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USER GUIDE

HLS 44-3P-SER

Produal

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Commissioning tool HLS 44-3P-SER

HLS 44-3P-SER is a tool for commissioning HLS 44-3P controllers. By using this tool the commissioning is fast and you may rely on that the settings are as planned.

It is useful to plan and program the settings to the tool with care in advance. After that, you can load the settings to the controllers in office or on the installation site during commissioning.

This user guide is for the commissioning tool software versions 1.2.0 or later. The tool software version shows on the tool display when the power is switched on.

PROFILES

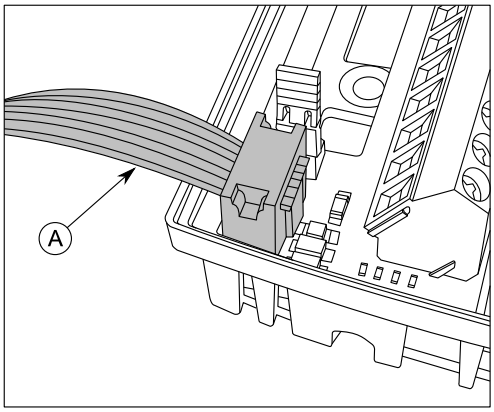
HLS 44-3P-SER commissioning tool contains fixed factory settings (PRSET 1), memory slots for 6 user defined solutions (SET 1...6) and 3 pre-programmed application profiles (SET 7...9). All parameters of SET 1...9 can be changed for a best possible room control solution. For more information see the HLS 44-3P user guide.

Pre-programmed applications (SET 7…9) are the following:

- SET 7 Heating with radiator and cooling with beam
- SET 8 Heating and cooling with fan coil unit
- SET 9 Heating with radiator, cooling with VAV and beam, demand based ventilation (CO_2)

GETTING STARTED

1. Remove the controller cover.
2. Connect the commissioning tool cable to the controller programming terminal.



A. Commissioning tool cable

NOTE: Connecting the tool to the programming terminal will disconnect the controller from the Modbus communication.

3. Connect the supply voltage either to the commissioning tool or the controller.

   IMPORTANT: Do not connect the supply voltage to both devices.

4. Check that the software version numbers are compatible.

   The software versions are shown on the displays when you switch on the power. See the compatible software versions from the following table.

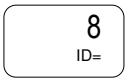
HLS 44-3P-SER software version	Compatible HLS 44-3P software versions
1.2.0	1.2.0

LOADING PARAMETERS TO THE CONTROLLER

1. Press the ⊕ and ⊖ buttons to select the profile (SET 1…9 or PRSET 1) which you want to load to the controller.



2. Press the ⚙ button to enter the Modbus address setting view.



3. Press the ⊕ and ⊖ buttons to select the Modbus address for the controller.
   The Modbus address number steps automatically forward number by number, when multiple controllers are programmed.
4. Press the ⚙ button to load the parameters to the controller.

SETTING THE PARAMETERS IN THE COMMISSIONING TOOL

1. Press the ⊕ and ⊖ buttons to select the profile (SET 1…9) in which you want to store the parameters.
   NOTE: The selected profile will be overwritten with the new parameters. You cannot recover the overwritten profiles.



2. Press the ⌂ button.
3. Make the wanted adjustments in the menu.
   See the detailed parameter setting instructions from the HLS 44-3P user guide.
4. Load the parameters to the controller.

LOADING PARAMETERS FROM THE CONTROLLER TO THE COMMISSIONING TOOL

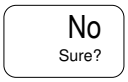
1. Press the ⊕ and ⊖ buttons to select the profile (SET 1…9) in which you want to load the parameters.
   NOTE: The selected profile will be overwritten with the new parameters. You cannot recover the overwritten profiles.



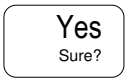
2. Press the ⌂ button until you reach the parameter loading menu.



3. Press the ⚙ button.
   Verification message appears on the display.



4. Press ⊕ button to change the verification message to “Yes” status.



5. Press the ⚙ button to load the parameters from the controller to the commissioning tool memory.

Information is subject to change without prior notice.

