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KNX Fan Coil Actuator

Product Manual



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1. Content of The Document

This document contains Interra ITR507-4290 coded KNX Fan Coil Actuator electronic and all essential feature information for programming the products. In each subtitle is explained the characteristics of the device. Modifications of the product and special change requests are only allowed in coordination with product management.

This manual provides detailed technical information concerning ITR507-4290 coded KNX Fan Coil Actuator. All the models have the same software functionality so, the features described in this document apply to all versions.

This user manual is intended for use by KNX installers and describes the functions and parameters of the ITR507-4290 coded KNX Fan Coil Actuator devices and how it is possible to change the settings and configurations using the ETS software tool. This document also describes the installation, programming, commissioning and use of the devices with detailed information.

2. Product Description

The Fan Coil Actuator with 0-10V is mainly used for the fan and valve control, can be installed in central air conditioning control system. The motor supports 230V AC drive and 24V AC with 0-10V drive interface. The device can be also used to control the lamp. Moreover, it supports manual operation which is on the front of the device to facilitate engineering commission.

The Fan Coil Actuator with 0-10V is a modular installation device for fast installation in the distribution board on 35 mm mounting rails to DIN EN 60 715. The electrical connection is implemented by using screw terminals. The connection to the KNX bus is implemented using the supplied bus connection terminal, and no need an extra voltage supply.

2.1. Technical Information

The following table shows the technical information of the ITR507-4290 KNX Fan Coil Actuator.

Product Code	ITR507-4290
Power Supply	21-30 V DC, KNX Bus Voltage
Current Consumption	< 15 mA (Standby) < 24 mA (Normal)
Power Consumption	450 mW
Output Voltage	1-10 V DC (passive), max. 1.5 mA per output
Output Switch Current	Max. 16 A / 30 V DC 10 A / 105 µF @ 250 V AC
Cable Distance	Max. 2 M
Cable Cross-Section	0.5-2.5 mm ²
Output Voltage	1-10 V DC (passive)
Output Switch Current	Max. 1.5 mA per output
Temp Measurement	-45°C ... +80°C, ±1°C (PT100 Temp Sensor Measuring scope of Temp.)
Push Buttons	1 x Man./Auto Operation Button 1 x Programming Button 4 x Operate Buttons 1 x Programming LED
LED Indicators	1 x Man./Auto Operation LED 3 x Operate LEDs 5 x Switch Output Status LEDs
Type of Protection	IP 20
Temperature Range	Operation (-5°C...45°C) Storage (-25°C...55°C) Transport (-25°C ... 70°C)
Maximum Air Humidity	< 93 RH
Colour	Light Grey
Mounting Type	On 35 mm DIN-Rail
Dimensions	72 x 90 x 64 mm (H x W x D)
Certification	KNX Certified
Configuration	Configuration with ETS

2.2. Connection Features

The figure below shows the KNX Fan Coil Actuator. All of the ITR507-4290 models have the same connection layout.

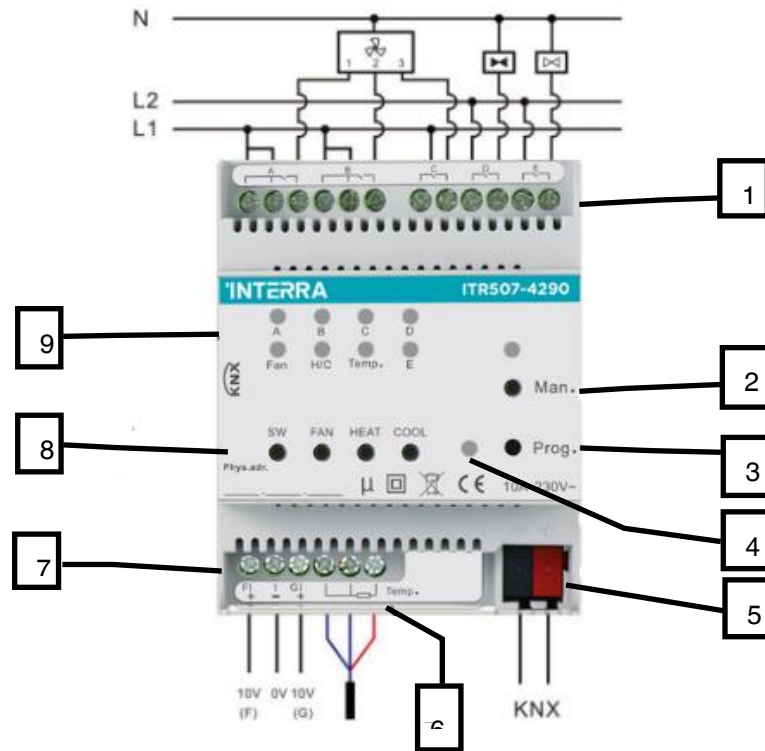
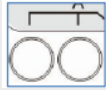


Fig. 1: Connection Features of KNX Fan Coil Actuator

Letter	Feature	Description
1	5 fold relay outputs	<p>Via the parameters can be set as fan speeds (A/B/C), valves (“D” for Heating, “E” for Cooling) or general switch outputs.</p>  <p>Note: the silk screen mark the two terminals are internally connected.</p>
2	Man./Auto. operation switch button	Switch to Man. operation via long press 1s, and the LED is on in the front of button. SS
3	Programming button	Assign physical address.
4	Programming LED	Red LED for assigning the physical address, Green LED for displaying application layer running normally.
5	KNX Connector	
6	Temperature sensor connector	Three-wires PT1000 temperature sensor.
7	Two channel 0-10V outputs	Via the parameters can be set as the fan or valve outputs.
8	Operate buttons	<p>From left to right: Switch control, Fan speed, Heating, Cooling.</p> <p>SW: Switch output button, via long operation to select the output channels, via short operation switch on/off the current selected channel. The output LED flashing display the selected channel, fast flashing is that relay contact is open, slow flashing is that the relay contact is closed.</p> <p>FAN: Via long operation to switch off the fan, via short operation to switchover the fan speeds.</p> <p>HEAT: Switch on/off fully the heat valve.</p> <p>COOL: Switch on/off fully the cool valve.</p>
9	LEDs display	<p>A,B,C,D, E display switch output status</p> <p>Fan LED status Red: Fan speed 1 Green: Fan speed 2 Blue: Fan speed 3</p> <p>H/C LED status Red: Heating, Blue: Cooling;</p> <p>Temperature LED status Temp. On: Local temperature error.</p>

2.3. Dimensions

All values given in the device dimensions are millimetres.

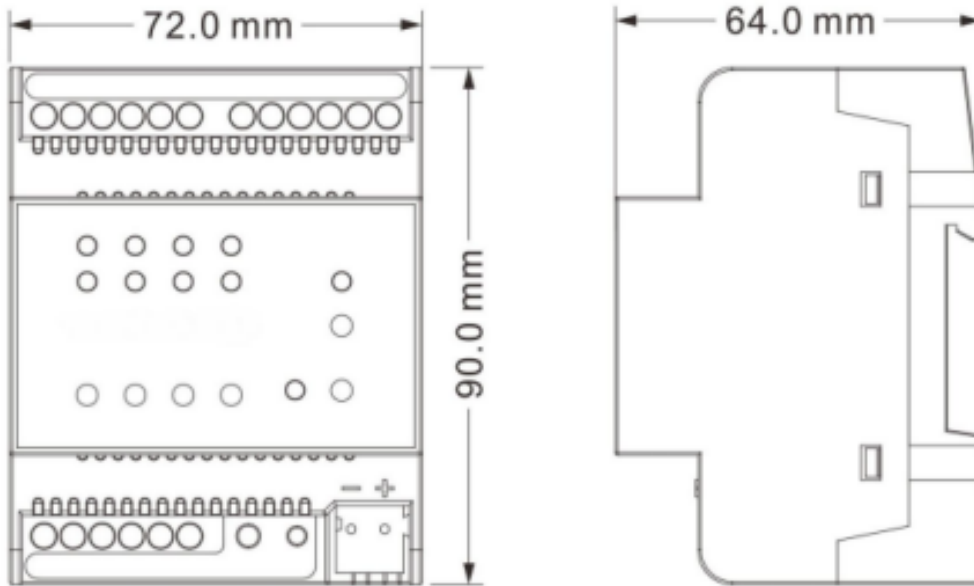


Fig. 2: Dimensions of KNX Fan Coil Actuator

2.4. Functionality

The complete configuration of the device is performed via ETS5 or higher. Depending on ETS configuration and settings, the product features will be different. Available functions are:

The functions of the Fan Coil Actuator with 0-10V is summarized as follows:

Fan control:

- Support the fan with 1-2-3 level fan speed
- **Forced operation:** the fan speed is only allowed to run in set fan speed range, and the force operation has the highest priority.
- **Auto. Operation:** the desired speed is run automatically according the control value that is received from the sensor device, and the auto. Operation can be set four limits and the minimum dwell period of fan speed
- **Direct operation:** control the fan speeds via a manual operation, as via operating a panel
- The fan with multi-level speeds can set its starting characteristic
- The fan with single-level speed can set on/off delay or on/off minimum time
- Status response, as the current operation, fan on/off status, speed status
- Power recovery function, the fan speed can be defined after reset

Coil control:

- Ordinary on/off valve control and PWM continuous valve control supporting two/four tube control
- Built-in PI algorithm to support local / bus control valves
- Disable/enable heating or refrigerating valves
- Valve switch status feedback
- Manual or automatic cleaning of the valve to send cleaning status
- Provides 8 scene functions for joint control of fan and coil status, call or store via 1 byte object
- Local control supports standby, comfort, night and protection modes of operation and status feedback
- With temperature acquisition function, input external three-wire PT1000 temperature sensor
- Can collect local actual temperature

Switch output:

- Set the relay contact position after bus voltage recovery or bus failure
- **Time function:** on/off delay, flashing switch, staircase lighting control
- Provide 8 scenes, recall and storing via a 1 byte object
- **Logic operation:** AND, OR, XOR, gate function
- **Forced operation:** 1bit/2bit
- Operation hours counter
- Central control function

Load drive interface:

- The relays can be used as switch output when it is not used to control the fan speed or valve.
- 2 channels of 0-10V output can be used for fan or valve control
- The assignment of the physical address and the setting of the parameters can be done using the engineering tool software ETS (version ETS4 or higher) with the knxprod file.
- In order to ensure that all functions of this product are used correctly, it is necessary to check whether there is any problem with the wiring before use. At the same time, attention should be paid to the technical characteristics of the load device when setting the parameters, especially the fan coil. Some technical

characteristics are inherent to the device. If the settings are not appropriate, it may cause damage to the load device or may not operate properly.

Application program:

Model	Max. number of communication objects	Max. number of group addresses	Max. number of associations
ITR507-4290	91	160	160

3.1. General Page

When the ITR507-4290 KNX Fan Coil Actuator ETS configuration file is attached to the project from the ETS software, a configuration setting must be made primarily before loading. When entering the “GENERAL” in the parameter page, the configuration screen will appear as shown below. General settings for the devices are made in this window.

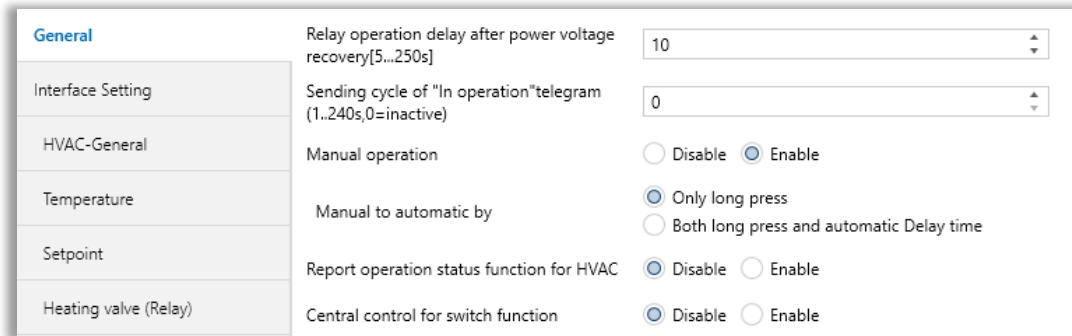


Fig. 3: General Configuration Page

3.1.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Relay operation delay after power voltage recovery	<p>This parameter defines the delay time of the relay operation after the device power voltage recovery.</p> <p>The actions are only executed or the telegrams are only sent when the delay is completed.</p> <p>This delay time does not include the initialization time of the device. After the power supply voltage is restored, the initialization time of the device start-up is about 3 s. It means the delay time starts after the device initialization.</p> <p>Note: During delay, the programming green LED is on, after the delay is completed, the green LED flashes, and the relay can be operated.</p>	5...10... 250
Sending cycle of “In Operation” telegram (0=inactive)	<p>This parameter sets the interval time this module cyclically sends telegram through the bus to indicate the normal operation of this module.</p> <p>When it is set as “0”, the object "in operation" will not send a telegram.</p> <p>If the setting is not "0", the object "in operation" will send a telegram with logic "1" to the bus according to the set time period.</p> <p>Options: 0.....240s,0=cyclic transmission prohibited</p> <p>In order to reduce the bus load as much as possible, the maximum time interval should be selected according to actual needs.</p> <p>Note: The time period starts from bus voltage recovery, regardless of the operation delay.</p>	0... 240
Manual Operation	<p>The parameter defines whether the manual operation enables.</p> <p>If the enable is selected, the Man. /Auto Button has been enabled. And the follow parameter is visible.</p>	<p>Disable</p> <p>Enable</p>
-> Manual to automatic by¹	<p>If set “only long press”, the manual/auto. Operation only can be switched via long press the Man. Button.</p> <p>If set “both long press and automatic delay time”, the manual/auto. Operation can be switched via long press the Manual button or the set time for the manual to automatic has elapsed.</p>	<p>Only long press</p> <p>Both long press and automatic Delay time</p>
Delay time (s)²	<p>The parameter appears when “Both long press and automatic delay time” is selected in the parameter “Manual to automatic by”. It is used for setting the time for an automatic reset from the “manual</p>	10...6000

	operation” to “automatic operation” state after the last push button operation.	
Report operation status function for HVAC	This parameter is to set the Report operation status function for HVAC. While “Enable”, the object “Status of operation” is visible. Define object as follows Table 1	Disable Enable
Central control for switch function	This parameter sets the central control for switch function. If enable, the object Central control for all of switch is visible, all channels with central control enabled can be switched together via the object.	Disable Enable

¹ This parameter is visible when the parameter “Manual Operation” is set to “Enable”.

² This parameter is visible when the parameter “Manual to automatic by” is set to “Only long press”.

DPT_StatusHVAC: B6N2							
7	6	5	4	3	2	1	0
0: Auto Op. 1: Manual Op.	0: Limit 4 disable 1: Limit 4 enable	0: Limit 3 disable 1: Limit 3 enable	0: Limit 2 disable 1: Limit 2 enable	0: Limit 1 disable 1: Limit 1 enable	0: Cooling 1: heating	00: comfort mode 01: standby mode 10: night mode 11: Frost/heat protection mode	

Table 1: DPT Status HVAC: B6N2

3.2. Interface Setting

Parameter window “Interface Setting” can be shown in Fig. 4, here mainly set the fan drive interface and valve drive interface for the Fan Coil Actuator. Fan or valve drive can be selected to the relay output or 0-10V output. Relays can be used as switch output when it is not used as the fan or valve drive interface. When the outputs A~E as switch outputs, parameters and objects which are assigned to each output are the same. The follow chapters are described in the form of function blocks.

