USER GUIDE

HLS 44-CO2-SER

Produal

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Commissioning tool HLS 44-CO2-SER

HLS 44-CO2-SER is a tool for commissioning HLS 44-CO2 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 1.3.0 or later. The tool software version shows on the tool display when the power is switched on.

PROFILES

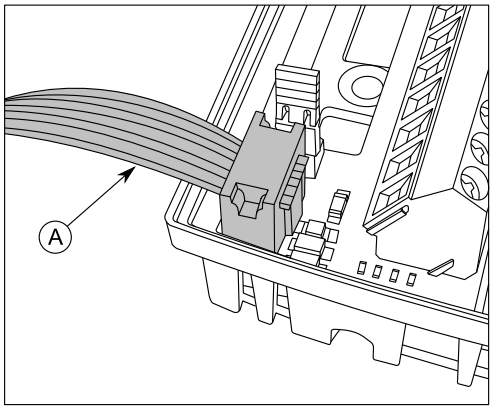
HLS 44-CO2-SER commissioning tool contains fixed factory settings (PRSET 1), memory slots for 6 user defined solutions (SET 1...6) and 3 pre-programmed application profiles (SET 7...9). All parameters of SET 1...9 can be changed for a best possible room control solution. For more information see the HLS 44-CO2 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 to the controller.

   IMPORTANT: Do not connect the supply voltage to commissioning tool.

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-CO2-SER software version	Compatible HLS 44-CO2 software versions
1.3.1	1.3.0…1.3.5
1.3.9	1.3.6 ->

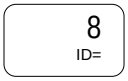
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LOADING PARAMETERS TO THE CONTROLLER

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



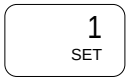
2. Press the ⟲ button to enter the Modbus address setting view.



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-CO2 user guide.
4. Load the parameters to the controller.

LOADING PARAMETERS FROM THE CONTROLLER TO THE COMMISSIONING TOOL

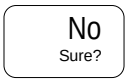
1. Press the ⊕ and ⊖ buttons to select the profile (SET 1…9) in which you want to load the parameters.
   NOTE: The selected profile will be overwritten with the new parameters. You cannot recover the overwritten profiles.



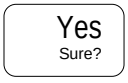
2. Press the ⌂ button until you reach the parameter loading menu.



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.

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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
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
37	ABC calibration	Off=0, On=1	Off - On	1	No effect on this process
	HOLDING REGISTERS				
4000**1**	FAN Speed by Modbus	0 … 4	0 - 1 - 2 - 3 - 4	0	No effect on this process
4000**2**	Setpoint by Modbus	80 … 500	8,0 … 50,0 °C	210	Temperature setpoint from modbus 21°C
4000**3**	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)
4000**4**	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)
4000**5**	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)
4000**6**	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)
4000**7**	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)
4000**8**	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)
4000**9**	DI2 Not used, ext T, door/window, condensation	0 … 3	0 … 3	0	DI2 is not used in this process
400**10**	Temperature sensor adjustment	-30 … 30	-3,0 … 3,0 °C	0	Internal sensor has its factory calibration
400**11**	Center of user setpoint	180 … 260	18,0 … 26,0 °C	210	Center of the user setpoint 21°C
400**12**	User setpoint limits	0 … 160	0,0 … 16,0 °C	30	End user can change the setpoint +/- 3 °C from the point above
400**13**	Control mode	0 … 1	P/PI	1	Control mode PI
400**14**	Dead zone	0 … 30	0,0 … 3,0 °C	10	Dead zone 1,0 °C
400**15**	Setpoint relation to Dz	0 … 100	0 … 100%	50	Setpoint is in the center of the dead zone
400**16**	Proportional band	10 … 320	1,0 … 32,0 °C	20	Proportional band 2,0 °C
400**17**	Integral time	50 … 5000	50 … 5000s	150	Ti = 150 seconds
400**18**	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
400**19**	Dead zone night mode	0 … 100	0,0 … 10,0 °C	60	No affect, if the device is always in day mode, see Coil 14
400**20**	FG Thermostat setpoint	80 … 500	8,0 … 50,0 °C	170	No affect, if the device is always in day mode, see Coil 14 and Coil 20
400**21**	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
400**22**	DI1 operation Direction	0 … 1	0 … 1	0	DI1 not used ... No influence
400**23**	DI1 delay passive to active	0 … 60	0 … 60min	0	DI1 not used ... No influence
400**24**	DI1 delay active to passive	0 … 60	0 … 60min	5	DI1 not used ... No influence
400**25**	“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
400**26**	DI1 boost level	0 … 1000	0,0 … 100,0%	0	DI1 not used ... No influence
400**27**	U1 mode: not used, T setpoint, T meas	0 … 2	0 … 2	0	U1 not connected
400**28**	Minimum of cooling actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**29**	Maximum of cooling actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**30**	Minimum of heating actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**31**	Maximum of heating actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**32**	Minimum of FAN output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**33**	Maximum of FAN output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**34**	Minimum of VAV output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**35**	Maximum of VAV output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**36**	Output scale FAN output Hi	0 … 1000	0,00 … 100,0%	1000	The process has not FAN... No influence
400**37**	Output scale FAN output Low	0 … 1000	0,00 … 100,0%	0	The process has not FAN... No influence
400**38**	Fan Control	0 … 3	0 … 3	0	The process has not FAN... No influence
400**39**	Low limit SP for the CO2 control	400 … 1000	400 … 1000ppm	700	The process have not CO2 control ... No influence
400**40**	High limit SP for the CO2 control	500 … 2000	500 … 2000ppm	1250	The process have not CO2 control ... No influence

