K-BUS® Fan Coil Controller

User manual-Ver. 1

AFVF-01/220.1

KNX/EIB Intelligent Installation Systems

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1. Overview

This manual provides detailed technical information about the Fan Coil Controller for users as well as assembly and programming details, and explains how to use the Fan Coil Controller by the application examples. To achieve convenient installation in distribution box, the Fan Coil Controller is designed to a modular installation device, and is installed on 35mm DIN Rail according to EN 60 715. It adopts screw terminal to achieve electrical connection. The connection to EIB/KNX BUS is established via EIB connecting terminal. It requires a 230V AC power supply.

The Fan Coil Controller can be connected to other EIB/KNX devices to make up the system via EIB/KNX BUS.

1.1Products and Function Overview

The Fan Coil Controller can work after connecting 230V AC voltage input and bus power supply directly, without extra power. The parts of valve need voltage input of 75V~265V AC according to demands. It is able to use the Engineering Tool Software ETS (ETS3 or later) with a VD4 file to allocate the physical address and set the parameters.

The Fan Coil Controller outputs heating and cooling according to temperature's setting, and the max. load current of valve output is 2A. There are 3 levels of fan speeds, and max. load current of each level reaches 6A. Both valves of heating and cooling and fan speeds can be switched on or off by manual buttons, and their status are shown by LED.

The functions of the Fan Coil Controller are shown as follows:

- Output heating and cooling according to temperature's setting
- Output modes of Standby, Comfort, Night and Protection according to user's demands.
- Control fan speeds in 3 gears (High, Medium, and Low) manually or automatically.
- Control the raise/lower valves and ordinary switching valves intelligently and manually.
- Achieve continuous or PWM output control for valves by PI controlling value.
- Report local fan speeds and valves' status.
- Obtain temperature data from local or BUS, and achieve the monitoring function to actual temperature and frost temperature.
- Scene control, output specific operation mode and speed directly via recall scene.
- Detect shutter's on-off status or binary input.
- Achieve the controlling by external controller (e.g. via the Panel of Temperature Controller)

2. Technical Data, Dimension and Circuit Diagram

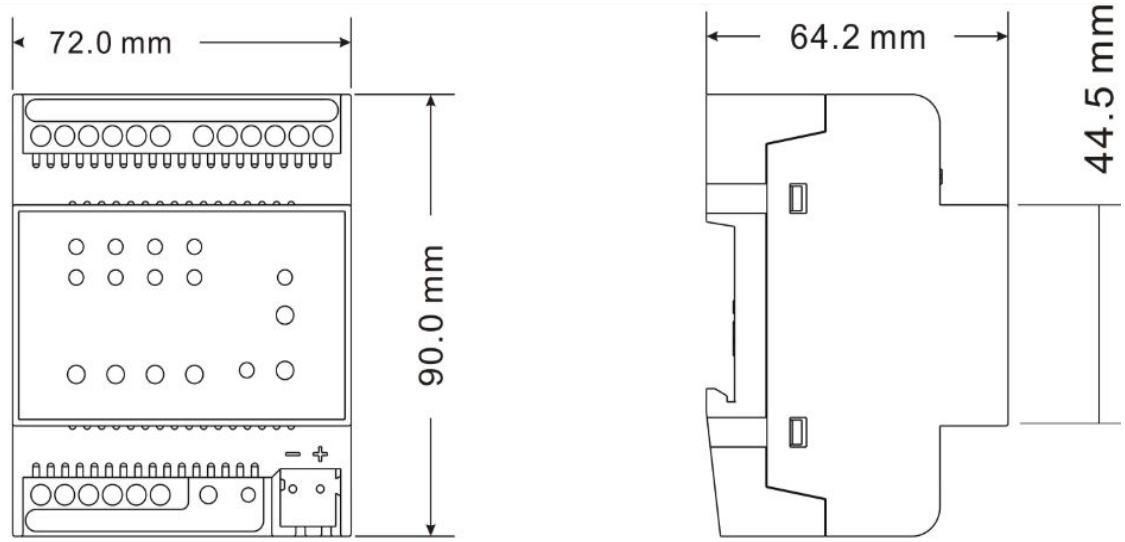
Fan Coil Controller is a modular installation device, and installed on 35mm DIN Rail in distributor box. It is connected EIB/KNX system via BUS connecting terminal.

2.1 Technical Data

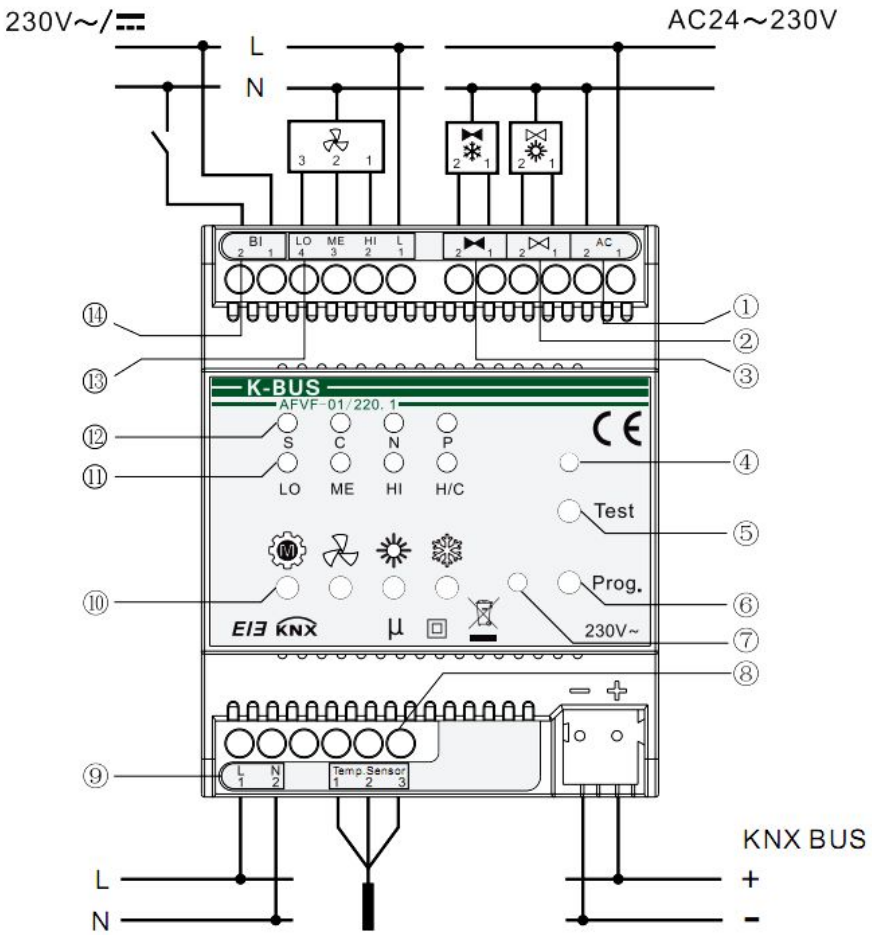
Power Supply	Bus voltage	21-30V DC, via the EIB bus
	Current consumption, bus	<12mA
	Power consumption, bus	<360mW
	Input Voltage	230 V AC +/-10%（50/60Hz）
	Total Power Consumption	1.4W
Control of Heating/Cooling	2 folds Valve Control	Raise/lower valve and thermal valve can be connected. One fold for heating, the other for cooling.
	Nominal Voltage	75V~265V AC (220VAC or 110VAC Motor)
	Nominal Current	2A
	Cable Length	Max. 20m (cross-sectional: 1-1.5mm^2)
Fan Control	1 fold Fan	3 level fan speeds
	Nominal Voltage	230V~（50/60Hz）
	Nominal Current	6A
	Note：In the case that above 3 level speeds are used as independent switching outputs, the max. Current of each output 6 A, and the total of 3 outputs cannot exceed 13A.	
Binary Input	1 fold	For shutter's on/off status and binary input
	input Voltage	9V~265V AC/DC
	Cable Length	Max. 100m (cross-sectional:1- 1.5mm^2)
Tem. Measurement	Three-wire system PT1000 Tem. Sensor	It is used to detect room temperature
	Measuring Scope of Tem.	– 45°C ... + 80°C
	Cable Length	2m
Buttons and Indicator LEDs	Fan Gears	1 button and 3 green LED
	Operation modes	1 button and 4 red LED

	Heating/cooling	2button and 1 red & blue LED
	Programming	1buton and 1 red & green LED
	Please refer to section 2.3 for location of Button and Indicator LED, and 3.2 for operation description	
Temperature rang	Operation	-5℃ ... + 45 ℃
	Storage	-25℃ ... + 55℃
	Transport	-25℃ ... + 70℃
Dimensions	90 x 72 x 64.2 mm	
Installation	On 35mm DIN Rail, and on clean, dry indoor places	
Safety class	-II	to EN61140
Electronic control	Type1.B	To EN 60730-1
Weight	0.3kg	
Color	Grey	

2.2 Dimensional Drawing



2.3Wiring Diagram (Taking Continuous Valve for Example)



①Power supply for valve

② Heating Valve (1-close, 2-open)

③ Cooling Valve (1-close, 2-open)

④ Control Mode Indicator LED

⑤ Testing Button

⑥ Programming Button

⑦ Programming LED

⑧ Temperature sensor input

⑨ Power supply 230V AC

⑩ manual buttons, from left to right: operation modes, Fan speeds, Heating and Cooling

⑪ Indicators of Fan speed (LO-Low, Me- Medium, and HI-High) and Heating/Cooling

⑫ Indicators of Room operation Mode: S- Standby, C-Comfort, N-Night, P-Protection

⑬ output 3 fan speeds: LO, ME , HI

⑭ Binary Input

μ This symbol indicates Micro-disconnection on operation, Type 1.B

⧈ This symbol indicates Class II

This symbol indicates separate collection for electrical and Electronic equipments.

3. Project Design and Application

3.1 General Introduction

Application Program	Max. number of Communication Objects	Max. number of Group Addresses	Max. number of Associations
Fan coil Controller	38	50	50

The Fan Coil Controller controls Fan's fan speeds and Valve's opening degree intelligently by PI Algorithm, and achieve heating/cooling to make rooms comfortable through comparison between setting temperature and actual temperature. The Fan Coil Controller contains 1 fold temperature data collection, 1 fold binary input, 1 fold Fan control and 2 folds Valve control.

3.2 System Mode and Button Operation Introduction

The Fan Coil Controller has 3 control modes: Automatic Control Mode, Manual Control Mode and Testing Control Mode.

Automatic Control Mode: When testing/auto indicator light is off, the mode is automatic control. In this mode, Fan Coil's output is controlled via the Fan Coil Controller, and the mode can be switched to testing or manual control mode, as well as room operation modes can also be switched by manual button.

Manual Control Mode: When testing/auto indicator light is on, the mode is manual control. The manual control mode can be activated via recalling scene (Object 12) or controlling fan speed manually (Object 15), and be returned to the automatic control mode via setting Object 16 to 1. The Manual control mode refers to adjusting Fan's fan speed via KNX telegram (Note: this mode is for Fan only, the Valve is still controlled automatically). In this mode, room operation modes can be switched by manual button, and the control mode only can be switched to the Automatic Control Mode.

Testing Control Mode: When testing/auto indicator light is flashing, the mode is testing control. The mode can be activated or returned to automatic control mode via pressing testing button for 2s. In this mode, output of valves can be controlled via heating button and cooling button. Besides, for local continuous raise/lower valve the controller can control it pause via pressing heating or cooling button for 2s and the heating/ cooling indicator would flash. The pause function can be exited via a short operation of the button. The Fan speeds can be adjusted via

fan-speed button; the fan-speed gear is change via a short operation, the current speed is switched on or off via a long operation, and the corresponding indicators would on or off. In this mode, room operation modes cannot be changed, and the control mode only can be returned to the Automatic Control Mode.

3.3 Coil System

Fan Coil can be designed as 2-pipe, 3-pipe, or 4-pipe version, according to hot and cold water's circulation loops.

The 2-pipe version consists of a single water circulation loop for both hot and cold water. It is achieved only by connecting one fold valve to control flow of hot and cold water, and the default connecting is heating output. In lots of practical application, only cooling is carried out via a 2-pipe fan coil, and heating is implemented by other conventional heaters.

The 3-pipe and 4-pipe versions are quite similar to each other. For 3-pipe version, the hot and cold water have separate inlet, while they share one outlet. The 4-pipe version has separate water circulation loops for both hot and cold water. For both 3-pipe and 4-pipe, hot and cold water's flow can be controlled by connecting to Fan Coil Controller's control terminal of heating and cooling valve.

Valve has two types: Raise/ lower valve and Thermal valve. Raise/ lower valve control valve's opening according to its run time, to achieve status of on, off and pause. It is 3-wire system, shown as wiring diagram. Thermal valve is usually divided to normally open type and normally closed type, and has only two statuses: on/off. It is 2-wire system, and one for valve's open (as wiring diagram ②and ③ of 2 shown), the other for null line of valve power supply (as wiring diagram ① of 2) .

3.4 Fan System

Fan system can control local Fan, as well external Fan, and it is achieved via parameter setting of "Type of fan"

Fan can be controlled both automatically and manually. Auto control is Fan Coil's control according to algorithm output. Manual control is used to adjust current fan speed according to KNX telegram. Under manual control, Fan cannot be controlled by Fan Coil, unless the mode is auto control.