General	Fan drive interface	Disable
Interface Setting	HVAC Control mode	Heating and Cooling
HVAC-General	HVAC System	<input type="radio"/> 2 pipes system <input checked="" type="radio"/> 4 pipes system
Temperature	Heating valve drive interface	Relay control(CH D)
Setpoint	Cooling valve drive interface	Relay control(CH E)

Fig. 4: Interface Setting Page

3.2.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Fan drive interface	<p>This parameter is used to select the drive type of the fan speed.</p> <p>Disable: The fan drive is not enabled</p> <p>Relay control (CH A-C): The fan drive selects the Relay output CH A-C, CH A: Fan speed 1; CH B: Fan speed 2; CH C: Fan speed 3.</p> <p>0-10V (CH F): The fan drive selects the 0-10V output CH F</p>	<p>Disable</p> <p>Relay Control (CH A-C)</p> <p>0-10 V (CH F)</p>
HVAC control mode	<p>This parameter sets the HVAC control mode.</p> <p>Heating: The fan coil can only achieve heating function;</p> <p>Cooling: The fan coil can only achieve the cooling function;</p> <p>Heating and cooling: It can achieve heating or cooling, the fan coil controller will automatically outputs whether it is heating or cooling according to d-value between the set temperature and the actual temperature and Insensitive zone temperature. In the meantime, the following parameters are visible.</p>	<p>Disable</p> <p>Heating</p> <p>Cooling</p> <p>Heating and Cooling</p>
HVAC System¹	<p>This parameter is used to set the HVAC system, that is, define the pipe system of Fan coil.</p> <p>2 pipes system: Heating and cooling shared one inlet and outlet pipe. (Heating and cooling are controlled via one valve).</p> <p>4 pipes system: Heating and cooling use their own inlet and outlet pipes, they have their valve to control the in and out of hot and cold water.</p>	<p>2 pipes system</p> <p>4 pipes system</p>
--> Fan speed 1 voltage *0.5V²	<p>When the drive type of the fan speed of the fan is 0-10V, this parameter is visible. It is used to set the voltage value that drives the output of each fan speed.</p>	1... 5 ...20
--> Fan speed 2 voltage *0.5V²	<p>When the drive type of the fan speed of the fan is 0-10V, this parameter is visible. It is used to set the voltage value that drives the output of each fan speed.</p>	1... 10 ...20
--> Fan speed 3 voltage *0.5V²	<p>When the drive type of the fan speed of the fan is 0-10V, this parameter is visible. It is used to set the voltage value that drives the output of each fan speed.</p>	1... 15 ...20

<p>If fan is one level, the setting of 2 and 3 will be ignored</p>	<p>This parameter indicates that the setting of fan speed 2 and 3 will be ignored if the fan is only one level. Similarly, if the fan is two levels, the setting of fan speed 3 is ignored.</p>	<p><-- Attention</p>
<p>--->Heating valve drive interface³</p>	<p>This parameter is used to select the type of drive for the heating/cooling valve.</p> <p>Relay control: the valve drives are selected the relay output.</p> <p>0-10V: the valve drives are selected 0-10V output. The following three sections describe the switch output, fan and coil control functions:</p>	<p>Relay Control (CH D) 0-10 V(CH G)</p>
<p>--->Cooling valve drive interface⁴</p>	<p>This parameter is used to select the type of drive for the heating/cooling valve.</p> <p>Relay control: the valve drives are selected the relay output.</p> <p>0-10V: the valve drives are selected 0-10V output. The following three sections describe the switch output, fan and coil control functions:</p>	<p>Relay Control (CH E) 0-10 V(CH F)¹ 0-10 V(CH G)</p>
<p>----> Heating/ Cooling valve drive interface⁵</p>	<p>This parameter is used to select the type of drive for the heating/cooling valve.</p> <p>Relay control: the valve drives are selected the relay output.</p> <p>0-10V: the valve drives are selected 0-10V output. The following three sections describe the switch output, fan and coil control functions:</p>	<p>Relay Control (CHD) 0-10 V(CH G)</p>

¹ This parameter is visible when the parameter "HVAC Control mode" is set to "Heating and Cooling".

² This parameter is visible when the parameter "Fan Drive Interface" is set to "0-10V (CH F)".

³ This parameter is visible when the parameter "HVAC Control Mode" is set to "Heating and Cooling" or "Heating".

⁴ This parameter is visible when the parameter "HVAC Control Mode" is set to "Heating and Cooling" or "Cooling".

⁵ This parameter is visible when the parameter "HVAC Control Mode" is set to "Heating and Cooling".

3.3. HVAC General

The “HVAC General” parameter window is shown in Figure 5. The controller can be defined as local control or bus control according to requirements, as shown in the figure below.

This parameter window mainly sets some basic parameters of the coil controller. The specific description of each parameter is as follows.

General	Controller define	<input checked="" type="radio"/> Local <input type="radio"/> Bus
Interface Setting	Insensitive zone between heating and cooling	1°C
HVAC-General	Minimum changeover time between heating and cooling*min[0...255](0=inactive)	5
Temperature	2-point control method setting	
Setpoint	Lower Hysteresis*0.1°C[0...200] (for heating)	10
Heating valve (Relay)	Upper Hysteresis*0.1°C[0...200] (for cooling)	10
Cooling valve (Relay)	PI control method setting	
Scene	Heating speed	Normal(12000/900)
	Cooling speed	Normal(12000/900)

Fig. 5: HVAC General Page

3.3.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Control Define	<p>This parameter is used to set the source of pipe controller.</p> <p>Local: The cooling and heating is controlled via the output control of controller, that is, to be control equipment, to control the valve.</p> <p>Bus: The cooling and heating is controlled via external input, that is, to be controlled equipment, the valve only can be controlled via external input (e.g. thermostat panel).</p> <p>Note: Due to the different control methods, the parameters setting of database are also different. The following content are consist of the parameters setting of “Local” and “Bus”.</p>	Local Bus
Heating or Cooling switch by	<p>This parameter is in 3.2 Interface Settings, the parameter “HVAC-System” is visible while “2 pipes system” is selected, to set the Heat and Cool switch methods in the case of 2 pipes system.</p> <p>Local: Determine the output control is heating or cooling according the actual temperature and setting parameter, while switch the object 46 “Heating/Cooling mode” will send the status to the bus.</p> <p>Bus: The heating and cooling is controlled via external input. While “Bus” is chosen, the following parameter is visible.</p>	Local Bus
Number of Heating/Cooling switch object¹	<p>The parameter define the Number of Heating/Cooling Object.</p> <p>1 object: Determine the water of pipe is cold water or hot water through the object “Switch Heating/Cooling Mode”, while receiving telegram “1”, switch to heating; while receiving telegram “0”, switch to Cooling.</p> <p>2 objects: Determine the water of pipe is cold water or hot water through object “Heating mode enable” and “Cooling mode enable”, while receiving telegram “1”, switch to the corresponding operation; while receiving telegram “0”, it in invalid.</p>	1 object 2 objects
Insensitive zone between heating and cooling	<p>This parameter is visible while “Heating and cooling” is selected on “HVAC Control mode”.</p> <p>It is used to set the insensitive zone automatically switch between heating and cooling.</p>	0.5°C, 1°C , 1.5°C, 2°C, 2.5°C, 3°C, 3.5°C, 4°C, 4.5°C, 5°C, 5.5°C, 6°C

	<p>The smaller the insensitive zone value is, the faster the response of switching heating and cooling, that is, the more frequent of switching heating and cooling;</p> <p>The bigger the insensitive zone value is, the switching heating and cooling will less, to save energy, however the response of switching and cooling will slower.</p> <p>For the usage of Insensitive zone please refer to the section Temperature adjustment instruction.</p>	
Minimum changeover time between heating and cooling (0= inactive)	This parameter is used to set the changeover time between heating and cooling, mainly for prevent frequent change heating and cooling.	0...5...255
2-point control method setting		
Lower Hysteresis*0.1°C (for heating)	<p>In the case of heating, while actual temperature(T) > setting temperature, stop heating;</p> <p>While actual temperature <= setting value- Lower Hysteresis, start heating.</p> <p>For example, while hysteresis is 3°C, setting temperature is 22°C, when T exceeds 22°C, stop heating;</p> <p>When T smaller than 19°C, start heating; while T is between 19~22°C, remain the working status as previous.</p>	0...10...200
Upper Hysteresis*0.1°C (for cooling)	<p>In the case of cooling, if the actual temperature (T) is less than the set temperature, cooling is stopped; while the actual temperature is greater than or equal to the set value plus the Upper Hysteresis, cooling starts. For example, with a hysteresis of 3°C and a setting temperature of 26°C, when T is lower than 26°C, cooling stops; when T is more than 29°C, cooling starts; while T is between 29~26°C, the previous working status is maintained.</p>	0...10...200
PI control method setting		
Heating speed	The parameter is used to set the response speed of heating and cooling PI control.	Slow(12000/1800) Normal(12000/900) Fast(12000/450) User defined
-> Proportional range (P value)²	The above parameters are visible while “User defined” is selected on parameter “Heating/Cooling speed”. They are used to set the P value and I value of PI controller.	0...12000...65535

-> Readjust time (I value)²	The above parameters are visible while “User defined” is selected on parameter “Heating/Cooling speed”. They are used to set the P value and I value of PI controller.	0... 600 ...65535
Number of control value³	This parameter will visible while “4 pipes system” is selected on parameter “HVAC-System”. It is used to set the number of external input control valve. 1 control value with switching object: Control the Heating valve and Cooling valve via one object (object 34). Switch Heating and Cooling via object “Switch Heating/Cooling mode”. 2 control values: Heating valve and cooling valve have their own objects.	1 control value with switching object 2 control value
Control value object type³	This parameter is to set the control value object type. The local heating/cooling valve will be controlled by the received the control value. 1Bit: The control value of external input is 1Bit 1Byte: The control value of external input is 1Byte	1 bit 1 byte
Monitoring control value³	This parameter is for monitoring control value of external input. While “yes” is selected, the following parameters are visible.	No Yes
Monitoring period of control value*s^{3,4}	The parameter is used to set the monitoring period of control value, if it can not receive control value during the period, the controller will consider the external controller error, it will output according the next parameter setting value.	10... 60 ...65535
Reply mode of Obj “Control value fault” 1 bit function^{3,4}	The parameter defines the reply mode of Obj. “Control value fault”. Respond after read only: Respond after read only the device receiving the device from bus or other bus, Object “Control value fault” respond the current status to the bus. Respond after change: While error change or the device receiving the request of read status, object “Control value fault” will send telegram to respond the bus.	Respond after read only Respond after change
Control value after fault occurs (%)^{3,4}	While the external controller error, the controller will adjust valve according the parameter setting value.	0... 20 ...100

¹ This parameter is visible when the parameter “Heating or Cooling switch by” is set to “Bus”.

² This parameter is visible when the parameter “Heating speed” is set to “User defined”.

³ This parameter is visible when the parameter “Control Define” is set to “Bus”.

⁴ This parameter is visible when the parameter “Monitoring control value” is set to “Yes”

3.4. Temperature

The “Temperature” parameter window is shown in Figure 6. The relevant parameters for temperature detection are set under this interface.

General	Temperature measure by	Local sensor
Interface Setting	Temperature calibration for local sensor*0.1° C[-50..50]	0
HVAC-General	Reply error of local sensor measurement	<input type="radio"/> Respond after read only <input checked="" type="radio"/> Respond after change
Temperature	Object value of error	<input checked="" type="radio"/> 0=no error/1=error <input type="radio"/> 1=no error/0=error
Setpoint	Send actual temperature to bus	<input type="radio"/> No <input checked="" type="radio"/> Yes
Heating valve (Relay)	Send temperature when the result change by*0.5°C[1...20]	4
Cooling valve (Relay)	Cyclically send actual temperature[0..255] *min	10

Fig. 6: Temperature Page

3.4.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Temperature measure by	<p>Local sensor: The temperature value measured by the temperature sensor of this device is sent or read to the bus by the object "Actual temperature output"; when the temperature sensor is faulty, the temperature value will be 0.</p> <p>External sensor: The temperature value is measured by other temperature control devices on the bus and is received by the object "External sensor". When the device does not receive the measurement value of the external sensor, the control value will be 0 in case of the local controller.</p> <p>Local and External sensor combination: The built-in temperature sensor and the external sensor will measure the temperature value in combination method. When the device does not receive the measurement value of the external sensor, the temperature will be the value detected by the built-in temperature sensor.</p>	<p>Disable</p> <p>Local Sensor</p> <p>External Sensor</p> <p>Local and External Sensor Combination</p>
Temperature calibration for local sensor*0.1°C ^{1,4}	This parameter is used to set the temperature correction value of the temperature sensor of the device, that is, the measured value of the temperature sensor is corrected to be closer to the current ambient temperature.	-50...0...50
Reply error of local sensor measurement ^{1,4}	<p>This parameter defines the feedback method for the error of the temperature sensor of this device.</p> <p>Respond after read only: The object "Local sensor error output" sends the current status to the bus only when the device receives a status read from another bus device or bus.</p> <p>Respond after change: When the error status changes or the device receives a request to read the status, the object "Local sensor error output" immediately sends a message to the bus to report the current status.</p>	<p>Respond after read only</p> <p>Respond after change</p>
Object value of error ^{1,4}	This parameter defines the object value of the device's temperature sensor error. 0=no error/1=error : When there is no error in temperature detection, the object "Local sensor error output" sends the message "0". When an error occurs, the object sends the message "1"; vice versa.	<p>0= no error/1=error</p> <p>1=no error/0=error</p>
Send actual temperature to bus ¹	This parameter sets whether to send the current actual temperature to the bus.	<p>No</p> <p>Yes</p>

	Yes: the follow two parameters and the object “Actual temperature output” are visible.	
Send temperature when the result change by*0.5°C^{2,4}	This parameter sets the current temperature value to the bus when the temperature changes by a certain amount.	1...4...20
Cyclically send actual temperature *min^{2,4}	This parameter sets the current temperature value to the bus when the temperature changes by a certain amount. The timing starts from the time of programming completion or reset, and the current temperature value will be reported to the bus when the timing period expires.	0...10...255
-> Time period for requesting external sensor *min³	This parameter is visible when the sensor type selects “External sensor” and is used to set the time period during which the device sends a read request to the external temperature sensor.	0...1...255
--> Combination ratio⁴	This parameter is available when the “Internal and External sensor combination” is activated in the above parameter. It is used to set the combination ratio of the temperature value from the internal temperature sensor and the temperature value from the KNX bus. For example, if the “40% Internal to 60% External “is activated, the temperature value from the internal sensor(A) takes 40% and the temperature value from the external sensor(A) takes 60%.Then the actual value of the sensor = (A×40%) + (B×60%)	10% Local to 90% External 20% Local to 80% External 30% Local to 70% External 40% Local to 60% External 50% Local to 50% External 60% Local to 40% External 70% Local to 30% External 80% Local to 20% External 90% Local to 10% External
Time period for requesting external sensor*min	This parameter is visible when the sensor type selects “External sensor” and is used to set the time period during which the device sends a read request to the external temperature sensor.	0...1...255

¹ This parameter is visible when the parameter “Temperature measure by” is set to “Local Sensor”.

² This parameter is visible when the parameter “Send actual temperature to bus” is set to “Yes”

³ This parameter is visible when the parameter “Temperature measure by” is set to “External sensor”.

⁴ This parameter is visible when the parameter “Temperature measure by” is set to “Local and External sensor combination”.

3.5. Setpoint

The parameter window “Setpoint” is as shown in the Figure 7.

The window is visible while “Local” is selected on parameter “Controller define” in the figure 5.

Mainly set the basic parameter of heating and cooling, the parameter of “Heating” and “Cooling” will appear

While selecting the corresponding heating or cooling in the figure 4. There is the specific introduction of setting of each parameter.

