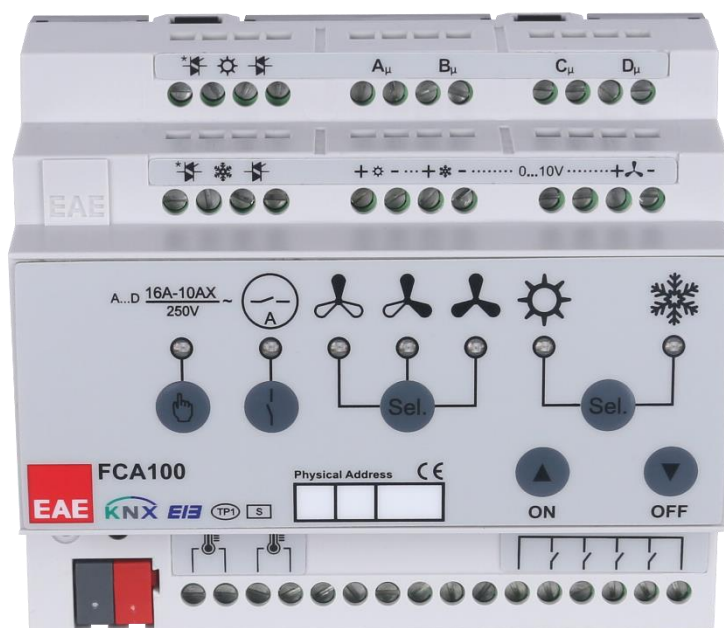


EAE KNX FANCOIL ACTUATOR



Product Order Nr: 48132

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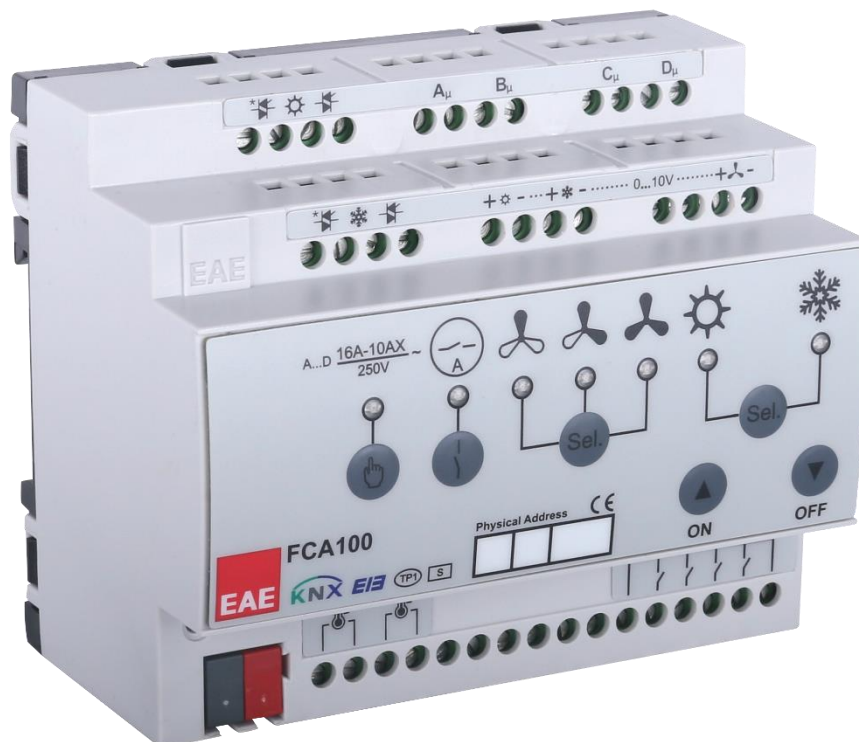
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1. General Features

EAE KNX Fan Coil Actuator FCA100 is designed to work with 2-pipe or 4-pipe Fan coil systems. The device can be operated manually via push buttons. It can be programmed via ETS4 or above.

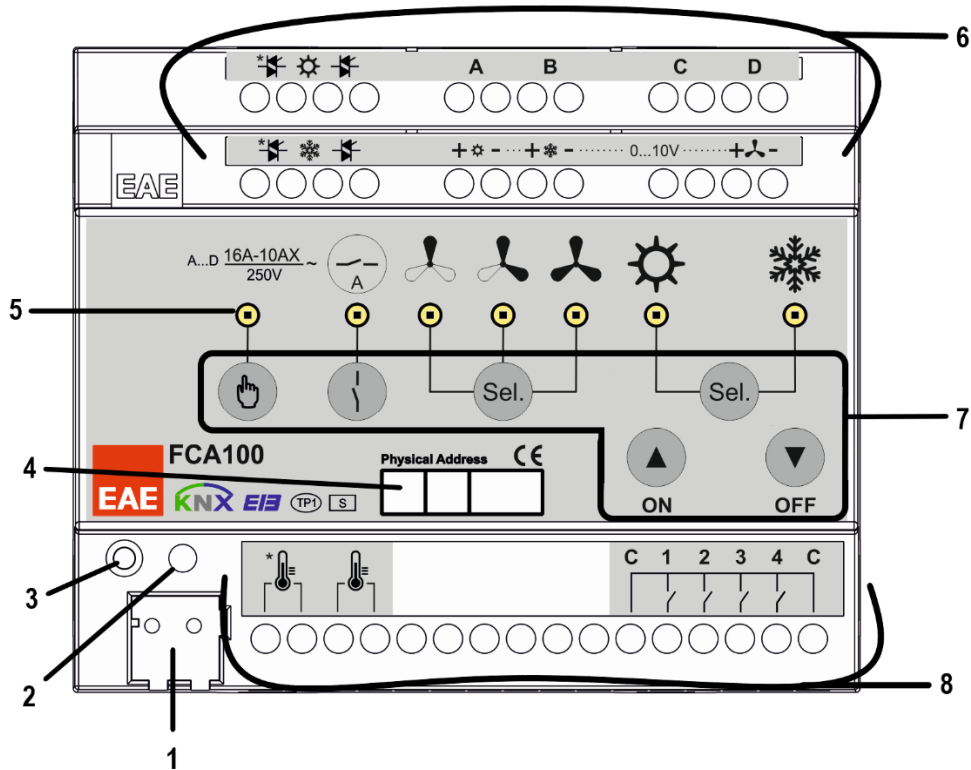


Fan coil actuator has;

- Triac controlled Valve Output
- Relay controlled Fan Output
- 0-10V controlled Valve Output
- 0-10V controlled Fan Output
- Auxiliary Output
- Temperature Input
- Binary Input

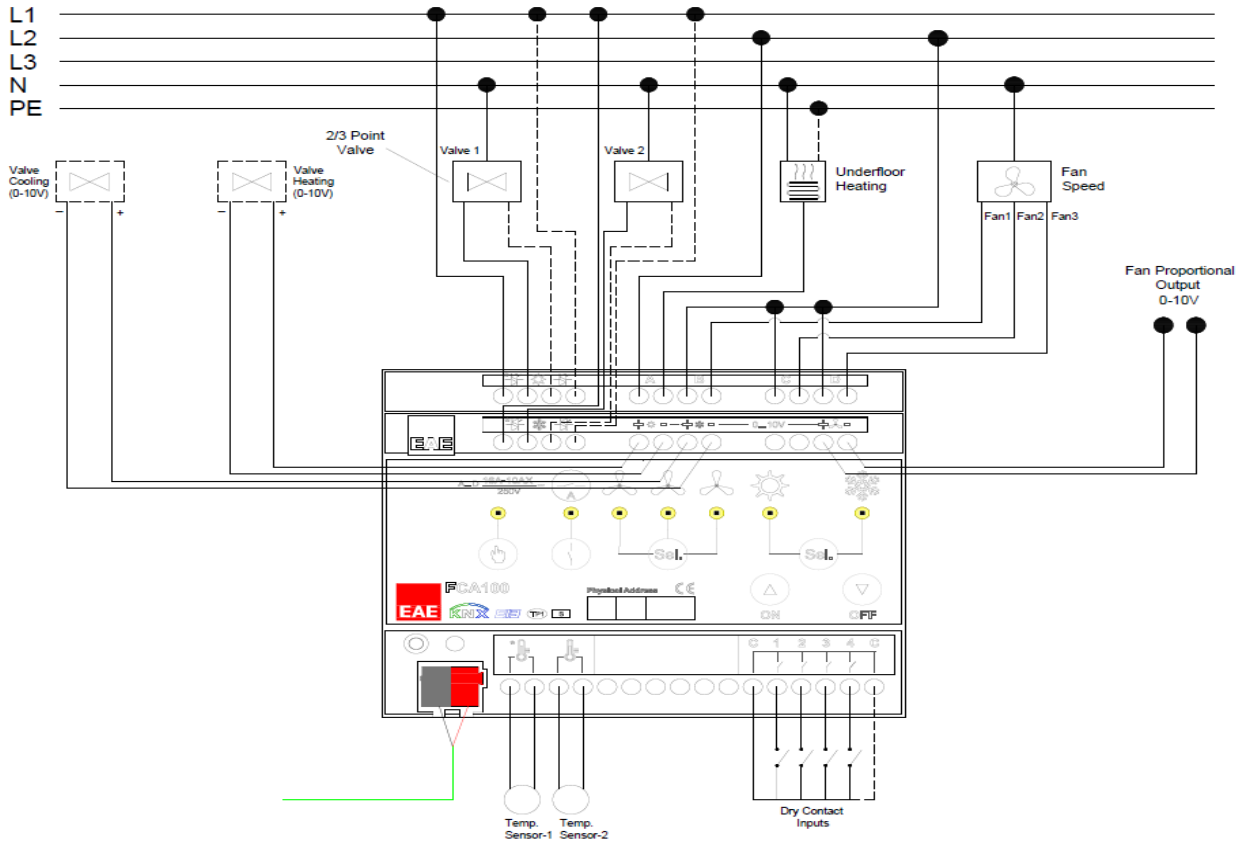
2. Device Technology

2.1. Device Peripherals



- 1- KNX Connection
- 2- Programming Button using for physical address assignment
- 3- Programming LED
- 4- Physical Address Label
- 5- Indicator LEDs
- 6- Triac and 0-10V Outputs
- 7- Selection Buttons
- 8- Temperature and Binary Inputs

2.2. Connection Diagram



2.3. Technical Data

Type of protection	IP 20	EN 60 529
Safety class	II	EN 61 140
Power supply	- Voltage	21V... 30V DC, SELV
	- Current consumption	≤ 10 mA
External supply	-	-
Connections	- Screw terminals	0,5...3,31 mm ² solid and stranded wire 0,5...3,31 mm ² stranded wire with ferrule
	- Max tightening torque	0.5 Nm
	- KNX	Bus connect terminal
	Outputs	- Number
Triac	- Non-floating	Yes
	- Rated Voltage	250 V AC; 50/60 Hz
	- Rated Current	0.5 A
	- Short-Circuit Protection	Yes
Relay	- Switching voltage	250 V AC; 50/60 Hz
	- Switching current 250 V AC	16A / AC 1
	- Switching current 250 V AC, capacitive load	16A (200μF)
	- Maximum switching power	4000 VA
	- Mechanical life	> 1 x 10 ⁶
0-10 V	- Current Limit	1.4 mA
	- Signal	0...10V DC
	- Source/Sink	Source
Inputs	- Number	6 Inputs
Generic Input	- Scanning Voltage (for binary input)	5 V pulsed
	- Current (for binary input)	1 mA
	- Cable length	< 300 m
Temp. Input	- Sensor Type	NTC
Installation	- 35mm mounting rail	EN 60 715
Operating elements	- LED (red) and prg. Button-----→	For physical address
	- Manual Button-----→	Switching to manual mode
	- Sel. Buttons-----→	Fan speed and Heat/Cool change
	- ON / OFF Buttons-----→	Switching Valve ON / OFF
	- Switch Button-----→	Auxiliary Output Control
Temperature range	- Ambient	-5° C + 45° C
	- Storage	-25° C + 55° C
Humidity	- max. air humidity	85 % no moisture condensation
Dimensions		66 x W x 90mm
	Width W in mm	108 mm
	Width W in units (18 mm modules)	6 modules
Weight	0,395 kg	
Box	Plastic, polycarbonate, color grey	
CE	In accordance with the EMC guideline and low voltage	
Application program	Communications objects	Number of addresses(max)
	44	255

NOTE: Device default physical address is 15.15.255. In order to configure the FCA, ETS application file “.knxprod” is needed. It’s possible to download the file on EAE website. ETS 4 or higher is required for programming the device. Parameter settings and related group addresses can be changed by ETS. Learn more by reading ETS help file.