Auto-control Fan adopts stepping sequence, that is, the fan speed can be adjusted step by step only, but not phase step. For example, to change current gear 0 to 3, the operation order is 1->2->3, and between each two gears, it would stay at least 2mins due to the parameter "**Minimum delay at fan speed**". The limitation is un available when it is manual mode or testing mode.

3.5 Room Temperature Control Mode and Setting Temperature Adjustment

Room Temperature Control Mode

Room temperature control has 4 modes: comfort mode, standby mode, night mode, and protection mode, and it is used to adjust rooms' setting temperature, and it can be switched via KNX BUS or room mode button.

Via KNX BUS, to select a 1byte communication object or three 1bit objects can help to switch room modes.

When selecting three 1bit objects as above-mentioned, the objects have priority as follows: protection mode >comfort mode > night mode > standby mode. Writing "1" on the relevant object enables room mode, and writing "0" disable it. When lower priority would replace the higher priority, close the latter first. When object 9, object 10 and object 11 are "0", the mode is lowest priority – standby mode.

When selecting a 1byte to switch to room mode, value 0: stay; value 1-4 represent comfort mode, standby mode, night mode, and protection mode respectively; value 5-255, invalid.

Setpoint values

Setpoint value is configured in the parameter window "Setpoints".

Setpoint temperature of actual output can be calculated according to following:

Comfort mode: Heating: Setpoint temperature = Base setpoint temperature + Setpoint adjustment

Cooling: Setpoint temperature = Base setpoint temperature + Setpoint adjustment + Insensitive zone + external temperature correction (Pls refer to "External temperature" in the parameter window "Temperature setting " under cooling control)

Standby mode: Heating: Setpoint temperature = Base setpoint temperature – Reduces heating in standby mode + Setpoint adjustment;

Cooling: Setpoint temperature = Base setpoint temperature + Increased cooling in standby mode + Setpoint adjustment

Night mode: Heating: Setpoint temperature = Base setpoint temperature –Reduces heating in night mode + Setpoint adjustment;

Cooling: Setpoint temperature = Base setpoint temperature + Increased cooling in night mode +

Setpoint adjustment

Protection mode: Heating: Setpoint temperature = Threshold value for heat protection

Cooling: Setpoint temperature = Threshold value for frost protection

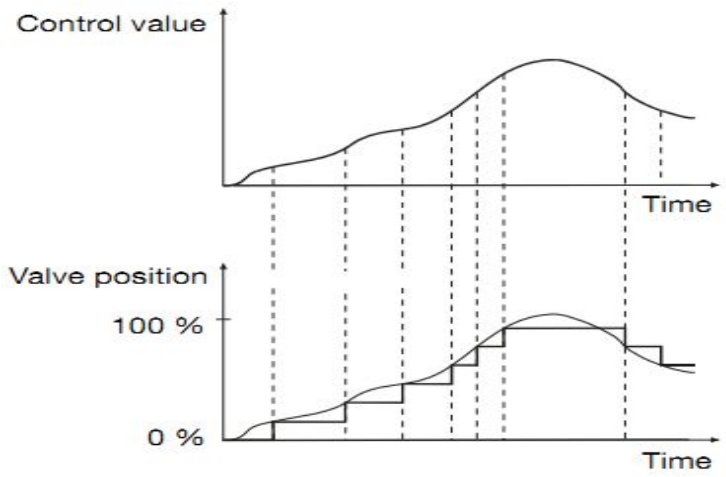
Setpoint adjustment is realized via object 5.

Note: When user chooses “Heating and cooling ” of “Controller mode in Heating/Cooling” in the parameter window “General”, auto control to toggle heating and cooling is related to setting temperature in comfort mode only, that is, the comparison between setting temperature and actual temperature generate heating or cooling.

3.6 Type of control

Continuous control

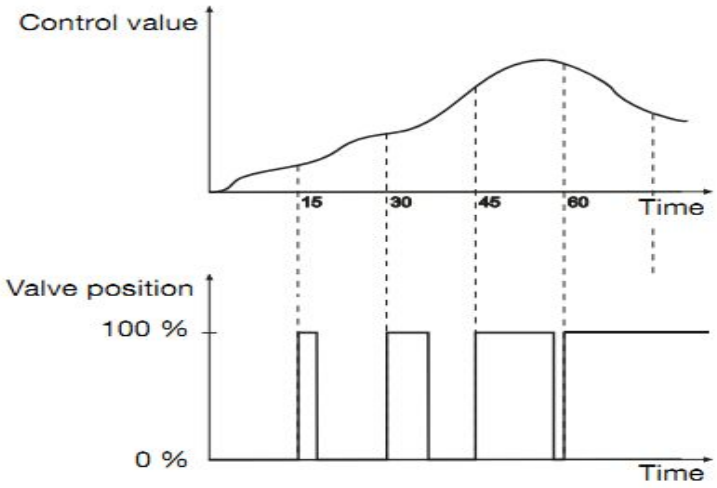
Continuous control is based on the actual temperature and set the thermometer calculates a control value, and the valve opening degree of the continuous control, the temperature to achieve a comfortable condition. For example: the current control value is the maximum 50% of the control value , then the valve position will be under the control value to 50% open position ; If the control value output to the maximum control value , the valve will be fully open. Continuous control can be achieved "on" and "off” and “stop" three-step operation, the specific action as shown below:



Continuous control, can achieve the most accurate temperature control, no considerable overshoot. Meanwhile, the positioning of the valve drive frequency can be maintained at a low level. Continuous control can be used with the Fan Coil Controller for electromotive raise/lower valves or KNX valve drives.

PWM control

PWM (pulse width modulation) control is based on the actual temperature and set the thermometer calculates a control value, and then calculates the valve opening and closing time of the switch valve is controlled to achieve a comfortable temperature state. On/off valve that only “full open" and “fully closed” two kinds of control operations. PWM control need to set a fixed cycle time period, For example, set the PWM period of 15 minutes, when the control value is the maximum 20% of the control value, the valve will open 15 * 20 % = 3 minutes; Off 15 * 80 % = 12 minutes; when the control value is the maximum control value of 50 %, the valve will open 15 * 50 % = 7.5 minutes; off 15 * 50 % = 7.5 minutes. Diagram is as follows:



PWM control is a relatively accurate adjustment, if you select the appropriate cycle, temperature overshoot will not be great, and you can use a simple low cost general switching valve actuator. Fan coil can be used to control the common switching valve, electric valve or KNX valve drives.

4. ETS System Parameter Setting Description

4.1 Outline

Fan coil controller either as a master device can also be used as the controlled device.

1. Local（master device）

Local control fan coil controller acts as the master role, which according to the set temperature and the actual temperature difference to calculate the control value, thus control the valve and the speed. In this mode, the local wind speed and valve can be controlled by own, or via bus fan speed and valve of the external fan coil can be also controlled.

2. Bus (controlled device)

As controlled by the external control fan coil controller role, and its temperature is not monitored and does not output the control value, but by an external controller (e.g., temperature and humidity sensors, temperature control panel, etc.) is sent to the control value for the output control. In this mode, the control value from external only can control the fan coil local control valve and speed controller.

4.2 Parameter window “General”

"General" parameter setting interface shown in Figure 4.2, this parameter setting window is mainly set some basic parameters of fan coil controller. Intro of each parameter follows.

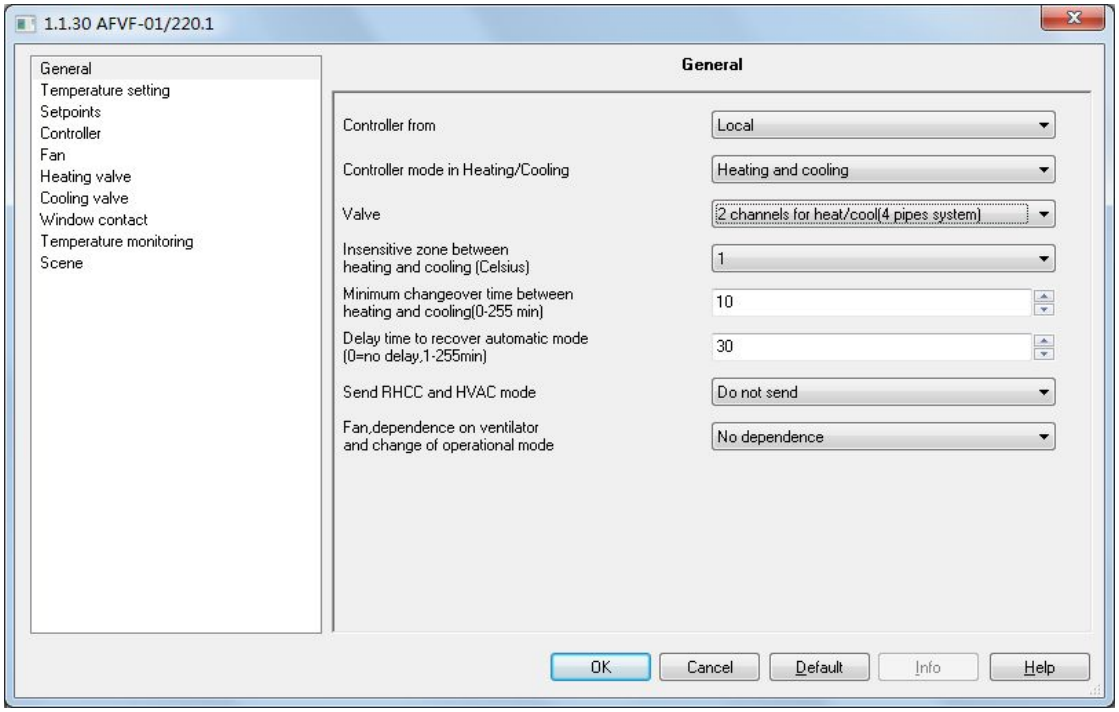


Fig.4.2 parameter window “General”

Parameter： Controller from

Options： Local

Bus

This parameter sets the fan coil controller source. Wind speed and valve of fan coil controller can be locally controlled by an internal controller (the connected temperature sensor in the input), can also be controlled via bus (such as temperature panel).

“Local” shows that the outputs of the fan coil controller are controlled by the internal controller, i.e. as the master device. In this mode, the fan coil controller can either control the local wind speed and valve, or can also

control the wind speed and valve of external fan coil controller via bus.

"Bus" shows that the fan coil controller is controlled by an external controller, i.e. as the controlled device; in this mode, the outputs of the fan coil controller are controlled via bus.

Since the sources are not the same, so their parameter settings are also not the same, we then introduce "Local" parameter settings, "Bus" in case of parameter settings to 4.11 do detail.

Parameter：Controller mode in Heating/Cooling

Options： Heating

Cooling

Heating and cooling

This parameter sets the HVAC heating and cooling.

Select the "Heating", controller is in heating control state, then fan coil only achieved heating function;

Select "Cooling", controller is in cooling mode, the cursor can only achieve cooling,

If select "Heating and cooling", both heating and cooling can be achieved, fan coil controller outputs automatically heating or cooling according to the set temperature and the actual temperature difference and the dead zone. Meantime, the corresponding parameters will be visible.

Parameter：Valve

Options： 1 channel for heat/cool(2 pipes system)

2 channels for heat/cool(4 pipes system)

This parameter sets the water pipe type of fan coil.

"1 channels for heat / cool (2 pipes system)" for the heating and cooling shared an inlet and outlet pipe, that is hot and cold water pipes are out from a pipe. In the case, you only need a valve to connect with heating valve output of fan coil controller;

"2 channels for heat / cool (4 pipes system)" for the heating and cooling, respectively, have their own pipe to in and out water, requires two separate control valve to control in and out of hot and cold water.

Parameter：Choose heating or cooling by

Options： Local

Bus

This parameter is visible if the option "1 channels for heat / cool (2 pipes system)" is select in the parameter "Valve", which is used to set heating or cooling for the 2 pipes system.

With “Bus”, the cooling and heating can be controlled via external input, and the control of cold or hot water

is realized via the communication object 7 and 8.

"Local" means that the actual temperature and the set of local parameters to determine the output control of heating or cooling.

Parameter：Insensitive zone between heating and cooling

Options： [°C] 0.5...6.0

This parameter set the dead zone that is used to switch automatically heating and cooling. When the smaller the value of the dead zone, the faster switching between heating and cooling according to the temperature, but the heating and cooling frequent exchange; larger values when the dead zone is not so frequent exchange heating and cooling, energy conservation, but switching heating and cooling of the reaction is slow. Dead zone temperature usages see 3.5 Introduction. The parameter will be visible in the parameter window "General" of the "Controller mode in Heating / Cooling" with the option "Heating and cooling".

Parameter：Minimum changeover time between heating and cooling

Options： [min.] 0...255

This parameter sets the minimum pause in minutes when toggling between heating mode and cooling mode. Mainly prevent frequent switching heating and cooling, and energy conservation.

Parameter：Delay time to recover automatic mode

Options： [min.] 0...255

This parameter set the delay time from the manual or test mode switch back to automatic mode.

With option "0", the controller does not automatically switch back to automatic mode until the user via the KNX communication objects or local button to switch back to automatic mode;

For "1-255" the manual mode or test mode will switch back to automatic mode after delay.

Parameter：Send RHCC and HVAC status

Options： Do not send

Send on change

Send cyclically

The parameter sets the transmission event for the HVAC and RHCC status.

With "Do not send" two status reports is not sent.

With "Send on change", the status is only sent if there is a change in the object value.

With "Send cyclically", the object value is sent according to the parameterized period for cyclical sending, but

also sent when changes.