MODBUS REGISTERS OF THE SET 7…9 PROFILES

SET 7: Heating with radiator and cooling with beam

Register	Parameter Description	Value	Range	Default	Comments
	COILS				
1	Cooling PWM overdrive enable (A1)	Off=0, On=1	Off - On	0	No modbus overdrives
2	Cooling 0-10V overdrive enable (Y3)	Off=0, On=1	Off - On	0	No modbus overdrives
3	Heating PWM overdrive enable (A2)	Off=0, On=1	Off - On	0	No modbus overdrives
4	Heating 0-10V overdrive enable (Y4)	Off=0, On=1	Off - On	0	No modbus overdrives
5	VAV overdrive enable (Y1)	Off=0, On=1	Off - On	0	No modbus overdrives
6	FAN overdrive enable (Y2)	Off=0, On=1	Off - On	0	No modbus overdrives
7	On/Off damper overdrive enable (B1)	Off=0, On=1	Off - On	0	No modbus overdrives
8	Light control overdrive enable (B2)	Off=0, On=1	Off - On	0	No modbus overdrives
9	Overdrive On/off damper by modbus (B1)	Off=0, On=1	Off - On	0	No modbus overdrives
10	Overdrive Light control by modbus (B2)	Off=0, On=1	Off - On	0	No modbus overdrives
11	SERVICE ALARM RESET	Off=0, On=1	Off - On	0	
12	Cooling disabled	Off=0, On=1	Off - On	0	Cooling working
13	Heating disabled	Off=0, On=1	Off - On	0	Heating working
14	NIGHT MODE	Off=0, On=1	Off - On	0	The device is always in day mode
15	Cooling output mode (DIR/REV)	Off=0, On=1	Off - On	0	Direct output mode
16	Heating output mode (DIR/REV)	Off=0, On=1	Off - On	0	Direct output mode
17	Cooling stages (1st/2st)	Off=0, On=1	Off - On	0	1 stage cooling, chilled beam
18	Sequence of cooling stages (A-st/V-st)	Off=0, On=1	Off - On	0	No effect on this process
19	Fan ramp with motor ramp	Off=0, On=1	Off - On	1	No effect on this process
20	Night operation mode (DZ/FG)	Off=0, On=1	Off - On	0	No effect, if the device is always in day mode, see Coil 14
21	Night to day setpoint transition	Off=0, On=1	Off - On	0	No effect, if the device is always in day mode, see Coil 14
22	Jam function	Off=0, On=1	Off - On	0	the jam function is not activated
23	Fan type (3coil/CE)	Off=0, On=1	Off - On	0	No effect on this process
24	Fan speed 3 disabled	Off=0, On=1	Off - On	0	No effect on this process
25	Fan night to day transition	Off=0, On=1	Off - On	0	No effect, if the device is always in day mode, see Coil 14
26	VAV for heating	Off=0, On=1	Off - On	0	No effect on this process, the VAV function is not used
27	Display TE/SP	Off=0, On=1	Off - On	0	The display shows the room temperature (not the setpoint)
28	DI2 operation direction	Off=0, On=1	Off - On	0	DI2 is not used. No effect on this process
29	Cooling on/off thermostat (off = P/PI)	Off=0, On=1	Off - On	0	P/PI mode for cooling
30	Heating on/off thermostat (off = P/PI)	Off=0, On=1	Off - On	0	P/PI mode for heating
31	Y1 for cooling (off = VAV)	Off=0, On=1	Off - On	0	Y1 is not connected ... No influence
32	Y2 for heating (off = FAN)	Off=0, On=1	Off - On	0	Y1 is not connected ... No influence
34	Cooling actuator type	Off=0, On=1	Off - On	0	Cooling actuator is a thermal actuator
35	Heating actuator type	Off=0, On=1	Off - On	0	Heating actuator is a thermal actuator
	HOLDING REGISTERS				
40001	FAN Speed by Modbus	0 … 4	0 - 1 - 2 - 3 - 4	0	No effect on this process
40002	Setpoint by Modbus	80 … 500	8,0 … 50,0 ℃	210	Temperature setpoint from modbus 21℃