3. Communication Object Table

Object No	Name	Object Function	DPT Type	Value	Flags		
0	General	In operation	1.002	1 bit	CRT		
1	Input a	Switch	1.001	1 bit	CWT		
		Switch – short	1.001	1 bit	CWT		
		Window contact	1.008	1 bit	CRT		
		Dew point alarm	1.001	1 bit	CRT		
		Value/Forced Operation (- short)	1.001	1 bit	CRT		
			2.001	2 bit	CRT		
			5.001	1 Byte	CRT		
			8.001	2 Byte	CRT		
			7.001	2 Byte	CRT		
			14.000	4 Byte	CRT		
		12.001	4 Byte	CRT			
		2	Input a	Switch – long	1.001	1 bit	CWT
				Value/Forced Operation – long	1.001	1 bit	CRT
2.001	2 bit				CRT		
5.001	1 Byte				CRT		
8.001	2 Byte				CRT		
7.001	2 Byte				CRT		
14.000	4 Byte				CRT		
12.001	4 Byte			CRT			
3	Input a	Disable	1.001	1 bit	CW		
4	Input b	Switch	1.001	1 bit	CWT		
		Switch – short	1.001	1 bit	CWT		
		Window contact	1.008	1 bit	CRT		
		Dew point alarm	1.001	1 bit	CRT		
		Value/Forced Operation (- short)	1.001	1 bit	CRT		
			2.001	2 bit	CRT		
			5.001	1 Byte	CRT		
			8.001	2 Byte	CRT		
			7.001	2 Byte	CRT		
			14.000	4 Byte	CRT		
		12.001	4 Byte	CRT			
		5	Input b	Switch – long	1.001	1 bit	CWT
				Value/Forced Operation – long	1.001	1 bit	CRT
2.001	2 bit				CRT		
5.001	1 Byte				CRT		
8.001	2 Byte				CRT		
7.001	2 Byte				CRT		
14.000	4 Byte				CRT		
12.001	4 Byte	CRT					
6	Input b	Disable	1.001	1 bit	CW		

Object No	Name	Object Function	DPT Type	Value	Flags		
7	Input c	Switch	1.001	1 bit	CWT		
		Switch – short	1.001	1 bit	CWT		
		Window contact	1.008	1 bit	CRT		
		Dew point alarm	1.001	1 bit	CRT		
		Value/Forced Operation (- short)	1.001	1 bit	CRT		
			2.001	2 bit	CRT		
			5.001	1 Byte	CRT		
			8.001	2 Byte	CRT		
			7.001	2 Byte	CRT		
			14.000	4 Byte	CRT		
8	Input c	12.001	4 Byte	CRT			
		Switch – long	1.001	1 bit	CWT		
		Value/Forced Operation – long	1.001	1 bit	CRT		
			2.001	2 bit	CRT		
			5.001	1 Byte	CRT		
			8.001	2 Byte	CRT		
			7.001	2 Byte	CRT		
14.000	4 Byte		CRT				
9	Input c	12.001	4 Byte	CRT			
		Disable	1.001	1 bit	CW		
		10	Input d	Switch	1.001	1 bit	CWT
				Switch – short	1.001	1 bit	CWT
				Window contact	1.008	1 bit	CRT
				Dew point alarm	1.001	1 bit	CRT
				Value/Forced Operation (- short)	1.001	1 bit	CRT
2.001	2 bit				CRT		
5.001	1 Byte				CRT		
8.001	2 Byte				CRT		
7.001	2 Byte				CRT		
14.000	4 Byte				CRT		
11	Input d	12.001	4 Byte	CRT			
		Switch – long	1.001	1 bit	CWT		
		Value/Forced Operation – long	1.001	1 bit	CRT		
			2.001	2 bit	CRT		
			5.001	1 Byte	CRT		
			8.001	2 Byte	CRT		
			7.001	2 Byte	CRT		
14.000	4 Byte		CRT				
12	Input d	12.001	4 Byte	CRT			
		Disable	1.001	1 bit	CW		

Object No	Name	Object Function	DPT Type	Value	Flags
13	Temp. Sensor 1	Current Temperature 1 (°C / °F)	(°C)9.001 / (°F)9.027	2 Byte	CRT
14	Temp. Sensor 2	Current Temperature 2 (°C / °F)	(°C)9.001 / (°F)9.027	2 Byte	CRT
15	Temp. Sensor 1&2	Average Temperature 2 (°C / °F)	(°C)9.001 / (°F)9.027	2 Byte	CRT

16	Auxiliary Output	Switch Auxiliary	1.001	1 bit	CW
17		Status Switch Auxiliary	1.001	1 bit	CRT

18	Switching Output 1	Switch Output 1	1.001	1 bit	CW	
19		Status Switch Output 1	1.001	1 bit	CRT	
20	Switching Output 2	Switch Output 2	1.001	1 bit	CW	
21		Status Switch Output 2	1.001	1 bit	CRT	
22	Switching Output 3	Switch Output 3	1.001	1 bit	CW	
23		Status Switch Output 3	1.001	1 bit	CRT	
24	Valve Control	Heating/Cooling Switchover	1.100	1 bit	CW	
			20.105	1 Byte		
25		Status Heating/Cooling Switchover	1.100	1 bit	CRT	
		Status Heating/Cooling Switchover	20.105	1 Byte	CRT	
26		Heat Control Value (%0...%100)	5.001	1 Byte	CW	
		Heat/Cool Control Value (%0...%100)	5.001	1 Byte	CW	
27		Cool Control Value (%0...%100)	5.001	1 Byte	CW	
28		Status Heat Control Value (%0...%100)	5.001	1 Byte	CRT	
		Status Heat/Cool Control Value (%0...%100)	5.001	1 Byte	CRT	
29		Status Cool Control Value (%0...%100)	5.001	1 Byte	CRT	
30		Status Heat Mode	1.001	1 bit	CRT	
31		Status Cool Mode	1.001	1 bit	CRT	
32		Fan Control	Fan Speed (%0...%100)	5.001	1 Byte	CW
33			Fan Speed 1	1.002	1 bit	CW
34	Fan Speed 2		1.002	1 bit	CW	
35	Fan Speed 3		1.002	1 bit	CW	
36	Status Fan Speed (%0...%100)		5.001	1 Byte	CRT	
37	Status Fan Speed 1		1.002	1 bit	CRT	
38	Status Fan Speed 2		1.002	1 bit	CRT	
39	Status Fan Speed 3		1.002	1 bit	CRT	
40	Fan Automatic		1.002	1 bit	CW	
41	Status Fan Automatic		1.002	1 bit	CRT	
42	Errors	Heating Valve Short Circuit	1.005	1 bit	CRT	
43		Cooling Valve Short Circuit	1.005	1 bit	CRT	

4. Parameters

4.1. General Parameters

4.1.1. In Operation

Enable In operation

***Disable**

Enable

This object is using to report device still alive and connected the KNX bus line. Telegram value is selectable as "0" or "1". If telegram is not received, device may be defective or KNX cable may be interrupted.

If the parameter selected "Enable";

In Operation bit

Off

***On**

This parameter is used to select "In Operation" telegram value.

In Operation send interval (sec)

*1... *300...65535*

This parameter defines the "In operation" sending period. In operation information will be sent to KNX line at the end of the period time.

4.1.2. Telegram Limiting

<i>Enable Telegram Limit</i>	<i>Enable</i> <i>*Disable</i>
------------------------------	----------------------------------

This parameter is used to limit the sending telegrams in a period time. If parameter selected "**Enable**"; "**Telegram limit count**" and "**Telegram limit period duration**" parameters will be shown.

<i>Telegram limit period</i>	<i>*50ms</i> <i>100ms</i> <i>200ms</i> <i>500ms</i> <i>1s</i> <i>2s</i> <i>5s</i> <i>10s</i> <i>30s</i> <i>1min</i>
------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------

The limit period can be adjusted via this parameter.

<i>Maximum telegram count in period</i>	<i>1... *10...255</i>
-----------------------------------------	-----------------------

Max number of telegrams can be sent in period time.

NOTE: If the value of the object cannot send in the time of period, the object value will be buffered for the next period time.

NOTE: The buffered object value will be updated if the object value is updated.

4.1.3. Manual Operation

Enable manual operation

Disable

****Enable***

This parameter is used to enable or disable manual operation. FCA100 has manual operation buttons to control device outputs via related buttons below.

- Auxiliary Switch Button
- Fan Speed Select Button
- HVAC Mode Select Button
- Valve ON, OFF Buttons

- Set the parameter to “Disable”
This selection is used to disable manual operation.
- Set the parameter to “Enable”
This selection is used to enable manual operation.

Reset manual operation to KNX operation

automatically and via push button

**** via push button***

This parameter can be used to select the Manual Operation disabling method.

- Set the parameter to “via push button”
This selection is used to allow the manual operation deactivating via push button only.
- Set the parameter to “automatically and via push button”
This selection is used to disable the Manual Operation automatically at end of the timeout time or manually.

Time for automatic reset (sec)

*1... *30...255*

This parameter will be displayed if “Reset manual operation to KNX operation” is selected “automatically and via push button”. Automatic disabling of Manual Operation time can be selected as desired.

4.2. Functions

4.2.1. HVAC Settings

<i>Valve control type</i>	<i>*standard</i> <i>0-10 V</i>
---------------------------	------------------------------------------

This parameter is used to select the valve control method based on valve control type.

- Set the parameter to “standard”
This selection is used to control the valves via Triac Outputs.
- Set the parameter to “0-10 V”
This selection is used to control the valves via 0-10 V Outputs.

<i>Fan Control Type</i>	<i>*standard</i> <i>0-10 V</i>
-------------------------	------------------------------------------

This parameter is used to select the fan control type.

- Set the parameter to “standard”
This selection is used to control the fans via Relay Outputs.
- Set the parameter to “0-10 V”
This selection is used to control the fans via 0-10 V Outputs. Moreover, Fan Speed Relays will be converted to 3 Switching Outputs, additionally.

<i>Control Mode</i>	<i>*Heating</i> <i>Cooling</i> <i>Heating and cooling</i>
---------------------	------------------------------------------------------------------------

This parameter is used to select the control mode.

- Set the parameter to “Heating”
This selection enables Heating Control only. Heating Valve Outputs (Triac or 0-10 V) will be enabled. Cooling Outputs (Triac or 0-10 V) will not be available.
- Set the parameter to “Cooling”
This selection enables Cooling Control only. Cooling Valve Outputs (Triac or 0-10 V) will be enabled. Heating Outputs (Triac or 0-10 V) will not be available.
- Set the parameter to “Heating and cooling”
This selection enables Heating and Cooling Control. Heating and Cooling Valve Outputs (Triac or 0-10 V) will be enabled. Additional functions will appear if this parameter selected.

<i>Type of heating/cooling system</i>	*2-pipe 4-pipe
---------------------------------------	--------------------------

This parameter is shown if “**Control mode**” is selected as “**Heating and cooling**”. It is used to select HVAC system type. It is very important to select the correct configuration. Otherwise, the valves may not be controlled properly.

- Set the parameter to “2-pipe”
This selection enables one valve control for output only. Heating or Cooling valve will be controlled according to Switchover object value. This function is suitable for 2-pipe Fan Coil systems.
- Set the parameter to “4-pipe”
This selection enables valve control outputs separately. Heating or Cooling valve will be controlled according to Switchover object value. This function is suitable for 4-pipe Fan Coil systems.

<i>Heat/Cool comm. object type</i>	*Common Separate
------------------------------------	----------------------------

This parameter is shown if “*Type of heating/cooling system*” is selected as “**4-pipe**”. It is used to select the Heating and Cooling Valve control value group object type.