Parameter：Period of sending fan coil status

Options：[min.] 1…255

This parameter sets the period for cyclical sending the RHCC and HVAC status. This parameter is visible when the option "Send cyclically" in the parameter "Send RHCC and HVAC status" is selected.

Parameter：Fan,dependence on ventilator and mode change of operational mode

Options： No dependence

Switch fan to automatic on mode change

Switch comfort mode on manual operate fan

This parameter sets the connection between the fan and the operation mode.

"No dependence" indicates no relationship between both of them;

If "Switch fan to automatic on mode change" is selected, and the fan is in manual control (via the object 15), fan coil control is automatically switched to automatic control mode when the operation mode changes via KNX telegram.

If "Switch comfort mode on manual operate fan" is selected, and the room of control mode is not comfort mode, the fan coil control is automatically switched to the comfort mode when the fan speed changes via KNX telegram (the object 15).

4.3 Parameter window: “Temperature setting”

Parameter window "Temperature setting" is shown in Figure 4.3. The window primarily sets the basic parameters of the temperature. "Actual temperature" and "External temperature" two parts, of which "External temperature" parameters are visible with the option "Cooling" or "Heating and cooling" in the parameter "Controller mode in Heating / Cooling" of the "General" parameter window. The following detailed describe settings of each parameter.

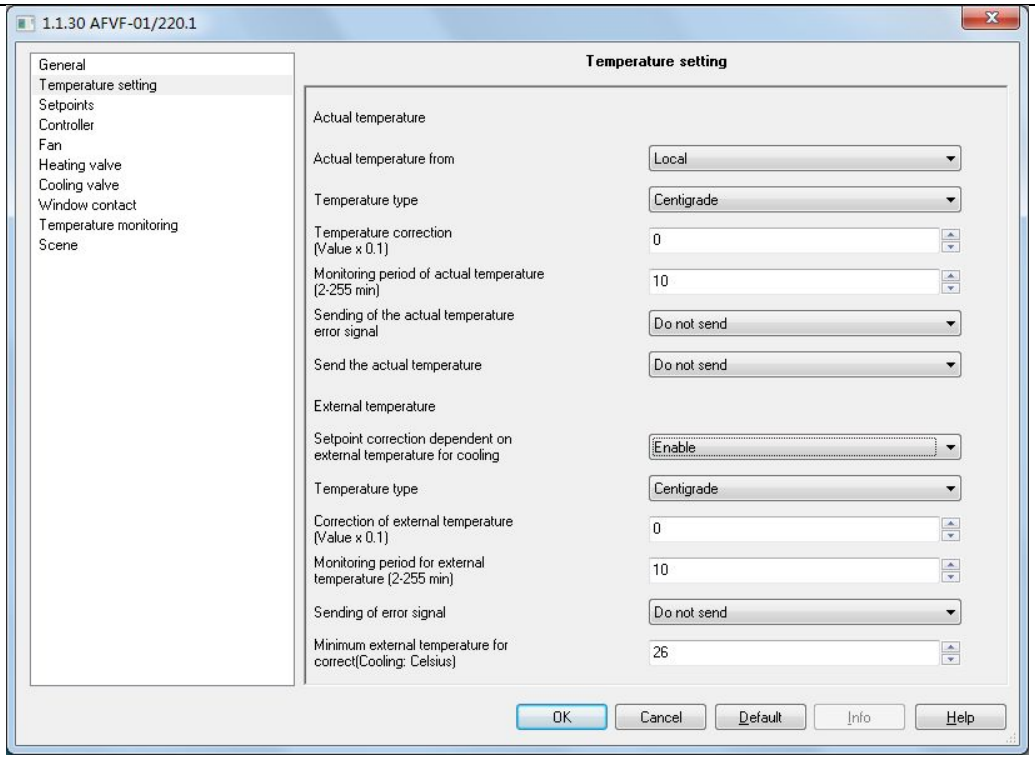


Fig. 4.3.1 parameter window "Temperature setting"

Actual temperature

Actual temperature, mainly setting the way of collecting temperature, temperature type and correction, monitoring and sending of the temperation and so on.

Parameter：Actual temperature from

Options： Local

Bus

Setting the temperature sensor.

If the temperature sensor PT1000 is connected to the Fan Coil Controller, the option "Local" must be selected.

If the temperature is received via the KNX, the option "Bus" must be set.

Note: The fan coil controller needs to know the current heating or cooling output clearly to control to work properly, the heating or cooling can be the actual temperature and the set temperature compared to determine, in some cases need to clear through the communication objects, such as the two coils control systems and as a controlled device.

Parameter：Temperature type

Options： Centigrade

Fahrenheit

This parameter is set to the bus output, or received from the bus type of the actual temperature.

"Centigrade" indicates the actual temperature is expressed in degrees Celsius;

"Fahrenheit" indicates the actual temperature is Fahrenheit.

Wherein the relationship between Fahrenheit and Celsius are as follows: F = 32 + °C × 1.8.

Parameter：Temperature correction

Options： [val x 0.1°C] -50...50

Correction of the value measured by the temperature sensor PT1000 or the actual value received via the KNX.

When the temperature sensor receives the temperature value and the actual value of the parameter deviation can be corrected. For example: no output before calibration temperature of 25 degrees, but the indoor temperature is 25.5 degrees, then the database where the calibration temperature must be set to 5 (0.1 * 5), and then re-download the database, it will have 25.5 degrees output temperature.

Parameter：Monitoring period of actual temperature

Options： [min.] 2...255

Setting the monitoring period for the actual temperature (local and via the KNX).

When the temperature is up from the Bus, then within the set time did not update, then it is wrong temperature, the corresponding telegram is sent "True"; when the temperature reading from the Local, at this set time has remained the same a temperature value, it is considered wrong temperature, the corresponding telegram will be sent "True". Error occurs when the control value output parameter page "Temperature monitoring" parameter "when actual temperature is absent or in event of frost" setting maximum control value (10,000) Percentage.

Note: If a sensor value is received via the KNX, the monitoring period should be selected so that it is at least twice as long as the cyclical transmission period of the sensor so that an error message is not sent immediately when a signal fails to appear.

Parameter：Sending of error signal

Options： Do not send

Send on change

Send cyclically

This parameter is setting to send the actual temperature of the wrong way.

"Do not send" when an exception occurs for the actual temperature is not transmitted to the bus error status report;

"Send on change" is the actual temperature of the abnormal state when there is a change on the transmission error status value, which is only made when actual temperature anomaly a "1" (True means 1), until the actual

temperature returned to normal hair only a "0" (Flase means 0);

"Send cyclically" send for the cycle, depending on the setting of the transmission time , time to send a message , but the actual temperature anomalies also sent telegram, and sent at this time to re-cycle timing .

Parameter：Period of sending

Options：[min.] 1…255

This parameter is setting when actual temperature occurs an exception, the controller sends the error status reporting time period to BUS. This parameter only "Sending of error signal" option to "Send cyclically" is visible.

Parameter：Send the actual temperature

Options： Do not send

Send on change

Send cyclically

This parameter is setting to read from the local pt1000 temperature sensor value and sent to the BUS.

"Do not send" the local acquisition temperature does not occur on the bus made;

"Send on change" for the local temperature changes when a certain value, the controller transport the temperature value on the bus;

"Send cyclically" Send for the cycle, that is every once in a while to send a temperature value. This parameter is only "Actual temperature from" option for the "Local" visible.

Parameter：Send temperature at variation of

Options：0.1…5

This parameter is to set the actual temperature variation. When the actual temperature changes every time the option value, the fan coil controller will be sent to the bus once the actual temperature. This parameter is only "Send the actual temperature" option to "Send on change" visible.

Parameter：Time lag of sending actual temperature

Options： [min.] 1…255

This parameter is set to send the local actual temperature period time. This parameter is only "Send the actual temperature" option to "Send cyclically" visible.

External temperature

External temperature only in the case of a cooling occurs , the parameter item in the "General" parameter page "Controller mode in Heating / Cooling" is selected for "Cooling" or "Heating and cooling" is visible . Mainly used to adjust the room temperature setting , indoor outdoor temperature can not be too large. As below:

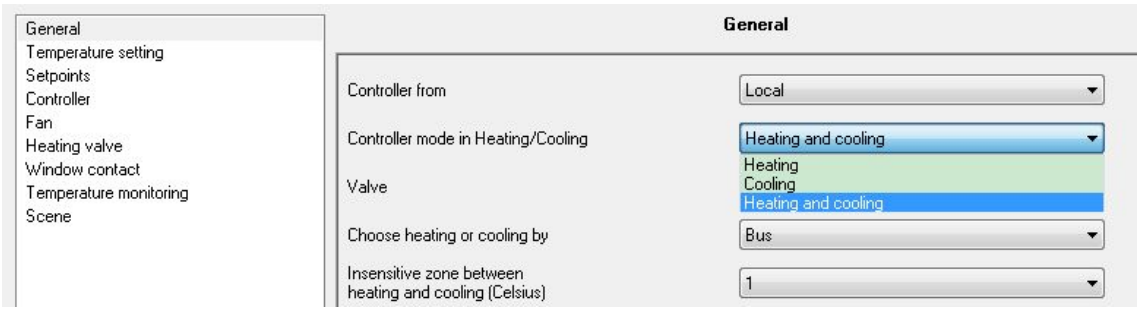


Fig. 4.3.2 parameter window “External temperature”

4.4 Parameter window "Setpoints"

"Setpoints" parameter setting window is shown in Figure 4.4. It is for setting the basic setpoint temperature of heating or cooling. Divided into "Base setting", "Heating" and "Cooling" three parts, "Heating" and "Cooling" parameter can be seen when choosing the appropriate heating or cooling option in parameter "Controller mode in Heating / Cooling" in the "General" page, Following is detail description for each of the parameter settings.

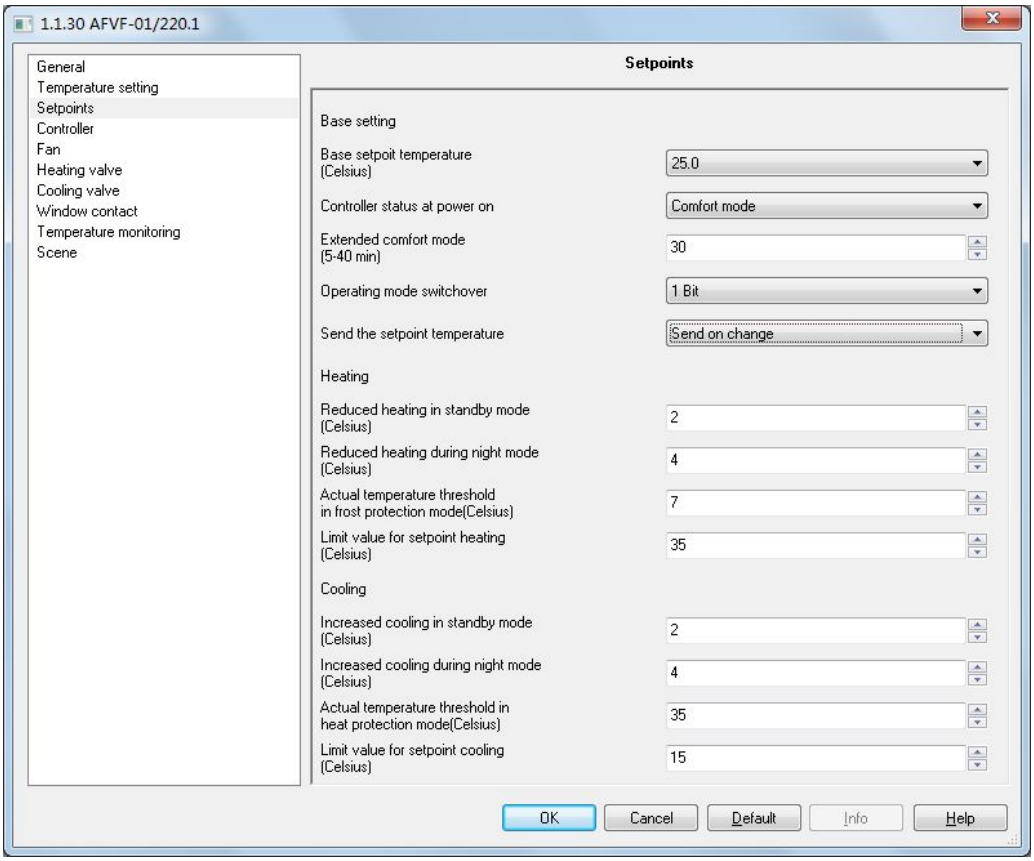


Fig. 4.4.1 parameter window “Setpoints”

Base setting

Setting the basic setting for either heating or cooling

Parameter: Base setpoint temperature

Options: [° C] 15 ... 30

This parameter is a reference value to set the set temperature, the set temperature of room modes generated via the value.

Parameter: Controller status at power on

Options: Standby mode

Comfort mode

Night setback

Frost protection

Setting of the operation mode when connecting the supply voltage.

Parameter: Extended comfort mode

Options:[min.] 0 ... 1-255

The comfort mode parameter is set delay time. When the setting is "0", it means do not use comfort mode delay function; when set value at 1-255, the room mode Night mode switch back from comfort mode, this function is enabled, comfort mode will be delayed user settings, when the delay time exceeds the set value, it will automatically switch to night mode. This mode is only for night mode and comfort mode switch.

Parameter: operating mode switchover

Options: 1bit

1byte

This parameter sets the operating room Switching mode.