40003	Overdrive Cooling PWM by modbus (A1)	0 … 1000	0,00 … 100,0%	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40004	Overdrive Cooling 0...10V by modbus (Y3)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40005	Overdrive Heating PWM by modbus (A2)	0 … 1000	0,00 … 100,0%	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40006	Overdrive Heating 0...10V by modbus (Y4)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40007	Overdrive VAV by modbus (Y1)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40008	Overdrive FAN by modbus (Y2)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40009	DI2 Not used, ext T, door/window, condensation	0 … 3	0 … 3	0	DI2 is not used in this process
40010	Temperature sensor adjustment	-30 … 30	-3,0 … 3,0 ℃	0	Internal sensor has its factory calibration
40011	Center of user setpoint	180 … 260	18,0 … 26,0 ℃	210	Center of the user setpoint 21℃
40012	User setpoint limits	0 … 160	0,0 … 16,0 ℃	30	End user can change the setpoint +/- 3 ℃ from the point above
40013	Control mode	0 … 1	P/PI	1	Control mode PI
40014	Dead zone	0 … 30	0,0 … 3,0 ℃	2	Dead zone 2,0 ℃
40015	Setpoint relation to Dz	0 … 100	0 … 100%	50	Setpoint is in the center of the dead zone
40016	Proportional band	10 … 320	1,0 … 32,0 ℃	20	Proportional band 2,0 ℃
40017	Integral time	50 … 5000	50 … 5000s	300	Ti = 300 seconds
40018	Fresh air control: 0:CO2 (T), 1:PIR (T), 2: CO2, 3:PIR	0 … 3	0 … 3	0	No influence because VAV is not used in this process
40019	Dead zone night mode	0 … 100	0,0 … 10,0 ℃	60	No affect, if the device is always in day mode, see Coil 14
40020	FG Thermostat setpoint	80 … 500	8,0 … 50,0 ℃	170	No affect, if the device is always in day mode, see Coil 14 and Coil 20
40021	DI1 mode selection: 0= not used, 1= day night by ext contact	0 … 1	0 … 1	0	DI1 is not used to control day/night mode
40022	DI1 operation Direction	0 … 1	0 … 1	0	DI1 not used ... No influence
40023	DI1 delay passive to active	0 … 60	0 … 60min	0	DI1 not used ... No influence
40024	DI1 delay active to passive	0 … 60	0 … 60min	5	DI1 not used ... No influence
40025	“man in house”-button, day extension period	1 … 480	1 … 480min	120	No affect, if the device is always in day mode, see Coil 14
40026	DI1 boost level	0 … 1000	0,0 … 100,0%	0	DI1 not used ... No influence
40027	U1 mode: not used, CO2, T setpoint, T meas	0 … 3	0 … 3	0	U1 not connected
40028	Minimum of cooling actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40029	Maximum of cooling actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40030	Minimum of heating actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40031	Maximum of heating actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40032	Minimum of FAN output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40033	Maximum of FAN output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40034	Minimum of VAV output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40035	Maximum of VAV output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40036	Output scale FAN output Hi	0 … 1000	0,00 … 100,0%	1000	The process has not FAN... No influence
40037	Output scale FAN output Low	0 … 1000	0,00 … 100,0%	0	The process has not FAN... No influence
40038	Fan Control	0 … 3	0 … 3	0	The process has not FAN... No influence
40039	Low limit SP for the CO2 control	400 … 1000	400 … 1000ppm	700	The process have not CO2 control ... No influence
40040	High limit SP for the CO2 control	500 … 2000	500 … 2000ppm	1250	The process have not CO2 control ... No influence
40041	3-point actuator running time, cooling	30 … 300	30 … 300s	180	No effect on this process
40042	3-point actuator running time, heating	30 … 300	30 … 300s	180	No effect on this process