General	Base setpoint temperature(°C)	20
Interface Setting	When bus recovery,controller status	Comfort mode
HVAC-General	Extended comfort mode*min (0=inactive,1-255 is valid)	30
Temperature	Operating mode switchover	<input checked="" type="radio"/> 1bit <input type="radio"/> 1byte
	Operating mode status	<input type="radio"/> 1bit <input checked="" type="radio"/> 1byte
Setpoint		
Heating valve (Relay)	Heating	
	Reduced heating in standby mode[0...10] °C	2
Cooling valve (Relay)	Cooling	
	Reduced heating during night mode[0...10] °C	4
Scene	Actual temperature threshold in frost protection mode[2...10] °C	7
Output A	Limit value for setpoint heating [5...40]°C	35
Output B	Increased cooling in standby mode[0...10] °C	2
Output C	Increased cooling during night mode [0...10] °C	4
	Actual temperature threshold in heat protection mode[5...40] °C	40
	Limit value for setpoint cooling [5...60]°C	15

Fig. 7: Setpoint Page

3.5.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Base setpoint temperature (°C)	The parameter is used to set the base set point temperature, producing the set point temperature of room mode.	15, 15.5, 16, 16.5, 17, 17.5, 18, 18.5, 19, 19.5, 20 , 20.5, 21, 21.5, 22, 22.5, 23, 23.5, 24, 24.5, 25, 25.5, 26, 26.5, 27, 27.5, 28, 28.5, 29, 29.5, 30.
When bus recovery, controller status	<p>This parameter is used to set the controller status when power recovery.</p> <p>In Comfort mode Heating: Actual setting temperature= basic value setting temperature+ setting temperature adjustment value. 2-pipe system mode cooling: actual setting temperature=basic value setting temperature+ setting temperature adjustment value. 4-pipe system mode cooling: actual setting temperature=basic value setting temperature+ setting temperature adjustment+ Insensitive zone temperature.</p> <p>In Standby mode Heating: actual setting temperature=basic value temperature- decrement in standby mode+ setting temperature adjustment value. Cooling: actual setting temperature=basic value temperature + increment in standby mode + setting temperature adjustment value.</p> <p>In night mode Heating: actual setting temperature=basic value temperature- decrement in night mode+ setting temperature adjustment value. Cooling: actual setting temperature=basic value temperature + increment in night mode + setting temperature adjustment value</p> <p>In Frost/heat protection: Heating: actual setting temperature=heat protection setting temperature. Cooling: actual setting temperature=frost protection setting temperature.</p> <p>Setting temperature adjustment value can amend through object 5 "Setpoint adjustment". Actual temperature setting value will be sent after object 6 read the request.</p>	Standby mode Comfort mode Night mode Frost/heat protection

	<p>Note: When “Heating and cooling” is chose on “HVAC Control mode”, the automatic control switching heating and cooling is only related to the setting temperature in Comfort mode, that is, heating or cooling is obtained after comparison between setting temperature and actual temperature. That is while the actual temperature is larger than setting temperature at cooling, it shift to cooling; while the actual temperature is smaller than setting temperature at heating, it shift to heating.</p>	
<p>Operating mode switchover</p>	<p>This parameter is used to set the Object type of operating mode switchover. While select “1bit”, 4 object 1bit are visible, which will switch different mode depending on it’s ON or OFF.</p> <p>The 4 objects are Comfort mode, Night mode, standby mode and Frost/heat protection mode, while the value of them all are “0”, the operating mode is standby mode.</p> <p>Priority should be note while switching, Frost/heat protection mode has highest-priority, the other modes have the same priority.</p> <p>Thus, before entering a mode with a low priority, the mode with a higher priority should be turn off.</p> <p>While select “1byte”, 1 means Comfort mode, 2 means standby mode, 3 means Night mode, 4 means Frost/heat protection mode, it will shift to the corresponding mode according the received telegram value.</p>	<p>1 bit 1 byte</p>
<p>Operating mode status</p>	<p>This parameter is used to set the room operation mode status. While select “1bit”, 4 object 1bit are visible. The 4 objects are Comfort mode, Night mode, standby mode and Frost/heat protection mode, while a certain mode is activated, the corresponding object will send telegram “1”, otherwise, it is “0”.</p> <p>While select 1byte, the sending telegram value:1 means Comfort mode, 2 means standby mode, 3 means Night mode, 4 means Frost/heat protection mode.</p>	<p>1 bit 1 byte</p>
<p>Heating</p>		
<p>Reduced heating in standby mode (°C)</p>	<p>These parameters are used to set the room’s temperature set value in various operation mode.</p> <p>This parameter is used to set the temperature set value on Standby mode.</p> <p>The temperature set value of Standby mode is base value minus setting value.</p>	<p>0...2...10</p>

Reduced heating during night mode (°C)	This parameter is used to the temperature set value on Night mode. The temperature set value of Night mode is base value minus setting value	0... 4 ...10
Actual temperature threshold in frost protection mode (°C)	This parameter is used to set the temperature set value in frost protection mode. In frost protection mode, when the room temperature drops to the value sets by this parameter, the fan coil controller will output control to prevent the temperature from falling below this temperature setting value. For example, when the setting temperature is 5°C, while the room temperature lower than 5°C, the fan coil controller will output to maintain the room temperature at 5°C or so for protection.	2... 7 ...10
Limit value for setpoint heating (°C)	The parameters on the side are used to set the limit value on heating. The temperature setting value can not higher than this limit value, if higher, it will output as this limit value.	5... 35 ...40
Cooling		
Increased cooling in standby mode (°C)	This parameter is used to the temperature set value on Standby mode.	0... 2 ...10
Increased cooling during night mode (°C)	This parameter is used to the temperature set value on Night mode.	0... 4 ...10
Actual temperature threshold in heat protection mode (°C)	This parameter is used to set the temperature setting value in heat protection mode. In heat protection mode, when the room temperature rises to the value sets by this parameter, the fan coil controller will output control to prevent the temperature from being higher than this temperature setting value. For example, when the setting temperature is 30°C, while the room temperature higher than 30°C, the fan coil controller will output to maintain the room temperature at 30°C or so for protection.	5... 40
Limit value for setpoint cooling	The parameters on the side are used to set the limit value on heating and cooling. The temperature setting value can not lower than this limit value, if lower, it will output as this limit value.	5... 15 ...60

3.6. Heating valve (Relay)

The parameter setting interface of “Heating valve (Relay)” is shown in Figure 8. When the drive interface of the heating valve is controlled by relay, the following uses the parameters of the heating valve in detail.

General	Valve control mode	<input checked="" type="radio"/> 2 state-ON/OFF <input type="radio"/> Continuous,PWM
Interface Setting	Valve type	<input checked="" type="radio"/> Normal (de-energised closed) <input type="radio"/> Inverted (de-energised open)
HVAC-General	The Controller use 2-point control method	<--Attention
Temperature	When bus failure, valve position	Unchange
Setpoint	Reply mode of Obj."status of valve position" 1bit function	<input type="radio"/> Respond after read only <input checked="" type="radio"/> Respond after change
Heating valve (Relay)	Valve purge function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Cooling valve (Relay)	"Disable heating" object function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

Fig.8: Heating valve (Relay) Page

3.6.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Valve Control mode	This parameter is used to set the type of valve to be controlled. 2 state-ON/OFF: Two-point switch control mode; Continuous, PWM: PWM continuous control mode.	2 state-ON/OFF Continuous, PWM
Valve type	This parameter sets the direction of the valve switch. Normal (de-energised closed): Indicates a normally closed switch; Inverted (de-energised open): Indicates a normally open switch.	Normal (de-energised closed) Inverted (de-energised open)
PWM cycle time*s¹	This parameter is visible when the valve type is "Continuous, PWM" and is used to set the time period for PWM control. The larger the value of the parameter, the smaller the valve switching frequency. Conversely, the smaller the value, the more frequent the valve switch.	60... 120 ...3000
When bus failure , valve position	This parameter sets the position of the valve after the voltage is de-energized. Unchanged: After the voltage is de-energized, the valve state remains unchanged; Open: Valve open; Close: Valve close	Unchange Open Close
Reply mode of Obj. "status of valve position" 1 bit function	This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status. Respond after read only: The object "Status of valve purge" sends the current status to the bus only when the device receives the status from another bus device or bus; Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately sends a message to the bus to report the current status; Respond always: Always respond, receive control commands, regardless of whether the status changes or not.	Respond after read only Respond after change
Valve purge function	Enable: 1-bit communication object "Trigger valve purge" is visible to trigger the valve cleaning operation while the following parameters are visible.	Disable Enable
-> Duration of valve purge time*min²	This parameter sets the duration of the valve cleaning. During this time, the valve is fully open.	1... 10 ...255

	<p>When this time passes, the state before cleaning is re-established.</p> <p>If the heating/cooling operation is prohibited during cleaning, the cleaning will continue.</p>	
-> Automatic valve purge²	<p>Visible when the valve cleaning function is enabled.</p> <p>Enable: Enable the automatic valve cleaning function, the following parameters are visible.</p>	Disable Enable
-> Purge Cycle in weeks³	<p>This parameter defines the period of automatic valve cleaning, in weeks, the time starts from the power-on of the device, and the cleaning operation is triggered after timing.</p> <p>Once the cleaning is completed, the time is reset, whether it is done by automatic cleaning or by object-triggered cleaning, this time will be reset.</p> <p>Note: The manual priority is the highest, and the cleaning priority is the second highest. If the cleaning time is not reached, the cleaning process is manually interrupted. After the cleaning is finished, the manual exit will not continue the cleaning.</p>	1...12
-> Reply mode of Obj. "Status of valve purge" 1 bit function	<p>This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status.</p> <p>Respond after read only: The object "Status of valve purge" sends the current status to the bus only when the device receives the status from another bus device or bus;</p> <p>Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately sends a message to the bus to report the current status;</p> <p>Respond always: Always respond, receive control commands, regardless of whether the status changes or not.</p>	Respond after only Respond after change Respond always
"Disable heating" object function	<p>Enable: 1-bit communication object "Disable, heating/cooling" is visible and can be used to disable heating/cooling operations while the following parameters are visible.</p>	Disable Enable
-> Trigger object value⁴	<p>This parameter sets the value of the message used to disable the heating/cooling operation.</p> <p>0=Disable/1=Enable: When the object "Disable, Heat/Cool" receives the message value "0", the heating/cooling operation is prohibited. Reactivate when receiving "1".</p>	0=Disable/1=Enable 1=Disable/0=Enable

¹ This parameter is visible when the parameter "Valve Control mode" is set to "Continuous, PWM".

² This parameter is visible when the parameter "Valve purge function" is set to "Enable".

³ This parameter is visible when the parameter "Valve purge function Automatic valve purge" is set to "Enable".

⁴ This parameter is visible when the parameter "Disable heating" object function" is set to "Enable".

3.7. Cooling valve (Relay)

The parameter setting interface of “Cooling valve (Relay)” is shown in Figure 9. When the drive interface of the cooling valve is controlled by relay, the following uses the parameters of the cooling valve in detail.

General	Valve control mode	<input checked="" type="radio"/> 2 state-ON/OFF <input type="radio"/> Continuous,PWM
Interface Setting	Valve type	<input checked="" type="radio"/> Normal (de-energised closed) <input type="radio"/> Inverted (de-energised open)
HVAC-General	The Controller use 2-point control method	<--Attention
Temperature	When bus failure, valve position	Unchange
Setpoint	Reply mode of Obj, "status of valve position" 1bit function	<input type="radio"/> Respond after read only <input checked="" type="radio"/> Respond after change
Heating valve (Relay)	Valve purge function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Cooling valve (Relay)	"Disable cooling" object function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

Fig. 9: Cooling valve (Relay) Page

3.7.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Valve Control mode	This parameter is used to set the type of valve to be controlled. 2 state-ON/OFF: Two-point switch control mode; Continuous, PWM: PWM continuous control mode.	2 state-ON/OFF Continuous, PWM
Valve type	This parameter sets the direction of the valve switch. Normal (de-energised closed): Indicates a normally closed switch; Inverted (de-energised open): Indicates a normally open switch.	Normal (de-energised closed) Inverted (de-energised open)
PWM cycle time*s ¹	This parameter is visible when the valve type is "Continuous, PWM" and is used to set the time period for PWM control. The larger the value of the parameter, the smaller the valve switching frequency. Conversely, the smaller the value, the more frequent the valve switch.	60...120...3000
When bus failure , valve position	This parameter sets the position of the valve after the voltage is de-energized. Unchanged: After the voltage is de-energized, the valve state remains unchanged; Open: Valve open; Close: Valve close	Unchange Open Close
Reply mode of Obj. "status of valve position" 1 bit function	This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status. Respond after read only: The object "Status of valve purge" sends the current status to the bus only when the device receives the status from another bus device or bus; Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately	Respond after read only Respond after change
Valve purge function	Enable: 1-bit communication object "Trigger valve purge" is visible to trigger the valve cleaning operation while the following parameters are visible.	Disable Enable
-> Duration of valve purge time*min ²	This parameter sets the duration of the valve cleaning. During this time, the valve is fully open. When this time passes, the state before cleaning is re-established. If the heating/cooling operation is prohibited during cleaning, the cleaning will continue.	1...10...255

<p>-> Automatic valve purge 2</p>	<p>Visible when the valve cleaning function is enabled. Enable: Enable the automatic valve cleaning function, the following parameters are visible.</p>	<p>Disable Enable</p>
<p>--> Purge Cycle in weeks 3</p>	<p>This parameter defines the period of automatic valve cleaning, in weeks, the time starts from the power-on of the device, and the cleaning operation is triggered after timing. Once the cleaning is completed, the time is reset, whether it is done by automatic cleaning or by object-triggered cleaning, this time will be reset. Note: The manual priority is the highest, and the cleaning priority is the second highest. If the cleaning time is not reached, the cleaning process is manually interrupted. After the cleaning is finished, the manual exit will not continue the cleaning.</p>	<p>1...12</p>
<p>-> Reply mode of Obj. "Status of valve purge" 1 bit function</p>	<p>This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status. Respond after read only: The object "Status of valve purge" sends the current status to the bus only when the device receives the status from another bus device or bus; Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately</p>	<p>Respond after only Respond after change Respond always</p>
<p>"Disable cooling" object function</p>	<p>Enable: 1-bit communication object "Disable, heating/cooling" is visible and can be used to disable heating/cooling operations while the following parameters are visible.</p>	<p>Disable Enable</p>
<p>-> Trigger object value 4</p>	<p>This parameter sets the value of the message used to disable the heating/cooling operation. 0=Disable/1=Enable: When the object "Disable, Heat/Cool" receives the message value "0", the heating/cooling operation is prohibited. Reactivate when receiving "1".</p>	<p>0=Disable/1=Enable 1=Disable/0=Enable</p>

¹ This parameter is visible when the parameter "Valve Control mode" is set to "Continuous, PWM".

² This parameter is visible when the parameter "Valve purge function" is set to "Enable".

³ This parameter is visible when the parameter "Valve purge function Automatic valve purge" is set to "Enable".

⁴ This parameter is visible when the parameter "Disable heating" object function" is set to "Enable".

3.8. Heating Valve (0-10V)

The parameter setting interface of “Heating valve (0-10V)” is shown in Figures 4.10.

When the drive interface of the heating valve/cooling valve is controlled by 0-10V, the following uses the parameters of the heating valve in detail.