Select 1bit, according to the writing of ON or Off, switch to a different mode. Switch to the attention of priority, if you want to enter the low level mode, you must first close the high level mode, otherwise unable to enter the low level mode. Mode priority is as follows: Mode of priority is as follows: protected mode (Frost / heat protection mode)> Comfort mode (comfort mode)> Night mode (night mode)> standby mode (standby mode).

When selected 1byte, 1 comfort mode, said preparation mode 2, 3 for the night mode, 4 denotes a protective mode, different values are written into the mode is not the same.

Parameter: Send the setpoint temperature

Options: Send on change

Send cyclically

This parameter is set to send mode temperature setpoint.

"Send on change" means that there is a change occurs when the set temperature set temperature.

"Send cyclically" means that periodically sends the temperature setpoint.

Parameter: Period for cyclical sending

Options: [min.] 2 ... 255

This parameter is set to send the set temperature cycle time. In the parameter "Sending the setpoint temperature" select "Send cyclically" is visible.

Heating / Cooling

The two parts under the "General" parameter page "Controller mode in Heating / Cooling" select the appropriate "Heating" or "Cooling" or "Heating and Cooling" see the different open. Mainly used to set the room temperature setting various modes.

Parameter: Reduced heating in standby mode

Parameter: Increased cooling in standby mode

Options: [° C] 0 ... 10

This parameter is set ready mode, the set temperature. When set to "Heating" mode, the standby mode is set as the reference value minus the temperature values of options; when set to "Cooling" Mode, the standby mode is set as a reference temperature value plus the value of the options available.

Parameter: Reduced heating during night setback

Parameter: Increased cooling during night setback

Options: [° C] 0 ... 10

This parameter is set in night mode set temperature. When set to "Heating" mode, night mode setting temperature of the reference value minus the value of the options; when set to "Cooling" Mode, night mode setting temperature of the reference value plus the value of the options.

Parameter: Actual temperature threshold in frost protection mode

Options [° C] 2 ... 10

Parameter: Actual temperature threshold in heat protection mode

Options [° C] 5 ... 40

This parameter is set overheating or frost protection mode set temperature. When the indoor heating mode when the frost protection mode, when the room temperature falls to the options available for the set temperature

value, the controller outputs a control not to fan coil temperature is below the set temperature value; cooling mode when the room is The over-temperature protection mode when the room temperature rises to a set temperature value of the option, the controller outputs a control not to fan coil temperature is higher than the set temperature value.

For example: When the room for the heating mode, this parameter is set at a temperature of 10 ° C, room temperature below 10 ° C, in order to play a protective role, the controller will output control ensure outdoor at 10 ° C or so.

When the room is cooling mode, the parameter setting temperature of 30 ° C, the outside temperature is higher than 30 C, is also meant to play a protective role, the system will output control ensures outdoor at 30 ° C or so.

Parameter: Limit value for setpoint heating

Options: [° C] 5 ... 40

Parameter: Limit value for setpoint cooling

Options: [° C] 5 ... 60

This parameter is set heating or cooling set temperature limits. When set to "Heating" mode, the set temperature is not higher than this value, if the output value is higher than the click; when set to "Cooling" Mode, the set temperature not lower than this value, if the output value is less than the click.

4.5 Parameter window "Controller"

"Controller" parameter setting window is shown in Figure 4.5. The interface is mainly set up in the case of heating or cooling the parameters of the PI controller. The following detailed description of each parameter settings.

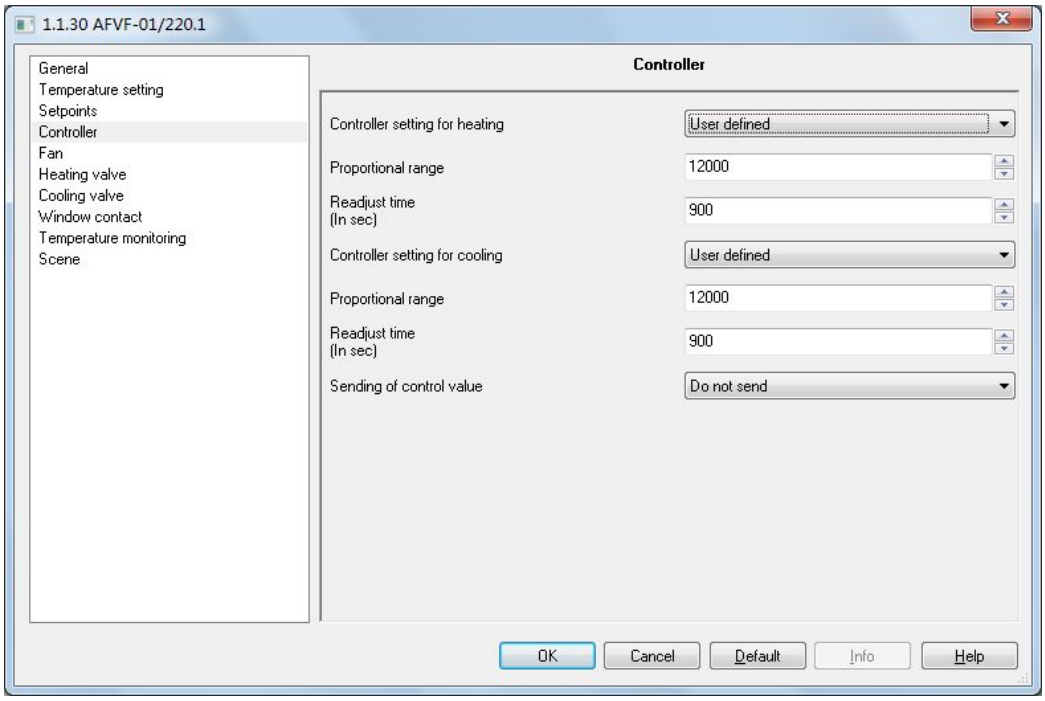


Fig. 4.5 parameter window "Controller"

Parameter: Controller setting for heating

Parameter: Controller setting for cooling

Options: - Slow

- Normal

- Fast

- User defined

This parameter is set when setting the heating or cooling of PI corresponding

Slow: the I-gain 1800 s

Normal: the I-gain 900 s

Fast: the I-gain 450 s

Parameter: Proportional range

Options: 0 ... 65,535

Parameter: Readjust time

Options: 0 ... 65,535 (900)

Setting parameters of the PI controller. In the parameter "Controller setting for heating" or "Controller setting for cooling" option is "User defined" visible.

Parameter: Sending of control value

Options: - Do not send

-Send on change

-Send cyclically

The transmission control parameters by value.

"Do not send" is not sent to the bus control value;

"Send on change" for the control value is changed certain value, the controller was sent on to the bus control value;

"Send cyclically" Send for the cycle, that every once in a while sends a control value.

Parameter: Period for cyclical sending of control value

Options: [min.] 2 ... 255

The parameter values for the cycle time of transmission control. That is periodically sent once control values. Parameter "Send of control value" option to "Send cyclically" is visible.

Parameter: Differential value for sending the control value

Options: [%] 1 ... 10

The parameter values for the control of the percentage change in the option, the fan coil controller sends a control value to the bus. In the parameter entry "Send of control value" option for the "Send on change" is visible.

4.6 Parameter window "Fan"

"Fan" parameter setting window is shown in Fig. 4.6.1. The interface is mainly to set the fan speed of some parameters. The following detailed description of each parameter settings.

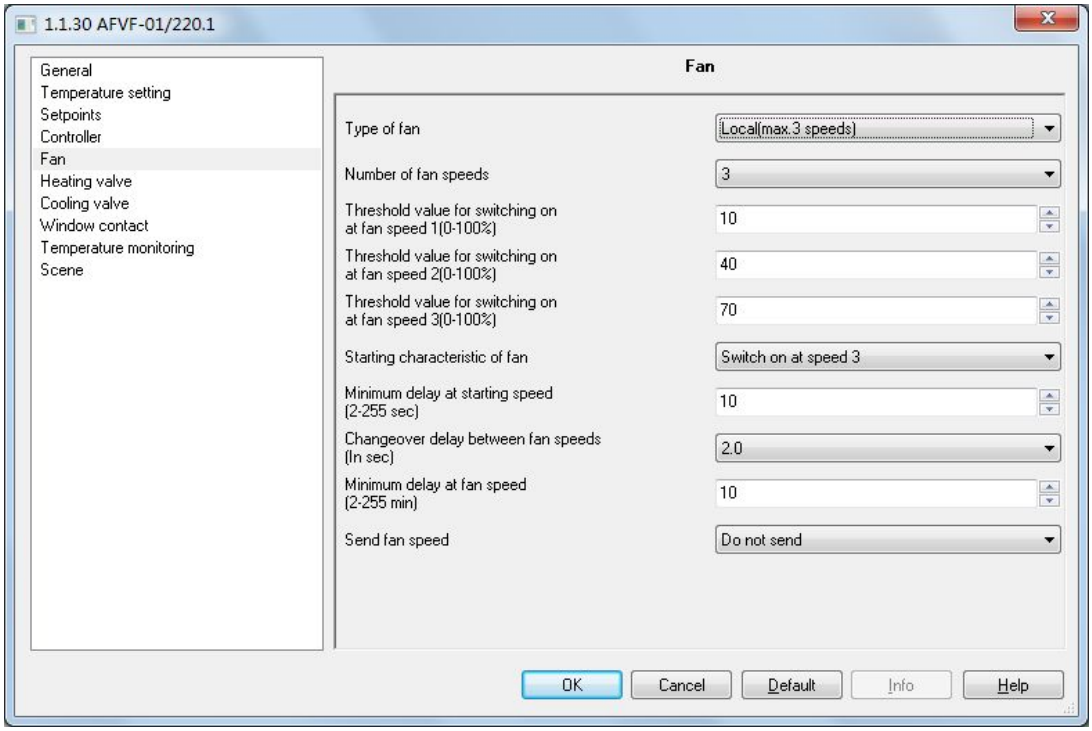


Fig. 4.6.1 parameter window "Fan"

Parameter: Type of fan

Options: - No fan

- Local (max. 3 speeds)

- KNX: on / off

-KNX: 3 speeds

-KNX: 0 ... 100%

This parameter sets the type of the fan.

"No fan" with no fan control, and no parameter is optional;

"Local (max. 3 speeds)" for the controller controls the local relay output to achieve control fan speed adjustment;

Options "KNX: on / off", "KNX: 3 speeds", "KNX: 0 ... 100% "as the controller viaKNX to control the packets on the bus other types of wind turbine output.

When the option is "No fan", "KNX: on / off", "KNX: 3 speeds" and "KNX: 0 ... 100%", the controller of the fan three way switch through the object 31, the object 32 and the object 33 to control the output.

Parameter: Number of fan speeds

Options: - 1

- 2

- 3

This parameter is the number of stalls set up wind speed. According to the actual needs of fan coil, the user can select the fan speed is divided into several files. This parameter is only in the parameter "Type of fan" option for the "Local (max.3speeds)", "KNX 3speeds" and "KNX 0 ... 100%" is visible.

Parameter: Threshold value for switching on at fan speed 1

Parameter: Threshold value for switching on at fan speed 2

Parameter: Threshold value for switching on at fan speed 3

Options: [%] 0 ... 100

The parameter for the fan gears threshold setting. The output is the output gear of the actual control value representing the maximum control value (10000) to achieve a percentage.

"Threshold value for switching on at fan speed 1" means that the threshold value of output gear 1;

"Threshold value for switching on at fan speed 2" means that the threshold value of output gear 2;

"Threshold value for switching on at fan speed 3" means that the threshold value of output gear 3.

Threshold value 1 < threshold value 2 < threshold value 3. This parameter is only in the parameter "Type of fan" option for the "Local (max.3speeds)", "KNX 3speeds" and "KNX 0 ... 100%" is visible.

Parameter: Starting characteristic of fan

Options: - switch on at speed 1

- Switch on at speed 2

- Switch on at speed 3

This parameter is set to start the fan speed, in order to stably start the fan motor, preferably starting from the high speed, so that a high torque can be obtained. When the start time has elapsed, the wind speed is controlled by the controller on the output value. Fans action following figure 4.6.2 below. This parameter is only in the parameter "Type of fan" option for the "Local (max.3speeds)", "KNX 3speeds" and "KNX 0 ... 100%" is visible.

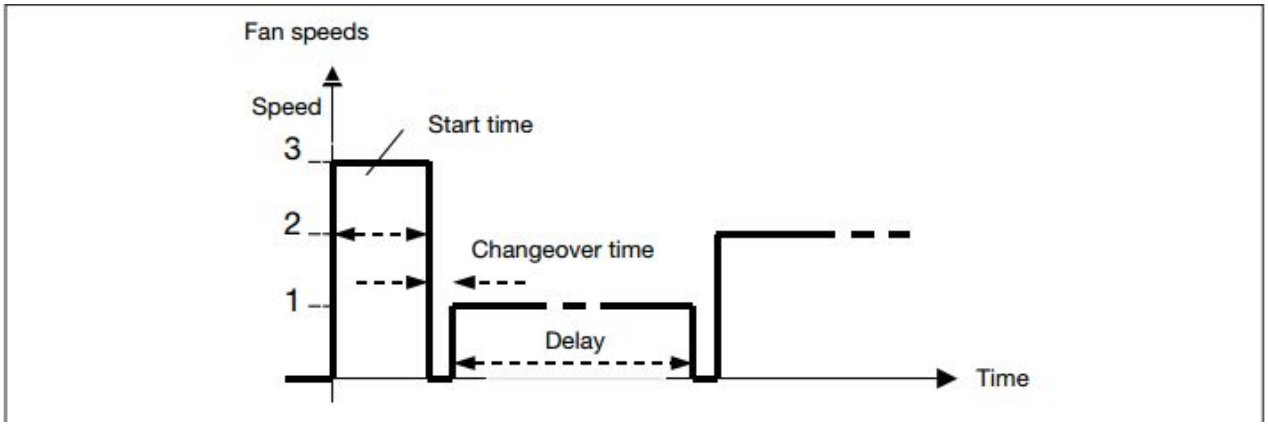


Fig. 4.6.2 fan gear shifting mode

Parameter: Minimum delay at starting speed

Options: [sec.] 2 ... 255

The parameter sets the minimum delay at the starting speed.