- Set the parameter to “Common”
If this parameter is selected, the single group object will be appeared for Heating and Cooling Valve control. Heating and Cooling Valve control value objects will be merged.
- Set the parameter to “Separate”
This selection enables valve control outputs on separate group objects, but the both outputs can’t be activated at the same time. Heating or Cooling Valve will be controlled according to the Switchover object value.

<i>Switchover object type</i>	*1 bit (DPT 1.100) 1 Byte (DPT 20.105)
-------------------------------	--------------------------------------------------

This parameter is shown if “**Control mode**” is selected as “**Heating and cooling**”. The selection applies for both Switchover Control & Switchover Status objects.

- Set the parameter to “1 bit (DPT 1.100)”
If this parameter is selected, there will be a 1-bit group object to select Heating/Cooling mode. “0” for Cooling Mode, “1” for Heating Mode
- Set the parameter to “1 Byte (DPT 20.105)”
If this parameter is selected, there will be a 1-Byte group object to select Heating/Cooling Valve control. “01” for Heating Mode, “03” for Cooling Mode

<i>Send switchover status</i>	<i>Cyclic</i> <i>*on Change</i> <i>on Request</i>
-------------------------------	---------------------------------------------------------

This parameter is shown if “**Control mode**” is selected as “**Heating and cooling**”. It is used to select the status sending method of the Switchover.

- Set the parameter to “Cyclic”
This selection is used to send the Switchover status cyclically. The switchover status will be sent at the end of the cyclic duration regardless to the switchover mode changes.
- Set the parameter to “on Change”
This selection is used to send the Switchover status on Switchover Mode changes.
- Set the parameter to “on Request”
This selection is used to send the Switchover status when requested on related group object.

<i>Cyclic sending interval</i>	<i>1... *300...65535 s</i>
--------------------------------	----------------------------

This parameter will be shown, if “**Send switchover status**” parameter is selected as “**Cyclic**”. Status of Switchover will be sent at the end of the interval.

4.2.2. Behaviors

Bus voltage failure, return, ETS Download/Reset behaviors will be explained in this section.

4.2.2.1. Bus Voltage Failure

<i>Fan output</i>	*Unchanged <i>Off</i>
-------------------	---------------------------------

If the “**Fan control type**” is selected as “**standard (1-3 step)**”, this parameter will be shown. It is used to select behavior for fan output in case of bus voltage failure.

- Set the parameter to “Unchanged”
If this parameter selected, Fan Outputs will remain in the current position.
- Set the parameter to “Off”
If this parameter selected, Fan Outputs will be switched off.

<i>Switching output 1, 2, 3</i>	*Unchanged <i>On</i> <i>Off</i>
---------------------------------	----------------------------------------------

If the “**Fan control type**” is selected “**0-10V**”, this parameter will be shown. It is used to select behavior for the switching outputs in case of bus voltage failure. All switching outputs can be parameterized separately.

NOTE: Fan relays will be converted to the switching outputs (1, 2, 3) due to 0-10V control.

- Set the parameter to “Unchanged”
If this parameter selected, related Switching Output will remain in the current position.
- Set the parameter to “Off”
If this parameter selected, related Switching Output will be switched OFF.
- Set the parameter to “On”
If this parameter selected, related Switching Output will be switched ON.

<i>Auxiliary output</i>	*Unchanged <i>On</i> <i>Off</i>
-------------------------	----------------------------------------------

This parameter is used to select the Auxiliary output behavior in case of bus voltage failure.

- Set the parameter to “Unchanged”
If this parameter selected, Auxiliary Output will remain in the current position.
- Set the parameter to “Off”
If this parameter selected, Auxiliary Output will be switched OFF.
- Set the parameter to “On”
If this parameter selected, Auxiliary Output will be switched ON.

4.2.2.2. After Bus Voltage Recovery

Heating/Cooling mode

****As before bus voltage failure***

Heating

Cooling

This parameter will be shown, if “**Control mode**” is selected as “**Heating and Cooling**”. It is used to select the Control Mode after Bus Voltage Recovery.

- Set the parameter to “As before bus voltage failure”
 If this parameter selected, the Control Mode will be processed as before bus voltage failure.
- Set the parameter to “Heating”
 If this parameter selected, the Control Mode will start in Heating Mode.
- Set the parameter to “Cooling”
 If this parameter selected, the Control Mode will start in Cooling Mode.

Control Value

****As before bus voltage failure***

Select

This parameter is used to select control value of the related valve on Bus Voltage Recovery.

- Set the parameter to “As before bus voltage failure”
 If this parameter selected, the Valve Control value will remain as before bus voltage failure.
- Set the parameter to “Select”
 If this parameter selected, the Valve Control value will be set as user-defined value after bus voltage recovery.

Value

****0...100 %***

This parameter is shown, if “**Control Value**” is selected as “**Select**” above. It is used to define the valve control value on Bus Voltage Recovery.

Fan output

****As before bus voltage failure***

Applies control value (Automatic)

Speed 1

Speed 2

Speed 3

If the “**Fan control type**” is selected as “**standard (1-3 step)**”, this parameter will be shown. It is used to select behavior for fan output after of bus voltage recovery.

- Set the parameter to “As before bus voltage failure”
If this parameter selected, Fan Output will remain as before bus voltage failure.
- Set the parameter to “Applies control value (Automatic)”
If this parameter selected, Fan Output will be processed according to control value.
- Set the parameter to “Speed 1”
If this parameter selected, Fan Output will be at Speed 1 after bus voltage recovery.
- Set the parameter to “Speed 2”
If this parameter selected, Fan Output will be at Speed 2 after bus voltage recovery.
- Set the parameter to “Speed 3”
If this parameter selected, Fan Output will be at Speed 3 after bus voltage recovery.

NOTE: If any Fan Speed selected in this parameter (Speed 1 or 2 or 3), Fan Automatic will be disabled. Therefore, the Control Value will not affect the fan speeds until the Fan Automatic object enabling manually.

Fan output

***Unchanged**

Applies control value (Automatic)

33 %

66 %

100 %

If the "**Fan control type**" is selected as "**0-10 V**", These parameters will be shown. It is used to select behavior for fan output on bus voltage recovery.

- Set the parameter to "As before bus voltage failure"
If this parameter selected, 0-10 V Fan Output will remain as before bus voltage failure.
- Set the parameter to "Applies control value (Automatic)"
If this parameter selected, 0-10 V Fan Output will be processed according to the control value.
- Set the parameter to "33 %"
If this parameter selected, 0-10 V Fan Output will be 33 % after bus voltage recovery.
- Set the parameter to "66 %"
If this parameter selected, 0-10 V Fan Output will be 66 % after bus voltage recovery.
- Set the parameter to "100 %"
If this parameter selected, 0-10 V Fan Output will be 100 % after bus voltage recovery.

NOTE: If any Fan Speed percentage selected in this parameter (Speed 33 % or 66 % or 100 %), Fan Automatic will be disabled. Therefore, the Control Value will not affect the fan speeds until the Fan Automatic object enabling manually.

Switching output 1, 2, 3

***Unchanged**

On

Off

If the "**Fan control type**" is selected "**0-10V**", these parameters will be shown. It is used to select behavior for the switching outputs on bus voltage recovery. All switching outputs can be parameterized separately.

NOTE: Fan relays will be converted to the switching outputs (1, 2, 3) due to 0-10V control.

- Set the parameter to "Unchanged"
If this parameter selected, related Switching Output will remain in the current position.
- Set the parameter to "Off"
If this parameter selected, related Switching Output will be switched OFF.
- Set the parameter to "On"
If this parameter selected, related Switching Output will be switched ON.

<i>Auxiliary output</i>	*Unchanged
	<i>On</i>
	<i>Off</i>

This parameter is used to select the Auxiliary output behavior on bus voltage recovery.

- Set the parameter to “Unchanged”
If this parameter selected, Auxiliary Output will remain in the current position.
- Set the parameter to “Off”
If this parameter selected, on Auxiliary Output will be switched OFF after bus voltage recovery.
- Set the parameter to “On”
If this parameter selected, on Auxiliary Output will be switched ON after bus voltage recovery.

<i>Switching output 1, 2, 3</i>	*Unchanged
	<i>On</i>
	<i>Off</i>

If the “**Fan control type**” is selected “**0-10V**”, these parameters will be shown. It is used to select behavior for the switching outputs in case of bus voltage failure. All switching outputs can be parameterized separately and independently.

NOTE: Fan relays will be converted to the switching outputs (1, 2, 3) due to 0-10V control.

- Set the parameter to “Unchanged”
If this parameter selected, related Switching Output will remain in the current position.
- Set the parameter to “Off”
If this parameter selected, related Switching Output will be switched OFF.
- Set the parameter to “On”
If this parameter selected, related Switching Output will be switched ON.

4.2.2.3. Reaction after ETS download/reset

<i>Heating/Cooling mode</i>	*Heating
	<i>Cooling</i>

This parameter will be shown, if “**Control mode**” is selected as “**Heating and Cooling**”. It is used to select the Control Mode after ETS download/reset.

- Set the parameter to “Heating”
If this parameter selected, the Control Mode will start in Heating Mode.
- Set the parameter to “Cooling”
If this parameter selected, the Control Mode will start in Cooling Mode.

<i>Control Value</i>	*Unchanged
	<i>Select</i>

This parameter is used to select control value of the related valve after ETS download/reset.

- Set the parameter to “Unchanged”
If this parameter selected, the Valve Control value will remain as before ETS download/reset.
- Set the parameter to “Select”
If this parameter selected, the Valve Control value will be set as user-defined value after ETS download/reset.

<i>Value</i>	*0...100 %
--------------	-------------------

This parameter is shown, if “**Control Value**” is selected as “**Select**” above. It is used to define the valve control value after ETS download/reset.

Fan output

***Unchanged**

Applies control value (Automatic)

Speed 1

Speed 2

Speed 3

If the "**Fan control type**" is selected as "**standard (1-3 step)**", this parameter will be shown. It is used to select behavior for fan output after ETS download/reset.

- Set the parameter to "Unchanged"
If this parameter selected, Fan Outputs will remain as before ETS download/reset.
- Set the parameter to "Applies control value (Automatic)"
If this parameter selected, Fan Output will be processed according to control value.
- Set the parameter to "Speed 1"
If this parameter selected, Fan Output will be set Speed 1 after ETS download/reset.
- Set the parameter to "Speed 2"
If this parameter selected, Fan Output will be set Speed 2 after ETS download/reset.
- Set the parameter to "Speed 3"
If this parameter selected, Fan Output will be set Speed 3 after ETS download/reset.

NOTE: If any Fan Speed selected in this parameter (Speed 1 or 2 or 3), Fan Automatic will be disabled. Therefore, the Control Value will not affect the fan speeds until the Fan Automatic object enabling manually.

Fan output

***Unchanged**

Applies control value (Automatic)

33 %

66 %

100 %

If the "**Fan control type**" is selected as "**0-10 V**", this parameter will be shown. It is used to select behavior for fan output after ETS download/reset.

- Set the parameter to "As before bus voltage failure"
If this parameter selected, 0-10 V Fan Output will remain as before ETS download/reset.
- Set the parameter to "Applies control value (Automatic)"
If this parameter selected, 0-10 V Fan Output will be processed according to the control value.
- Set the parameter to "33 %"
If this parameter selected, 0-10 V Fan Output will be 33 % after ETS download/reset.
- Set the parameter to "66 %"
If this parameter selected, 0-10 V Fan Output will be 66 % after ETS download/reset.
- Set the parameter to "100 %"
If this parameter selected, 0-10 V Fan Output will be 100 % after ETS download/reset.

NOTE: If any Fan Speed percentage selected in this parameter (Speed 33 % or 66 % or 100 %), Fan Automatic will be disabled. Therefore, the Control Value will not affect the fan speeds until the Fan Automatic object enabling manually.

Switching output 1, 2, 3

***Unchanged**

On

Off

If the "**Fan control type**" is selected "**0-10V**", these parameters will be shown. It is used to select behavior for the switching outputs after ETS download/reset. All switching outputs can be parameterized separately.

NOTE: Fan relays will be converted to the switching outputs (1, 2, 3) due to 0-10V control.

- Set the parameter to "Unchanged"
If this parameter selected, related Switching Output will remain in the current position before ETS download/reset.
- Set the parameter to "Off"
If this parameter selected, related Switching Output will be switched OFF after ETS download/reset.
- Set the parameter to "On"
If this parameter selected, related Switching Output will be switched ON after ETS download/reset.