General	Valve control mode	<input checked="" type="radio"/> 2 state-10V/0V <input type="radio"/> Continuous control
Interface Setting	Valve type	<input checked="" type="radio"/> Normal (de-energised closed) <input type="radio"/> Inverted (de-energised open)
HVAC-General	The Controller use 2-point control method	<--Attention
Temperature	-----	
Setpoint	Reply mode of Obj, "status of valve position" 1bit function	<input type="radio"/> Respond after read only <input checked="" type="radio"/> Respond after change
Heating valve (0-10V)	Valve purge function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Cooling valve (0-10V)	"Disable heating" object function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

Fig. 10: Heating Valve (0-10V) Page

3.8.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Valve Control mode	This parameter is used to set the type of valve to be controlled. 2 state-ON/OFF: Two-point switch control mode; Continuous, PWM: PWM continuous control mode.	2 state-10V/0V Continuous control
Valve type	This parameter sets the direction of the valve switch. Normal (de-energised closed): Indicates a normally closed switch; Inverted (de-energised open): Indicates a normally open switch.	Normal (de-energised closed) Inverted (de-energised open)
->Valve adjustment¹	This parameter sets whether the characteristic curve adjustment of the valve is enabled.	Disable Enable
--> Minimum controller output for closed valve²	The lower limit control value of the valve characteristic curve.	0...100
--> Maximum controller output for fully opened² valve	The upper limit control value of the valve characteristic curve.	0...100
--> Lower limit of active valve opening range²	The lower limit of the valve limit value.	0...100
--> Upper limit of active valve opening range²	The upper limit of the valve is limited.	0...100
Reply mode of Obj. "status of valve position" 1 bit function	This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status. Respond after read only: The object "Status of valve purge" sends the current status to the bus only when the device receives the status from another bus device or bus; Respond after change: When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately.	Respond after read only Respond after change
Valve purge function	Enable: 1-bit communication object "Trigger valve purge" is visible to trigger the valve cleaning operation while the following parameters are visible.	Disable Enable
-> Duration of valve purge time*min³	This parameter sets the duration of the valve cleaning. During this time, the valve is fully open. When this time passes, the state before cleaning is re-established. If the heating/cooling operation is prohibited during cleaning, the cleaning will continue.	1...10...255

<p>-> Automatic valve purge 3</p>	<p>Visible when the valve cleaning function is enabled. Enable: Enable the automatic valve cleaning function, the following parameters are visible.</p>	<p>Disable Enable</p>
<p>--> Purge Cycle in weeks 4</p>	<p>This parameter defines the period of automatic valve cleaning, in weeks, the time starts from the power-on of the device, and the cleaning operation is triggered after timing. Once the cleaning is completed, the time is reset, whether it is done by automatic cleaning or by object-triggered cleaning, this time will be reset. Note: The manual priority is the highest, and the cleaning priority is the second highest. If the cleaning time is not reached, the cleaning process is manually interrupted. After the cleaning is finished, the manual exit will not continue the cleaning.</p>	<p>1...12</p>
<p>“Disable heating” object function</p>	<p>Enable: 1-bit communication object "Disable, heating/cooling" is visible and can be used to disable heating/cooling operations while the following parameters are visible.</p>	<p>Disable Enable</p>
<p>-> Trigger object value 5</p>	<p>This parameter sets the value of the message used to disable the heating/cooling operation. 0=Disable/1=Enable: When the object "Disable, Heat/Cool" receives the message value "0", the heating/ cooling operation is prohibited. Reactivate when receiving "1".</p>	<p>0=Disable/1=Enable 1=Disable/0=Enable</p>

¹ This parameter is visible when the parameter “Valve Control mode” is set to “Continuous control”.

² This parameter is visible when the parameter “Valve Adjustment” is set to “Enable”.

³ This parameter is visible when the parameter “Valve purge function” is set to “Enable”.

⁴ This parameter is visible when the parameter “Valve purge function Automatic valve purge” is set to “Enable”.

⁵ This parameter is visible when the parameter “Disable heating” object function” is set to “Enable”.

3.9. Cooling valve (0-10V)

The parameter setting interface of “Cooling valve (0-10V)” is shown in Figures 11. When the drive interface of the heating valve/cooling valve is controlled by 0-10V, the following uses the parameters of the cooling valve in detail.

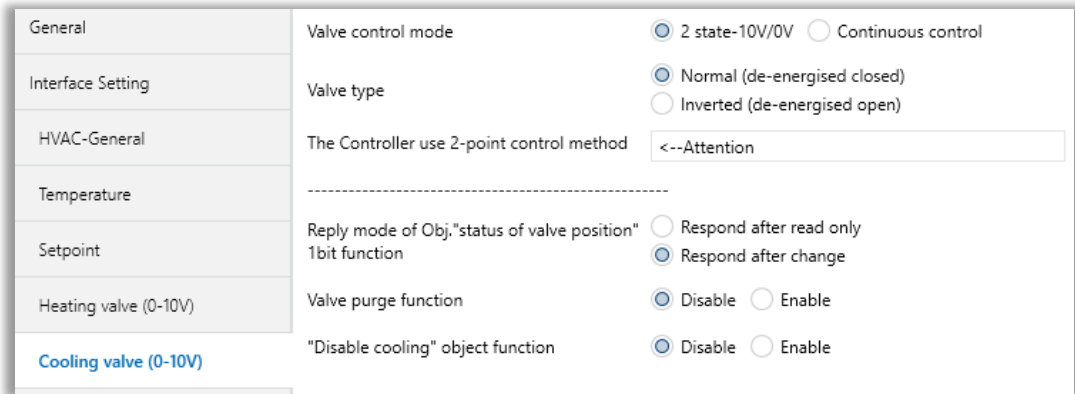


Fig. 11: Cooling Valve (0-10V) Page

3.9.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Valve Control mode	This parameter is used to set the type of valve to be controlled. 2 state-ON/OFF: Two-point switch control mode; Continuous, PWM: PWM continuous control mode.	2 state-10V/0V Continuous control
Valve type	This parameter sets the direction of the valve switch. Normal (de-energised closed): Indicates a normally closed switch; Inverted (de-energised open): Indicates a normally open switch.	Normal (de-energised closed) Inverted (de-energised open)
->Valve adjustment ¹	This parameter sets whether the characteristic curve adjustment of the valve is enabled.	Disable Enable
--> Minimum controller output for closed valve²	The lower limit control value of the valve characteristic curve.	0...100
--> Maximum controller output for fully opened valve²	The upper limit control value of the valve characteristic curve.	0...100
--> Lower limit of active valve opening range²	The lower limit of the valve limit value.	0...100
--> Upper limit of active valve opening range²	The upper limit of the valve is limited.	0...100
Reply mode of Obj. "status of valve position" 1 bit function	This parameter is visible when the valve cleaning function is enabled and defines the feedback mode for the valve cleaning status. Respond after read only : The object "Status of valve purge" sends the current status to the bus only when the device receives the status from another bus device or bus; Respond after change : When the status changes or the device receives a request to read the status, the object "Status of valve purge" immediately.	Respond after read only Respond after change
Valve purge function	Enable: 1-bit communication object "Trigger valve purge" is visible to trigger the valve cleaning operation while the following parameters are visible.	Disable Enable
-> Duration of valve purge time*min ³	This parameter sets the duration of the valve cleaning. During this time, the valve is fully open. When this time passes, the state before cleaning is re-established. If the heating/cooling operation is prohibited during cleaning, the cleaning will continue.	1...10...255

<p>-> Automatic valve purge 3</p>	<p>Visible when the valve cleaning function is enabled. Enable: Enable the automatic valve cleaning function, the following parameters are visible.</p>	<p>Disable Enable</p>
<p>--> Purge Cycle in weeks 4</p>	<p>This parameter defines the period of automatic valve cleaning, in weeks, the time starts from the power-on of the device, and the cleaning operation is triggered after timing. Once the cleaning is completed, the time is reset, whether it is done by automatic cleaning or by object-triggered cleaning, this time will be reset. Note: The manual priority is the highest, and the cleaning priority is the second highest. If the cleaning time is not reached, the cleaning process is manually interrupted. After the cleaning is finished, the manual exit will not continue the cleaning.</p>	<p>1...12</p>
<p>"Disable heating" object function</p>	<p>Enable: 1-bit communication object "Disable, heating/cooling" is visible and can be used to disable heating/cooling operations while the following parameters are visible.</p>	<p>Disable Enable</p>
<p>-> Trigger object value 5</p>	<p>This parameter sets the value of the message used to disable the heating/cooling operation. 0=Disable/1=Enable: When the object "Disable, Heat/Cool" receives the message value "0", the heating/ cooling operation is prohibited. Reactivate when receiving "1".</p>	<p>0=Disable/1=Enable 1=Disable/0=Enable</p>

¹ This parameter is visible when the parameter "Valve Control mode" is set to "Continuous control".

² This parameter is visible when the parameter "Valve Adjustment" is set to "Enable".

³ This parameter is visible when the parameter "Valve purge function" is set to "Enable".

⁴ This parameter is visible when the parameter "Valve purge function Automatic valve purge" is set to "Enable".

⁵ This parameter is visible when the parameter "Disable heating" object function" is set to "Enable".

3.10. Fan

The below parameters are basically same whatever the driver interface of fan control is relay or 0-10V. The function of each parameter will be described in detail below.

General	Fan type	<input type="radio"/> One level <input checked="" type="radio"/> Multi-level
Interface Setting	Fan speeds on 2 limit	<input checked="" type="radio"/> No <input type="radio"/> Yes
HVAC-General	When bus recovery, fan speed is	Unchange
Temperature	After downloading, fan speed is	OFF
Setpoint	Threshold value for Fan speed 1[1...255]	50
Heating valve (0-10V)	Threshold value for Fan speed 2[1...255]	150
	Threshold value for Fan speed 3[1...255]	255
Fan	"Forced operation" function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Fan status	Auto. operation function (only for HVAC)	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Scene	Direct operation function	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Output A	Obj. "Switch speed x " 1bit function	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Output B	Obj. "Fan speed Up/Down" 1bit function	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Output C	Delay time for function OFF *0.1s[0...65535]	0
Output D	Starting characteristic of fan	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Output E	Switch on over fan speed	2
	Minimum time in switch*s[1...65535]	10

Fig. 12: Fan Page

3.10.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Fan Type	<p>This parameter define the fan type which would be controlled.</p> <p>One level: Can control the fan with one level fan speed.</p> <p>Multi-level: Can control the fan as many as three levels fan speed, it can choose 2 level, but also can choose 3 level.</p>	<p>One level</p> <p>Multi-level</p>
Fan speeds on 2 limit	<p>With the parameter, the fan speeds can be limited to two.</p> <p>No: Can control the 3 level speed fan.</p> <p>Yes: Can control the 2 level speed fan. A two speed fan is controlled via fan speeds 1 and 2, the objects of fan speed 3 is non-functional.</p> <p>Note: When the fan speed is limited to 2 level, even the fan speed is set to 3 level after power recovery or reset, it will not be executed. It will keep the current status.</p>	<p>No</p> <p>Yes</p>
When bus recovery, fan speed is	<p>This parameter defines the fan speed when power recovery.</p> <p>Unchange: the status do not change;</p> <p>OFF: Turn off fan;</p> <p>ON: Turn on fan;</p> <p>As before as bus fail: The status before power failure.</p> <p>Note: It is advised to connect the bus and the auxiliary supply voltage firstly before connecting fan, to avoid possibility of damage for fan due to incorrect connection.</p>	<p>Unchange</p> <p>OFF</p> <p>1</p> <p>2</p> <p>3</p> <p>As before as bus fail</p>
After downloading, fan speed is	<p>This parameter notes the fan will be turn off after downloading.</p>	<p>OFF</p>
Threshold value for Fan speed 1¹	<p>The parameter is used to set a threshold value for switching to fan speed 1.if value of fan speed is no less than the value, then fan will run at speed 1,otherwise fan will be cut off.</p>	<p>1...50...255</p>
Threshold value for Fan speed 2¹	<p>The parameter is used to set a threshold value for switching to fan speed 2.if value of fan speed is no less than the value, then fan will run at speed 2.</p>	<p>1...50...255</p>

<p>Threshold value for Fan speed 3¹</p>	<p>The parameter is used to set a threshold value for switching to fan speed 3. If value of fan speed is no less than the value, then fan will run at speed 3.</p>	<p>1...150...255</p>
<p>“Forced operation” function</p>	<p>This parameter is used to enable the forced operation function. If “Enable”, the 1 bit communication object “Forced operation” will be visible, the following two parameters will also be visible, for setting the object value and the action of “Forced operation”.</p>	<p>Disable Enable</p>
<p>->Forced operation on object value²</p>	<p>This parameter is used to activate the object value of forced operation. 0=Force/1=Cancel: When object “Forced operation” receives value “0”, activate force operation. When receiving “1”, cancel force operation; 1=Force/0=Cancel: When object “Fan Forced operation” receives value “1”, activate force operation. When receiving “0”, cancel force operation.</p>	<p>0= Force/1=Cancel 1= Force/0=Cancel</p>
<p>->Limitation on forced operation²</p>	<p>This parameter defines forced under operation, the speed of the fan can run. Unchanged: Fan speed remains the same, to maintain the current running status 1: can only run fan speed 1 1, off: can only run fan speed 1 and turn off the fan 2: Can only run fan speed 2 2, 1: Can only run fan speed 1 and 2 2, 1, off: Can only run fan speed 1, 2, and turn off the fan 3: Can only run fan speed 3 3, 2: Can only run fan speed 3 and 2 3, 2, 1: Can only run fan speed 1, 2, and 3 Off: Only turn off the fan Note: In the case of the forced operation activation, if the current fan speed is not in the allowed range, the fan speed will switch to the fan speed near the current fan speed, running in the allowed range, such as the current fan speed is 1, allows the fan speed is 2, 3, so when activation the force operation, the fan speed will automatically switch to 2, if it is manually to the fan speed is set to 1, run the fan speed will also be 2. Another case, if the current fan speed is off, allowing the fan speed is 1, 2, 3, start fan speed is 3, when the</p>	<p>Disable Unchange 1 1, OFF 2 2,1 2,1,OFF 3 3,2 3,2,1 OFF</p>

	<p>force operation activation, fan to start with the fan speed 3, then automatically switch to the fan speed 1. If the current fan speed is 2, allowing the fan speed is 1, 2, when the force operation activation, receive a message with a fan speed off, then the fan speed will switch to 1, this kind of circumstance is the fan speed will switch to the near target fan speed.</p>	
Behaviour on Forced operation³	<p>This parameter defines how the fan should respond with the Forced operation.</p>	<p>Unchange OFF ON</p>
Auto. operation function (only for HVAC)	<p>This parameter is used to activate the telegram value of auto operation.</p> <p>0=Auto/1=Cancel: When the object "Automatic function" receives the telegram value "0", the auto. Operation is activated; when telegram value "1", the auto. Operation is cancelled.</p> <p>1=Auto/0=Cancel: When the object "Automatic function" receives the telegram value "1", the auto. Operation is activated; when telegram value "0", the auto. Operation is cancelled.</p>	<p>Disable Enable</p>
Direct operation function	<p>This parameter can make the fan control operation directly. Direct operating mainly in a different way to manually adjust the fan speed. Different types of fans, such as switch type of blower fan and stepping switch mode, suitable for different control mode, according to actual needs.</p> <p>Note: During the period of direct operation, it is ignored of the setting of the minimum residence time of the automatic mode. Therefore, timely detection of direct manipulation response.</p> <p>In order to protect the fan, the fan speed switch delay time are still valid. The forced operation is activated at the same time, need to take into account the force can run under fan speed.</p>	<p>Disable Enable</p>
->Obj. "Switch speed x" 1 bit function⁴	<p>Enable: Three 1 bit of object "Fan speed 1", "Fan speed 2" and "Fan speed 3" will be visible. When object received "1", open the corresponding fan speed, three objects of any object received "0", the fan off. If three objects in a short time continuous received ON/OFF, so the message is received by the final object value to control fan speed.</p>	<p>Disable Enable</p>

