the output signal to an ON and OFF pulse. This pulse does not have a fixed ON/OFF point as with the 2 point control, but the pulse length is determined using the output value calculated by the PID regulation (cycle time). The higher the calculated output value, the higher the time ratio between ON and OFF.

A short cycle time causes ON pulses at relatively short intervals. This avoids too great a temperature drop and the real value remains largely stable. However, this may also lead to the switching frequency being too high, which may affect the system or overload the KNX communication bus.

The following values are predefined and fixed:

- Cycle time: 15 min.

Example:

Value 100%: Always ON

Value 0%: Always OFF

20% value with cycle duration of 15 minutes: 3 min ON and 12 min OFF

Parameter	Description	Value
Type of heating equipment	This parameter is used to select the type of heating.	Warm water heating* Warm water underfloor heating Electric heating Electrical underfloor heating Fancoil Split unit

Note: A fancoil is an air treatment device designed to heat or cool the air. The thermal energy is provided by a fluid (water or refrigerant fluid) or by Joule effect (electricity).

Note: A Split unit is an air conditioner in which the cool air blower is separated into two parts connected by a refrigerant link transporting the calories from the inside unit to the external unit.

- Cooling

In cooling mode, the thermostat activates cooling if the room temperature rises above the requested value plus a hysteresis. The regulation deactivates cooling as soon as the requested temperature corresponding to the cooling mode is reached.

Parameter	Description	Value
Type of cooling control	This parameter is used to select the cooling regulation type.	Switching PI-control (PWM)* Switching 2-point control

Note: For the operation of the different types of regulation, please refer to chapter [Heating](#).

Parameter	Description	Value
Type of cooling equipment	This parameter is used to select the cooling type.	Cooling ceiling* Fancoil Split unit

Note: A fancoil is an air treatment device designed to heat or cool the air. The thermal energy is provided by a fluid (water or refrigerant fluid) or by Joule effect (electricity).

Note: A Split unit is an air conditioner in which the cool air blower is separated into two parts connected by a refrigerant link transporting the calories from the inside unit to the external unit.

*Note: The **Type of heating control** and **Type of heating equipment** parameters are used to adjust the heating only. The **Type of cooling control** and **Type of cooling equipment** parameters are used to adjust the air conditioning only. These parameters are always displayed, whatever the type of function selected (Heating, Cooling, Heating/Cooling).*

- Setpoint values

The operating modes are designed for heating and air conditioning. The temperature setpoint values for comfort mode are configurable. All the other setpoint values are fixed in the software for both modes.

To facilitate the configuration of the setpoint values, the temperatures for the Night setpoint and Standby modes are calculated automatically according to the comfort setpoint value.

Mode	Setpoint values Heating	Setpoint values Cooling
Comfort	Configurable	Configurable
Standby	Comfort temperature - 2 °C	Comfort temperature + 2° C
Night setpoint	Comfort temperature - 5 °C	Comfort temperature + 5° C
Protection	+ 7 °C	+ 35 °C

Example: For a comfort mode temperature of **21 °C**.

Mode	Setpoint values Heating	Setpoint values Cooling
Comfort	+ 21 °C	+ 21 °C
Standby	+ 19 °C	+ 23 °C
Night setpoint	+ 16 °C	+ 26 °C
Protection	+ 7 °C	+ 35 °C



























Note: The temperature values for the Frost protection and Heat protection setpoint are predefined and fixed.

Parameter	Description	Value
Comfort setpoint	This parameter defines the temperature taken into account as the basic setpoint value (Comfort mode).	7 ... 21* ... 40 °C

4.3.2 Regulation input control

It is also possible to send a heating control to the thermostat using an input contact. To do so, it is necessary to make a connection between two inputs.




The functions available to control the input are given below:

Heating/Cooling		Heating/Cooling		Common function	
	Comfort mode		Comfort priority		Scene
	Eco mode		Protection priority		Scene switch
	Standby mode		Comfort Priority push-button		Automatic control deactivation
	Protection mode		Protection priority push-button		Automatic control deactivation toggle
	Auto mode		Heating/Cooling		
	Switch mode		Heating/Cooling push-button		
	Comfort/eco mode		Comfort mode automatic control		
	Comfort/standby mode		Eco mode automatic control		
	Protection/Auto mode		Standby mode automatic control		
	Setpoint shift		Protection mode automatic control		
	Window status		Switch mode automatic control		

4.3.2.1 Heating mode

The heating command operates according to a heating instruction.