SET 8: Heating and cooling with fan coil unit

Register	Parameter Description	Value	Range	Default	Comments
	COILS				
1	Cooling PWM overdrive enable (A1)	Off=0, On=1	Off - On	0	No modbus overdrives
2	Cooling 0-10V overdrive enable (Y3)	Off=0, On=1	Off - On	0	No modbus overdrives
3	Heating PWM overdrive enable (A2)	Off=0, On=1	Off - On	0	No modbus overdrives
4	Heating 0-10V overdrive enable (Y4)	Off=0, On=1	Off - On	0	No modbus overdrives
5	VAV overdrive enable (Y1)	Off=0, On=1	Off - On	0	No modbus overdrives
6	FAN overdrive enable (Y2)	Off=0, On=1	Off - On	0	No modbus overdrives
7	On/Off damper overdrive enable (B1)	Off=0, On=1	Off - On	0	No modbus overdrives
8	Light control overdrive enable (B2)	Off=0, On=1	Off - On	0	No modbus overdrives
9	Overdrive On/off damper by modbus (B1)	Off=0, On=1	Off - On	0	No modbus overdrives
10	Overdrive Light control by modbus (B2)	Off=0, On=1	Off - On	0	No modbus overdrives
11	SERVICE ALARM RESET	Off=0, On=1	Off - On	0	
12	Cooling disabled	Off=0, On=1	Off - On	0	Cooling working
13	Heating disabled	Off=0, On=1	Off - On	0	Heating working
14	NIGHT MODE	Off=0, On=1	Off - On	1	The device is in night mode until the day mode is controlled
15	Cooling output mode (DIR/REV)	Off=0, On=1	Off - On	0	Direct output mode
16	Heating output mode (DIR/REV)	Off=0, On=1	Off - On	0	Direct output mode
17	Cooling stages (1st/2st)	Off=0, On=1	Off - On	0	1 stage cooling, fan coil unit with radiator
18	Sequence of cooling stages (A-st/V-st)	Off=0, On=1	Off - On	0	No effect on this process
19	Fan ramp with motor ramp	Off=0, On=1	Off - On	1	The FAN and valve is opened simultaneous
20	Night operation mode (DZ/FG)	Off=0, On=1	Off - On	0	The night controlling mode is "expanded dead zone"
21	Night to day setpoint transition	Off=0, On=1	Off - On	1	When returned from night to day mode the device takes modbus setpoint
22	Jam function	Off=0, On=1	Off - On	0	the jam function of thermic actuators is not activated
23	Fan type (3coil/CE)	Off=0, On=1	Off - On	0	The fan type is 3 coil
24	Fan speed 3 disabled	Off=0, On=1	Off - On	0	The FAN can use the speed 0....3 (The speed 3 is not disabled)
25	Fan night to day transition	Off=0, On=1	Off - On	1	When returned from night to day mode the device takes modbus setpoint
26	VAV for heating	Off=0, On=1	Off - On	0	No effect on this process, the VAV function is not used
27	Display TE/SP	Off=0, On=1	Off - On	0	The display shows the room temperature (not the setpoint)
28	DI2 operation direction	Off=0, On=1	Off - On	0	DI2 is not used. No effect on this process
29	Cooling on/off thermostat (off = P/PI)	Off=0, On=1	Off - On	0	P/PI mode for cooling
30	Heating on/off thermostat (off = P/PI)	Off=0, On=1	Off - On	0	P/PI mode for heating
31	Y1 for cooling (off = VAV)	Off=0, On=1	Off - On	0	Y1 is not connected ... No influence
32	Y2 for heating (off = FAN)	Off=0, On=1	Off - On	0	Y2 is for FAN control
34	Cooling actuator type	Off=0, On=1	Off - On	0	Cooling actuator is a 3-point actuator
35	Heating actuator type	Off=0, On=1	Off - On	0	Heating actuator is a 3-point actuator
	HOLDING REGISTERS				
40001	FAN Speed by Modbus	0 … 4	0 - 1 - 2 - 3 - 4	4	Default FAN speed = automatic
40002	Setpoint by Modbus	80 … 500	8,0 … 50,0 ℃	210	Temperature setpoint from modbus 21℃