<p>->Obj. "Fan speed Up/Down" 1 bit function⁴</p>	<p>Enable: 1 bit of object "Fan speed UP/DOWN" visible, object received "1" increase fan speed, while received "0" decrease fan speed.</p> <p>When fan speed reaches maximum (speed 3) or minimum (off), continue to increase or decrease, the fan speed will remain, continue to increase or reduce the message will be ignored and does not perform, and the fan speed is to increase or decrease step by step.</p> <p>If multiple upward or downward adjustment fan speed in a short time, the target speed will increase a continuous multistage or reduce stage, such as the current fan speed is 1, received two consecutive increase message, then will execute the fan speed 3.</p>	<p>Disable Enable</p>
<p>Delay time for function OFF *0.1s</p>	<p>This parameter is used to define the delay off time. For example, when the current fan speed is speed 1 and a fan OFF telegram is received, the fan will keep the current speed and start to count the delay time. After this delay time, the fan off action will be executed.</p> <p>Note: Under the auto operation mode, this parameter is executed when the parameter "Minimum time in fan speed [0...65535]s" is set to 0.</p>	<p>0...65535</p>
<p>Starting characteristic of fan¹</p>	<p>This parameter to define the fan characteristics of start, this is also a technical characteristics of the fan. Generally, in order to guarantee the safety of the fan motor start, when the fan open, to open a higher fan speed fan motor will be better, so that the fan motor to obtain a higher torque when start-up .</p> <p>Fan used in our life, such as floor fan, when open the fan, usually started from the second fan speed, and then switch to the minimum fan speed, some fans start also like this kind of situation.</p> <p>Enable: the following two parameters visible.</p> <p>Note: Due to it is a technical characteristics of start-up feature of the fan, so start behaviour has a higher priority than activate the automatic operation under the restriction or forced operation.</p> <p>If the fan has No start features, we don't have to consider the characteristics of relevant parameters, it can be as long as selecting "No".</p> <p>For example, Start fan speed is 3, limit allowed by the operation of the fan speed is 2, the current in the</p>	<p>Disable Enable</p>

	<p>OFF state, when receiving a control message in the fan speed is 1, the fan will open with fan speed 3, and then turn to fan speed 2, then the actual need of fan speed 1 will not run due to the limit. (to be automatic operation under the restrictions described in the next chapters 3.11)</p> <p>For stepping switch type of fan, the feature of start is not the same, stepping switch type of fan is usually continuous open fan speed, and switch to switch type of fan is directly open the fan speed. So in defining characteristic parameters of start, also need to consider the fan switch type.</p> <p>Switching fan speed in the Automatic mode, the minimum residence time will be considered after start-up phase, in the start-up phase it is not activated. Start-up fan speed on the minimum residence time can be set up in addition, refer to the following parameters.</p>	
->Switch on over fan speed ⁵	<p>This parameter is set the needed speed to start the fan from the OFF state.</p> <p>When in the fan speed 2, if start fan speed set 3, then start up automatically with speed 2 to start.</p> <p>But in order to ensure the normal operation of the fan , it can set the parameters associated with fan performance, it's best to know the characteristics of the fan, reasonable according to the characteristics of the fan to set these parameters, so that no damage to the fan.</p>	<p>1 2 3</p>
-> Minimum time in switch*s ⁵	The fan remains ON for at least this time.	1...10...65535
Time mode for function ON/OFF ⁶	<p>The function time at fan ON/OFF is defined with this parameter.</p> <p>Enable: With the “Enable”, Automatic mode is enabled, an Automatic operation Parameter window appears. And the auto operation will be influenced by the follow two parameters “switching delay” and “minimum time”.</p> <p>Note: The auto operation function is only effected when the HVAC control is enabled. Please refer to the details instruction at Table 2.</p>	<p>None Switch Delay Minimum Time</p>
-> Delay time *0.1s ⁷	The fan is switched on using this delay.	0...10...65535
-> Minimum time *0.1s ⁸	The fan remains ON for at least this time.	0...10...65535

¹ This parameter is visible when the parameter “Fan Type” is set to “Multi level”.

- ² This parameter is visible when the parameter “Forced operation function” is set to “Enable”.
- ³ This parameter is visible when the parameter “Fan Type” is set to “One level” and parameter “Forced operation function” is set to “Enable”.
- ⁴ This parameter is visible when the parameter “Direct operation function” is set to “Enable”.
- ⁵ This parameter is visible when the parameter “Starting characteristic of fan” is set to “Enable”.
- ⁶ This parameter is visible when the parameter “Fan Type” is set to “One level”.
- ⁷ This parameter is visible when the parameter “Time mode for function on” or “Time mode for function off” is set to “Switch Delay”.
- ⁸ This parameter is visible when the parameter “Time mode for function on” or “Time mode for function off” is set to “Minimum time”.

Controller	Valve control mode	Fan Type	Control value type	Description
	2-state	One-level	-----	The controller automatically switches the fan according to the temperature difference between the actual temperature and the set temperature. For the setting of the temperature difference threshold, see section 3.11;
		Multi-level	-----	The controller automatically switches the fan according to the temperature difference between the actual temperature and the set temperature. For the setting of the temperature difference threshold, see section 3.10;
	Continuous control	One-level	-----	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is obtained by PI operation inside the program and will not be sent to the bus. For the setting of the threshold, see section 3.10.
		Multi-level	-----	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is obtained by PI operation inside the program and will not be sent to the bus. The threshold settings are detailed in Section 3.10.
Bus	2-state/ Continuous Control	One-level	1 bit	Control value 0: Off the fan, control value 1: Open fan; control value is received from the bus by the object "Control value".
			1 byte	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is received from the bus by the object "Control value". The threshold settings are detailed in Section 3.11.
		Multi-level	1 bit	Control value 0: off the fan, control value 1: fan speed 3; control value is received from the bus by the object "Control value".
			1 byte	The controller determines the switch of the fan according to the threshold range in which the control value is located. The control value is received from the bus by the object "Control value". The threshold settings are detailed in Section 3.11.

Table 2: HVAC Table

3.11. Auto Operation

This parameter window (Fig.13) is visible if in Fig. 12 the option Enable has been selected in the parameter “Auto. Operation function”.

Here set the auto. Operation of multilevel fan, the threshold values for switch over of the fan ON/OFF is defined. If the coil controller is from the local, the fan will automatically ON/OFF the fan based on the control value or temperature difference in the threshold value range. The control value is defined by the PI algorithm of the device internal program, which will not be sent to the bus.

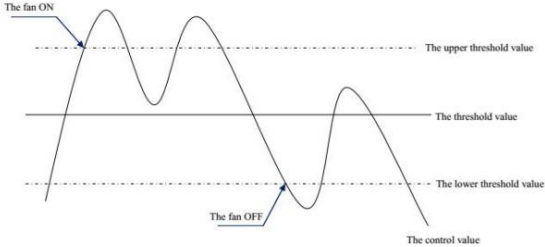
If the coil controller is from the bus, the speed is determined by the control value of the bus. Furthermore, there are 4 limitations can be set.

General	Auto.operation on object value	<input type="radio"/> 0=Auto/1=Cancel <input checked="" type="radio"/> 1=Auto/0=Cancel
Interface Setting	State of Auto.operation after startup	<input checked="" type="radio"/> Disable auto.operation <input type="radio"/> Enable auto.operation
HVAC-General	Automatically enable auto.operation	<input checked="" type="radio"/> No <input type="radio"/> Yes
Temperature	Threshold value OFF<-->speed 1[1..255](For 2 point,it's Tem.difference*0.1°C)	80
Setpoint	Threshold value speed 1<-->speed 2[1..255] (For 2 point,it's Tem.difference*0.1°C)	150
Heating valve (Relay)	Threshold value speed 2<-->speed 3[1..255] (For 2 point,it's Tem.difference*0.1°C)	200
Cooling valve (Relay)	Hysteresis value is threshold value in +/- [0...50](For 2 point,it is unused)	10
Fan	Minimum time in fan speed[0...65535]*s	10
Auto.operation	Limitation function	<input checked="" type="radio"/> Disable <input type="radio"/> Enable

Fig. 13: Auto Operation Page

3.11.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Auto. Operation on object value	<p>This parameter is used to activate the telegram value of auto operation.</p> <p>0=Auto/1=Cancel: When the object “Automatic function” receives the telegram value “0”, the auto. Operation is activated; when telegram value “1”, the auto. Operation is cancelled.</p> <p>1=Auto/0=Cancel: When the object “Automatic function” receives the telegram value “1”, the auto. Operation is activated; when telegram value “0”, the auto. Operation is cancelled.</p>	<p>0=Auto/1=Cancel 1=Auto/0=Cancel</p>
State of Auto. operation after start up	<p>This parameter is used to Enable/Disable the auto. Operation when the devices is started up.</p> <p>Disable auto. Operation: After start up, the default auto. Operation is disable.</p> <p>Enable auto. Operation: After start up, the default auto. Operation is enable.</p>	<p>Disable auto. operation Enable auto. operation</p>
Automatically enable auto. operation	<p>This parameter is used to set if the automatically enable function of the auto. Operation is enabled or not.</p> <p>This parameter is used to set if the automatically enable function of the auto operation is enabled or not.</p>	<p>No Yes</p>
-> Enable auto. operation after (min) ¹	<p>This parameter is used to set the time from the direct operation to auto operation.</p>	<p>10...80...6000</p>
Threshold value OFF <--> speed 1 (For 2 point, it's Tem. Difference*0.1 °C)	<p>Here the threshold value, at which switch on occurs, is defined. The control value is determined by the object “Control value”.</p> <p>If the control value is greater than or equal to the parameterized threshold value, the fan is switched on.</p> <p>If the value is less, the fan is switched off.</p> <p>Note: If the controller is from the local under the 2-point control, it will automatically ON/OFF the fan based on the temperature difference between the actual temp and set temp. Thus this parameter is used to set the temperature difference 1...255 (*0.1°C) Under PI control, the control value is defined by the PI algorithm of the internal program, which will not be sent to the bus. The controller will be determine the fan ON/OFF based on where the control value is located in threshold value range.</p>	<p>1...80...255</p>

<p>Threshold value speed 1 <--> speed 2 (For 2 point, it's Tem. Difference*0.1 °C)</p>	<p>Here to define the threshold value when switch to speed 2, if the control values greater than or equal to the threshold of the parameter Settings, run speed 2.</p>	<p>1...150...255</p>
<p>Threshold value speed 2 <--> speed 3 (For 2 point, it's Tem. Difference*0.1 °C)</p>	<p>Here to define the threshold value when switch to speed 3, if the control values greater than or equal to the threshold of the parameter Settings, run speed 3.</p>	<p>1...200...255</p>
<p>Hysteresis value is threshold value in +/- (For 2 point, it is unused)</p>	<p>Here a hysteresis value is set, at which switchover to the fan switch occurs. Using hysteresis, a continuous switching of the fan around the threshold value with the control value deviating can be avoided.</p> <p>The setting 0 causes immediate switching without hysteresis.</p> <p>Assuming the hysteresis value is 10 and the threshold value is 50, then the upper threshold value will be 60 (the threshold value + the hysteresis value), the lower threshold value will be 40 (the threshold value – the hysteresis value), then when the control value is between 40 and 60, it will not cause the operation of the fan. Only less than 40 is off the fan, and greater than 60 is on the fan. As shown below:</p> 	<p>0...10...50</p>
<p>Minimum time in fan speed (s)</p>	<p>This parameter to define the residence time before the current fan speed switch to a higher or lower fan speed, which is a minimum fan speed running time, if you want to switch to another fan speed, can only be to switch after waiting for this period of time, if the current fan speed has been running long enough, the fan speed change can quickly switch.</p> <p>Note: The setting of the residence time in this parameter is only using in automatic mode. Automatic mode of each fan speed (including off) need to consider the minimum operation time, and automatic operation of the fan speed is changed step by step, such as the current fan speed is 1, the</p>	<p>0...10...65535</p>

	<p>target speed is 3, then the fan speed transform from 1 to 2, and 3, and each operation of the fan speed over the minimum operation time to transform.</p> <p>Start fan speed without considering the minimum run time, because the starting fan speed has its own minimum running time.</p>	
Limitation function	<p>The parameter set the fan speed limitation under the Auto. Operation.</p> <p>Enable: The following parameters is visible and 4 communication objects “Fan Limitation x (x=1, 2, 3, 4)” for limitation of the fan switching are enabled.</p> <p>The four limitations can be used for example for the control of various operation modes such as:</p> <p>Limitation 1: e.g. for frost/heat protection Limitation 2: e.g. for comfort operation Limitation 3: e.g. for night shutdown</p>	<p>Disable Enable</p>
Fan with limitation 1, 2, 3, 4 ²	<p>With this parameter, the fan switching can be set in active limitation. There are the same parameters for each of the individual four limitations.</p> <p>Disable: The limitation is not effect to the Auto. Operation, but the status can be activated.</p> <p>Unchange: The fan status is remained the current status when the limitation is activated.</p> <p>OFF: The fan is only switched off when the limitation is activated.</p> <p>ON: The fan is only switched on when the limitation is activated.</p>	<p>Disable Unchange 1 1, OFF 2 2,1 2,1,OFF 3 3,2 3,2,1 OFF</p>

¹ This parameter is visible when the parameter “Automatically enable auto. operation” is set to “Yes”.

² This parameter is visible when the parameter “Limitation function” is set to “Enable”.

3.12. Fan Status

General	Reply mode of Obj. "status ON/OFF mode" 1bit function	Respond after change
Interface Setting	Reply mode of Obj. "Status fan speed x" 1bit function	Respond after change
HVAC-General	Reply mode of Obj. "Status fan speed" 1byte function	Respond after change
Temperature	Object value for Status Fan speed 1[1...255]	84
Setpoint	Object value for Status Fan speed 2[1...255]	168
Heating valve (Relay)	Object value for Status Fan speed 3[1...255]	255
Cooling valve (Relay)		
Fan		
Fan status		

Fig. 14: Fan Status Page

3.12.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
<p>Reply mode of Obj. “status ON/OFF mode” 1 bit function</p>	<p>This parameter is used to set the feedback way of fan working status.</p> <p>Respond, after read only: Only when the devices receives a read request of the working status from other devices or the bus, the object “Status Fan ON/OFF” will send the current working status to the bus.</p> <p>Respond after change: The object “Status Fan ON/OFF” status send the status after a change or a read request. Respond always: No matter the fan status is after read or after change, the object “Status Fan ON/OFF” is always send the current status to the bus.</p>	<p>Respond after only</p> <p>Respond after change</p> <p>Respond always</p>
<p>Reply mode of Obj. “status Auto. mode” 1 bit function</p>	<p>This parameter is visible when auto operation enabled and used to define the feedback way of auto. Operation status. When the parameter “Status Automatic” send telegram value 1, the auto. Operation is activated; send 0, the auto. Operation is disabled.</p> <p>Respond after read only: Only when the devices receives a read request of the working status from other devices or the bus, the object “Status Automatic” will send the current working status to the bus under the auto. Operation.</p> <p>Respond after change: The object “Status Fan ON/OFF” status send the status after a change or a read request under auto operation.</p> <p>Respond always: No matter the fan status is after read or after change, the object “Status Fan ON/OFF” is always send the current status to the bus under auto operation.</p>	<p>Respond after only</p> <p>Respond after change</p> <p>Respond always</p>
<p>Reply mode of Obj. “status fan speed x” 1 bit function</p>	<p>The parameter is used to define the feedback way of the speed status. The following three 1 bit object “Status Fan speed 1”, “Status Fan speed 2”and “Status Fan speed 3”are used to indicate the status of every level speed.</p> <p>Respond after read only: Only when the devices receives a read request of the working status from other devices or the bus, the objects will send the current working status to the bus.</p>	<p>Respond after only</p> <p>Respond after change</p> <p>Respond always</p>

	<p>Respond after change: The objects send the status after a change or a read request.</p> <p>Respond always: No matter the fan status is after read or after change, the objects are always send the current status to the bus.</p>	
<p>Reply mode of Obj. "status fan speed x" 1 byte function</p>	<p>This parameter is used to set the feedback way of current fan working status. The length is 1 byte. The fan speed output status value is defined by the following parameter</p> <p>Respond, after read only: Only when the devices receives a read request of the working status from other devices or the bus, the object will send the current working status to the bus.</p> <p>Respond after change: The object sends the status after a change or a read request.</p> <p>Respond always: No matter the fan status is after read or after change, the object always sends the current status to the bus.</p>	<p>Respond after only</p> <p>Respond after change</p> <p>Respond always</p>
<p>Object value for Status Fan speed 1</p>	<p>This parameter is used to set the output value of fan speed status. That is to say it can define the output value of every fan speed.</p>	<p>1...84...255</p>
<p>Object value for Status Fan speed 2</p>	<p>This parameter is used to set the output value of fan speed status. That is to say it can define the output value of every fan speed.</p>	<p>1...168...255</p>
<p>Object value for Status Fan speed 3</p>	<p>This parameter is used to set the output value of fan speed status. That is to say it can define the output value of every fan speed.</p>	<p>1...255</p>

3.13. Scene

The “Scene” parameter setting interface is shown in Figures 15, and it is visible when the HVAC output is enabled. Mainly set the scene of HVAC control, you can set 8 scenes.