Parameter: Changeover delay between fan speeds

Options: [sec.] 0.5 ... 10

This parameter sets the changeover delay between the fan speeds

Parameter: Minimum delay at fan speed

Options: [min.] 2 ... 255

This parameter sets the minimum delay at a fan speed. This parameter should be selected so that a fault is avoided by changing over the fan speed too frequently.

Parameter: Send fan speed status

Options: -Do not send

-Send on change

-Send cyclically

The parameter sets the sending function of the fan speed status. It is only visible in the parameter "Type of fan" option for the "Local (max.3speeds)".

"Do not send" is not sent on to the bus speed of the status report;

"Send on change" as the wind changes state reports status to the bus;

"Send cyclically" is sent once every so often cycle speed state, when there is wind condition Change is also sent, this time sending time re-timing cycle.

4.7 Parameter window “heating valve” and “cooling valve’

“Heating valve” and “cooling valve” parameter setting windows are shown in fig. 4.7.1 and fig. 4.7.2. They are respectively used to set some parameters of the heating and refrigeration valves. The following detailed settings for each parameter.

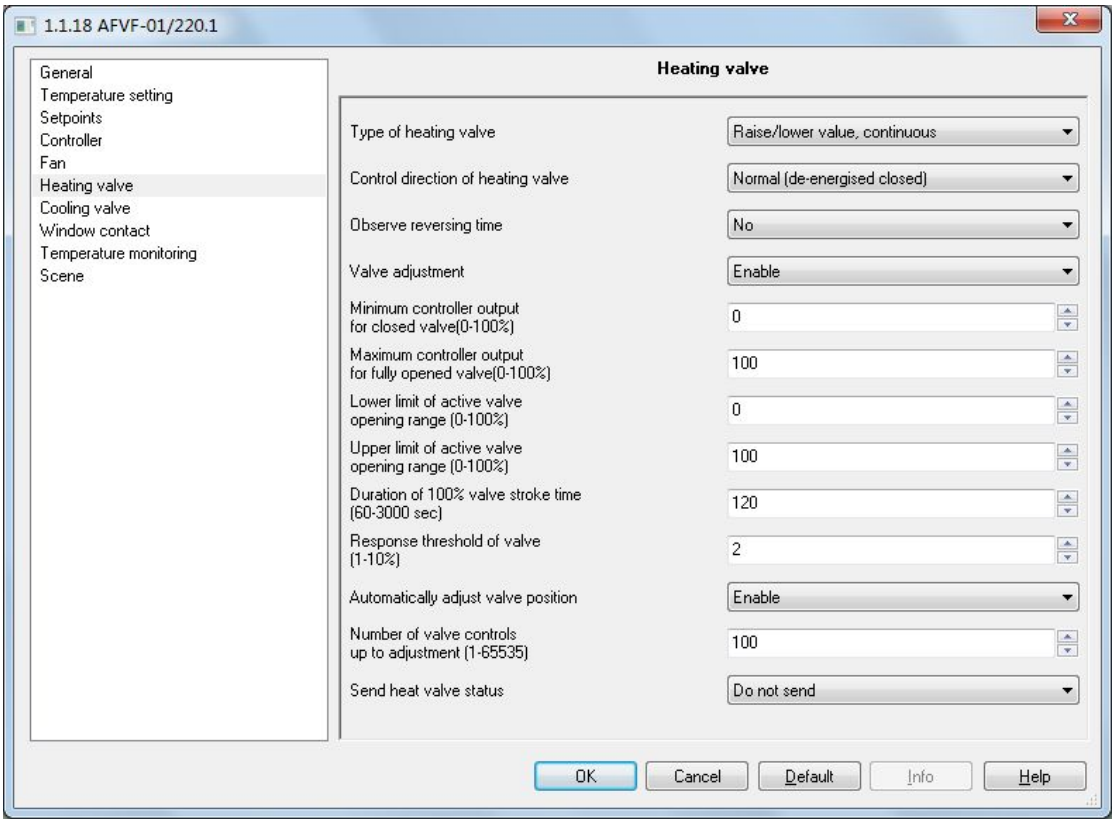


Fig. 4.7.1 parameter window “Heating valve”

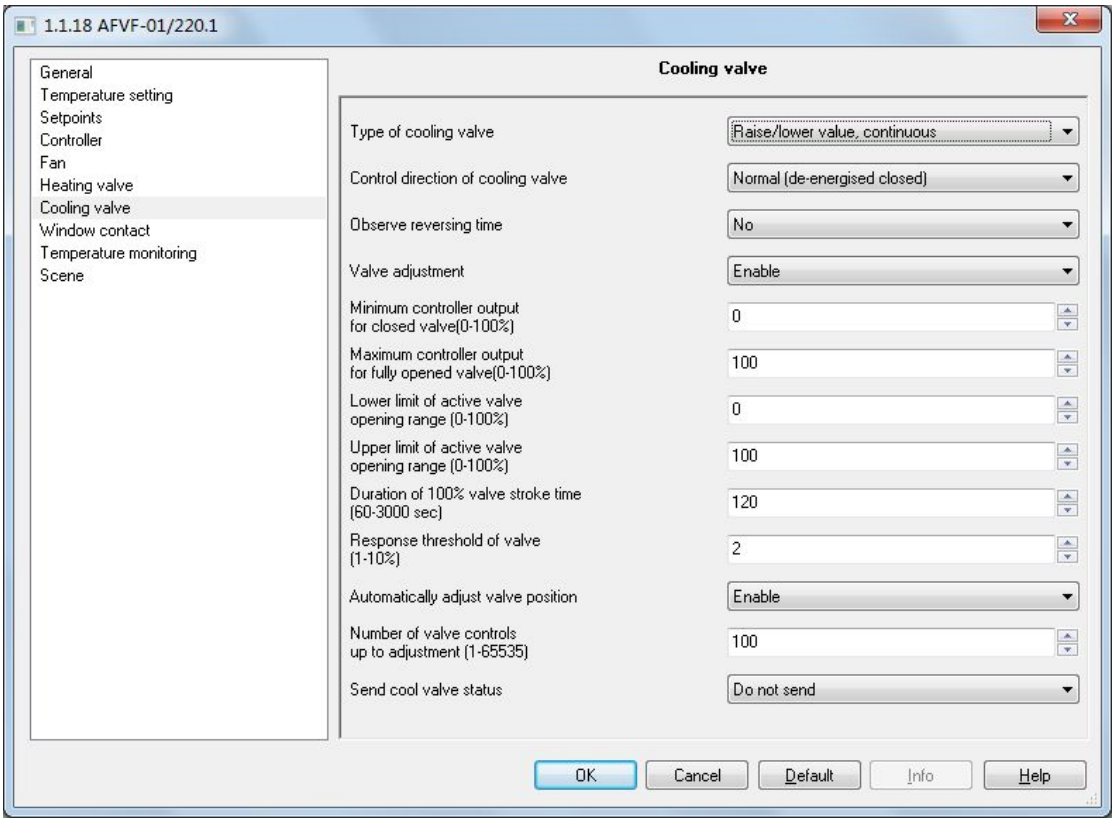


Fig. 4.7.2 parameter window “Cooling valve”

Parameter : Type of heating valve

Parameter: Type of cooling valve

Option Parameter:--Raise/lower valve, continuous

– Raise/lower valve, pulse width modulation

– Thermal valve

– BUS valve, continuous

– BUS valve, pulse width modulation

This parameter is to set the controller controls the type of valve. It can control the local valve also can control valves on the KNX bus. Valve has two types, one for the switch type, and the other is a continuous type.

Raise/lower valve, continuous” Represents the local movements of continuous control valve;

“Raise/lower valve, pulse width modulation”represent the rise and fall of local PWM control valve.

BUS valve, continuous”represnet bus continuous valve；

BUS valve, pulse width modulation”express the switching valve on the bus.

Parameter：Control direction of heating valve

Parameter：Control direction of cooling valve

Optional： – Normal (de-energised closed)

–Inverted (de-energised open)

This parameter is to set the direction of the valve switch.

Continuous valve "Normal (de-energised closed)" is positive; "Inverted (de-energised open)" to reverse.

Switch valves "Normal (de-energised closed)" indicates a normally closed switch; "Inverted (de-energised open)" indicates normally open switch.

Parameter：Observe reversing time

Option： -No…500ms…1.5s

This parameter is set to toggle continuous valve switch delay time. When the valve type is continuously adjustable, in order to prevent frequent switching valve switch, opening or closing the valve needs to be suspended for some time. This parameter is only in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, continuous" or "Raise / lower valve, pulse width modulation" is visible.

Parameter：Valve adjustment

Option： – Enable

– Disable

The parameter can be adjusted to make the characteristic curve of the valve

Parameter：Minimum controller output for closed valve

Parameter：Maximum controller output for fully opened valve

Parameter：Lower limit for active valve opening range

Parameter：Upper limit for active valve opening range

Option： [%] 0...100

This parameter is for setting the valve output characteristic curve.

“Minimum controller output for closed valve”show the scope of the control values of lower limit value

“Maximum controller output for fully opened valve”show the the scope of the controlled variable upper limit；

“Lower limit for active valve opening range” This value represents the lower limit value of the valve is limited；

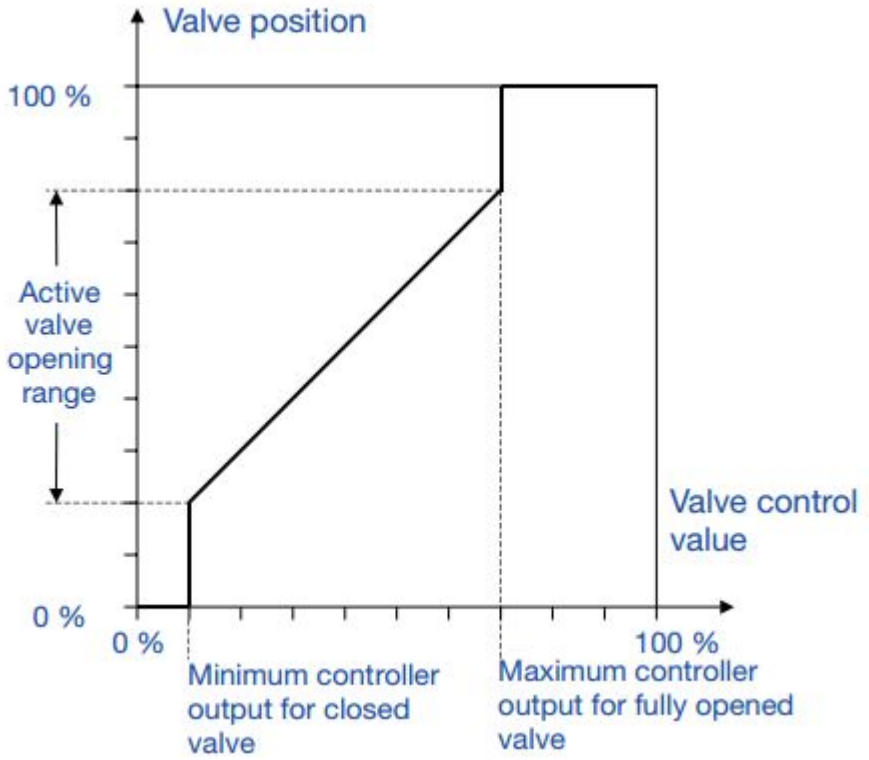
“Upper limit for active valve opening range” This value represents the upper limit value of the valve is limited.

For different valves, the limited is different：“Raise/lower valve, continuous” travel time is limited；

“ Raise/lower valve, pulse width modulation”、“Thermal valve” and“BUS valve, pulse width modulation”PWM

cycle is limited； “BUS valve, continuous” Restricted is made out of a heating or cooling control values. This parameter is only in the parameter entry "Valve adjustment" select “Enable” is visible.

To Raise/lower valve, continuous valve as an example, the output value of the diagram



Parameter：Duration of 100 % valve stroke time

Option： [sec.] 60...3,000

This parameter is set continuous valve travel time. Travel time refers to the valve from the closed to open to the maximum time value, this parameter only in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, continuous" or "Raise / lower valve, pulse width modulation "when visible.

Parameter: Response threshold of valve

Options: [%] 1 ... 10

The parameter values for the setting controls the amount of change. When the control value percentage change of the parameter, the controller will output once the valve control. Therefore, the larger value of this parameter to adjust the switching frequency of the smaller valve, on the contrary, the smaller the value, adjust the valve's switching frequency is greater. This parameter is only in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, continuous" or "BUS valve, continuous" when visible

Parameter：Automatically adjust valve position

Option： -Enable

-Disable

The parameter settings are automatically corrected for the continuous valve opening. This parameter is only in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, continuous" or "Raise / lower valve, pulse width modulation" when visible.