- **Comfort mode:** Activates Comfort mode for the heating. The device adjusts the room temperature to a predefined value on the thermostat (Presence).

Inputs	
	<u>TXM646R</u> Housing
	
	<u>WST316 - 1 - 1</u> Housing

Closing the input contact activates Comfort mode.

The effect of the command is cancelled by any other mode activation command.




- **Standby mode:** Activates StandBy mode for the heating. The device reduces the room temperature to a predefined value on the thermostat when you leave the room (Short absence).

Inputs	
	<u>TXM646R</u> Housing
	
	<u>WST316 - 1 - 1</u> Housing

Closing the input contact activates StandBy mode.

The effect of the command is cancelled by any other mode activation command.

- **Eco mode:** Activates Eco mode for the heating. The device reduces the room temperature to a predefined value on the thermostat when you leave the house (Long absence).

Inputs	
	<u>TXM646R</u> Housing
	
	<u>WST316 - 1 - 1</u> Housing

Closing the input contact activates Eco mode.

The effect of the command is cancelled by any other mode activation command.

- **Protection mode:** Activates Protection mode for the heating. The device reduces the room temperature to a minimum value on the thermostat when you are absent for several days (Frost protection).

Inputs	
	TXM646R Housing
	WST316 - 1 - 1 Housing

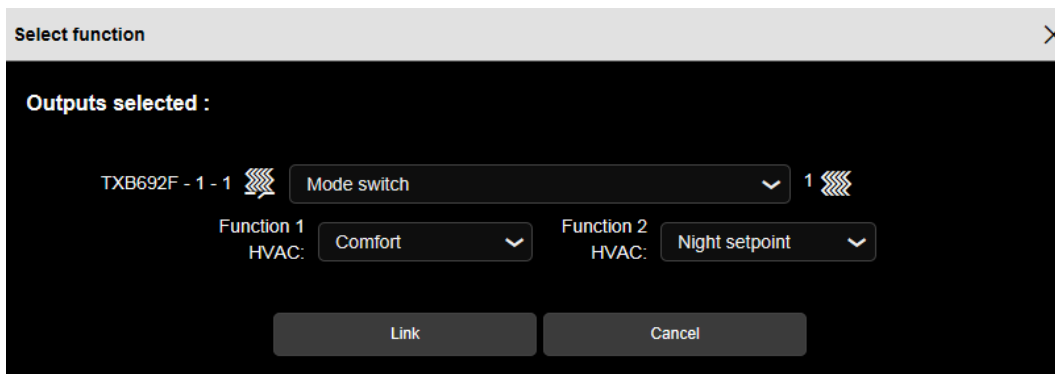
Closing the input contact activates Protection mode.
The effect of the command is cancelled by any other mode activation command.

- **Switch mode:** Switches between 2 heating modes.

Inputs	
	TXM646R Housing
	TXB692F - 1 - 1 Housing

Closing the input contact activates heating mode 1.
Opening the input contact activates heating mode 2.
The effect of the command is cancelled by any other mode activation command.




Note: At the time of the connection, one must define the heating mode for input contact closing and opening.



Heating mode available: **Auto, Comfort, Standby, Night setpoint** and **Freeze protection**.




Note: If the product does not have switch mode, the Comfort/Eco, Comfort/Standby and Protection/Auto modes are available.

- **Comfort/eco mode:** Used to toggle between Comfort mode and Eco mode for the heating.

Inputs	
	TXM646R Housing
	
	TXA304 - 1 - 1 Housing




Closing the input contact activates Comfort mode.
 Opening the input contact activates the Eco mode.
 The effect of the command is cancelled by any other mode activation command.

- **Comfort/standby mode:** Used to toggle between Comfort mode and Standby mode for the heating.

Inputs	
	TXM646R Housing
	
	TXA304 - 1 - 1 Housing

Closing the input contact activates Comfort mode.
 Opening the input contact activates the Standby mode.
 The effect of the command is cancelled by any other mode activation command.

- **Protection/Auto mode:** Used to toggle between the Protection mode and the Auto mode for the heating.



Inputs	
	TXM646R Housing
	
	TXA304 - 1 - 1 Housing

Closing the input contact activates Protection mode.
 Opening the input contact activates the Auto mode.
 The effect of the command is cancelled by any other mode activation command.