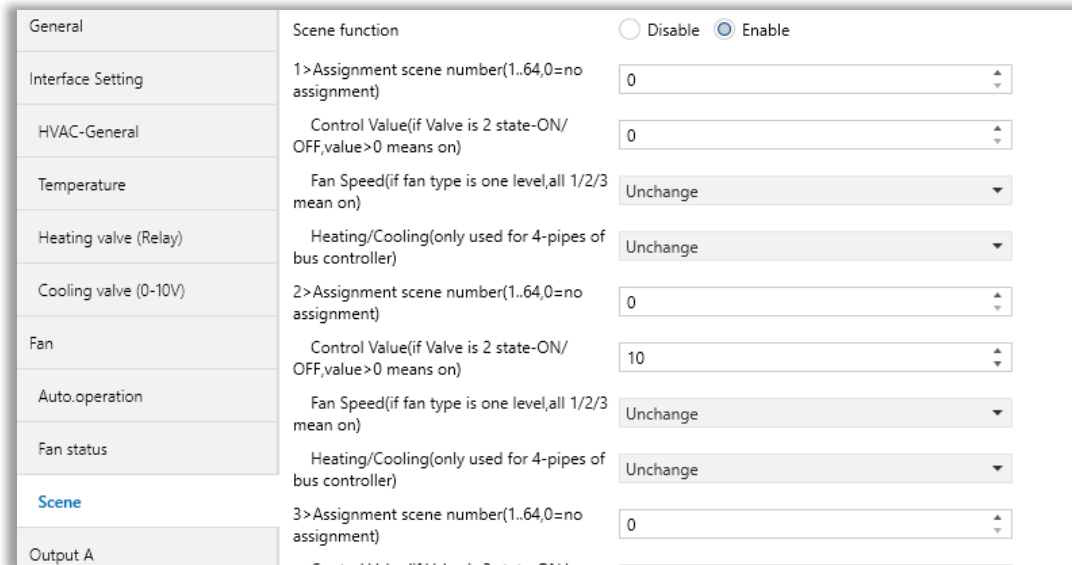


Fig. 15: Scene Page

3.13.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Scene function	This parameter is used to enable or disable to scene function.	Disable Enable
1-8>Assignment scene number (0= assignment)	64 different scene numbers can be assigned. Note: The effective scene number in the parameter setting option is 1~64, and the corresponding message is 0~63. The scene function can be saved.	1...64
HVAC Mode	This parameter is available when the coil control is controlled locally, setting the HVAC mode.	Standby mode Comfort mode Night mode Frost/heat protection
Fan Speed (if fan type is one level, all 1/2/3 mean on)	This parameter is available when the fan is enabled and is used to set the fan speed.	Unchange OFF 1 2 3
Heating/Cooling (only used for 4-pipes of bus controller)	This parameter is available when the HVAC control mode is “Heating and Cooling” and the heating/cooling mode is set.	Unchange Heating Cooling

3.14. Output X

Parameter window “Output X” can be shown in fig. 16 which applies to a whole output. In addition to setting general switching function, but also set position of switch on the bus power on and power down , reports of switch status, etc...

General	Switch function	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
Interface Setting	Central function of channel	<input type="radio"/> Disable <input checked="" type="radio"/> Enable
HVAC-General	When bus recovery,contact is	Unchange ▼
Temperature	When bus failure,contact is	Unchange ▼
Setpoint	After downloading,contact is	<input checked="" type="radio"/> Open <input type="radio"/> As bus recovery
Heating valve (Relay)	Object value of "switch" after bus recovery or downloading	<input checked="" type="radio"/> 0 <input type="radio"/> 1
Cooling valve (Relay)	Reply mode of switch status	Respond after change ▼
Scene	Object value of switch status	<input type="radio"/> 0=contact close;1=contact open <input checked="" type="radio"/> 1=contact close;0=contact open
Output A	Contact position if tele.value is "1" ("0" is opposite of "1" if changed)	<input type="radio"/> Open <input checked="" type="radio"/> Close
Output B	Special function of channel	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Output C		

Fig. 16: Output Page

3.14.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Switch Function	To set whether to enable the switch output channel X (X=A...E). If enable, the follow parameters will be visible.	Disable Enable
Central function of channel	The parameter sets whether the central control of the channel is enabled. If enable, the channel can be controlled via the object "Central switch".	Disable Enable
When bus recovery, contact is	The output can adopt a defined status on bus voltage recovery via this parameter. When selecting "Unchanged", the contact of the relay will remain the same as the last status on the power on. When selecting "open", the contact will be open; while it is closed when selecting "closed". The contact position after voltage recovery is the same as that before power off with "As before bus voltage fail".	Unchange Open Close As before as bus fail
When bus failure, contact is	The output can adopt a defined status after the bus voltage failure via this parameter. When selecting "Unchange", the contact of the relay will remain the same as the last status before power off. When selecting "open", the contact will be open; while it is closed when selecting "closed".	Unchange Open Close
After downloading, contact is	This parameter set the contact position of the output after downloading. If "open", the output is open after downloading. If "As bus recovery", the output adopts the defined status of the parameter "If bus recovery, contact is"	Open As bus recovery
Object value of "switch" after bus recovery or downloading	This parameter will be used when enabling the logic function "input 0" to define the default value of the communication object "Switch" after bus voltage recovery, which can be "0" or "1".	0 1
Reply mode of switch status	This parameter defines how to respond the current switch status to the bus. There are three options to select.	Respond after read only Respond after change Respond Always
Object value of switch status	It means the contact of the relay will be closed when the value of the communication object "reply switch status" is 0 when setting "0=contact close; 1=contact open", while it is open when the value is "1".	0= contact close; 1= contact open 1= contact close; 0= contact open

	It means the opposite with setting “0=contact open; 1=contact close”	
Contact Position if tele. value is “1” (“0” is opposite of “1” if changed)	<p>This parameter defines the contact position when switch on the switch, which will be triggered by the communication object “switch, X”. When enabling “input 0” in the logic function, it will use the communication object “switch, X” to modify the value of “input 0”, rather than triggering the switch operation.</p> <p>The parameter setting will affect the channel action of the central control.</p> <p>The parameter only works after the object “Switch x” receiving value, and defines the direction of the contact after receiving it. The details can be found in Table 3.</p> <p>Since the switch and logic functions share the same object “switch, X”, thus need to understand the relationship between them, the control sequence shown below Table 4 (the logic functions, please refer to the following chapter describe):</p>	<p>Open</p> <p>Close</p>
Special function of channel	<p>This parameter defines whether enable the special functions of the switch actuator. The parameter window “X: Function” will be seen with “enable”, and able to set the special functions individually in Fig. 17. Enable or disable the special function in “X: Function”.</p>	<p>Disable</p> <p>Enable</p>

Parameter Options	“Switch, X” object value=1	“Switch, X” object value =0
Open	Contact open (OFF)	Contact close (ON)
Close	Contact close (ON)	Contact close (OFF)

Table 3: Switch Table

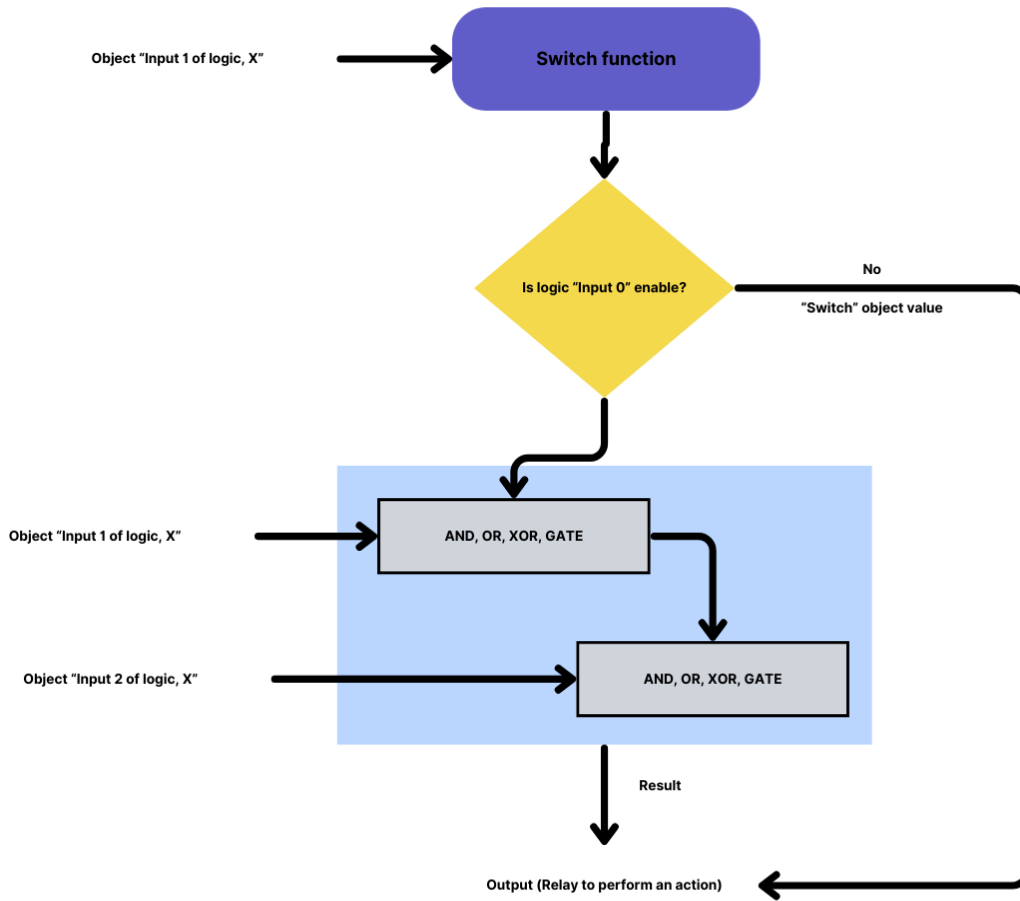


Table 4: Control Sequence

3.14.2. Function

General	Function of "time"	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Interface Setting	Function of "logic"	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
HVAC-General	Function of "scene"	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Temperature	Function of "Forced"	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Setpoint	Function of "Operation hours counter"	<input checked="" type="radio"/> Disable <input type="radio"/> Enable
Heating valve (Relay)		
Cooling valve (Relay)		
Scene		
Output A		
A: Function		
Output B		
Output C		

Fig. 17: Function Page

3.14.2.1. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Function of “time”	This parameter enables the activation of the time function.	Disable Enable
Function of “logic”	This parameter enables the activation of the logic function.	Disable Enable
Function of “scene”	This parameter enables the activation of the logic function.	Disable Enable
Function of “Forced”	This parameter enables the activation of the forced function.	Disable Enable
-> Force operation type	The parameter defines the control type of force operation. If selecting “1bit”, object “Forced output” receives telegram “1” to activate force operation, telegram “0” to cancel the force operation. If “2 bit” is selected and the object “Forced output” receives a telegram value, the action as follows in Table 5. Forced operation cancellation does not alter the position of the relay contact.	1Bit 2Bit
-->Contact position if forced operation	The parameter is visible if the option “1bit” is selected via last parameter, which defines the contact position of force operation. The forced operation has the highest priority, and all the other operations are ignored during the forced operation.	Unchange Open Close
Function of “Operation hours counter”	This parameter enables the activation of the forced function.	Disable Enable
-> Object data type of “operation hours counter”	This parameter is used to select data type of the operation hour’s counter.	2 byte Value in h(DPT 7.007) 4 byte Value in s(DPT 13.100)
-> Cyclically send counter value in hour (0= no send, only for reading)	The parameter determines the time interval to send the telegram which is used for counting the time of relay on.	0...100

Value of object “Forced output, X”	Action
00b (0), 01b(1)	Cancel force operation, other operation can be performed
10b (2)	Force switch off
11b (3)	Force switch on

Table 5: Forced Output

3.14.2.2. Time

This parameter window will become visible when selecting “enable” in the parameter “Function of “time” ” in the window “X:Function” shown in Fig. 17 See Fig. 18 And the object “enable time function” will be also visible, which is used to disable the time function. After disabled, previous operation is still carried out completely. Such as switch on delay, the function is disabled during delay, and then the switch is still switched on once the delay has been finished.