Parameter： Number of valve controls up to adjustment

Option：1...65535

This parameter is set automatically correct valve opening count. In continuous valve opening and closing process, the valve stop time period of one frequency each, when the count equals the set count value, the valve will be fully closed, the valve closing time is: travel time 0.5 * (0.5 * journey time: maximum of 1min). This parameter is only in the parameter entry "Automatically adjust valve position" of the option to "Enable" when open see.

Parameter：Cyclic time for heating valve

Parameter：Cyclic time for cooling valve

Option： for heating valve [min.] 1...255

Option： for cooling valve [min.] 1...255

This parameter is the time period of the PWM control. The larger the value of this parameter, the valve switching frequency is smaller, on the contrary, the smaller the value, the more frequent valve switch. This parameter is only in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, pulse width modulation", "Thermal valve" or "BUS valve, pulse width modulation" can be seen.

Parameter: Send heat valve status

Parameter: Send cool valve status

Options:-Do not send

-Send on change

-Send cyclically

This parameter is set to send the local way valve status report. It is only visible in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, pulse width modulation", "Thermal valve" or "BUS valve, pulse width modulation".

"Do not send" on the bus to not to send local valve status report;

"Send on change" as a local change in a certain amount of valve status report to the bus state;

"Send cyclically" is sent once per cycle intervals local valve status.

Parameter: Differential value for sending

Parameter: Differential value for sending

Options: [%] 1 ... 10

This parameter sets the local valve status change. When the valve is continuously changing the local value of the parameter, the controller sends a valve to the bus state values. This parameter is only in the parameter entry "Send heat valve status" or "Send cool valve status" select "Send on change" when open see.

Parameter: period for cyclical sending

Options: [min.] - 2 ... 255

This parameter is set to send the local valve state the time period. This parameter is only visible in the parameter entry "Send heat valve status" or "Send cool valve status" select "Send cyclically".

Parameter: Send of 1 byte control value

Options: Send on change

Send cyclically

This parameter is set to control external continuous valve control value is sent. This parameter is only visible in the parameter entry "Type of heating valve" or "Type of cooling valve" select "Raise / lower valve, continuous", "Raise / lower valve, pulse width modulation" or "Raise / lower valve, pulse width modulation ".

Parameter: Differential value for sending

Options: [%] 1 ... 10

This parameter is set when the external continuous valve control options in the percentage change in value is sent when a valve control values. This parameter is only visible in the parameter entry "Send of 1 byte control value" select "Send on change".

Parameter: Period for cyclical sending of control value

Options: [min.] - 2 ... 255

This parameter is set to send out an external continuous controller valve control value cycle. This parameter is only visible in the parameter entry "Send of 1 byte control value" select "Send cyclically".

4.8 Parameter window "Window contact"

"Window contact" parameter window is shown in Fig. 4.8. The page is mainly used to set the window switch status parameters. The following detailed description of each parameter settings.

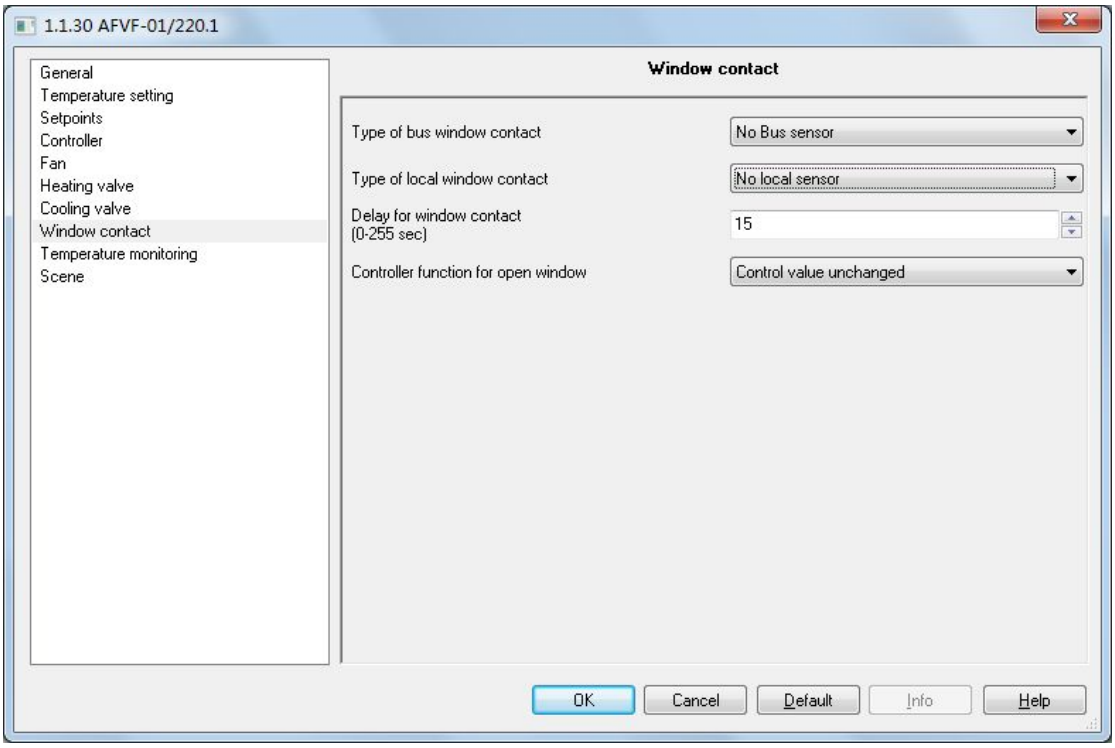


Fig. 4.8 parameter window “window contact”

Parameter: Type of bus window contact

Options: No BUS sensor

Normal

Inverted

The parameter settings from the windows on the bus type of contact.

"No Bus sensor" means that no bus window sensor;

"Normal" indicates the input mode to forward the bus window, the object 13 receives the bus up the "0" is that the windows are opened, "1" is turned off;

"Inverted" indicates that the bus windows input mode is reverse, ie up to the bus object 13 receives "1" is that the windows are open, "0" is off.

When the controller detects the windows open, the controller will output parameter entry "Controller function for open window" in the parameters set.

Parameter: Type of local window contact

Options: No local sensor

Contact open: window open

Contact closed: window open

Input: normal

Input: inverted

This parameter is set up a local window switch contacts or binary input.

"No local sensor" means no window switch contact sensor (Binary input is invalid);

"Contact open window open" means that the windows contacts open , the communication object 30 sends "0" , the contacts close a communication object sends "1";

"Contact closed window open" means that the windows closed contacts, the communication object 30 sends "0" , the contacts open communication object sends "1 ."

"Contact open window open" and "Contact closed window open" In both cases, the controller detects the windows open, the controller will output parameter entry "Controller function for open window" in the set parameters;

While "Input: normal" input voltage is detected, the communication object 30 sends "1", opposite to send "0";

"Input: inverted" voltage input is detected , the communication object 30 sends "0" , opposite to send "1";

"Input: normal" and "Input: inverted " detects only the binary input status does not affect the fan coil controller's normal output.

Parameter: Delay for window contact

Options: [s] 0 ... 255

This parameter is the window detection delay time. When the window is opened temporarily , not always open, can use this parameter to distinguish the time , that is, when the window opening time value set in the parameter within the window that has not been opened , if the time exceeds the setting value , then that window has been opened .

Parameter: Controller function for open window

Options: Normal (active)

Control value = 0 (all off)

Control value unchanged

The parameter setting window is opened for the operation of the controller .

"Normal" fan coil controller output at normal control value;

"Control value = 0 (all off)" fan coil controller output control value is 0, then the fan coil valves and wind are closed;

"Control value unchanged" for the fan coil controller maintains a constant output current value.

4.9 Parameter window "Temperature monitoring"

"Temperature monitoring" parameter setting window is shown in Fig. 4.9. It is mainly used to set the temperature of alarm. Hereunder is the detail information of each parameter.

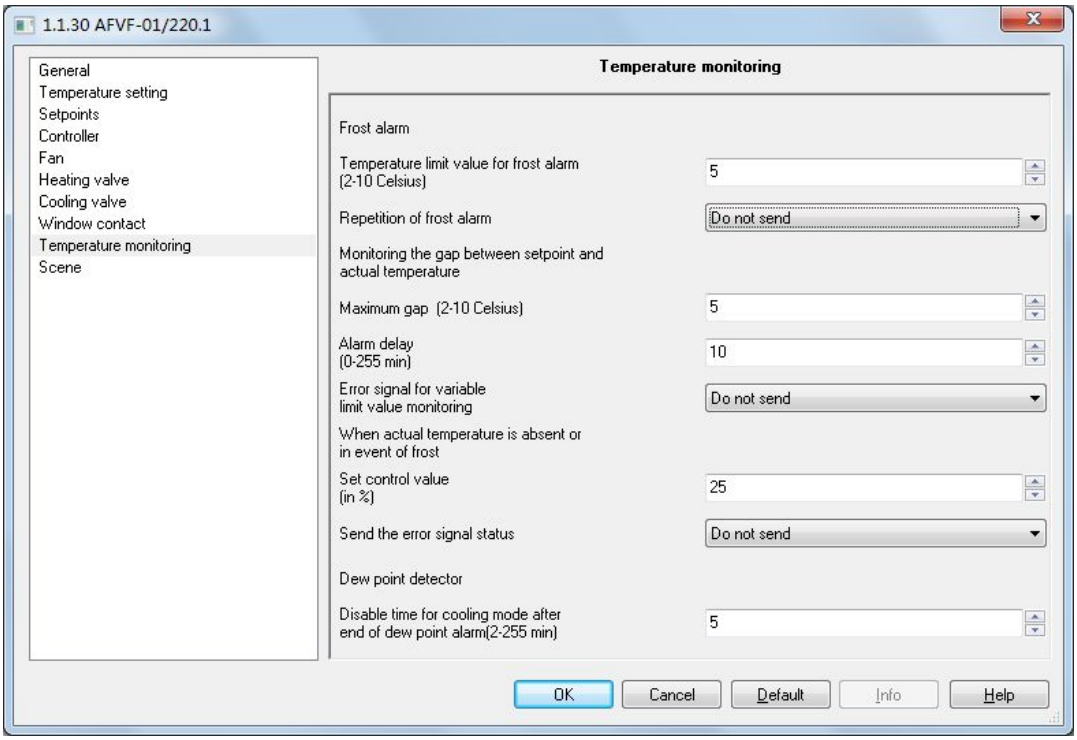


Fig. 4.9 parameter window "Temperature monitoring"

Frost alarm

Parameter：Temperature limit value for frost alarm

Options： [°C] 2...10

Setting the temperature of frost alarm. When the room temperature is lower than this setting one, the controler will send the signal of frost alarm to the bus.

Parameter：Repetition of frost alarm

Options： Do not send

Send on change

Send cyclically

Setting the mode of sending out the frost alarm.

“Do not send” means don’t send the frost alarm to the bus;

“Send on chang” means sending the signal to the bus when the forst alarm is changed;

“Send cyclically” means sending the signal periodically, and also the time when the frost alarm is changed, after that, the cycle time is recounted.

Parameter：Period for cyclical sending of frost alarm

Options： [min.] 2...255

Setting the cycle of sending the signal of frost alarm. This parameter is available only when you select “Send cyclically” in parameter “Repetition of frost alarm”.

Parameter：Maximum gap

Options： [°C] 2...10

Setting the alarm value between actual temperature and setting temperature. When the gap between the actual temperature and setting temperature is lager than the setting value, controler will send signal of alarm to the bus.

Parameter：Alarm delay

Options： [min.] 0...255

Setting the delay time of sending out the gap alarm. When the gap between actual temperature and setting temperature is lager than the setting parameter “Maximum gap”, the controler will not send the alram to the bus immediately, instead it will detect if the gap keeps larger than the value during the delay time, if yes, the controler will send the alarm to the bus after the delay time, if not, it won’t send the alarm.

Parameter：Error signal for variable limit value monitoring

Options： Do not send

Send on change

Send cyclicall

Setting the mode of sending out the gap alarm. When the gap between actual temperature and setting temperature is lager than the setting value, set the mode of sending out the gap alarm.

"Do not send" means don't send the alarm to the bus;

"Send on chang" means sending the signal to the bus when the alarm is changed;

"Send cyclically" means sending the signal periodically, and also the time when the alarm is changed, after that, the cycle time is recounted.

Parameter：Period of sending error signal

Options： [min.] 1...255

Setting the cycle of sending the signal of gap alarm. This parameter is available only when you select "Send cyclically" in parameter "Error signal for variable limit value monitoring".

when actual temperature is absent or in event of frost

Parameter：Set control value

Options： [%] 0...100

Setting the output value of the controler when the setting temperature is error. When the actual temperature is absent or in event of frost, controler will send out the value according to the percentage of the setting parameter.

Parameter：Send the error signal status

Options： Do not send

Send on change

Send cyclically

Setting the mode of sending out the error sets. Error sets including: indoor temperature alarm, outdoor temperature alarm, frost alarm, gap alarm, dew point alarm, KNX window opened alarm, and local window opened alarm. You could send by 1 bit or 1 byte.

"Do not send" means don't send the error sets to the bus;

"Send on chang" means sending the signal to the bus when the error stes are changed;

"Send cyclically" means sending the signal periodically, and also the time when the error stes are changed, after that, the cycle time is recounted.

Parameter：Group Errors report type

Options： 1 Bit

1Byte

Setting the type of sending out the error sets.