4.3.2.2 Windows contact

The devices have different possibilities to switch to Protection/Auto mode. This mode can be activated via a window contact.

- Links
 - **Windows contact:** The open and/or closed status of a window is sent to the thermostat.

Inputs	
	TXM646R Housing
	TRC301B - 1 - 1 Housing

It is used to indicate the position of the window.



0 = Window closed: Auto mode

1 = Window open: Protection mode

4.3.2.3 Setpoint shift

This function is used to modify the setpoint temperature of the thermostat by pressing successively.

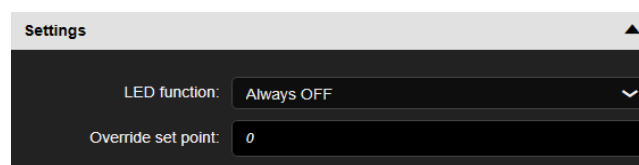
- Links
 - **Setpoint shift:** The setpoint temperature of the thermostat is shifted by X degrees each time the push-button is pressed.

Inputs	
	TXM646R Housing
	WST316 - 1 - 1 Housing

Activating the input by a short press causes an increase or decrease of X degrees in the setpoint temperature of the thermostat.

Successive activations increase or decrease the setpoint temperature of the thermostat by X degrees.

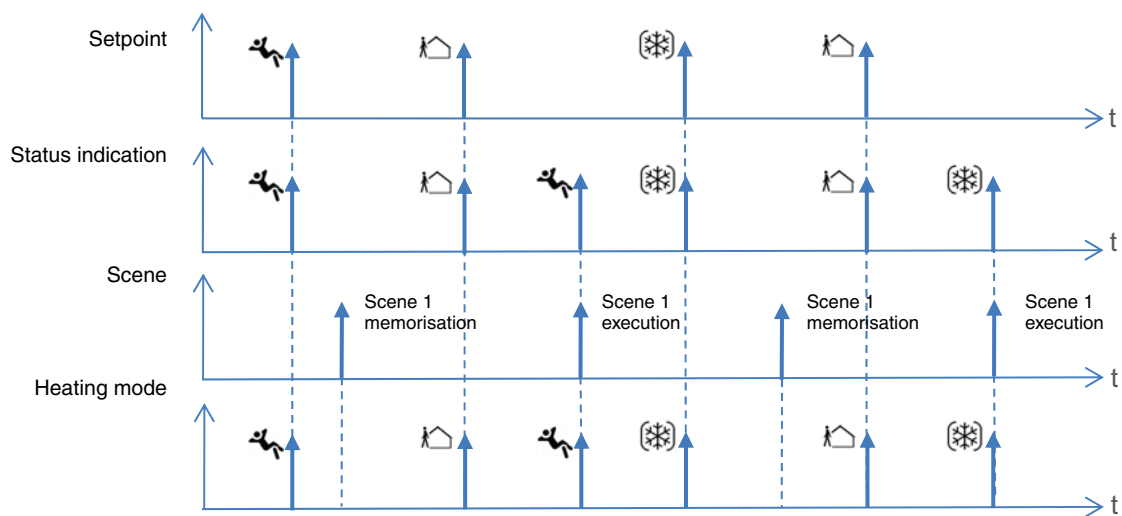
Note: The value by which the setpoint shifts is configurable on the input product. The value can be between -1 and +1 in increments of 0.1.



4.3.2.4 Scene

This function enables scenes to be saved or selected. These concern different types of output (lighting, blind, shutter, heating) to create ambiances or scenarios (leaving scenario, reading ambiance etc.).

Operating principle:



Mode	Symbols
Comfort	
Standby	
Night setpoint	
Frost/heat protection	

Learning and storing scenes

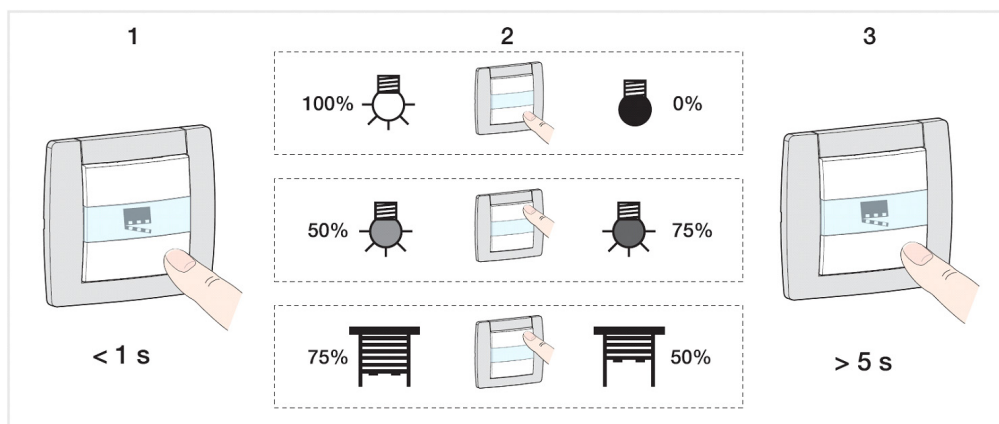
This process is used to change and store a scene. For example, by locally pressing the key in the room or by emission of the values from a visualization.

To access and store scenes, the following values must be sent:

Scene number	Access scene (Object value: 1 byte)	Store scene (Object value: 1 byte)
1-64	= Scene number - 1	= Scene number + 128
Examples		
1	0	128
2	1	129
3	2	130
...	...	
64	63	191

Here is the scene memorisation for local switches, for example.

- Activate scene by briefly pressing the transmitter that starts it.
- The outputs (lights, shutters, etc.) are set in the desired state using the usual local control devices (buttons, remote control, etc.).
- Memorise the status of the outputs with a press greater than 5 seconds long on the transmitter that starts the scene. The memorisation can be displayed by short-term activation of the outputs.



Product learning and memorisation

This procedure allows modifying a scene using a local action on the push buttons located on the front side of the product.

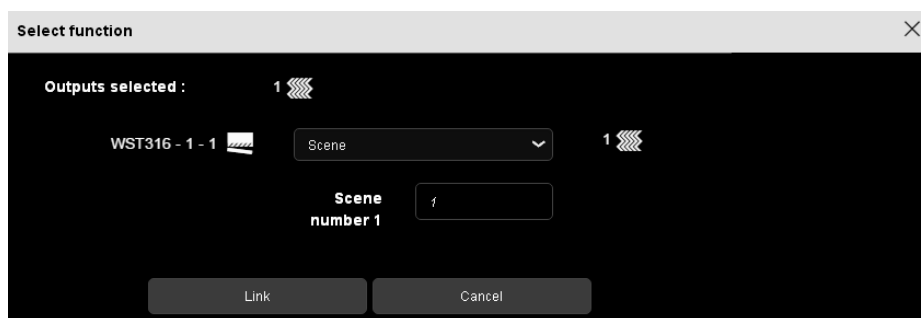
- Activate the scene using a short press on the ambiance push button, which triggers the scene,
- Set the product to manual mode and set the outputs to the desired status by pressing the push-buttons associated with the outputs,
- Return to Auto mode,
- Save the scene using a long push for more than 5 seconds on the push-button that triggers the scene,
- Memorisation is signalled by the inversion of the concerned output status for 3 sec.

- Links
 - **Scene:** The scene is activated by pressing the push-button.

Inputs	
	TXM646R Housing
	TXB692F - 1 - 1 Housing

Activating the input activates the scene.

Note: At the time the connection is made, the scene number must be defined for the closing input contact.



- **Scene switch:** The scene is activated according to the closing or opening input contact.

Inputs	
	TXM646R Housing
	TXB692F - 1 - 1 Housing

Closing input contact: scene activation 1.
Opening input contact: scene activation 2.

Note: At the time the connection is made, the scene number must be defined for the closing and opening input contact.






* Default value

4.3.2.5 Automatic control deactivation




The Automatic control function enables an output to be controlled in parallel to the standard control. An additional command object (Automatic control deactivation) is used to activate or deactivate Automatic control.

- **Automatic control deactivation:** Deactivates automatic control.

Inputs	
	TXM646R Housing
	
	TXB692F - 1 - 1 Housing

Closing the input contact deactivates automatic control.
Opening the input contact activates automatic control.

- **Automatic control deactivation toggle:** Deactivates automatic control.

Inputs	
	TXM646R Housing
	
	TXB692F - 1 - 1 Housing



Closing input contact: deactivated automatic control.
Opening input contact: no action.
A second closing input contact triggers activation of the automatic control.

Note: This function is only available with push-button input products with LEDs indicating status.