40003	Overdrive Cooling PWM by modbus (A1)	0 … 1000	0,00 … 100,0%	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40004	Overdrive Cooling 0...10V by modbus (Y3)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40005	Overdrive Heating PWM by modbus (A2)	0 … 1000	0,00 … 100,0%	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40006	Overdrive Heating 0...10V by modbus (Y4)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40007	Overdrive VAV by modbus (Y1)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40008	Overdrive FAN by modbus (Y2)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40009	DI2 Not used, ext T, door/window, condensation	0 … 3	0 … 3	0	DI2 is not used in this process
40010	Temperature sensor adjustment	-30 … 30	-3,0 … 3,0 ℃	0	Internal sensor has its factory calibration
40011	Center of user setpoint	180 … 260	18,0 … 26,0 ℃	210	Center of the user setpoint 21℃
40012	User setpoint limits	0 … 160	0,0 … 16,0 ℃	30	End user can change the setpoint +/- 3 ℃ from the point above
40013	Control mode	0 … 1	P/PI	1	Control mode PI
40014	Dead zone	0 … 30	0,0 … 3,0 ℃	2	Dead zone 2,0 ℃
40015	Setpoint relation to Dz	0 … 100	0 … 100%	50	Setpoint is in the center of the dead zone
40016	Proportional band	10 … 320	1,0 … 32,0 ℃	20	Proportional band 2,0 ℃
40017	Integral time	50 … 5000	50 … 5000s	300	Ti = 300 seconds
40018	Fresh air control: 0:CO2 (T), 1:PIR (T), 2: CO2, 3:PIR	0 … 3	0 … 3	0	No influence because VAV is not used in this process
40019	Dead zone night mode	0 … 100	0,0 … 10,0 ℃	60	Dead zone is 6 ℃ when device is in night mode
40020	FG Thermostat setpoint	80 … 500	8,0 … 50,0 ℃	170	The night mode "Dz" chosen, the frost guard setpoint has no influence (see coil 20)
40021	DI1 mode selection: 0= not used, 1= day night by ext contact	0 … 1	0 … 1	1	DI1 controls day/night mode (e.g card switch)
40022	DI1 operation Direction	0 … 1	0 … 1	1	When the DI1 contact closes the device goes to day mode
40023	DI1 delay passive to active	0 … 60	0 … 60min	0	From day night to day mode, delay 0 minutes
40024	DI1 delay active to passive	0 … 60	0 … 60min	5	From day to night mode, delay 5 minutes
40025	“main in house”-button, day extension period	1 … 480	1 … 480min	120	The user can control the device to day mode for 120min by "man in house button"
40026	DI1 boost level	0 … 1000	0,0 … 100,0%	0	VAV is not used ... No influence
40027	U1 mode: not used, CO2, T setpoint, T meas	0 … 3	0 … 3	0	U1 not connected
40028	Minimum of cooling actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40029	Maximum of cooling actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40030	Minimum of heating actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40031	Maximum of heating actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40032	Minimum of FAN output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40033	Maximum of FAN output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40034	Minimum of VAV output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40035	Maximum of VAV output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40036	Output scale FAN output Hi	0 … 1000	0,00 … 100,0%	1000	Full FAN operation range to 100%
40037	Output scale FAN output Low	0 … 1000	0,00 … 100,0%	0	Full FAN operation range from 0%
40038	Fan Control	0 … 3	0 … 3	3	The fan is running with cooling and heating
40039	Low limit SP for the CO2 control	400 … 1000	400 … 1000ppm	700	The process have not CO2 control ... No influence
40040	High limit SP for the CO2 control	500 … 2000	500 … 2000ppm	1250	The process have not CO2 control ... No influence
40041	3-point actuator running time, cooling	30 … 300	30 … 300s	180	Cooling actuator running time is 180 s.
40042	3-point actuator running time, heating	30 … 300	30 … 300s	180	Heating actuator running time is 180 s.