"1 Bit" means when whatever one alarm of the error sets is happened, controller will send the signal of alarm in 1 bit.

"1 Byte" means each alarm of the error sets, each number represents:

Bit no: 0 : actual temperature alarm

1: external temperature alarm

2: frost alarm

3: gap alarm

4-7:no use

This parameter is available only when you select "Send on change "or "Send cyclically" in parameter "Send the error signal status".

Parameter：Period of sending error information

Options： [min.] 1...255

Setting the cycle of sending the signal of error sets. This parameter is available only when you select "Send cyclically" in parameter "Send the error signal status".

Dew point detector

Parameter：Disable time for cooling mode after end of dew point alarm

Options： [min.] 1...255

Setting the disable time for cooling mode after end of dew point alarm. When fancoil controller receives dew point alarm from bus, it will shut down the valve and fan, and recover when the alaram is clear and the disable time is over.

4.10 Parameter window "Scene"

Fig. 4.10 is the parameter setting window of "Scene". It is used to set the scene parameter, such as the mode of room, heating or cooling, wind speed, etc. When you use scene, the controller will default it is manual control mode. Hereunder is the detail of each parameter.

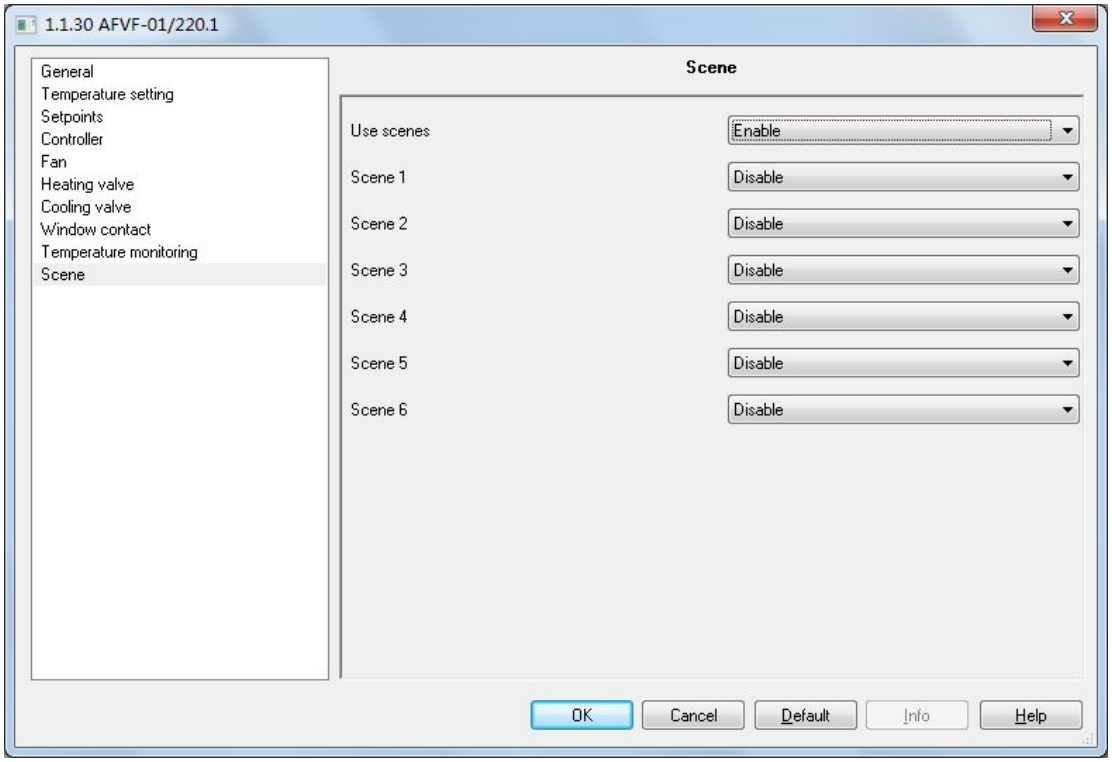


Fig. 4.10 parameter s window “Scene”

Parameter：Use scenes

Options：Enable

Disable

Setting the scene. There are 6 scenes can be choosed.

Parameter：Scene 1-6

Options：Enable

Disable

There are 6 scenes can be choosed, but each time, you can select only 1 scene.

Parameter：Scene number

Options：1…64

Setting the scene numbers. No.1-64 corresponding to telegram 0-63

Parameter：Mode

Options： Standby mode

Comfort mode

Night setback

Frost protection

Parameter：Fan

Options： No change

High

Medium

Low

Off

Setting the wind speed of each scene.

“No change” means keep the same speed.

“High”, “Medium”, “Low” means the different wind speed.

“Off” means to shut down the fan.

Parameter：Heating or Cooling

Options： No change

Auto

Heating

Cooling

This parameter is to set the controller for heating or cooling.

"No change" means that at the current value of the output of heating or cooling;

"Auto" means that the heating or cooling by the controller;

"Heating" means to set the controller for the heating mode;

"Cooling" means to set the controller for the cooling mode.

This parameter is only can be seen when be selected with the “Heating and cooling"in the "Controller mode in Heating / Cooling" function.

4.11 External control parameter setting interface

External control parameter setting interface is mainly used to set the external controller to the local control valve and fan parameters representing the device into the controlled mode. The following detailed description in this case the description of the parameter settings for each page.

External Control "General" parameter setting interface as shown in Figure 4.11.1, following detailed description of each of the parameter settings.

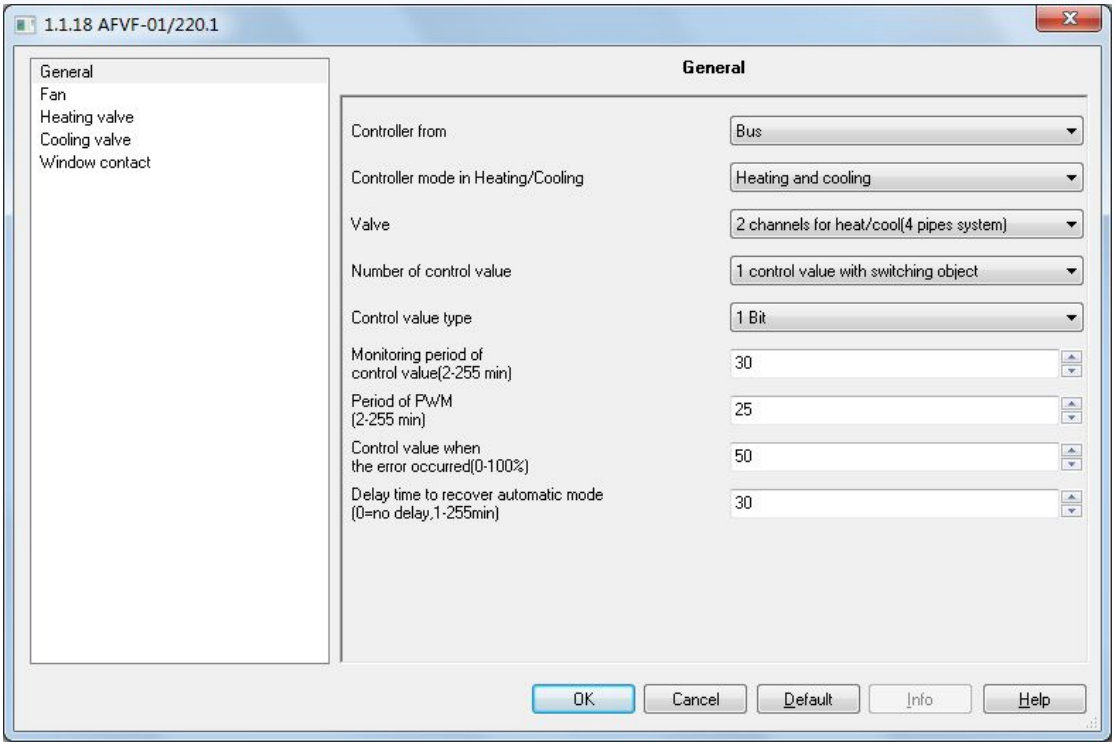


Fig. 4.11.1 External Control "General" parameter setting interface

Parameter: Controller from

Options: Local

Bus

This parameter is to set the fan coil controller.

"Local" means that the controller output from the fan coil control.

"Bus" indicates fan coil by an external controller input control, mainly through communication objects of the fan and valve control.

Parameter: Controller mode in Heating / Cooling

Options: Heating

Cooling

Heating and cooling

This parameter is the setting mode of the controller, can be individually heating or cooling, heating and cooling can also exist. Fan coil controller automatically according to the actual temperature output corresponding control values.

Parameter: Valves

Options: 1 channels for heat / cool (2 pipes system)

2 Channels for heat / cool (4 pipes system)

This parameter is set up out of the water pipe fan coil type.

"1 channels for heat / cool (2 pipes system)" for the heating and cooling shared an inlet and outlet pipe, the hot and cold water are in and out from the pipes. It only need a valve connected with output of the fan coil heating valve controller;

"2 channels for heat / cool (4 pipes system)" for the heating and cooling, respectively, have their own access to water, you need two separate control valves hot and cold water in and out.

Parameter: Number of control value

Options: 1 control value with switching object

2 Control values

This parameter is used to set the external input control valve of communication object number, it is only visible in the "Parameter: Controller mode in Heating / Cooling" with option "Heating and cooling".

"1 control value with switching object" indicates that only a communication object on the heating valve and cooling valve control (target 21), switching of heating and cooling through a communication object (object 7) to achieve;

"2 control values" means a two communication objects to separately control the heating valve and cooling valve.

Parameter: Control value type

Options: 1 Bit

1 Byte

The parameter values for the selected data type of external control. Local heating and cooling valve switch based on this control value for output control.

"1Bit" represents an external input control value is 1bit;

"1Byte" represents an external input control value id 1 Byte.

Parameter: Monitoring period of control value

Options: [min.] 2 ... 255

The parameter values for the monitoring of external control time period, if the control value has not been updated, but longer than the time set this option; it is considered an external controller error, the controller based on the output of user-set parameters.

Parameter: Control value when the error occurred

Options: 0 ... 100%

This parameter is when setting the external controller error of control value output percentage. External controller error, if the parameter entry "Control value type" option to "1 Bit", then the PWM output heating or cooling of the time as a parameter entry "Period of PWM" multiplied by the time set in this parameter entry percentage; if the parameter entry "Control value type" option to "1 Byte", then the continuous control of the percentage of the value set by the user output.

Parameter: Period of PWM

Options: [min.] 2 ... 255

This parameter is the external controller error of the PWM cycle. When the control value of the external controller is "1Bit" and the control value error is detected, the controller output will follow the PWM cycle. This parameter is only can be seen when in the parameter "Control value type" when select "1 Bit" value.

Parameter: Delay time to recover automatic mode

Options: [min.] 0 ... 255

This parameter is set to switch back from other modes automatic mode delay time.

Option is "0", the controller does not automatically switch back to automatic mode until the user through the KNX communication objects or local button to switch back to automatic mode;

For "1-255" when the manual mode or test mode will delay after the switch back to automatic mode.

Fan, Heating valve, Cooling valve and Window contact can refer to the case when the control is internal.

5. Description of the communication objects

Communication objects are devices on the bus to communicate with other media devices， That is only the communication objects can communicate on the bus. The following details description of the function of each communication object.

Note: "C" in "Flag" column in the below table means that the object has a normal link to the bus; "W" means the object value can be modified via the bus; "R" means the value of the object can be read via the bus; "T" means that a telegram is transmitted when the object value has been modified; "U" means that value response telegrams are interpreted as a write command, the value of the object is updated.

No.	Function	Communication Object name	Data Type	Property	DPT
0	**Actual temperature**	**Output, actual temperature** **Input, actual temperature**	**2byte**	**C,R,T** **C,R,W,U**	**[9.1] DPT_Value_Temp** **[9.1] DPT_Value_Temp**
1	**Actual temperature**	**Output, actual temperature error**	**1bit**	**C,R,T**	**[9.1] DPT_Value_Temp**
Objects 0: Interior actual temperature can be read from the local PT1000 sensors interface t, you can also get from the bus. Object 1: indoor temperature error flag, monitoring cycle by setting the indoor temperature to be monitored. If the actual temperature error occurs, then the object will be sent to the bus signal "1" to alarm.					
2	**External temperature**	**Input, external temperature**	**2byte**	**C,R,W,U**	**[9.1] DPT_Value_Temp**
3	**External temperature**	**Output, external temperature error**	**1bit**	**C,R,T**	**[1.5] DPT_Alarm**
Object 2: the outdoor temperature, the refrigeration case mainly for adjusting the set room temperature, i.e. when the external temperature is greater than the set point temperature value of "Minimum external temperature for correcting the set point", the outdoor temperature change of 3 degrees, the temperature setting value change of 1 degree. Object 3: outdoor temperature error flag, if the "Monitoring period for external temperature" parameter is received within a set time interval to the external temperature value is not updated, then the object is sent on the bus signal "1" to Alarm.					
4	**Setpoint**	**Input, base setpoint**	**2byte**	**C,R,W,U**	**[9.1] DPT_Value_Temp**
5	**Setpoint**	**Input, setpoint adjustment**	**2byte**	**C,W,U**	**[9.1] DPT_Value_Temp**
6	**Setpoint**	**Output, instantaneous setpoint**	**2byte**	**C,R,T**	**[9.1] DPT_Value_Temp**

Object 4: The benchmark set temperature. As the setting value for the reference value of the actual output. The value of the existing heating but also cooling the case with dead zone temperature is used to determine the current status of the refrigeration or heating.