4.3.2.6 Heating automatic control

The Automatic control function enables the heating mode to be controlled in parallel to the standard control. An additional command object (Automatic control deactivation) is used to activate or deactivate Automatic control.



- **Comfort mode automatic control:** Activates Comfort mode for heating using automatic control. The device adjusts the room temperature to a predefined value on the thermostat (Presence).

Inputs	
	TXM646R Housing
	⊗
	TXB692F - 1 - 1 Housing

Closing the input contact activates Comfort mode.

The effect of the command is cancelled by any other mode activation command.



- **Eco mode automatic control:** Activates Eco mode for heating using automatic control. The device reduces the room temperature to a predefined value on the thermostat when you leave the house (Long absence).

Inputs	
	TXM646R Housing
	⊗
	TXB692F - 1 - 1 Housing

Closing the input contact activates Eco mode.

The effect of the command is cancelled by any other mode activation command.



- **Standby mode automatic control:** Activates StandBy mode for the heating using automatic control. The device reduces the room temperature to a predefined value on the thermostat when you leave the room (Short absence).

Inputs	
	TXM646R Housing
	⊗
	TXB692F - 1 - 1 Housing

Closing the input contact activates StandBy mode.



The effect of the command is cancelled by any other mode activation command.

- **Protection mode automatic control:** Activates Protection mode for heating using automatic control. The device reduces the room temperature to a minimum value on the thermostat when you are absent for several days (Frost protection).

Inputs	
	TXM646R Housing
	TXB692F - 1 - 1 Housing

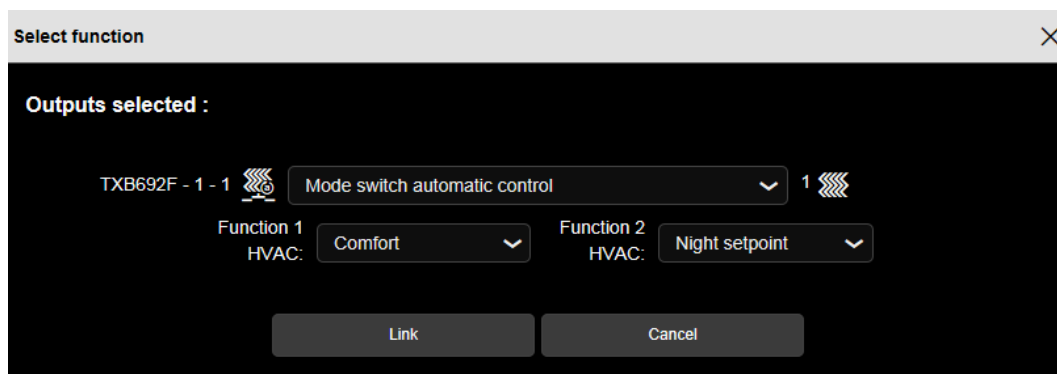
Closing the input contact activates Protection mode.
The effect of the command is cancelled by any other mode activation command.

- **Switch mode automatic control:** Switches between 2 heating modes using automatic control.

Inputs	
	TXM646R Housing
	TXB692F - 1 - 1 Housing

Closing the input contact activates heating mode 1.
Opening the input contact activates heating mode 2.
The effect of the command is cancelled by any other mode activation command.



Note: At the time of the connection, one must define the heating mode for input contact closing and opening.



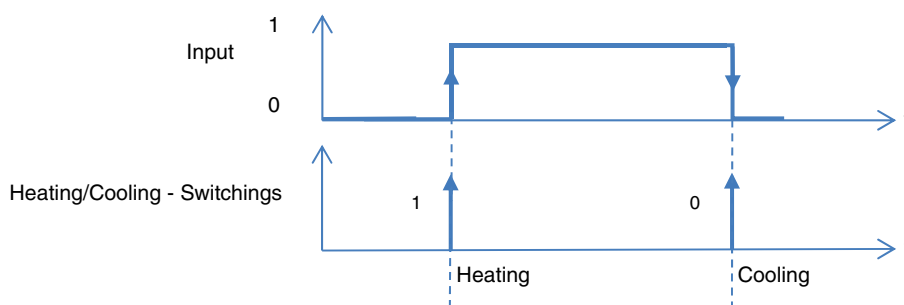
Heating mode available: **Auto, Comfort, Standby, Night setpoint** and **Freeze protection**.

4.3.2.7 Heating/Cooling



- **Heating/Cooling:** Enables switching between heating mode and cooling mode.