Information is subject to change without prior notice.

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
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
37	ABC calibration	Off=0, On=1	Off - On	1	No effect on this process
	HOLDING REGISTERS				
4000**1**	FAN Speed by Modbus	0 … 4	0 - 1 - 2 - 3 - 4	4	Default FAN speed = automatic
4000**2**	Setpoint by Modbus	80 … 500	8,0 … 50,0 °C	210	Temperature setpoint from modbus 21°C
4000**3**	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)
4000**4**	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)
4000**5**	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)
4000**6**	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)
4000**7**	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)
4000**8**	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)
4000**9**	DI2 Not used, ext T, door/window, condensation	0 … 3	0 … 3	0	DI2 is not used in this process
4001**0**	Temperature sensor adjustment	-30 … 30	-3,0 … 3,0 °C	0	Internal sensor has its factory calibration
4001**1**	Center of user setpoint	180 … 260	18,0 … 26,0 °C	210	Center of the user setpoint 21°C
4001**2**	User setpoint limits	0 … 160	0,0 … 16,0 °C	30	End user can change the setpoint +/- 3 °C from the point above
4001**3**	Control mode	0 … 1	P/PI	1	Control mode PI
4001**4**	Dead zone	0 … 30	0,0 … 3,0 °C	10	Dead zone 1,0 °C
4001**5**	Setpoint relation to Dz	0 … 100	0 … 100%	50	Setpoint is in the center of the dead zone
4001**6**	Proportional band	10 … 320	1,0 … 32,0 °C	20	Proportional band 2,0 °C
4001**7**	Integral time	50 … 5000	50 … 5000s	150	Ti = 150 seconds
4001**8**	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
4001**9**	Dead zone night mode	0 … 100	0,0 … 10,0 °C	60	Dead zone is 6 °C when device is in night mode
4002**0**	FG Thermostat setpoint	80 … 500	8,0 … 50,0 °C	170	The night mode "Dz" chosen, the frost guard setpoint has no influence (see coil 20)
4002**1**	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)
4002**2**	DI1 operation Direction	0 … 1	0 … 1	1	When the DI1 contact closes the device goes to day mode
4002**3**	DI1 delay passive to active	0 … 60	0 … 60min	0	From day night to day mode, delay 0 minutes
4002**4**	DI1 delay active to passive	0 … 60	0 … 60min	5	From day to night mode, delay 5 minutes
4002**5**	“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"
4002**6**	DI1 boost level	0 … 1000	0,0 … 100,0%	0	VAV is not used ... No influence
4002**7**	U1 mode: not used, T setpoint, T meas	0 … 2	0 … 2	0	U1 not connected
4002**8**	Minimum of cooling actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
4002**9**	Maximum of cooling actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
4003**0**	Minimum of heating actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
4003**1**	Maximum of heating actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
4003**2**	Minimum of FAN output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
4003**3**	Maximum of FAN output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
4003**4**	Minimum of VAV output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
4003**5**	Maximum of VAV output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
4003**6**	Output scale FAN output Hi	0 … 1000	0,00 … 100,0%	1000	Full FAN operation range to 100%
4003**7**	Output scale FAN output Low	0 … 1000	0,00 … 100,0%	0	Full FAN operation range from 0%
4003**8**	Fan Control	0 … 3	0 … 3	3	The fan is running with cooling and heating
4003**9**	Low limit SP for the CO2 control	400 … 1000	400 … 1000ppm	700	The process have not CO2 control ... No influence
4004**0**	High limit SP for the CO2 control	500 … 2000	500 … 2000ppm	1250	The process have not CO2 control ... No influence