General	Type of time function	Staircase
Interface Setting	Duration of staircase lighting: --(0..1000min)	1
HVAC-General	--(0..59s)	0
Temperature	Control mode of staircase lighting	Start with "1",Stop with "0"
Setpoint	During the lighting time,if receive the "start" telegram	<input checked="" type="radio"/> Restart duration of staircase lighting <input type="radio"/> Ignore the "start" telegram
Heating valve (Relay)		
Cooling valve (Relay)		
Scene		
Output A		
A: Function		
A: Time		

Fig. 18: Time Page

3.14.2.3. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Type of time function	The parameter defines the type of the time function, there are three options for the mode of work.	Delay Flashing Staircase
Delay for switch on (min):	This parameter defines the delay time of switching on. After receiving the delay ON telegram, the switch is on once the delay over.	0...240
-- (s)	This parameter defines the delay time of switching on. After receiving the delay ON telegram, the switch is on once the delay over.	0...59
Delay for switch off (min):	This parameter defines the delay time of switching off. After receiving the delay off telegram, the switch is off once the delay over. If receiving the relevant telegram again during delay, the delay will be reset.	0...240
-- (s)	This parameter defines the delay time of switching off. After receiving the delay off telegram, the switch is off once the delay over. If receiving the relevant telegram again during delay, the delay will be reset.	0...59
Number of ON-impulsed (0= no limited) ¹	This parameter sets the flashing times. 0 means no limited. A flashing includes an on and an off actions.	1...255
Contact position after flashing¹	This parameter defines the relay contact position after flashing.	Unchange Open Close
The control mode of flashing¹	The parameter is used to select the control mode of the flashing output. It will start flashing with value "1" when selecting "star with "1", stop with "0" "; it will stop flashing with "0". The stop position is defined via last parameter. It will start flashing with value "0" when selecting "star with "0", stop with "1" "; it will stop flashing with "1". The stop position is defined via last parameter.	Start with "1", Stop with "0" Start with "0", Stop with "1" Start with "0/1", can not be stop

	It will start flashing with either “1” or “0” when selecting “star with “1/0”, can not be stopped”; Under this circumstance it cannot terminate the flashing by value until operation over or it is blocked by other operation.	
Duration of staircase lighting: (min) ²	This parameter describes the duration time when switching on the staircase lighting.	0...1...1000
-- (s) ²	This parameter describes the duration time when switching on the staircase lighting.	0...59
Control mode of staircase lighting²	<p>This parameter defines the control mode on/off of the staircase lighting. Choose suitable control mode according to the needs.</p> <p>When selecting “Start with “1”, stop with “0””, it will switch on the staircase lights with the value “1”; it will stop the time counting operation with “0” and don't change the contact position until changed by other operations.</p> <p>When selecting “Start with “1”, no action with “0””, it will switch on the staircase lights with the value “1” and no reaction with “0”.</p> <p>When selecting “Start with “0/1”, cannot be stopped”, it will switch on the staircase lights either with “0” or “1” but cannot stop it until the duration time finished or changed by other operation.</p> <p>When selecting “Start with ‘1’, off with ‘0’”, it will switch on the staircase lights with the value “1”, and off with “0”.</p>	<p>Start with “1”, Stop with “0”</p> <p>Start with “0”, Stop with “1”</p> <p>Start with “0/1”, can not be stop</p>
During the lighting time, if receive the “start” telegram²	<p>If selecting “restart duration of staircase lighting”, if the object “Staircase function” again receive the telegram of starting staircase lighting during the duration time, then the staircase lighting will restart and the duration time will be restart.</p> <p>If selecting “Ignored the ‘switch on’ telegram”, then it will ignore the receiving telegram of the object “Staircase function” during the duration time.</p>	<p>Restart duration of staircase lighting</p> <p>Ignore “start” telegram</p>

¹ This parameter is visible when the parameter “Type of time function” is set to “Flashing”.

² This parameter is visible when the parameter “Type of time function” is set to “Staircase”.

3.14.2.4. Logic

Parameter window of logic function shown in Fig. 19, it will shown up in Fig. 17 “X: Function” when selecting “enable” in “Function of “logic”.

here are 2 logic communication objects to decide the status of each output, which are related to the “Switch”, as shown in Fig. 17.

It will re-operate when receiving a new object value as the final output status (close the contact with “1”, open it with “0”). The values of the communication object “Input 1 of logic” makes logic operation with “Switch” firstly, and then the result after that will makes operations with the value of “Input 2 of logic”. This operation will ignore the objects which are unable, and continue to the next step with the ones who are enabled.

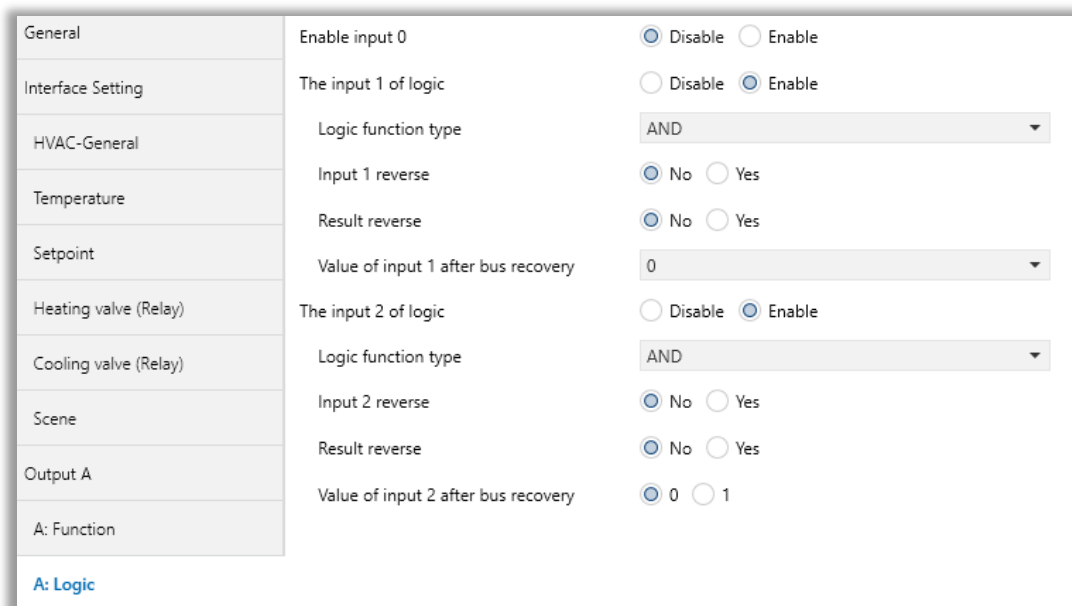


Fig. 19: Logic Page

3.14.2.5. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Enable input 0	This parameter is used to enable the function of logic operation of "input 0", whose values are wrote by the object "Switch".	Disable Enable
-> Input X reverse	This parameter defines whether negate the input value. Negate it with "yes", don't with "no".	No Yes
The input X of logic	This parameter is used to enable input1 and input 2. If enable, their communication objects "logic 1" and logic 2" will be also visible.	Disable Enable
Logic function type	This parameter set logic function type, provided three standard logic operations: AND, OR, XOR, and a GATE function. Explanation of gate function: it will use the next logic value as the enable mark of the previous logic. If the enable mark of the next logic is "1", that means it is able to use the previous logic value as the operation result. E.g. the value of input 1 is 1, which means the value of input 0 can be used as the operation result; if the value of input 2 is 1, which means the operation value of input 0/1 can be used as the result. The possible results of the logic operation are shown in Table 6.	AND OR XOR GATE
Result Reserve	This parameter defines whether negate the logical operation results. Negate it with "yes", don't with "no".	No Yes
Value of input 1 after bus recovery	This parameter defines the default value of the object "Logic1" after bus voltage recovery.	0 1 Value before power off
Value of input 2 after bus recovery	This parameter defines the default value of the communication object "Logic 2" after bus voltage recovery, "1" or "0" is optional.	0 1

Logic function	Object Values					Description
	Input0 (switch)	Input1	Result of Input 0/1	Input 2	Output	
AND	0	0	0	0	0	The results is 1 if both input values are 1
	0	1	0	1	0	
	1	0	0	0	0	
	1	1	1	1	1	
OR	0	0	0	0	0	The result is 1 if one of both input values is 1.
	0	1	1	1	1	
	1	0	1	0	1	
	1	1	1	1	1	
XOR	0	0	0	0	0	The result is 1 if both input values have a different value
	0	1	1	1	0	
	1	0	1	0	1	
	1	1	0	1	1	
GATE	0	Closed		Closed		The input0 of value is only allowed through if the GATE (input 1 and input2) is open Otherwise the input0 of value is ignored
	0	Open	0	Open	0	
	1	Closed		Closed		
	1	Open	1	Open	1	

Note:

1. The values of the communication object "Input 1" makes logic operation with "Switch" firstly, and then the result will makes operations with the value of "Input 2", and the final operation result as the final output (close the contact with "1", open it with "0").
2. If an input is not enabled, this input is ignored.
3. If logic result needs to be negated, the first negated, then the next step.
4. The signal can be passed if the GATE is open, otherwise it is ignored. For example, the input 0 of value is ignored when the GATE of input1 is closed, and the output is directly determined by the input2.

Table 6: Logic Function

3.14.2.6. Scene

The parameter window shown in Fig. 20 will be visible when selecting “enable” in “Function of “scene” ” in Fig. 17. Here can set 8 scenes.

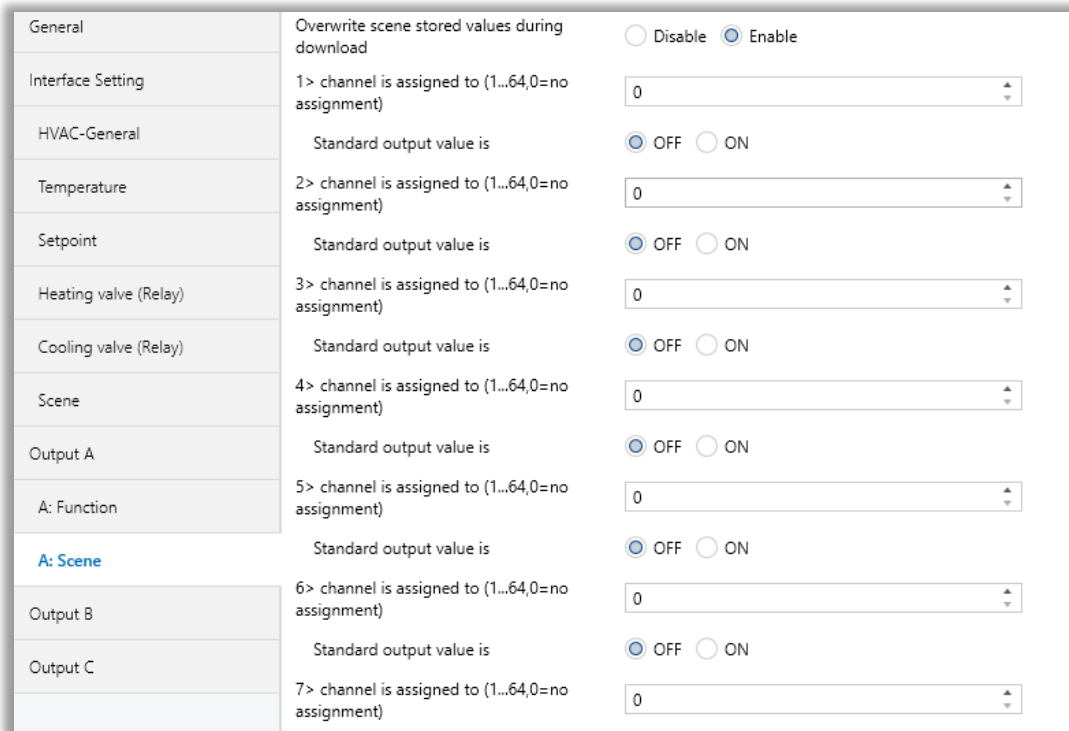


Fig. 20: Scene Page

3.14.2.7. Parameters List

PARAMETERS	DESCRIPTION	VALUES
Overwrite scene stored values during download	If selecting “Disable”, the stored values before the download can be not overwritten by the parameterized scene value.	Disable Enable
1-8> channel assigned to (0= no assignment)	It is able to allocate 64 different scene numbers to every output. There are 8 various scenes can be set per output. Note: 1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene”. If a scene is modified, the new scene will be stored when power off.	1...64
Standard output value is	This parameter defines the switch output status when recall the scene.	OFF ON

4. ETS Objects List & Descriptions

4.1. General Objects

This section describes the "general" group objects and their properties. General group objects, as the name suggests, indicate the general characteristics of the KNX Fan Coil Actuator.

Object No	Object Name	Function	Type	Flags
1	General	In operation	1 bit	CT

This object is always visible, used to send telegram "1" to the bus periodically to proof the device is under normal working condition.

DPT: 1.001 (Switch)

2	General	Central Switch	1 bit	CW
---	---------	----------------	-------	----

This object is used for the central control for all switch outputs. If the central control of outputs is enabled.

Telegram value:

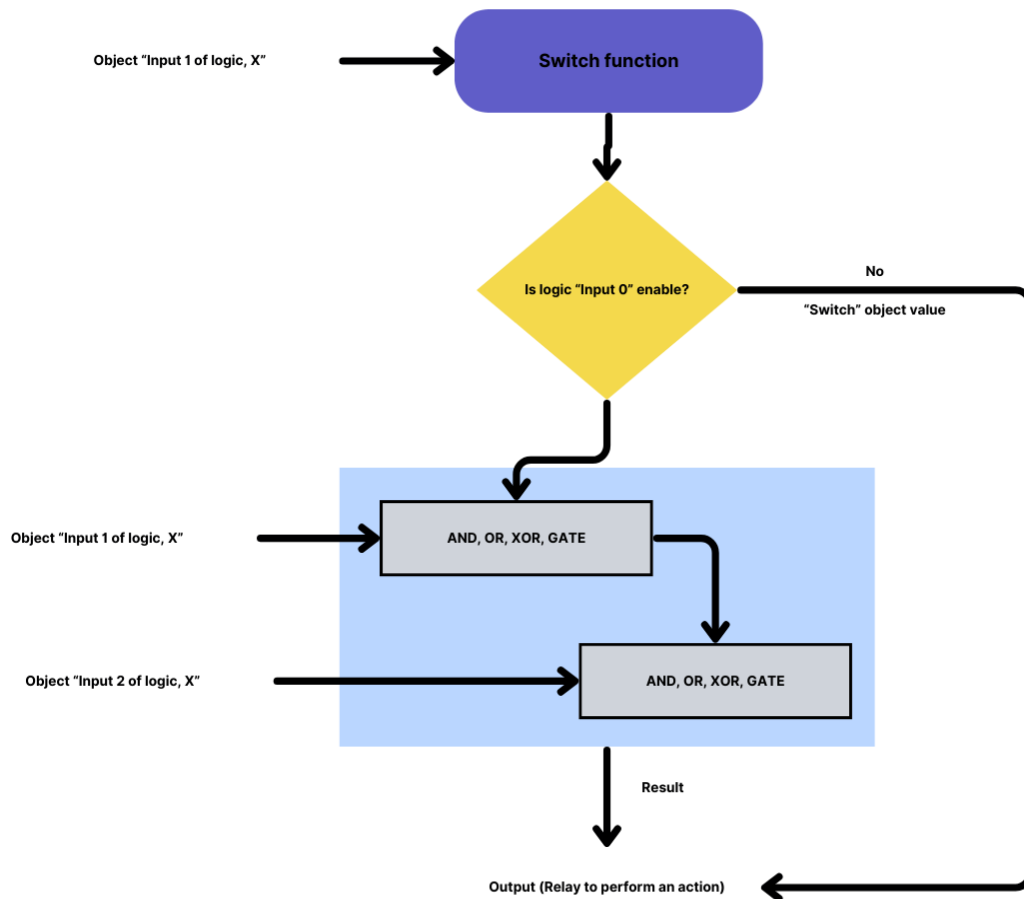
0: Off

1: On

DPT: 1.001 (Switch)

47, 56, 65, 74, 83	Output X	Switch	1 bit	CW
-----------------------	----------	--------	-------	----

This object is used to trigger the switch operation. It will start the switch operation with "1" and end with "0". When enabling "Input 0" in the logic function, the object "Switch X" will be subject to logic functions, rather than trigger the switch operation directly. For details, please refer to the following flowchart:



DPT: 1.001 (switch)

48, 57, 66, 75, 84	Output X	Switch Status	1 bit	CRT
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This object indicates the contact status (details will be defined by parameter “Object value of switch status”. In “Chanel X: Switch”).

If selecting “respond, after read only”, the status telegram will not be sent out until receiving a read request telegrams from the bus via the object.

If selecting “respond after change”, It will send the status automatically via the object when there are any changes on the output.

If selecting “respond always” The object will not send current status to the bus, until the device received the request of reading the switch status from the other bus device operation or the bus.

DPT: 1.001 (switch)

49, 58, 67, 76, 85	Output X	Enable time function	1 bit	CW
-------------------------------	-----------------	-----------------------------	--------------	-----------

This object will be enabled only when enabling the time function. It can be used to enable and disable the time function. It will enable the timing function when receiving the value “1”; will disable it when receiving “0”. The operation before disabled it is still carried out completely. Enable is a default setting after bus voltage recovery if the time function is set.