Inputs	
	TXM646R Housing
	⊗
	TXB692F - 1 - 1 Housing

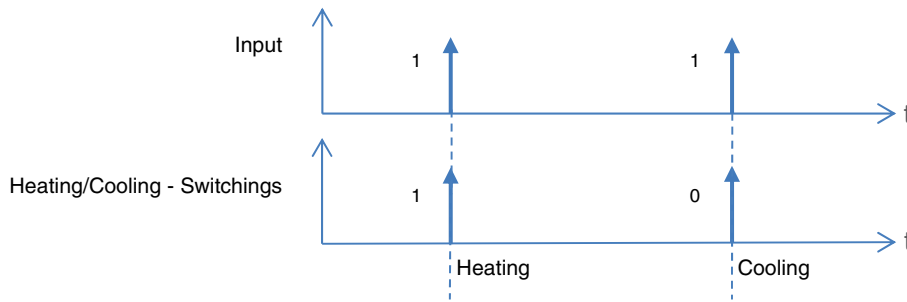
Closing the input contact activates the heating mode.
Opening the input contact activates the cooling mode.



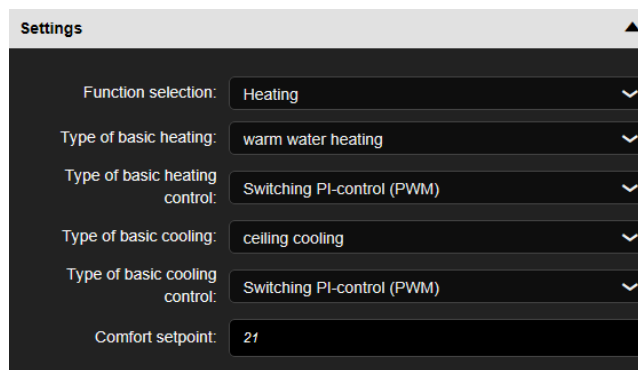
- **Heating/Cooling push-button:** Used to switch between heating mode and cooling mode using a push-button.

Inputs	
	TXM646R Housing
	⊗
	WST316 - 1 - 1 Housing

Closing input contact: activation of heating mode.
Opening input contact: no action.
Closing the input contact a second time activates cooling mode.





Note: For switching to function, the thermostat must be configured in **Heating-Air conditioning**.



4.3.2.8 Priority




The Priority function forces a heating mode. This function the priority or priority cancellation controls to be issued. No other command is taken into account when the Priority is active.

Comfort priority: Activates and maintains Comfort mode.

Inputs	
	<u>TXM646R</u> Housing
	<u>TXB692F - 1 - 1</u> Housing

Closing the contact activates and maintains Comfort mode.
 Closing the contact cancels the priority and returns to the usually active mode.




Protection priority: Activates and maintains Protection mode.

Inputs	
	<u>TXM646R</u> Housing
	
	<u>TXB692F - 1 - 1</u> Housing

Closing the contact activates and maintains Protection mode.

Closing the contact cancels the priority and returns to the usually active mode.

- **Comfort Priority push-button:** used to activate and maintain Comfort mode using a push-button.

Inputs	
	<u>TXM646R</u> Housing
	
	<u>WST316 - 1 - 1</u> Housing




Closing input contact: activation of comfort mode.

Opening input contact: no action.

Closing the input contact a second time cancels the priority and returns to the mode normally active.

Note: This function is only available with push-button input products with LEDs indicating status.

- **Protection priority push-button:** used to activate and maintain Protection mode using a push-button.

Inputs	
	<u>TXM646R</u> Housing
	
	<u>WST316 - 1 - 1</u> Housing

Closing input contact: activation of protection mode.

Opening input contact: no action.

Closing the input contact a second time cancels the priority and returns to the mode normally active.

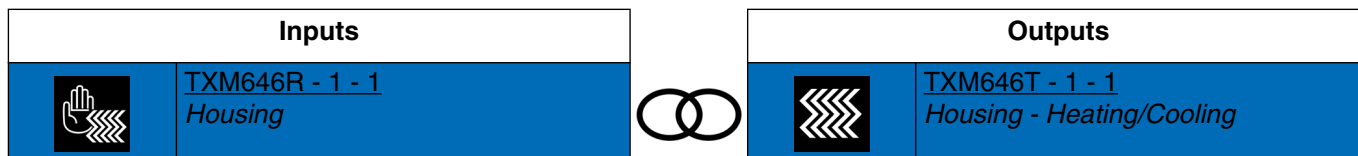
Note: This function is only available with push-button input products with LEDs indicating status.