Auxiliary output

****Unchanged***

On

Off

This parameter is used to select the Auxiliary output behavior after ETS download/reset.

- Set the parameter to “Unchanged”
If this parameter selected, Auxiliary Output will remain in the current position before ETS download/reset.
- Set the parameter to “Off”
If this parameter selected, Auxiliary Output will be switched OFF after ETS download/reset.
- Set the parameter to “On”
If this parameter selected, Auxiliary Output will be switched ON after ETS download/reset.

4.3. Heating Valve (Standard Control)

Heating Valve Standard Control parameters tab will be shown if the “**Valve control type**” is selected as “**standard**” and “**Control mode**” is selected as “**Heating**” or “**Heating and cooling**” in the “**Functions**” parameters page.

<i>Valve output</i>	*Thermoelectric (PWM) <i>Motor-driven (3-point)</i> <i>Open/Close signal</i>
---------------------	-------------------------------------------------------------------------------------------

This parameter is used to select valve driving method.

- Set the parameter to “Thermoelectric (PWM)”
If this parameter selected, the Heating Valve will be driven with PWM method. Single Triac Output (Heating) will be used.
- Set the parameter to “Motor-driven (3-point)”
If this parameter selected, the Heating Valve will be driven with floating (3-point) control method. Both Triac Outputs (Heating) will be used.
- Set the parameter to “Open/Close signal”
If this parameter selected, the Heating Valve will be driven Open/Close control method. Single Triac Output (Heating) will be used.

<i>Cyclic transmission of Heating Status</i>	<i>1... *100 x10 s</i>
----------------------------------------------	------------------------

This parameter is used to set-up the cyclical sending of Heating Status. 1-bit Heating Status object value will be sent at the end of the cycle duration.

<i>Send status values</i>	<i>Cyclic</i> *on Change <i>on Request</i>
---------------------------	---------------------------------------------------------

This parameter is used to select the status sending method of the Heating Control Value.

- Set the parameter to “Cyclic”
This selection is used to send the Heating Control Value status cyclically. The Heating Control Value status will be sent at the end of the cyclic duration regardless to the Heating Control Value changes.
- Set the parameter to “on Change”
This selection is used to send the Heating Control Value status regarding to the Heating Control Value changes.
- Set the parameter to “on Request”
This selection is used to send the Heating Control Value status when requested on related group object.

<i>Cyclic sending interval</i>	<i>1... *300...65535 s</i>
--------------------------------	----------------------------

This parameter will be shown, if “**Send status values**” parameter is selected as “**Cyclic**”. Status of Heating Control Value will be sent at the end of the time.

4.3.1. Thermoelectric (PWM)

<i>Valve drive operating principle, de-energized</i>	*Closed
	<i>Open</i>

This parameter is used to select valve position when de-energized (without supply power).

- Set the parameter to “Closed”
If this parameter selected, the Heating Valve output contacts will be open at OFF position.
When the valve driving needed, the related output contact will be closed.

- Set the parameter to “Open”
If this parameter selected, the Heating Valve output contacts will be closed at OFF position.
When the valve driving needed, the related output contact will be opened.

<i>PWM cycle time</i>	<i>1... *18...180 x10 s</i>
-----------------------	------------------------------------

This parameter is used to determine the PWM cycle time. Heating output active duration will be calculated according to PWM time and the control signal value.

Example; PWM Cycle Time= 180 seconds, Heat Control Signal = 30%

Heating Output Active duration = 54 seconds

Heating Output De-active duration = 126 seconds

<i>Valve drive opening/closing time (seconds)</i>	<i>1... *180...900</i>
---------------------------------------------------	-------------------------------

This parameter is used to determine the valve opening (0 % to 100 %) duration. This information can be found on the related valve datasheet.

NOTE: The device calibrates the valves to the 0 (zero) for “**Valve drive opening/closing time**” on ETS download/reset or bus voltage return.

4.3.2. Motor-driven (3-point)

<i>Reversing time (Milliseconds)</i>	<i>1...500...1000</i>
--------------------------------------	------------------------------

This parameter is used to determine the delay time on every valve direction change.

e.g. Consider that Valve is moving to 80% from 0%. If a signal sent for 30% when it has already passed the 50% then the Valve will be stopped for a "Reversing time" duration, then it will be driven to opposite direction (to 30%).

<i>Switch ON time for valve drive from 0 to 100 % (Seconds)</i>	<i>1...*120...900</i>
---------------------------------------------------------------------	------------------------------

This parameter is used to determine the valve opening (0 % to 100 %) duration.

NOTE: The device calibrates the valves to the 0 (zero) for "**Switch ON time for valve drive from 0 to 100 %**" on ETS download/reset or bus voltage return.

<i>Number of changes until adjustment</i>	<i>1...50...255 x10</i>
-------------------------------------------	--------------------------------

This parameter is used to calibrate the valve after the "**Number of changes until adjustment**" value is reached. The calibration will be handled via driving the valve to 0% for "0 to 100 % valve opening time". After calibration, the valve will be driven back to the last control position.

4.3.3. Open/Close Signal

<i>Valve drive operating principle, de-energized</i>	*Closed
	<i>Open</i>

This parameter is used to select valve position when de-energized.

- Set the parameter to “Closed”
If this parameter selected, the Heating Valve output contacts will be open at off position. When the valve driving needed, the related output contact will be closed.

- Set the parameter to “Open”
If this parameter selected, the Heating Valve output contacts will be closed at off position. When the valve driving needed, the related output contact will be opened.

<i>Open if control value greater than or equal to</i>	<i>0... *1...100 %</i>
-------------------------------------------------------	------------------------

This parameter is used to activate the valve output when the valve control signal greater than or equal to this value.

<i>Valve drive opening/closing time</i>	<i>1... *60...900</i>
-----------------------------------------	-----------------------

This parameter is used to determine the valve opening (0 % to 100 %) duration. This information can be found on the related valve datasheet.

NOTE: The device calibrates the valves to the 0(zero) for “**Valve drive opening/closing time**” on ETS download/reset or bus voltage return.

4.4. Heating Valve (0 – 10 V Control)

Heating Valve Standard Control parameters tab will be shown if the “**Valve control type**” is selected as “**0-10 V**” and “**Control mode**” is selected as “**Heating**” or “**Heating and cooling**” in the “**Functions**” parameters page.

<i>Voltage range valve control value</i>	*0 – 10 V <i>1 – 10 V</i> <i>2 – 10 V</i> <i>10 – 0 V</i>
------------------------------------------	---------------------------------------------------------------------------

This parameter is used to select the voltage range of analog output.

- Set the parameter to “0 – 10 V”
 If this parameter selected, the 0-10 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **0 V**
 15 % than output will be approx. = **1.5 V**
 100 % than output will be approx. = **10.0 V**
- Set the parameter to “1 – 10 V”
 If this parameter selected, the 1-10 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **1 V**
 15 % than output will be approx. = **2.3 V**
 100 % than output will be approx. = **10.0 V**
- Set the parameter to “2 – 10 V”
 If this parameter selected, the 2-10 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **2 V**
 15 % than output will be approx. = **3.2 V**
 100 % than output will be approx. = **10.0 V**
- Set the parameter to “10 – 0 V”
 If this parameter selected, the 10-0 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **10 V**
 15 % than output will be approx. = **8.5 V**
 100 % than output will be approx. = **0 V**

More detailed “control signal - voltage output proportion” table is written below.

“%” means Valve Control Signal

“2-10V 1-10V 10-0V” means Analog Output Types

%	2-10V	1-10V	10-0V	%	2-10V	1-10V	10-0V	%	2-10V	1-10V	10-0V
0	2	1	10	34	4,72	4,06	6,6	68	7,44	7,12	3,2
1	2,08	1,09	9,9	35	4,8	4,15	6,5	69	7,52	7,21	3,1
2	2,16	1,18	9,8	36	4,88	4,24	6,4	70	7,6	7,3	3
3	2,24	1,27	9,7	37	4,96	4,33	6,3	71	7,68	7,39	2,9
4	2,32	1,36	9,6	38	5,04	4,42	6,2	72	7,76	7,48	2,8
5	2,4	1,45	9,5	39	5,12	4,51	6,1	73	7,84	7,57	2,7
6	2,48	1,54	9,4	40	5,2	4,6	6	74	7,92	7,66	2,6
7	2,56	1,63	9,3	41	5,28	4,69	5,9	75	8	7,75	2,5
8	2,64	1,72	9,2	42	5,36	4,78	5,8	76	8,08	7,84	2,4
9	2,72	1,81	9,1	43	5,44	4,87	5,7	77	8,16	7,93	2,3
10	2,8	1,9	9	44	5,52	4,96	5,6	78	8,24	8,02	2,2
11	2,88	1,99	8,9	45	5,6	5,05	5,5	79	8,32	8,11	2,1
12	2,96	2,08	8,8	46	5,68	5,14	5,4	80	8,4	8,2	2
13	3,04	2,17	8,7	47	5,76	5,23	5,3	81	8,48	8,29	1,9
14	3,12	2,26	8,6	48	5,84	5,32	5,2	82	8,56	8,38	1,8
15	3,2	2,35	8,5	49	5,92	5,41	5,1	83	8,64	8,47	1,7
16	3,28	2,44	8,4	50	6	5,5	5	84	8,72	8,56	1,6
17	3,36	2,53	8,3	51	6,08	5,59	4,9	85	8,8	8,65	1,5
18	3,44	2,62	8,2	52	6,16	5,68	4,8	86	8,88	8,74	1,4
19	3,52	2,71	8,1	53	6,24	5,77	4,7	87	8,96	8,83	1,3
20	3,6	2,8	8	54	6,32	5,86	4,6	88	9,04	8,92	1,2
21	3,68	2,89	7,9	55	6,4	5,95	4,5	89	9,12	9,01	1,1
22	3,76	2,98	7,8	56	6,48	6,04	4,4	90	9,2	9,1	1
23	3,84	3,07	7,7	57	6,56	6,13	4,3	91	9,28	9,19	0,9
24	3,92	3,16	7,6	58	6,64	6,22	4,2	92	9,36	9,28	0,8
25	4	3,25	7,5	59	6,72	6,31	4,1	93	9,44	9,37	0,7
26	4,08	3,34	7,4	60	6,8	6,4	4	94	9,52	9,46	0,6
27	4,16	3,43	7,3	61	6,88	6,49	3,9	95	9,6	9,55	0,5
28	4,24	3,52	7,2	62	6,96	6,58	3,8	96	9,68	9,64	0,4
29	4,32	3,61	7,1	63	7,04	6,67	3,7	97	9,76	9,73	0,3
30	4,4	3,7	7	64	7,12	6,76	3,6	98	9,84	9,82	0,2
31	4,48	3,79	6,9	65	7,2	6,85	3,5	99	9,92	9,91	0,1
32	4,56	3,88	6,8	66	7,28	6,94	3,4	100	10	10	0
33	4,64	3,97	6,7	67	7,36	7,03	3,3				

Valve Control Value and Analog Output Proportion Table

Valve drive opening/closing time *1... *180...900*

This parameter is used to determine the valve opening (0 % to 100 %) duration. This information can be found on the related valve datasheet.

NOTE: The device calibrates the valves to the 0 (zero) for “**Valve drive opening/closing time**” on ETS download/reset or bus voltage return.

Cyclic transmission of Heating Status *1... *100 x10 s*

This parameter is used to set-up the cyclical sending of Heating Status. 1-bit Heating Status object will be sent at the end of the cycle duration.

Minimum valve position change *Always set exactly*
*1... *5...15 %*

This parameter is used to set the minimum control changes. If the difference between old control value and new control value has not reached to “**Minimum valve position change**”, the control output will not be processed.

NOTE: If “**Always set exactly**” is selected, the control value will be processed instantly regardless to the difference between the old control and new control value.

Minimum valve position **0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 %*

This parameter is used to determine the minimum valve position. When the control value is lower than min. valve position value, the analog output will be the same as minimum valve position value.

Maximum valve position *55, 60, 65, 70, 75, 80, 85, 90, 95, *100 %*

This parameter is used to determine the maximum valve position. When the control value is higher than max. valve position value, the analog output will be the same as maximum valve position value.