DPT: 1.001 (switch)

50, 59, 68, 77, 86	Output X	Delay Function	1 bit	CW
-------------------------------	-----------------	-----------------------	--------------	-----------

When select “delay” in the parameter “Type of time function”, the object will be activated, then the flashing switch function will be activated via the object.

DPT: 1.001 (switch)

50, 59, 68, 77, 86	Output X	Flashing Function	1 bit	CW
-------------------------------	-----------------	--------------------------	--------------	-----------

When select “flashing” in parameter “Type of time function”, the object will be activated, then the flashing switch function will be activated via the object.

DPT: 1.001 (switch)

50, 59, 68, 77, 86	Output X	Staircase Function	1 bit	CW
-------------------------------	-----------------	---------------------------	--------------	-----------

When select “staircase” in the parameter “Type of time function”, the object will be activated, then the staircase lighting function will be activated via the object.

DPT: 1.001 (switch)

51, 60, 69, 78, 87	Output X	Operation hours counter	2 byte/ 4 byte	CRWTU
-------------------------------	-----------------	--------------------------------	---------------------------	--------------

This communication object is used to report load working time, It displays when the parameter “function of” operation hours counter select “enable”, the data type of report value can be set in the parameter “Object data type of “operation hours counter”.

DPT: 7.007 (time(h)), 13.100 (time lag(s))

52, 61, 70, 79, 88	Output X	Scene	1 byte	CW
---------------------------	-----------------	--------------	---------------	-----------

It is able to recall or save the scene when sending an 8-bit command by this object, which will be enabled e-when enabling the scene function. The definition of the 8-bit command will be described below:

Assuming an 8-bit command (binary coding) as: FXNNNNNN

F: recall the scene with “1”;

X: 0

NNNNNN: Scene number (0-63).

1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object “Scene”. For example, scene 1 in the parameter setup has the same output result as scene 0 in the communication object “Scene”. As follow:

Object Value	Description
0	Recall scene 1
1	Recall scene 2
2	Recall scene 3
...	...
63	Recall scene 64
128	Store scene 1
129	Store scene 2
130	Store scene 3
...	...
191	Store scene 64

DPT:18.001 (Scene Control)

53, 62, 71, 80, 89	Output X	Forced Output	1 bit/ 2 bit	CW
---------------------------	-----------------	----------------------	-------------------------	-----------

This object will be enabled after enabling the forced function.

If 1 bit, Enable the forced operation with “1”, and the device behaviours will be ignored except the forced function; cancel the forced operation with “0”. The contact position of force operation can be set via a parameter.

If 2 bit, the contact is forced closed when receiving telegram “3”, the contact is forced opened when receiving telegram “2”; cancel the force operation with telegram “1” or “0”.

DPT: 1.003 (enable)

54, 63, 72, 81, 90	Output X	Logic 1	1 bit	CW
-------------------------------	-----------------	----------------	--------------	-----------

This object will be enabled when selecting “enable” in the parameter “The Input 1 of logic”, which is used to modify logic value of input 1.

DPT: 1.002 (Boolean)

55, 64, 73, 82, 91	Output X	Logic 2	1 bit	C,W
-------------------------------	-----------------	----------------	--------------	------------

This object will be enabled when selecting “enable” in the parameter “The Input 2 of logic”, which is used to modify logic value of input 2.

DPT: 1.002 (Boolean)

4.2. Fan Coil Control

X: 1...3

Object No	Object Name	Function	Type	Flags
3	General	Operation status for HVAC	1 byte	CRT

This object is used to report operation status HVAC, definition as below:

DPT_Status HVAC: B6N2							
7	6	5	4	3	2	1	0
0: Auto. (bus) operation 1: Manual operation	0: Limit 3 disable 1: Limit 3 enable	0: Limit 3 disable 1: Limit 3 enable	0: Limit 2 disable 1: Limit 2 enable	0: Limit 1 disable 1: Limit 1 enable	0: Heating 1: cooling	00: comfort mode 01: standby mode 10: night mode 11: protection mode	

4	Input Setpoint	Base setpoint	2 bytes	CW
---	----------------	---------------	---------	----

Benchmark sets temperature. The object is used as benchmark value for temperature setting value of each operation mode. The value is used to judge current status as cooling or heating by combining dead zone temperature under the circumstance with both heating and cooling.

DPT: 9.001 (temperature (°C))

5	Input Setpoint	Setpoint adjustment	2 bytes	CW
---	----------------	---------------------	---------	----

Benchmark sets correction of temperature. Benchmark setup temperature can be modified via written value to the object. (Relative adjustment, modifying on the original setup temperature.)

DPT: 9.001 (temperature (°C))

6	Output Setpoint	Instantaneous setpoint	2 bytes	CRT
---	-----------------	------------------------	---------	-----

Temperature setup value of actual output, which is used to send temperature setup value of current operation mode to the bus.

DPT: 9.001 (temperature (°C))

7	Temperature	Actual temperature output	2 bytes	CRT
---	-------------	---------------------------	---------	-----

This communication object is used to send the local actual temperature to the bus and is obtained from the local PT1000 sensor interface.

DPT: 9.001 (temperature (°C))

8	Temperature	Local sensor error output	1 bit	CRT
----------	--------------------	----------------------------------	--------------	------------

Local sensor error report. When an error occurs in the temperature sensor of this device (such as PT1000), this object will send a message to the bus to report an error.

DPT: 1.005 (alarm)

9	Temperature	External Sensor	2 bytes	CWTU
----------	--------------------	------------------------	----------------	-------------

When an external sensor is enabled to measure temperature, the device receives temperature measurements from the external sensor through this object.

DPT: 9.001 (temperature (°C))

27	HVAC	Scene	1 byte	CW
-----------	-------------	--------------	---------------	-----------

The object is visible when HVAC scene enables, which is used to call or save scene.

1-64 in the parameter setup corresponds to the scene number 0-63 received by the communication object "Scene". For example, scene 1 in the parameter setup has the same output result as scene 0 in the communication object "Scene".

DPT: 18.001 (scene control)

30	HVAC mode	Switch heating cooling/ mode	1 bit	CW
-----------	------------------	-------------------------------------	--------------	-----------

The object is visible when heating/cooling switch via one object. It's used to receive telegram of switching heating and cooling. Cooling with "0", and heating with "1".

DPT: 1.100 (cooling/heating)

31	HVAC mode	Comfort mode	1 bit	CW
32	HVAC mode	Night mode	1 bit	CW
33	HVAC mode	Frost/heat protection mode	1 bit	CW
34	HVAC mode	Standby mode	1 bit	CW
42	HVAC status	HVAC mode	1 byte	CRT

Room operation mode can be switched via 4 objects of 1bit (object 31, 32, 33, 34) and 1 object of 1 byte (HVAC mode).

1 bit: object 31: room comfort mode. Object 32: room night mode. Object 33: room protection mode. Object 34: room standby mode. Meanwhile, when writing "1" in corresponding object, means enabling corresponding operation mode; "0" means cancelling corresponding operation mode.

Notes: the priority of the 4 objects if 1bit should be: (Frost/heat protection mode) > (Comfort mode) = (Night mode) = (Standby mode). When the object value of 31, 32, and 33 are all zero, room operation mode is considered as standby mode by default.

When it's 1byte: the relationship between input value and operation mode is as follows: no: 0: unused.

1: comfort mode, 2: standby mode, 3: room mode, 4: protection mode, 5-255: unused

DPT: 1.001 (switch)/ 20.102 (HVAC mode)

38	HVAC	Heating mode enable	1 bit	CW
-----------	-------------	----------------------------	--------------	-----------

The object is visible when heating/cooling switch via two objects. Enables corresponding control mode, when object receives telegram of "1", and invalid of "0".

DPT: 1.003 (enable)

39	HVAC	Cooling mode enable	1 bit	CW
-----------	-------------	----------------------------	--------------	-----------

The object is visible when heating/cooling switch via two objects. Enables corresponding control mode, when object receives telegram of "1", and invalid of "0".

DPT: 1.003 (enable)

42	HVAC Status	Comfort mode HVAC mode	1 bit 1 byte	CRT
43	HVAC Status	Night mode	1 bit	CRT
44	HVAC Status	Frost/heat protection mode	1 bit	CRT
45	HVAC Status	Standby mode	1 bit	CRT

This object is used to feedback the HVAC mode of current controller. It will be sent to the bus when changing, definition of object value refers to object 31, 32, 33, 34.

DPT: 1.003 (enable)/ 20.102 (HVAC mode)

46	HVAC Status	Heating /Cooling mode	1 bit	CRT
-----------	--------------------	------------------------------	--------------	------------

This object is used to feedback heating /cooling status of current controller, being sent to the bus when changing, "0" means cooling, "1" means heating.

DPT:1.100 (cooling/heating)

4.3. Fan Control

X: 1...3, Y: 1...4

Object No	Object Name	Function	Type	Flags
10	Fan	Fan speed	1 bit	CW

To single fan speed, the objects is 1 bit type, which is used to switch on/off fan.

Telegram "0" ----- fan OFF

"1" ----- fan ON

To multi fan speed, the objects is 1 byte, which is used to switch on/off each level fan speed. There's only one level fan speed is switching on at the same time, meanwhile, a new fan speed is switched on taking the start-up phase into consideration. Corresponding fan speed of object value is as follows:

Telegram value:

< threshold value 1 ----- the fan off

>= threshold value 1 ----- fan speed 1

>= threshold value 2 ----- fan speed 2

>= threshold value 3 ----- fan speed 3

DPT: 1.001 (switch)

11, 12, 13	Fan	Fan speed X	1 bit	CW
------------	-----	-------------	-------	----

The communication object is available in multi-level fan speed

The communication object can switch on the fan speed X.

If several On telegrams are received consecutively in a short period of time at various fan speed 1-3 communication objects, the value last received by the fan control is the decisive value.

An OFF telegram to one of the three communication objects, fan speed 1-3, switches off the fan completely.

Telegram value:

0: Fan OFF

1: Fan ON

DPT: 1.001 (switch)

14	Fan	Fan speed Up/Down	1 bit	CW
----	-----	-------------------	-------	----

The object is available in multi-level fan speed.

With this communication object, the fan can be switched one fan speed further up or down. After the maximum or minimum speed is achieved, further UP/DOWN telegrams are ignored and not executed.

Telegram value:

0: Switch fan speed DOWN

1: Switch fan speed UP

DPT: 1.008 (Up/Down)

15	Fan	Status Fan ON/OFF	1 bit	CRT
----	-----	-------------------	-------	-----

This object used to send fan OFF/ON status to the bus. As long as there's fan speed, the fan is switching on.

Telegram value:

0: Fan OFF

1: Fan ON

DPT: 1.001 (Switch)

16	Fan	Status Fan Speed	1 byte	CRT
-----------	------------	-------------------------	---------------	------------

The object is available in multi-level fan speed

The object is used to send current operating speed to the bus. Parameter "Object value for Status Fan speed X [1...255] appoint telegram value corresponded by per level fan speed.

Telegram "0": fan OFF

DPT: 5.010 (counter pulses (0...255))

17,18,19	Fan	Status Fan Speed X	1 bit	CRT
-----------------	------------	---------------------------	--------------	------------

The object is available in multi-level fan speed.

The object is used to send operating status of fan speed 1 to the bus.

Telegram value:

0: Fan speed x OFF

1: Fan speed X ON

DPT: 1.001 (switch)

20	Fan	Automatic function	1 bit	CW
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This communication object is used to activate automatic operation.

After power-down reset or programming, the automatic operation whether is activated by the parameter settings. Normal operation can exit automatic operations. After the automatic operation is exited, the limit states under the automatic operation will remain, and will be activated again when the automatic operation is entered again.

Under automatic operation, if the forced operation is activated, the automatic operation is still active, except that the state of the fan allowed to operate is determined by the forced operation, and the fan speed allowed under the forced operation is followed.

If the parameter "carry out auto. Operation when the object value is" is set to "0":

Telegram value:

0: The Auto. Operation active

1: The Auto. operation inactive

If the parameter "carry out auto. Operation when the object value is set to "1":

Telegram value:

0: The Auto. Operation inactive

1: The Auto. operation active

The general operation as the following objects can active the operation like:

Object 10: Fan Speed

Object 11, 12, 13: Fan speed X

Object 14: Fan speed UP/DOWN

DPT: 1.003 (enable)

21	Fan	Status Automatic	1 bit	CRT
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This communication object is used to send the status of automatic operations to the bus.

Telegram value:

0: The Auto. operation inactive

1: The Auto. operation active

DPT: 1.003 (enable)

22, 23, 24, 25	Fan	Fan Limitation Y	1 bit	CW
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The limitation 1 is active if a telegram “1” is received on the object. The limitation 1 is deactivated if a telegram “0” is received on the object.

When the limitation 1 is activated, the fan speed at which the fan is allowed to operate under limit 1 is set by the parameter “Fan limitation Y”

Telegram value :

0: limitation Y inactive

1: limitation Y active

DPT: 1.003 (enable)

26	Fan	Forced operation	1 bit	CW
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The communication object is used to activate the forced operation.

When the forced operation is activated, the fan speed that the fan can operate is set by the parameter "Behaviour on Forced operation is" or Limitation on forced operation". Meanwhile, during Forced operation, the limits setting in Automatic operation is ignored, like the Fan Limitation 1 to 4.

If the parameter "forced operation on object value is set to "0":

Telegram value:

0: forced operation

1: no forced operation

If the parameter "forced operation on object value is set to "1":

Telegram value:

1: forced operation

0: no forced operation

DPT: 1.003 (enable)

4.4. Coil Output

Object No	Object Name	Function	Type	Flags
28	HVAC	Disable, Heating	1 bit	CW

Through this communication object, the heating valve can be disabled or enabled. When disabled, the valve position is immediately adjust back to 0% (off state), and when enabled again, the valve operates according to the current control value. For details, see the description of the relevant parameters in section 3.6 and 3.7.
DPT: 1.003 (enable)

29	HVAC	Disable, cooling	1 bit	CW
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Refer to communication object 28.

DPT: 1.003 (enable)

34	Valve Heating/ Cooling	Control value	1 bit/ 1 byte	CW
38	Valve Cooling	Control Value	1 bit/ 1 byte	CW

The object is used to receive valve control value from other controllers

If heating valve and cooling valve share one object (34) to receive valve control value, decided by parameter setup, so heating and cooling will switch via object 30 (Switch heating/ cooling mode).

Control value can be 1 bit or 1 byte, which is decided by parameter setup.

DPT: 1.001(switch)/ 5.001(Percentage)

35, 39	Valve Heating/Cooling	Trigger valve purge	1 bit	CW
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The communication is used to trigger the valve purge. When the valve purge is triggered, the valve will be fully opened.

Telegram value:

0: end valve purge

1: start valve purge

DPT: 1.003 (enable)

36, 40	Valve Heating/Cooling	Status of valve purge	1 bit	CRT
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This communication object is used to indicate the cleaning status of the valve. Once the cleaning function is activated, its status immediately indicated.

Telegram value:

0: Valve purge not active

1: Valve purge active

DPT: 1.003 (enable)

37	Valve Heating/Cooling	Status of valve position	1 bit	CRT
-----------	------------------------------	---------------------------------	--------------	------------

This object is used to indicate the switch status of the valve.

Telegram value:

0: Valve off

1: Valve on

DPT: 1.001 (switch)

42	HVAC	Control value fault	1 bit	CRT
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When controller is bus control, and control value monitors enabling, the object will be visible.

When the present device can not punctually receive the control valve sent by outer controller, this object will report error of the control value. Once control value is received, error status will be relieved.

Telegram:

0: No mistake

1: mistake occur

DPT: 1.005 (alarm)

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