4.4 Closing type for the outputs

4.4.1 Heating control

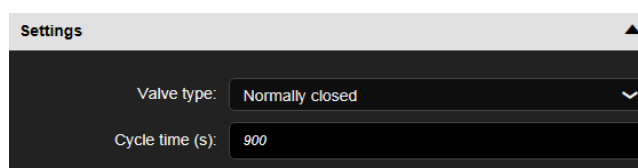
The thermostat is used to regulate the room temperature for the heating systems.

- Heating control in % (0-100%)



The input controls the heating output by a value in %.

This parameter window is used to set the device outputs. These parameters are available individually for each output.



- Valve

There are 2 types of valves which can be connected to the outputs. The valves can be opened or closed when they are switched off. This parameter is used to configure the output thus determining the direction in which the valves are driven.

Parameter	Description	Value
Default valve status	The valves connected to the output are of the type: <ul style="list-style-type: none"> - The valves are opened when they are switched off - The valves are closed when they are switched off 	<p>Normally open*</p> <p>Normally closed</p>

- Command value

The product receives information from the KNX bus in 1 bit or 1 byte format from a KNX room thermostat for example. In general, based on room temperature, the regulator determines the values to be sent to the output product.

The different formats of the control value for the valve outputs are:

- ON/OFF (1 bit)

Valve output is controlled using an object in 1 bit format (ON/OFF). The value of the object depends on the **Default valve status** parameter.

Normally open:

On reception of an OFF control, the valve is powered and closes.

On reception of an ON control, the valve is not powered and opens.

Normally closed:

On reception of an OFF control, the valve is not powered and closes.

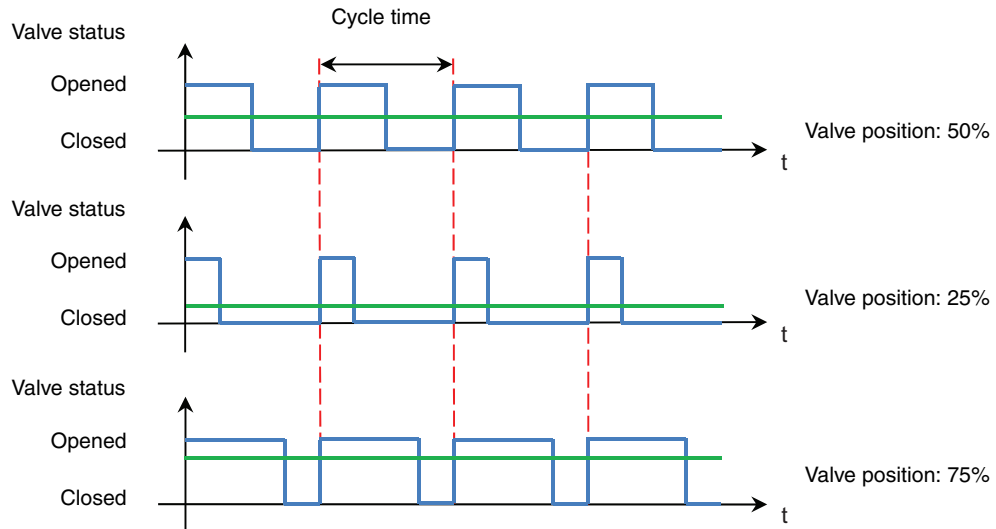
On reception of an ON control, the valve is powered and opens.

Note: The ON/OFF command value (1 bit) is only used if the command value in % (1 byte) is not available on the thermostat.

- Continuous with PWM (1 byte)

The value of the valve output control is converted by the product into a pulse-width modulation switching signal. The behaviour of the output is constantly adapted according to the parameter received. The cycle time can also be configured using the **Cycle time for continuous control with PWM** parameter.

Taking into account the default valve status, the output is powered or not depending on the position the valve is to adopt.