Delay between heating and cooling **0...30 min*

This parameter will be shown, if the “**Control mode**” is selected as “**Heating and cooling**” on “**Functions**” menu. It is used to select delay time between heating and cooling to conserve energy.

Send status values

Cyclic
****on Change***
on Request

This parameter is used to select the status sending method of the Heating Control Value.

- Set the parameter to “Cyclic”
This selection is used to send the Heating Control Value status cyclically. The Heating Control Value status will be sent at the end of the cyclic duration regardless to the Heating Control Value changes.
- Set the parameter to “on Change”
This selection is used to send the Heating Control Value status according to the Heating Control Value changes. The status will be sent according to “**Minimum valve position change**”.
- Set the parameter to “on Request”
This selection is used to send the Heating Control Value status when requested on related group object.

Cyclic sending interval

*1... *300...65535 s*

This parameter will be shown, if “**Send status values**” parameter is selected as “**Cyclic**”. Status of Heating Control Value will be sent at the end of the time.

4.5. Cooling Valve (Standard Control)

Cooling Valve Standard Control parameters tab will be shown if the “**Valve control type**” is selected as “**standard**” and “**Control mode**” is selected as “**Cooling**” or “**Heating and cooling**” in the “**Functions**” parameters page.

<i>Valve output</i>	*Thermoelectric (PWM) <i>Motor-driven (3-point)</i> <i>Open/Close signal</i>
---------------------	-------------------------------------------------------------------------------------------

This parameter is used to select valve driving method.

- Set the parameter to “Thermoelectric (PWM)”
If this parameter selected, the Cooling Valve will be driven with PWM method. Single Triac Output (Cooling) will be used.
- Set the parameter to “Motor-driven (3-point)”
If this parameter selected, the Cooling Valve will be driven with floating (3-point) control method. Both Triac Outputs (Cooling) will be used.
- Set the parameter to “Open/Close signal”
If this parameter selected, the Cooling Valve will be driven Open/Close control method. Single Triac Output (Cooling) will be used.

<i>Cyclic transmission of Cooling Status</i>	1... *100 x10 s
----------------------------------------------	------------------------

This parameter is used to set-up the cyclical sending of Cooling Status. 1-bit Cooling Status object value will be sent at the end of the cycle duration.

<i>Send status values</i>	<i>Cyclic</i> *on Change <i>on Request</i>
---------------------------	---------------------------------------------------------

This parameter is used to select the status sending method of the Cooling Control Value.

- Set the parameter to “Cyclic”
This selection is used to send the Cooling Control Value status cyclically. The Cooling Control Value status will be sent at the end of the cyclic duration regardless to the Cooling Control Value changes.
- Set the parameter to “on Change”
This selection is used to send the Cooling Control Value status regarding to the Cooling Control Value changes.
- Set the parameter to “on Request”
This selection is used to send the Cooling Control Value status when requested on related group object.

<i>Cyclic sending interval</i>	1... *300 ...65535 s
--------------------------------	-----------------------------

This parameter will be shown, if “**Send status values**” parameter is selected as “**Cyclic**”. Status of Cooling Control Value will be sent at the end of the time.

4.5.1. Thermoelectric (PWM)

<i>Valve drive operating principle, de-energized</i>	*Closed
	<i>Open</i>

This parameter is used to select valve de-energized position.

- Set the parameter to “Closed”
If this parameter selected, the Cooling Valve output contacts will be Open at OFF position.
When the valve driving needed, the related output contact will be closed.

- Set the parameter to “Open”
If this parameter selected, the Cooling Valve output contacts will be Closed at OFF position.
When the valve driving needed, the related output contact will be opened.

<i>PWM cycle time</i>	<i>1... *18...180 x10 s</i>
-----------------------	------------------------------------

This parameter is used to determine the PWM cycle time. Cooling output active duration will be calculated according to PWM time and the control signal value.

Example; PWM Cycle Time= 180 seconds, Cool Control Signal = 30%

Cooling Output Active duration = 54 seconds

Cooling Output De-active duration = 126 seconds

<i>Valve drive opening/closing time (seconds)</i>	<i>1... *180...900</i>
---------------------------------------------------	-------------------------------

This parameter is used to determine the valve opening (0 % to 100 %) duration. This information can be found on the related valve datasheet.

NOTE: The device calibrates the valves to the 0(zero) for “**Valve drive opening/closing time**” on ETS download/reset or bus voltage return.

4.5.2. Motor-driven (3-point)

<i>Reversing time (Milliseconds)</i>	<i>1...500...1000</i>
--------------------------------------	------------------------------

This parameter is used to determine the delay time on every valve direction change.

e.g. Consider a Valve is moving to 70% from 0%. If a signal sent for 30% when it has already passed the 50% then the Valve will be stopped for a "Reversing time" duration, then it will be driven to opposite direction (to 30%).

<i>Switch ON time for valve drive from 0 to 100 % (Seconds)</i>	<i>1...*120...900</i>
---------------------------------------------------------------------	------------------------------

This parameter is used to determine the valve opening (0 % to 100 %) duration.

NOTE: The device will calibrate the valves to the 0(zero) for "**Switch ON time for valve drive from 0 to 100 %**" on ETS download/reset or bus voltage return.

<i>Number of changes until adjustment (K x 10)</i>	<i>1...50...255 K</i>
----------------------------------------------------	------------------------------

This parameter is used to calibrate the valve after the "**Number of changes until adjustment**" value is reached. The calibration will be handled via driving the valve to 0% for "0 to 100 % valve opening time". After calibration, the valve will be driven back to the last control position.

4.5.3. Open/Close Signal

<i>Valve drive operating principle, de-energized</i>	*Closed <i>Open</i>
------------------------------------------------------	-------------------------------

This parameter is used to select valve position when de-energized.

- Set the parameter to “Closed”
If this parameter selected, the Cooling Valve output contacts will be open at off position. When the valve driving needed, the related output contact will be closed.
- Set the parameter to “Open”
If this parameter selected, the Cooling Valve output contacts will be closed at off position. When the valve driving needed, the related output contact will be opened.

<i>Open if control value greater than or equal to</i>	<i>0... *1...100 %</i>
-------------------------------------------------------	------------------------

This parameter is used to activate the valve output when the valve control signal greater than or equal to this value.

<i>Valve drive opening/closing time</i>	<i>1... *60...900</i>
-----------------------------------------	-----------------------

This parameter is used to determine the valve opening (0 % to 100 %) duration. This information can be found on the related valve datasheet.

NOTE: The device calibrates the valves to the 0(zero) for “**Valve drive opening/closing time**” on ETS download/reset or bus voltage return.

4.6. Cooling Valve (0 – 10 V Control)

Cooling Valve Standard Control parameters tab will be shown if the “**Valve control type**” is selected as “**0-10 V**” and “**Control mode**” is selected as “**Cooling**” or “**Heating and cooling**” in the “**Functions**” parameters page.

<i>Voltage range valve control value</i>	*0 – 10 V <i>1 – 10 V</i> <i>2 – 10 V</i> <i>10 – 0 V</i>
------------------------------------------	---------------------------------------------------------------------------

This parameter is used to select the voltage range of analog output.

- Set the parameter to “0 – 10 V”
 If this parameter selected, the 0-10 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **0 Volt**
 15 % than output will be approx. = **1.5 Volt**
 100 % than output will be approx. = **10.0 Volt**
- Set the parameter to “1 – 10 V”
 If this parameter selected, the 1-10 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **1 Volt**
 15 % than output will be approx. = **2.3 Volt**
 100 % than output will be approx. = **10.0 Volt**
- Set the parameter to “2 – 10 V”
 If this parameter selected, the 2-10 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **2 Volt**
 15 % than output will be approx. = **3.2 Volt**
 100 % than output will be approx. = **10.0 Volt**
- Set the parameter to “10 – 0 V”
 If this parameter selected, the 10-0 V valve output will be proportioned with the control value.
 E.g. If Control Value;
 0 % than output will be **10 Volt**
 15 % than output will be approx. = **8.5 Volt**
 100 % than output will be approx. = **0 Volt**

More detailed “control signal - voltage output proportion” table is written below.

“%” means Valve Control Signal

“2-10V 1-10V 10-0V” means Analog Output Types

%	2-10V	1-10V	10-0V	%	2-10V	1-10V	10-0V	%	2-10V	1-10V	10-0V
0	2	1	10	34	4,72	4,06	6,6	68	7,44	7,12	3,2
1	2,08	1,09	9,9	35	4,8	4,15	6,5	69	7,52	7,21	3,1
2	2,16	1,18	9,8	36	4,88	4,24	6,4	70	7,6	7,3	3
3	2,24	1,27	9,7	37	4,96	4,33	6,3	71	7,68	7,39	2,9
4	2,32	1,36	9,6	38	5,04	4,42	6,2	72	7,76	7,48	2,8
5	2,4	1,45	9,5	39	5,12	4,51	6,1	73	7,84	7,57	2,7
6	2,48	1,54	9,4	40	5,2	4,6	6	74	7,92	7,66	2,6
7	2,56	1,63	9,3	41	5,28	4,69	5,9	75	8	7,75	2,5
8	2,64	1,72	9,2	42	5,36	4,78	5,8	76	8,08	7,84	2,4
9	2,72	1,81	9,1	43	5,44	4,87	5,7	77	8,16	7,93	2,3
10	2,8	1,9	9	44	5,52	4,96	5,6	78	8,24	8,02	2,2
11	2,88	1,99	8,9	45	5,6	5,05	5,5	79	8,32	8,11	2,1
12	2,96	2,08	8,8	46	5,68	5,14	5,4	80	8,4	8,2	2
13	3,04	2,17	8,7	47	5,76	5,23	5,3	81	8,48	8,29	1,9
14	3,12	2,26	8,6	48	5,84	5,32	5,2	82	8,56	8,38	1,8
15	3,2	2,35	8,5	49	5,92	5,41	5,1	83	8,64	8,47	1,7
16	3,28	2,44	8,4	50	6	5,5	5	84	8,72	8,56	1,6
17	3,36	2,53	8,3	51	6,08	5,59	4,9	85	8,8	8,65	1,5
18	3,44	2,62	8,2	52	6,16	5,68	4,8	86	8,88	8,74	1,4
19	3,52	2,71	8,1	53	6,24	5,77	4,7	87	8,96	8,83	1,3
20	3,6	2,8	8	54	6,32	5,86	4,6	88	9,04	8,92	1,2
21	3,68	2,89	7,9	55	6,4	5,95	4,5	89	9,12	9,01	1,1
22	3,76	2,98	7,8	56	6,48	6,04	4,4	90	9,2	9,1	1
23	3,84	3,07	7,7	57	6,56	6,13	4,3	91	9,28	9,19	0,9
24	3,92	3,16	7,6	58	6,64	6,22	4,2	92	9,36	9,28	0,8
25	4	3,25	7,5	59	6,72	6,31	4,1	93	9,44	9,37	0,7
26	4,08	3,34	7,4	60	6,8	6,4	4	94	9,52	9,46	0,6
27	4,16	3,43	7,3	61	6,88	6,49	3,9	95	9,6	9,55	0,5
28	4,24	3,52	7,2	62	6,96	6,58	3,8	96	9,68	9,64	0,4
29	4,32	3,61	7,1	63	7,04	6,67	3,7	97	9,76	9,73	0,3
30	4,4	3,7	7	64	7,12	6,76	3,6	98	9,84	9,82	0,2
31	4,48	3,79	6,9	65	7,2	6,85	3,5	99	9,92	9,91	0,1
32	4,56	3,88	6,8	66	7,28	6,94	3,4	100	10	10	0
33	4,64	3,97	6,7	67	7,36	7,03	3,3				

Valve Control Value and Analog Output Proportion Table

Valve drive opening/closing time *1... *180...900*

This parameter is used to determine the valve opening (0 % to 100 %) duration. This information can be found on the related valve datasheet.

NOTE: The device calibrates the valves to the 0(zero) for “**Valve drive opening/closing time**” on ETS download/reset or bus voltage return.