Information is subject to change without prior notice.

SET 9: Heating with radiator, cooling with VAV and chilled beam, CO_2 concentration based VAV

Register	Parameter Description	Value	Range	Default	Comments
	COILS				
1	Cooling PWM overdrive enable (A1)	Off=0, On=1	Off - On	0	No modbus overdrives
2	Cooling 0-10V overdrive enable (Y3)	Off=0, On=1	Off - On	0	No modbus overdrives
3	Heating PWM overdrive enable (A2)	Off=0, On=1	Off - On	0	No modbus overdrives
4	Heating 0-10V overdrive enable (Y4)	Off=0, On=1	Off - On	0	No modbus overdrives
5	VAV overdrive enable (Y1)	Off=0, On=1	Off - On	0	No modbus overdrives
6	FAN overdrive enable (Y2)	Off=0, On=1	Off - On	0	No modbus overdrives
7	On/Off damper overdrive enable (B1)	Off=0, On=1	Off - On	0	No modbus overdrives
8	Light control overdrive enable (B2)	Off=0, On=1	Off - On	0	No modbus overdrives
9	Overdrive On/off damper by modbus (B1)	Off=0, On=1	Off - On	0	No modbus overdrives
10	Overdrive Light control by modbus (B2)	Off=0, On=1	Off - On	0	No modbus overdrives
11	SERVICE ALARM RESET	Off=0, On=1	Off - On	0	
12	Cooling disabled	Off=0, On=1	Off - On	0	Cooling working
13	Heating disabled	Off=0, On=1	Off - On	0	Heating working
14	NIGHT MODE	Off=0, On=1	Off - On	0	The device is in night mode until the day mode is controlled
15	Cooling output mode (DIR/REV)	Off=0, On=1	Off - On	0	Direct output mode
16	Heating output mode (DIR/REV)	Off=0, On=1	Off - On	0	Direct output mode
17	Cooling stages (1st/2st)	Off=0, On=1	Off - On	1	2 stage cooling, VAV and chilled beam
18	Sequence of cooling stages (A-st/V-st)	Off=0, On=1	Off - On	0	The motor actuator (Chilled beam) is first and the the VAV
19	Fan ramp with motor ramp	Off=0, On=1	Off - On	1	No effect on this process
20	Night operation mode (DZ/FG)	Off=0, On=1	Off - On	0	The night controlling mode is "expanded dead zone"
21	Night to day setpoint transition	Off=0, On=1	Off - On	0	When returned from night to day mode the device takes modbus setpoint
22	Jam function	Off=0, On=1	Off - On	0	the jam function of thermic actuators is not activated
23	Fan type (3coil/CE)	Off=0, On=1	Off - On	0	No fan in this process .. no influence
24	Fan speed 3 disabled	Off=0, On=1	Off - On	0	No fan in this process .. no influence
25	Fan night to day transition	Off=0, On=1	Off - On	0	No fan in this process .. no influence
26	VAV for heating	Off=0, On=1	Off - On	0	VAV is used only for cooling (no heating radiator in the VAV box)
27	Display TE/SP	Off=0, On=1	Off - On	0	The display shows the room temperature (not the setpoint)
28	DI2 operation direction	Off=0, On=1	Off - On	0	DI2 is not used. No effect on this process
29	Cooling on/off thermostat (off = P/PI)	Off=0, On=1	Off - On	0	P/PI mode for cooling
30	Heating on/off thermostat (off = P/PI)	Off=0, On=1	Off - On	0	P/PI mode for heating
31	Y1 for cooling (off = VAV)	Off=0, On=1	Off - On	0	Y1 is for VAV
32	Y2 for heating (off = FAN)	Off=0, On=1	Off - On	0	FAN not used. No effect on this process
34	Cooling actuator type	Off=0, On=1	Off - On	0	Cooling actuator is a thermal actuator
35	Heating actuator type	Off=0, On=1	Off - On	0	Heating actuator is a thermal actuator
	HOLDING REGISTERS				
40001	FAN Speed by Modbus	0 … 4	0 - 1 - 2 - 3 - 4	0	No effect on this process
40002	Setpoint by Modbus	80 … 500	8,0 … 50,0 ℃	210	Temperature setpoint from modbus 21℃