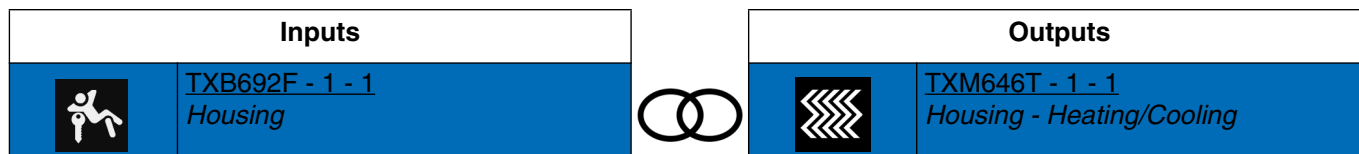


Parameter	Description	Value
Cycle time for continuous control with PWM	This parameter defines the switching frequency of the pulse-width modulation output signal of the valve output. It allows an adaptation of the operation of the different actuators having different cycle times (duration of movement between the valve's open and closed position).	00:00:01 ... 00:15:00* ... 23:59:59 (hh:mm:ss)

4.4.2 Priority

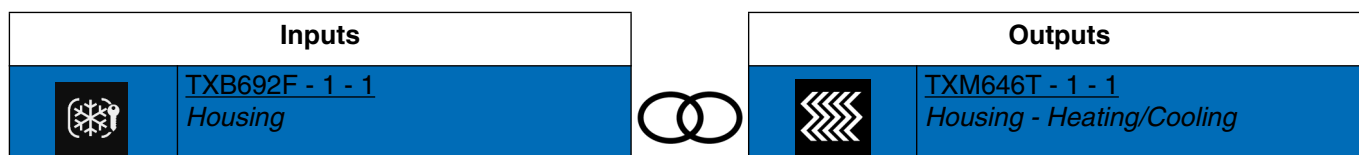
The Priority function forces a heating mode.
 This function the priority or priority cancellation controls to be issued.
 No other command is taken into account when the Priority is active.

Comfort priority: Activates and maintains Comfort mode.



Closing the contact activates and maintains Comfort mode.
 Closing the contact cancels the priority and returns to the usually active mode.
Note: when this priority mode is activated, the output in question switches to 30%.

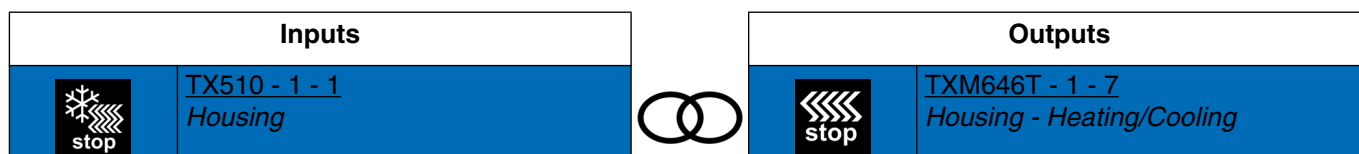
Protection priority: Activates and maintains Protection mode.



Closing the contact activates and maintains Protection mode.
 Closing the contact cancels the priority and returns to the usually active mode.
Note: when this priority mode is activated, the output in question switches to 0%.

4.4.3 Heating/cooling off

This function is used to control the activation and deactivation of all the valve outputs at the same time by the KNX bus.



Closing the contact activates all the valve outputs at the same time.
 Opening the contact deactivates all the valve outputs at the same time.

Note: When the product starts up, all the valve outputs are activated.

5 Appendix

5.1 Specifications

Supply voltage KNX	20 ... 30 V= TBTS
Product and valves power supply voltage:	
▪ 230 V~	+10/-15 %
▪ 240 V~	+/-6 %
▪ 24 V~	+/-5 %
Network frequency	50 / 60 Hz
Own consumption on the KNX bus:	
--typical	18,5 mA
--in standby	5 mA
Ambient conditions	
Operating temperature	-5° ... +45°C
Storage/transport temperature	-25° ... +70°C
Relative humidity	95% à 25°C
Degree of contamination	2
Insulation class	2
Degree of protection of housing	IP20
Degree of protection of housing under front panel	IP30
Impact protection	IK 04
Operating altitude max.	2000 m
Action type	2Y
Surge voltage	4 kV
Circuit breaker protection	16A
Voltage and current declared for	
EMC emission testing	230 V~ 1 A / 24 V~ 1A
Box	
Dimension 4 TE,	4 x 17,5 mm (72mm)
Installation method	rail DIN - EN 60715

5.2 Characteristics

Device	TXM646T	TXM646R
Max. number of group addresses	3568	3568
Max. number of allocations	3569	3569
Objects	38	302