Cyclic transmission of Cooling Status *1... *100 x10 s*

This parameter is used to set-up the cyclical sending of Cooling Status. 1-bit Cooling Status object will be sent at the end of the cycle duration.

Minimum valve position change *Always set exactly*
*1... *5...15 %*

This parameter is used to set the minimum control changes. If the difference between old control value and new control value has not reached to “**Minimum valve position change**”, the control output would not be processed.

NOTE: If “**Always set exactly**” is selected, any control value will be processed instantly regardless to the difference between the old control and new control value.

Minimum valve position **0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 %*

This parameter is used to determine the minimum valve position. When the control value is lower than minimum valve position value, the analog output will be the same as minimum valve position value.

Maximum valve position *55, 60, 65, 70, 75, 80, 85, 90, 95, *100 %*

This parameter is used to determine the maximum valve position. When the control value is higher than maximum valve position value, the analog output will be the same as maximum valve position value.

Send status values

Cyclic
**on Change*
on Request

This parameter is used to select the status sending method of the Cooling Control Value.

- Set the parameter to “Cyclic”
This selection is used to send the Cooling Control Value status cyclically. The Cooling Control Value status will be sent at the end of the cyclic duration regardless to the Cooling Control Value changes.
- Set the parameter to “on Change”
This selection is used to send the Cooling Control Value status according to the Cooling Control Value changes. The status will be sent according to “**Minimum valve position change**”.
- Set the parameter to “on Request”
This selection is used to send the Cooling Control Value status when requested on related group object.

Cyclic sending interval

*1... *300...65535 s*

This parameter will be shown, if “**Send status values**” parameter is selected “**Cyclic**”. Status of Cooling Control Value will be sent at the end of the time.

4.7. Fan (Standard Control)

Fan Standard Control parameters tab will be shown if the “**Fan control type**” is selected as “**standard**” in the “**Functions**” parameters page.

<i>Number of fan steps</i>	1 step 2 steps *3 steps
----------------------------	--------------------------------------

This parameter is used to select the fan speed level count.

<i>Switch-on threshold for fan step 1</i>	5 %... *10 % ... 40 %
-------------------------------------------	------------------------------

This parameter is used to determine fan level 1 according to Valve Control signal during Automatic Fan mode. (0 % < X < Step 1 Threshold Value)

<i>Switch-on threshold for fan step 2</i>	0 %... *40 % ... 100 %
-------------------------------------------	-------------------------------

This parameter is used to determine fan level 2 according to Valve Control signal during Automatic Fan mode. (Step 1 Threshold Value < X < Step 2 Threshold Value)

<i>Switch-on threshold for fan step 3</i>	0 %... *70 % ... 100 %
-------------------------------------------	-------------------------------

This parameter is used to determine fan level 3 according to Valve Control signal during Automatic Fan mode. (Step 2 Threshold Value < X < 100 %)

<i>Threshold values hysteresis</i>	*0 % ... 20%
------------------------------------	---------------------

This parameter is used for tolerance between threshold values and the control signal. Written value is applied for subtracting and adding to threshold values on lowering and increasing control value, respectively. It is used to prevent fan speed switching too frequently.

E.g. Threshold hysteresis value= +/- 5% Fan Control default parameters;

When Valve Control signal = 50 % => Fan speed is 2.

If the new Control Signal is 75 %, Fan speed will be 3.

If the new Control Signal is 38 %, Fan speed will be still 2 due to hysteresis.

If the new Control Signal is 35 %, Fan speed will be 1.

<i>Enable start-up behavior</i> (Switch ON from OFF)	*No Yes
---------------------------------------------------------	-------------------

This parameter is used to determine the behavior of Fan switching ON when it is OFF. This function is used to energize the fans on desired fan speed for desired duration on fan start.

NOTE: This function is possible for Fan Levels from OFF to ON, only.

<i>Switch ON at fan speed</i>	*Speed 1 Speed 2 Speed 3
-------------------------------	---------------------------------------

This parameter will be shown if "**Enable start-up behavior**" is selected as "**Yes**". It is used to select start-up Fan Speed when fan is OFF.

<i>Minimum holding time at switch-on speed</i>	1... *5...255 s
------------------------------------------------	------------------------

This parameter will be shown if "**Enable start-up behavior**" is selected as "**Yes**". It is used to determine the start-up fan level duration.

<i>Fan mode</i>	*Changeover Step switch
-----------------	-----------------------------------

This parameter is used to select Fan Level switching method.

- Set the parameter to "Changeover"
This selection is used if each fan speed selection is activated with single output. Each speed switch activates its related fan output and deactivates other outputs.

- Set the parameter to "Step switch"
This selection is used for Fan Speed switching via using Fan relay outputs hierarchically. E.g. If the Fan Speed 2 is wanted to activate, Fan Speed 1 and Fan Speed 2 relay outputs will be activated simultaneously.

<i>Control object type</i>	Percentage *Fan step (0 – 3)
----------------------------	----------------------------------------

This parameter is used to select fan speed control object type

- Set the parameter to "Percentage"
This selection is used to control the Fan levels via 1-byte (percentage) object.
%0 is OFF
1 % – 33 % is Fan Speed 1
34 % – 66 % is Fan Speed 2
67 % – 100 % is Fan Speed 3

- Set the parameter to "Fan Step"
This selection is used to control the Fan levels via 1-bit object. Totally 3 control objects will be appeared. And each fan speed will have its own fan speed control object.

Send status values

Cyclic
**on Change*
on Request

This parameter is used to select the status sending method of the Fan Speed value.

- Set the parameter to “Cyclic”
This selection is used to send Fan Speed status cyclically. The Fan Speed status will be sent at the end of the cyclic duration regardless to the Fan Speed changes.
- Set the parameter to “on Change”
This selection is used to send Fan Speed status according to the Fan Speed changes.
- Set the parameter to “on Request”
This selection is used to send Fan Speed status when requested on related group object, only.

Cyclic sending interval

*1...*300...65535 s*

This parameter will be shown, if “**Send status values**” parameter is selected “**Cyclic**”. Status of Fan Speed will be sent at the end of the time.

4.8. Fan (0 – 10 V Control)

Fan 0-10V Control parameters tab will be shown if the “**Fan control type**” is selected as “**0-10 V**” in the “**Functions**” parameters page. This selection enables the 3 pcs. Switching Output relays. (See 5.11.) Fan relays will not be use due to 0-10 V Fan Control. They can be used as like switching outputs. Switching relays functions will be explained in chapter 4.11.

<i>Fan control minimum output voltage</i>	*0...10 V
<i>(0 % is always 0V)</i>	

This parameter is used to determine the minimum output voltage of Fan Control 0-10V output.

<i>Fan control maximum output voltage</i>	0...*10 V
-------------------------------------------	------------------

This parameter is used to determine the maximum output voltage of Fan Control 0-10V output.

<i>Enable start-up behavior</i>	*No
<i>(Switch ON from OFF)</i>	
	Yes

This parameter is used to determine the behavior of Fan switching ON when it is OFF. This function is used to energize the fans on desired fan speed for desired duration on fan start.

NOTE: This function is possible for Fan Levels from OFF to ON, only.

<i>Switch ON at fan speed</i>	0...*30...100 %
-------------------------------	------------------------

This parameter will be shown If “**Enable start-up behavior**” is selected as “**Yes**”. It is used to select start-up Fan Speed when fan is OFF.

<i>Minimum holding time at switch-on speed</i>	1...*5...255 s
------------------------------------------------	-----------------------

This parameter will be shown If “**Enable start-up behavior**” is selected as “**Yes**”. It is used to determine the start-up fan level duration.

<i>Switch fan speed via 1-bit objects</i>	*No
	Yes

This parameter is used to activate/deactivate additional 1-bit Fan Speed control objects.

- Set the parameter to “No”
This selection is used to control the Fan Speeds via using 1-byte object, only.
- Set the parameter to “Yes”
This selection is used to control the Fan Speeds via using either 1-byte or 1-bit control objects. Additional 1-bit Fan Speed Control objects will be appeared on group object list.

Send status values

Cyclic
**on Change*
on Request

This parameter is used to select the status sending method of the Fan Speed value.

- Set the parameter to “Cyclic”
This selection is used to send the Fan Speed status cyclically. The Fan Speed status will be sent at the end of the cyclic duration regardless to the Fan Speed changes.
- Set the parameter to “on Change”
This selection is used to send the Fan Speed status according to the Fan Speed changes.
- Set the parameter to “on Request”
This selection is used to send the Fan Speed status when requested on related group object, only.

Cyclic sending interval

*1... *300...65535 s*

This parameter will be shown, if “**Send status values**” parameter is selected “**Cyclic**”. Status of Fan Speed will be sent at the end of the time.

4.9. Auxiliary Output

This parameter is used to set an additional switching relay beside of the valve control. This output can be combined with heating or cooling or can be used individually.

4.9.1. If Valve Control is Standard

Switch ON Auxiliary Relay

****via object***

together with heating valve

together with cooling valve

This parameter will be shown, if "**Valve control type**" parameter is selected as "**standard**" and if "**Control mode**" is selected as "**Heating and cooling**" in "**Functions**" page.

Switch ON Auxiliary Relay

****via object***

together with heating valve

This parameter will be shown, if "**Valve control type**" parameter is selected as "**standard**" and if "**Control mode**" is selected as "**Heating only**" in "**Functions**" page.

Switch ON Auxiliary Relay

****via object***

together with cooling valve

This parameter will be shown, if "**Valve control type**" parameter is selected as "**standard**" page and if "**Control mode**" is selected as "**Cooling only**" in "**Functions**" page.

- Set the parameter to "via object"
This selection is used to set the auxiliary output as independent switching output. 1-bit switching control object will be appeared in the group object list.
- Set the parameter to "together with heating valve"
This selection is used to set the auxiliary output together with heating valve. Auxiliary output will be activated when heating valve control signal (1 % or higher) received. Auxiliary output will be deactivated If the heating valve control signal is zero. (0 %)
- Set the parameter to "together with cooling valve"
This selection is used to set the auxiliary output together with cooling valve. Auxiliary output will be activated when cooling valve control signal (1 % or higher) received. Auxiliary output will be deactivated If the cooling valve control signal is zero. (0 %)

Output reaction

***Normally open**
Normally closed

This parameter is used to select the state of the output contact when Auxiliary is OFF.

- Set the parameter to “Normally open”
This selection is used to set the Auxiliary output contact as “open-circuit” when no use (off).
- Set the parameter to “Normally closed”
This selection is used to set the Auxiliary output contact as “closed-circuit” when no use (off).

Send status values

Cyclic
***on Change**
on Request

This parameter is used to select the status sending method of the Auxiliary Output.

- Set the parameter to “Cyclic”
This selection is used to send Auxiliary Output status cyclically. Auxiliary Output status will be sent at the end of the cyclic duration regardless to Auxiliary Output changes.
- Set the parameter to “on Change”
This selection is used to send Auxiliary Output status according to Auxiliary Output changes.
- Set the parameter to “on Request”
This selection is used to send Auxiliary Output status when requested on related group object, only.

Cyclic sending interval

1... ***450**...65535 s

This parameter will be shown if “**Send status values**” parameter is selected “**Cyclic**”. Auxiliary Output status will be sent at the end of the time.

4.9.2. If Valve Control is 0–10 V

Switch ON Auxiliary Relay

via object
***if heating is required**
 if cooling is required
 together with heating valve
 together with cooling valve

This parameter will be shown, if “**Valve control type**” parameter is selected as “**0 – 10 V**” and if “**Control mode**” is selected as “**Heating and cooling**” in “**Functions**” page.

Switch ON Auxiliary Relay

via object
***if heating is required**
 together with heating valve

This parameter will be shown, if “**Valve control type**” parameter is selected as “**0 – 10 V**” and if “**Control mode**” is selected as “**Heating only**” in “**Functions**” page.

Switch ON Auxiliary Relay

via object
***if cooling is required**
 together with cooling valve

This parameter will be shown, if “**Valve control type**” parameter is selected as “**0 – 10 V**” page and if “**Control mode**” is selected as “**Cooling only**” in “**Functions**” page.