Object 5: Basis set temperature correction. By writing to the object value, you can set the temperature to be modified.

Object 6: the actual output set temperature value. The value is sent on the bus to the current set temperature.

7	**2-pipe operation** **Heating/cooling**	**Output, heating** **Input, heating** **Input, heating/cooling**	**1bit**	**C,R,T** **C,R,W,U** **C,R,W,U**	**[1.1] DPT_Switch**
8	**2-pipe operation**	**Output, cooling** **Input, cooling**	**1bit**	**C,R,T** **C,R,W,U**	**[1.1] DPT_Switch**

Object 7: heating enabled.

Object 8: cooling enabled.

In this device as a master device, the two objects as two pipe fan coil open see, you can choose to receive or send parameters to enable the heating or cooling of the object.

In a controlled device, the object 7 is also used to denote a separate heating or cooling, "0", indicates cooling, "1" indicates heating.

9	**HVAC mode**	**Input, comfort mode** **Input, RTC mode**	**1bit** **1byte**	**C,W,U** **C,W,U**	**[1.1] DPT_Switch** **[20.102] DPT_HVACMode**
10	**HVAC mode**	**Input, night mode**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**
11	**HVAC mode**	**Input, Frost/heat protection mode**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**

Room Mode can be divided into three 1bit objects, (objects 9,10, 11) and one 1byte objects (object 9) to switch.

1bit object:

Object 9: Room Comfort mode.

Object 10: Room night mode.

Object 11: Room protected mode.

Among them, the corresponding object to write "1" indicates that the corresponding room mode enabled; write "0" to cancel the corresponding room mode. Note: 3 1bit object has priority: protected mode (Frost / heat protection mode)> Comfort mode (Comfort mode)> Night mode (Night mode)> Ready Mode (Standby mode),

when the object 9, the object 10 and object 11 received are zero, then the room is ready mode control mode.

1byte: Enter the number and pattern relationship is as follows:

Bit no: 0: Automatic

1: Comfort mode

2: Ready Mode

3: Room Mode

4: Protected Mode

5-255: Idle invalid

12	**Scene**	**Input, Scene number**	**1byte**	**C,W,U**	**[17.001] DPT_SceneNumber**

The object is a scene number. There are six scenes, according to the number of different scenes to recall different scenes. .

Through this communication object sends an 8bit command can be invoked or stored scenes. This communication object is enabled as long as the function is enabled for a scene. The following detailed description of the meaning of 8bit instruction.

Let a 8bit instruction (binary coded): XXNNNNNN

X: 0;

NNNNNN: scene number (0 ... 63).

Parameter setting options are 1 to 64, in fact, the corresponding object value is 0 to 63. If the parameters are set in Scene 1, the communication object receives the scene should be 0.

13	**Window contact**	**Input, window contact**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**

This object is detected on the bus window switch. When the parameter Type of BU window contact options are "Normal" when the object is to write "1" indicates the windows shut, "0" indicates the windows open; option "Inverted", to the object write "0" indicates that windows are closed, "1" indicates the windows open. If it detects an open window on the bus, the controller will follow the parameters Window contact in the "Controller function for open window" to set the output control values.

14	**Presence sensor**	**Input, presence detector**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**
Presence detection, and presence sensor is connected. Object receives a "1" indicates that someone in the room; when receives "0" means no one in the room. When someone is detected, regardless of the current room modes and why modes are forced to switch back to the Comfort mode; when the person is not detected, the room mode switch back to the previous state of the room modes.					
15	**Fan**	**Input, manual operation of fan**	**1byte**	**C,W,U**	**[5.1] DPT_Scaling**
Manually adjust the fan speed according to the parameters Fan set percentage of each file to adjust the fan speed. For example, when "Threshold value for switching on of fan speed 1" in the value of 10, the object 15 to be greater than 255 * 10% wind a trigger. Object 15 written value, the controller into manual operation mode.					
16	**Fan**	**Input, toggling to automatic mode**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**
This object is used to switch the controller back to automatic control mode. If the current controller's control mode for testing or manual mode, the object through to write "1" to switch back to automatic control mode control mode.					
17	**Fan**	**Output, fancoil automatic or not**	**1bit**	**C,R,T**	**[1.1] DPT_Switch**
Fan control mode status, 1for the automatic control mode, 0 to manual / test mode.					
18	**Fan**	**Output, fan speed status**	**1byte**	**C,R,T**	**[5.1] DPT_Scaling**
		Output, On/Off	**1bit**	**C, T**	**[1.1] DPT_Switch**
		Output, speed 1	**1bit**	**C, T**	**[1.1] DPT_Switch**
19	**Fan**	**Output, speed 2**	**1bit**	**C,T**	**[1.1] DPT_Switch**
		Output, speed:0-100%	**1byte**	**C,T**	**[5.1] DPT_Scaling**
		Input, automatic operation of fan	**1byte**	**C,W,U**	**[5.1] DPT_Scaling**
20	**Fan**	**Output, speed 3**	**1bit**	**C,T**	**[1.1] DPT_Switch**

For the controlled device:

Automatic control object 19 (**Input, automatic operation of fan**) is used to enter the fan control values. Object 18 and object 20 are not used.

As the master device:

When the parameter Fan in "Type of fan" of Local (max.3 speeds), with the object 18 (**Output, fan speed status**) to represent the fan speed state of the local valve. 0 (0%) said that fan off, 85 (33.3%) said that the first gear, 170 (66.7%) said that the second gear, 255 (100%) represents the third gear.

When the parameter Fan in "Type of fan" of KNX: on / off, the object 18 (**Output, On/Off**) is used to switch

fan. "1" means ON; "0" indicates OFF.

When the parameter Fan in "Type of fan" to KNX: 3 speeds, object 18, object 19, object 20 representing wind speed 1, wind speed 2 and speed 3. "1" means ON; "0" indicates OFF.

When the parameter Fan in "Type of fan" to KNX: 0...100%, the object 19（**Output, speed:0-100%**）is used to control fan speed. Object value 33% enable speed 1, value 66% enable speed 2, value 100% enable speed 3.

21	**Heating valve**	**Output, heating control value**	**1byte/1bit**	**C, T**	**[1.1] DPT_Switch/**
		Input, heating control value	**1byte/1bit**	**C,W,U**	**[5.1] DPT_Scaling**
	valve	**Input, control value**	**1byte/1bit**	**C,W,U**	

When this device as the master device, the object represents the heating valve control output value, i.e. parameter Heating valve in the "Type of heating valve" for the "Bus valve, continuous" when the output is 1byte heating valve control value; for the "Bus valve, pulse width modulation " when the output is 1bit heating valve control values.

When the device as a controlled device, the object （**Input, heating control value**）as a heating valve control value input. The heating and cooling valves can use in common one object（**Input, control value**） to receive control value from bus, depend on parameter setting, then the heating and cooling can be switch-over via the object **"Input, heating/cooling".** Via an external controller the valves of this device can be controlled, the control value can be a 1bit or 1byte value, depend on parameter setting.

22	**Cooling valve**	**Output, cooling control value**	**1bit/1byte**	**C, T**	**[1.1] DPT_Switch/**
		Input cooling control value	**1bit/1byte**	**C,W,U**	**[5.1] DPT_Scaling**

When the device as a master device, the object represents the output cooling valve control value, ie parameter Cooling valve in the "Type of cooling valve" for the "Bus valve, continuous" when the output is 1byte refrigeration valve control value; "Bus valve, pulse width modulation ", the output is 1bit cooling valve control values.

When the device as a controlled device, the cooling valve control value object as input. Via an external controller can carry the equipment cooling valve control that value can be 1bit also be 1byte.

23	**Controller**	**Output, PI control value**	**2byte**	**C,R,T,U**	**[7.1] DPT_Value_2_Ucount**

The output control value based on the set value and the actual temperature difference between the size of the pid control output values. Maximum output control value is 10000, the actual control value by the output control value accounted for the largest percentage of the ratio can draw fans and the state of the valve position

24	**Dew point detector**	**Input, dew point alarm**	**1bit**	**C,W,U**	**[1.5] DPT_Alarm**
This object is received for the refrigeration case dew point alarm signal. If the received value of "1", the object 23 outputs the control value is "0"; fans and the valve closed; receives the value "0", the cooling function is restored.					
25	**Temperature monitoring**	**Output, frost alarm**	**1bit**	**C,R,T**	**[1.5] DPT_Alarm**
Frost alarm, when the temperature falls below the value of the setting parameter point of “Temperature limit value for frost alarm” in the “Temperature monitoring ", the object 25 sends "1", otherwise "0."					
26	**Temperature monitoring**	**Output, temperature limit alarm**	**1bit**	**C,R,T**	**[1.5] DPT_Alarm**
Temperature deviation detection, when the set temperature and the room temperature is greater than the difference between the parameter Temperature monitoring of the "Maximum value" the value, the object is sent to "1", or "0".					
27	**Error signal**	**Output, error information**	**1bit/1byte**	**C,R,T**	**[1.5] DPT_Alarm/ DPT_ErrorGroupStatus**
Error group reports can be divided into 1bit and 1byte report. 1bit error when actual temperature, outdoor temperature error, frost alarms and temperature deviation alarm any one is wrong, it sends "1". 1byte error status report is as follows, Bit no: 0: Actual temperature error "0" is normal, "1" for the error 1: External temperature error "0" is normal, "1" for the error 2: Frost alarm "0" is normal, "1" for the error 3: Temperature monitoring (maximum gap) "0" is normal, "1" for the error 4-7: Free (contains no information)					
28	**RHCC status**	**Output, RHCC status**	**2byte**	**C,R,T**	**[22.101] DPT_StatusRHCC**
RHCC Status Report Bit no: 0: actual temperature error, "1" for the alarm, "0" is normal. 8: The heating or cooling, "0" cooling "1" heat 12: Dew point alarm, "1" for the alarm, "0" is normal. 13: frost alarm, "1" for the alarm, "0" is normal. 14: frost protection and heat protection, "1" for alarm, "0" is normal.					

		Other: no use			
29	**HVAC status**	**Output, HVAC status**	**1byte**	**C,R,T**	**DPT_HVACStatus**
HVAC Status Report Bit no: 0: Comfort mode, "1" enabled, "0" means not enabled. 1: Standby mode, "1" enabled, "0" means not enabled. 2: night mode, "1" enabled, "0" means not enabled. 3: Frost / Heat protection mode, "1" enabled, “0" means not enabled. 4: Dew Point alarm, "1" indicates an error, "0" means no mistakes. 5: Heating / Cooling, "1" heating, "0" indicates cooling. 6: Controller status (actual temperature), "1" indicates an error, "0" means no error. 7: Frost alarm, "1" indicates an error, "0" means no mistakes.					
30	**Window contact**	**Output, Window contact**	**1bit**	**C,R,T,U**	**[1.9] DPT_OpenClose**
This object represents the local window contact switch or binary input status. Option “Contact open: window open”, Telegram value: ‘0’ contact open ‘1’ contact close Option “Contact closed: window open”, Telegram value: ‘0’ contact close ‘1’ contact open Option “Input: normal”, Telegram value: ‘0’ no voltage input ‘1’ 9-265V input Option “Input: inverted”, Telegram value: ‘0’ 9-265V input ‘1’ no voltage input					
31	**Switch input**	**Input, Switch 1**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**
32	**Switch input**	**Input, Switch 2**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**
33	**Switch input**	**Input, Switch 3**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**

when local outputs don't be used by the fan, these output can be controlled through the following communication objects:

Object 31: Fan's low position "LO" switch output.

Object 32: Fan of the stall "MI" switch output.

Object 33: Fan's upscale place "HI" switch output.

Among them, the "1" for the relay contacts are closed, and "0" for the relay contact opens

34	**Valve status** **Switch input**	**Output, heat valve status** **Input, heat valve switch 2**	**1bit/1byte** **1bit**	**C,R,T** **C,W,U**	**[1.1] DPT_Switch /** **[5.1] DPT_Scaling**

1. as reported local heating valve switching state. The state of data type can be 1bit and 1byte:

1bit for the switching valve, only two states: ON and OFF. "1" means ON, "0" indicates OFF.

1byte is for continuously adjustable valve which with the states of opening and closing and stop. 1byte used to indicate the size of the valve opening.

2. as the relay switch of the external input to control the heating valve "2". When the local access valve control valve relay is not available, this object can control the relay switch.

35	**Switch input**	**Input, heat valve switch 1**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**

As the relay switch of the external input to control the heating valve "1". When the local access valve control valve relay is not available ,when this object control relay switch

36	**Valve status** **Switch input**	**Output, cool valve status** **Input, cool valve switch 2**	**1bit/1byte** **1bit**	**C,R,T** **C,W,U**	**[1.1] DPT_Switch /** **[5.1] DPT_Scaling**

1. as reported local heating valve switching state. The state of data type can be 1bit and 1byte:

1bit for the switching valve, only two states: ON and OFF. "1" means ON, "0" indicates OFF.

1byte is for continuously adjustable valve which with the states of opening and closing and stop. 1byte used to indicate the size of the valve opening.

2. as the relay switch of the external input to control the heating valve "2". When the local access valve control valve relay is not available, this object can control the relay switch.

37	**Switch input**	**Input, cool valve switch 1**	**1bit**	**C,W,U**	**[1.1] DPT_Switch**

As the switching relays of the external input control cooling valve "1". When the local access valve control valve relay is not available ,this object can be controlled by the relay switch.