40003	Overdrive Cooling PWM by modbus (A1)	0 … 1000	0,00 … 100,0%	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40004	Overdrive Cooling 0...10V by modbus (Y3)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40005	Overdrive Heating PWM by modbus (A2)	0 … 1000	0,00 … 100,0%	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40006	Overdrive Heating 0...10V by modbus (Y4)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40007	Overdrive VAV by modbus (Y1)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40008	Overdrive FAN by modbus (Y2)	0…1000	0 …10.00 V	0	No modbus overdrives chosen... The value has no affect (see coils 1 ... 10)
40009	DI2 Not used, ext T, door/window, condensation	0 … 3	0 … 3	0	DI2 is not used in this process
40010	Temperature sensor adjustment	-30 … 30	-3,0 … 3,0 ℃	0	Internal sensor has its factory calibration
40011	Center of user setpoint	180 … 260	18,0 … 26,0 ℃	210	Center of the user setpoint 21℃
40012	User setpoint limits	0 … 160	0,0 … 16,0 ℃	30	End user can change the setpoint +/- 3 ℃ from the point above
40013	Control mode	0 … 1	P/PI	1	Control mode PI
40014	Dead zone	0 … 30	0,0 … 3,0 ℃	2	Dead zone 2,0 ℃
40015	Setpoint relation to Dz	0 … 100	0 … 100%	50	Setpoint is in the center of the dead zone
40016	Proportional band	10 … 320	1,0 … 32,0 ℃	20	Proportional band 2,0 ℃
40017	Integral time	50 … 5000	50 … 5000s	300	Ti = 300 seconds
40018	Fresh air control: 0:CO2 (T), 1:PIR (T), 2: CO2, 3:PIR	0 … 3	0 … 3	0	The VAV is controlled by CO2 value and cooling demand
40019	Dead zone night mode	0 … 100	0,0 … 10,0 ℃	60	Dead zone is 6 ℃ when device is in night mode
40020	FG Thermostat setpoint	80 … 500	8,0 … 50,0 ℃	170	The night mode "Dz" chosen, the frost guard setpoint has no influence (see coil 20)
40021	DI1 mode selection: 0= not used, 1= day night by ext contact	0 … 1	0 … 1	0	DI1 is not used to control day/night mode
40022	DI1 operation Direction	0 … 1	0 … 1	0	DI1 not used ... No influence
40023	DI1 delay passive to active	0 … 60	0 … 60min	0	DI1 not used ... No influence
40024	DI1 delay active to passive	0 … 60	0 … 60min	5	DI1 not used ... No influence
40025	"main in house"-button, day extension period	1 … 480	1 … 480min	120	The user can control the device to day mode for 120min by "man in house button"
40026	DI1 boost level	0 … 1000	0,0 … 100,0%	0	DI1 not used ... No influence
40027	U1 mode: not used, CO2, T setpoint, T meas	0 … 3	0 … 3	1	CO2 transmitter connected to U1
40028	Minimum of cooling actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40029	Maximum of cooling actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40030	Minimum of heating actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40031	Maximum of heating actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40032	Minimum of FAN output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
40033	Maximum of FAN output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40034	Minimum of VAV output	0 … 500	0,0 … 50,0 %	100	The VAV controls always at least 10% fresh air level
40035	Maximum of VAV output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
40036	Output scale FAN output Hi	0 … 1000	0,00 … 100,0%	1000	The process has not FAN... No influence
40037	Output scale FAN output Low	0 … 1000	0,00 … 100,0%	0	The process has not FAN... No influence
40038	Fan Control	0 … 3	0 … 3	0	The process has not FAN... No influence
40039	Low limit SP for the CO2 control	400 … 1000	400 … 1000ppm	700	VAV starts to open when 700ppm CO2 level exceeded
40040	High limit SP for the CO2 control	500 … 2000	500 … 2000ppm	1250	VAV is fully open when 1250ppm CO2 level exceeded
40041	3-point actuator running time, cooling	30 … 300	30 … 300s	180	No effect on this process
40042	3-point actuator running time, heating	30 … 300	30 … 300s	180	No effect on this process

Information is subject to change without prior notice.