- Set the parameter to “via object”
 This selection is used to set the auxiliary output as independent switching output. 1-bit switching control object will be appeared in the group object list.
- Set the parameter to “if heating is required”
 This selection is used to set the auxiliary output together with heating valve. Auxiliary output will be activated when heating valve control signal (1 % or higher) received.
- Set the parameter to “if cooling is required”
 This selection is used to set the auxiliary output together with cooling valve. Auxiliary output will be activated when cooling valve control signal (1 % or higher) received.
- Set the parameter to “together with heating valve”
 This selection is used to set the auxiliary output together with heating valve. Auxiliary output will be activated if the min. heating valve control signal or higher received.
- Set the parameter to “together with cooling valve”
 This selection is used to set the auxiliary output together with cooling valve. Auxiliary output will be activated if the min. cooling valve control signal or higher received.

<i>Output reaction</i>	* Normally open <i>Normally closed</i>
------------------------	--------------------------------------------------

This parameter is used to select the state of the output contact when Auxiliary is OFF.

- Set the parameter to “Normally open”
This selection is used to set the Auxiliary output contact as “open-circuit” when no use (off).
- Set the parameter to “Normally closed”
This selection is used to set the Auxiliary output contact as “closed-circuit” when no use (off).

<i>Send status values</i>	<i>Cyclic</i> * on Change <i>on Request</i>
---------------------------	----------------------------------------------------------

This parameter is used to select the status sending method of the Auxiliary Output.

- Set the parameter to “Cyclic”
This selection is used to send Auxiliary Output status cyclically. Auxiliary Output status will be sent at the end of the cyclic duration regardless to Auxiliary Output changes.
- Set the parameter to “on Change”
This selection is used to send Auxiliary Output status according to Auxiliary Output changes.
- Set the parameter to “on Request”
This selection is used to send Auxiliary Output status when requested on related group object, only.

<i>Cyclic sending interval</i>	1... * 450 ...65535 s
--------------------------------	------------------------------

This parameter will be shown, if “**Send status values**” parameter is selected “**Cyclic**”. Auxiliary Output status will be sent at the end of the time.

4.10. Input A...D

Input

****Deactivated***

Window contact

Dew point sensor

Binary signal input

Value/Forced operation

This parameter is used to configure the physical Inputs. They can be combined with the HVAC system or can be used independently.

4.10.1. Window Contact

Window open when

***Contact open**

Contact closed

This parameter is used to recognize the "Window Open state" according to selected parameter.

Allowed window open delay (0 = No Wait)

0... ***10**...15 m

This parameter is used to determine the delay for the Window-Open state.

Transmit object value after bus voltage recovery

***No**

Yes

This parameter is used to select whether the window-contact value will be transmitted after bus voltage recovery or not.

NOTE: If the Window Open status is active, HVAC system will be turned off.

When the Window Open status is de-active, the HVAC system will be turned on.

4.10.2. Dew Point Sensor

Dew point reached when

Contact open

****Contact closed***

This parameter is used to recognize the dew point state according to selected parameter.

Transmit object value after bus voltage recovery

****No***

Yes

This parameter is used to select whether the dew point sensor value will be transmitted after bus voltage recovery or not.

NOTE: If the Dew Point Sensor state is active, HVAC cooling function will be turned off.

When the Dew Point Sensor State is de-active, the HVAC cooling function can be turned on.

4.10.3. Binary Signal Input

<i>Distinction between long and short operation</i>	*No Yes
-----------------------------------------------------	-------------------

This parameter is used to add an extra function to long press action of related input.

<i>Contact Type</i>	Normally Close *Normally Open
---------------------	-----------------------------------------

This parameter will be shown, if "***Distinction between long and short operation***" parameter is selected as "**Yes**". It is used to select Input contact type.

<i>Reaction on Short Operation</i>	*OFF ON Toggle No Reaction
------------------------------------	--------------------------------------------

This parameter will be shown, if "***Distinction between long and short operation***" parameter is selected as "**Yes**". It is used to select action on short press.

<i>Reaction on Long Operation</i>	OFF *ON Toggle No Reaction
-----------------------------------	--------------------------------------------

This parameter will be shown, if "***Distinction between long and short operation***" parameter is selected as "**Yes**". It is used to select action on long press. Long press duration can be set on "***Long Operation After***" parameter. See next below.

<i>Long Operation After</i>	*1...255 s
-----------------------------	-------------------

This parameter will be shown, if "***Distinction between long and short operation***" parameter is selected as "**Yes**". It is used to determine long press duration. Long Operation action will be processed at the end of the long operation duration.

<i>Number of Objects for Short/Long Operation</i>	*1 Object 2 Objects
---------------------------------------------------	-------------------------------

This parameter will be shown, if "***Distinction between long and short operation***" parameter is selected as "**Yes**". It is used to select whether long and short action group objects will be merged or separated.

<i>Reaction on closing contacts (rising edge)</i>	<i>OFF</i> <i>*ON</i> <i>Toggle</i> <i>No Reaction</i>
---------------------------------------------------	------------------------------------------------------------------------

This parameter is used to determine the closing contact action.

<i>Reaction on opening contacts (falling edge)</i>	<i>*OFF</i> <i>ON</i> <i>Toggle</i> <i>No Reaction</i>
----------------------------------------------------	------------------------------------------------------------------------

This parameter is used to determine the opening contact action.

<i>Transmit object value after bus voltage recovery</i>	<i>*No</i> <i>Yes</i>
---------------------------------------------------------	---------------------------------

This parameter is used to select whether the binary signal input value will be transmitted after bus voltage recovery or not.

4.10.4. Value/Forced Operation

<i>Contact Type</i>	Normally Close *Normally Open
---------------------	-----------------------------------------

This parameter is used to select input contact type.

<i>Distinction between long and short operation</i>	*No Yes
-----------------------------------------------------	-------------------

This parameter is used to add an extra function to long press action of related input.

<i>Reaction on Short Operation</i>	*1-bit value 2-bit value (Forced Position) 1-Byte value [0...255] 2-Byte value [-32768...32767] 2-Byte value [0...65535] 4-Byte value (floating point) 4-Byte value [0...4294967295]
------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

This parameter is used to select datapoint type of communication object to send value to KNX line on short press.

<i>Reaction on Long Operation</i>	*1-bit value 2-bit value (Forced Position) 1-Byte value [0...255] 2-Byte value [-32768...32767] 2-Byte value [0...65535] 4-Byte value (floating point) 4-Byte value [0...4294967295]
-----------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

This parameter will be shown, if "**Distinction between long and short operation**" parameter is selected "**Yes**". It is used to select datapoint type of communication object to send value to KNX line on short press. Long press duration can be set via "**Long Operation After**" parameter. See next below.

<i>Long Operation After</i>	*1...255 s
-----------------------------	-------------------

This parameter will be shown, if "**Distinction between long and short operation**" parameter is selected "**Yes**". It is used to determine long press duration. Long Operation action will be processed at the end of the long operation duration.

<i>Transmit object value after bus voltage recovery</i>	*No Yes
---------------------------------------------------------	-------------------

This parameter is used to transmit the value/forced operation value after bus voltage recovery.

4.11. Switching Outputs 1, 2, 3

Switching Output 1,2,3 Parameter tab will be shown if the “**Fan control type**” is selected as “**0-10 V**” in the “**Functions**” parameters page.

Output reaction

Normally Closed
***Normally Open**

This parameter is used to select the state of the output contact when switching state is OFF.

- Set the parameter to “Normally open”
This selection is used to set the switching output contact as “open-circuit” when switching state is OFF.
- Set the parameter to “Normally closed”
This selection is used to set the switching output contact as “closed-circuit” when switching state is OFF.

Send status values

Cyclic
***on Change**
on Request

This parameter is used to select the status sending method of the Switching Output.

- Set the parameter to “Cyclic”
This selection is used for sending Switching Output status cyclically. Switching Output status will be sent at the end of the cyclic duration regardless to Switching Output changes.
- Set the parameter to “on Change”
This selection is used for sending Switching Output status according to Switching Output changes.
- Set the parameter to “on Request”
This selection is used for sending Switching Output status when requested on related group object, only.

Cyclic sending interval

*1... *10...65535 s*

This parameter will be shown, if “**Send status values**” parameter is selected “**Cyclic**”. Switching Output status will be sent at the end of the time.

4.12. Temperature Sensor

<i>Temperature Unit</i>	*Celsius (°C) <i>Fahrenheit (°F)</i>
-------------------------	----------------------------------------------------

This parameter is used to select temperature transmit unit.

<i>Temperature Measurement</i>	*Temp. Sensor 1 <i>Temp Sensor 1&2</i>
--------------------------------	------------------------------------------------------

This parameter is used to select the temperature measurement from single or multiple sensors.

NOTE: Temp Sensor 1&2 is recommended for large area temperature measurements.

<i>Filter</i>	*Inactive <i>Low (floating mean value over 30 seconds)</i> <i>Medium (floating mean value over 60 seconds)</i> <i>High (floating mean value over 120 seconds)</i>
---------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

This parameter is used to set a filter for temperature reading. This can be used to select the temperature output value as a mean value using three different options.

- Set the parameter to “Low (floating mean value over 30 seconds)”
This parameter is used to take the average of measured values for last 30 seconds.
- Set the parameter to “Medium (floating mean value over 60 seconds)”
This parameter is used to take the average of measured values for last 60 seconds.
- Set the parameter to “High (floating mean value over 120 seconds)”
This parameter is used to take the average of measured values for last 120 seconds.

NOTE: Using the filter "smooths" the temperature output via the mean value so that it is available for further processing. The higher the degree of filtering, the smoother the result. This means that changes to the output value become slower.

Send Temperature

Cyclically
****Cyclically and on Change***

This parameter is used select the Temperature status sending method.

- Set the parameter to “Cyclically”
This parameter is used to send the Temperature values at the end of the cycle time.
- Set the parameter to “Cyclically and on Change”
This parameter is used to send the Temperature values at the end of the cycle time or any temperature changes.

Cyclic Sending Interval

*1...*300...65535 s*

Temperature status sending cycle time.

Minimum Change

**1...255 x 0.1 °C/°F*

This parameter will be shown if “***Send Temperature***” is selected as “***Cyclically and on Change***”. It is used to set the minimum temperature change which is required to transmit from communication object.

4.12.1. Temperature Sensor 1

<i>Temperature Sensor Type</i>	<p>*NTC 10-01 [-15... +50] NTC 10-02 [-15... +50] NTC 10-03 [-15... +50] NTC 20 [0... +50]</p>
--------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

This parameter is used to choose the NTC sensor type that is connected.

An NTC10 sensor has a resistance of 10 K ohms at 25 °C.

An NTC20 has a resistance of 20 K ohms. Individual types vary in terms of their resistance curves.

<i>Sensor Offset</i>	-128... *0 ...127 x 0.1 °C/°F
----------------------	--------------------------------------

This parameter is used to determine the offset can be added to the measured temperature with this parameter.

<i>Cable Error Compensation</i>	<p>*None Via Cable Length Via Cable Resistance</p>
---------------------------------	-------------------------------------------------------------------------------------------------------------

This parameter is used to calibrate temperature reading.

- Set the parameter to “Via Cable Length”
 This selection is used to determine the cable error compensation by entering the cable length.
 NOTE: This method can be used for copper wires only.
- Set the parameter to “Via Cable Resistance”
 This selection is used to determine the cable error compensation by entering the cable resistance value.

<i>Cable Length</i>	1... *10 ...100 meter(s)
---------------------	---------------------------------

This parameter will be shown if “**Cable Error Compensation**” is selected as “**Via Cable Length**”. It is used to set the one-way cable length of the connected temperature sensor.

NOTE: The maximum cable length is allowed between the sensor and device input is 100 m.

<i>Cross-section of Conductor</i>	1... *100 ...150 mm ²
-----------------------------------	-----------------------------------------

This parameter will be shown if “**Cable Error Compensation**” is selected as “**Via Cable Length**”. It is used to set the cross-section of the conductor to which the temperature sensor is connected.

<i>Cable Resistance (total of forward and return conduct.)</i>	0... *500 ...10000 mΩ
----------------------------------------------------------------	------------------------------

This parameter will be shown if “**Cable Error Compensation**” is selected as “**Via Cable Resistance**”. It is used to set the cable resistance that is used to connected temperature sensor.

4.12.2. Temperature Sensor 2

The parameters will be shown below if, “**Temperature Measurement**” is selected as “**Temp. Sensor 1&2**”.

<i>Temperature Sensor Type</i>	*NTC 10-01 [-15... +50] NTC 10-02 [-15... +50] NTC 10-03 [-15... +50] NTC 20 [0... +50]
--------------------------------	---------------------------------------------------------------------------------------------------------

This parameter is used to choose the NTC sensor type that is connected.
An NTC10 sensor has a resistance of 10 K ohms and NTC20 has a resistance of 20 K ohms at 25 °C.
Individual types vary in terms of their resistance curves.

<i>Sensor Offset</i>	-128... *0 ...127 x 0.1 °C/°F
----------------------	--------------------------------------

This parameter is used to determine the offset can be added to the measured temperature with this parameter.

<i>Cable Error Compensation</i>	*None Via Cable Length Via Cable Resistance
---------------------------------	----------------------------------------------------------

This parameter is used to calibrate temperature reading.

- Set the parameter to “Via Cable Length”
This selection is used to determine the cable error compensation by entering the cable length.
NOTE: This method can be used for copper wires only.
- Set the parameter to “Via Cable Resistance”
This selection is used to determine the cable error compensation by entering the cable resistance value.

<i>Cable Length</i>	1... *10 ...100 meter(s)
---------------------	---------------------------------

This parameter will be shown if “**Cable Error Compensation**” is selected as “**Via Cable Length**”. It is used to set the one-way cable length of the connected temperature sensor. The maximum cable length is allowed between the sensor and device input is 100 m.

<i>Cross-section of Conductor</i>	1... *100 ...150 mm ²
-----------------------------------	-----------------------------------------

This parameter will be shown if “**Cable Error Compensation**” is selected as “**Via Cable Length**”. It is used to set the cross-section of the conductor to which the temperature sensor is connected.

<i>Cable Resistance (total of forward and return conduct.)</i>	0... *500 ...10000 mΩ
----------------------------------------------------------------	------------------------------

This parameter will be shown if “**Cable Error Compensation**” is selected as “**Via Cable Resistance**”. It is used to set the cable resistance that is used to connected temperature sensor.

Sensor-2 Weight

*0...*90...100 %*

This parameter is used to determine the weighted average of Temperature Sensor 1 and 2 measured values.

E.g. If the Sensor-2 Weight is 90 % then, Sensor-1 Weight will be 10 %

The result will be calculated with this mathematical formula;

Sensor-1 temp. reading 25.7 °C

Sensor-2 temp. reading is 26.3 °C

$$Avg.Temp = \left(Sensor2 Temp Read \times \frac{x}{100} \right) + \left(Sensor1 Temp Read \times \frac{y}{100} \right)$$

$x = Sensor2 Weight$

$y = Sensor1 Weight$

$y = 100 - x$

$$Avg.Temp = \left(26,3 \times \frac{90}{100} \right) + \left(25,7 \times \frac{10}{100} \right)$$

$Avg.Temp = (23,67) + (2,57)$

$Avg.Temp = 26,24 \text{ °C}$

5. Object Descriptions

5.1. General Object Description

Object name	Function	DPT Type	Length	Flags
In operation	General	1.002	1 bit	CRT
<p>This object is used to report the device still alive and communicated by the KNX bus. Telegram value is selectable ON/OFF. If this telegram is not received at the end of the cycle duration, device may be defective or KNX cable may be interrupted.</p>				

5.2. Input Objects Description

Object name	Function	DPT Type	Length	Flags
Switch	Input A...D	1.001	1 bit	CRWT
<p>This object is used to send Binary Signal input status from related input.</p> <p>0 = Switch OFF 1 = Switch ON</p>				
Switch - short	Input A...D	1.001	1 bit	CRWT
<p>This object is used for Binary Signal Value when the related input is short-pressed.</p> <p>0 = Switch OFF 1 = Switch ON</p>				
Switch - long	Input A...D	1.001	1 bit	CRWT
<p>This object is used for Binary Signal Value when the related input is long-pressed.</p> <p>0 = Switch OFF 1 = Switch ON</p>				
Window contact	Input A...D	1.008	1 bit	CRT
<p>This object is used to transmit Window status from related input.</p> <p>0 = Window closed 1 = Window opened</p>				
Dew point alarm	Input A...D	1.005	1 bit	CRT
<p>This object is used to send the dew point alarm status from the related input.</p> <p>0 = No alarm 1 = Alarm</p>				
Disable	Input A...D	1.003	1 bit	CRT
<p>This object is used for activation/deactivation of the related input.</p> <p>0 = Input is Active 1 = Input is Deactive</p>				

Object name	Function	DPT Type	Length	Flags
Value/Forced Operation	Input A...D	CRT
This object is used to send a value from related input according to selected parameter.				
Value/Forced Operation - short	Input A...D	CRT
This object is used to send a value according to selected parameter when the related input is short-pressed.				
Value/Forced Operation - long	Input A...D	CRT
This object is used to send a value according to selected parameter when the related input is long-pressed.				
1-bit	[0 / 1]	DPT 1.001	switch command	
2-bit	[0...3]	DPT 2.001	forced operation	
1-Byte	[0...255]	DPT 5.001	brightness value	
2-Byte	[-32768...32767]	DPT 7.001	signed value	
2-Byte	[0...65535]	DPT 8.001	unsigned value	
4-Byte	[float value]	DPT14.068	temperature	
4-Byte	[0...4294967295]	DPT12.001	value unsigned	
NOTE: Forced operation 2-bit object detailed description is shown below.				
Bit Field	Description			
Bit 0	:	Switching state	"0": switching off	"1": switching on
Bit 1	:	Forced control	"0": inactive	"1": active

5.3. Temperature Objects Description

Object name	Function	DPT Type	Length	Flags
Current Temperature °C	Temp. Sensor 1	1.001	2 bytes	CRT
Current Temperature °F		9.027		
This object is used to transmit the first (main) Temperature sensor measurement.				
Current Temperature °C	Temp. Sensor 2	9.001	2 bytes	CRT
Current Temperature °F		9.027		
This object is used to transmit the second (additional) Temperature sensor measurement.				
Average Temperature °C	Temp. Sensor 1&2	9.001	2 bytes	CRT
Average Temperature °F		9.027		
This object is used to transmit the average Temperature measurement.				

5.4. Output Objects Description

Object name	Function	DPT Type	Length	Flags
Switch Auxiliary	Auxiliary Output	1.001	1 bit	CW
<p>This object is used to control auxiliary output.</p> <p>0 = Switch OFF 1 = Switch ON</p>				
Status Switch Auxiliary	Auxiliary Output	1.001	1 bit	CRT
<p>This object is used to transmit auxiliary output status.</p> <p>0 = Switch OFF 1 = Switch ON</p>				
Switch Output 1, 2, 3	Switching Output 1, 2, 3	1.001	1 bit	CW
<p>These objects will be shown if “fan control type” is selected as “0-10 V” It is used to control switching outputs separately.</p> <p>0 = Switch OFF 1 = Switch ON</p>				
Status Switch Output 1, 2, 3	Switching Output 1, 2, 3	1.001	1 bit	CRT
<p>These objects will be shown if “fan control type” is selected as “0-10 V” It is used to transmit the related switching outputs statuses.</p> <p>0 = Switch OFF 1 = Switch ON</p>				

5.5. Valve Control Objects Description

Object name	Name	DPT Type	Length	Flags
Heating/Cooling Switchover	Valve Control	1.100	1 bit	CW
<p>This object is used to set the HVAC mode via 1-bit object</p> <p>0 = Cooling 1 = Heating</p>				
Heating/Cooling Switchover	Valve Control	20.105	1 byte	CW
<p>This object is used to set the HVAC mode via 1-Byte object</p> <p>01 = Heating 03 = Cooling</p>				
Status Heating/Cooling Switchover	Valve Control	1.100	1 bit	CRT
<p>This object is used to transmit the HVAC mode Status via 1-bit object</p> <p>0 = Cooling 1 = Heating</p>				
Status Heating/Cooling Switchover	Valve Control	20.105	1 byte	CRT
<p>This object is used to transmit the HVAC mode Status via 1-Byte object</p> <p>01 = Heating 03 = Cooling</p>				
Heat Control Value (0%...100%)	Valve Control	5.001	1 byte	CW
<p>This object is used to set the Heating Valve control value.</p> <p>0% = Valve Output OFF 1%...to 100% = Valve Output ON</p>				
Cool Control Value (0%...100%)	Valve Control	5.001	1 byte	CW
<p>This object is used to set the Cooling Valve control value.</p> <p>0% = Valve Output OFF 1%...to 100% = Valve Output ON</p>				

Object name	Name	DPT Type	Length	Flags
Heat/Cool Control Value (0%...100%)	Valve Control	5.001	1 byte	CW
<p>This object is used to set the Heating or Cooling Valve control value according to HVAC mode.</p> <p>0% = Valve Output OFF 1%...to 100% = Valve Output ON</p>				
Status Heat Control Value (0%...100%)	Valve Control	5.001	1 byte	CRT
<p>This object is used to transmit the Heating Valve control value status.</p> <p>0% = Valve Output OFF 1%...to 100% = Valve Output ON</p>				
Status Control Value (0%...100%)	Valve Control	5.001	1 byte	CRT
<p>This object is used to transmit the Cooling Valve percental controlling.</p> <p>0% = Valve Output OFF 1%...to 100% = Valve Output ON</p>				
Status Heat/Cool Control Value (0%...100%)	Valve Control	5.001	1 byte	CRT
<p>This object is used to transmit the Heating or Cooling Valve percental controlling. Related Valve will be switched according to Switchover value.</p> <p>0% = Valve Output OFF 1%...to 100% = Valve Output ON</p>				
Status Heat Mode	Valve Control	1.001	1 bit	CRT
<p>This object is used to transmit the Heating mode status.</p> <p>0 = Heating Mode OFF 1 = Heating Mode ON</p>				
Status Heat Mode	Valve Control	1.001	1 bit	CRT
<p>This object is used to transmit the Cooling mode status.</p> <p>0 = Cooling Mode OFF 1 = Cooling Mode ON</p>				

5.6. Fan Control Objects Description

	Object name	Name	DPT Type	Length	Flags
	Fan Speed 1, 2, 3	Fan Control	1.002	1 bit	CW
<p>These objects are used to set the Fan Speed levels with 1-bit objects manually.</p> <p>x= Fan Speed Level</p> <p>False = Fan Speed (x) OFF True = Fan Speed (x) ON</p>					
	Fan Speed (0%...100%)	Fan Control	5.001	1 byte	CW
<p>This object is used to set the Fan Speed levels with 1-byte percentage object manually.</p> <p>0% = Fan OFF 1%...100% = Fan ON</p>					
	Status Fan Speed 1, 2, 3	Fan Control	1.002	1 bit	CRT
<p>This object is used to transmit the Fan Speed levels with 1-bit objects.</p> <p>x= Fan Speed Level</p> <p>False = Status Fan Speed (x) OFF True = Status Fan Speed (x) ON</p>					
	Status Fan Speed (0%...100%)	Fan Control	5.001	1 byte	CRT
<p>This object is used to transmit the Fan Speed levels with 1-Byte percentage object.</p> <p>0% = Status Fan OFF 1%...100% = Status Fan ON</p>					
	Fan Automatic	Fan Control	1.002	1 bit	CW
<p>This object is used to enable or disable Automatic Fan Control function.</p> <p>False = Fan Automatic OFF True = Fan Automatic ON</p>					
	Status Fan Automatic	Fan Control	1.002	1 bit	CRT
<p>This object is used to transmit the Automatic Fan Control function status.</p> <p>False = Status Fan Automatic OFF True = Status Fan Automatic ON</p>					

5.7. Valve Error Objects Description

Object name	Name	DPT Type	Length	Flags
Heating Valve Short Circuit	Valve Control	1.005	1 bit	CW
<p>This object is used to transmit alarm telegram in case of a short circuit in the Heating output.</p> <p>0 = no alarm 1 = alarm</p>				
Cooling Valve Short Circuit	Valve Control	1.005	1 bit	CW
<p>This object is used to transmit alarm telegram in case of a short circuit in the Cooling output.</p> <p>0 = no alarm 1 = alarm</p>				