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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
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
37	ABC calibration	Off=0, On=1	Off - On	1	ABC calibration is active
	HOLDING REGISTERS				
4000**1**	FAN Speed by Modbus	0 … 4	0 - 1 - 2 - 3 - 4	0	No effect on this process
4000**2**	Setpoint by Modbus	80 … 500	8,0 … 50,0 °C	210	Temperature setpoint from modbus 21°C
4000**3**	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)
4000**4**	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)
4000**5**	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)
4000**6**	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)
4000**7**	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)
4000**8**	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)
4000**9**	DI2 Not used, ext T, door/window, condensation	0 … 3	0 … 3	0	DI2 is not used in this process
400**10**	Temperature sensor adjustment	-30 … 30	-3,0 … 3,0 °C	0	Internal sensor has its factory calibration
400**11**	Center of user setpoint	180 … 260	18,0 … 26,0 °C	210	Center of the user setpoint 21°C
400**12**	User setpoint limits	0 … 160	0,0 … 16,0 °C	30	End user can change the setpoint +/- 3 °C from the point above
400**13**	Control mode	0 … 1	P/PI	1	Control mode PI
400**14**	Dead zone	0 … 30	0,0 … 3,0 °C	10	Dead zone 1,0 °C
400**15**	Setpoint relation to Dz	0 … 100	0 … 100%	50	Setpoint is in the center of the dead zone
400**16**	Proportional band	10 … 320	1,0 … 32,0 °C	20	Proportional band 2,0 °C
400**17**	Integral time	50 … 5000	50 … 5000s	150	Ti = 150 seconds
400**18**	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
400**19**	Dead zone night mode	0 … 100	0,0 … 10,0 °C	60	Dead zone is 6 °C when device is in night mode
400**20**	FG Thermostat setpoint	80 … 500	8,0 … 50,0 °C	170	The night mode "Dz" chosen, the frost guard setpoint has no influence (see coil 20)
400**21**	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
400**22**	DI1 operation Direction	0 … 1	0 … 1	0	DI1 not used ... No influence
400**23**	DI1 delay passive to active	0 … 60	0 … 60min	0	DI1 not used ... No influence
400**24**	DI1 delay active to passive	0 … 60	0 … 60min	5	DI1 not used ... No influence
400**25**	“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”
400**26**	DI1 boost level	0 … 1000	0,0 … 100,0%	0	DI1 not used ... No influence
400**27**	U1 mode: not used, T setpoint, T meas	0 … 2	0 … 2	0	U1 not connected
400**28**	Minimum of cooling actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**29**	Maximum of cooling actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**30**	Minimum of heating actuator	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**31**	Maximum of heating actuator	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**32**	Minimum of FAN output	0 … 500	0,0 … 50,0 %	0	Full operation range from 0%
400**33**	Maximum of FAN output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**34**	Minimum of VAV output	0 … 500	0,0 … 50,0 %	100	The VAV controls always at least 10% fresh air level
400**35**	Maximum of VAV output	500 … 1000	50,0 … 100,0 %	1000	Full operation range to 100%
400**36**	Output scale FAN output Hi	0 … 1000	0,00 … 100,0%	1000	The process has not FAN... No influence
400**37**	Output scale FAN output Low	0 … 1000	0,00 … 100,0%	0	The process has not FAN... No influence
400**38**	Fan Control	0 … 3	0 … 3	0	The process has not FAN... No influence
400**39**	Low limit SP for the CO2 control	400 … 1000	400 … 1000ppm	700	VAV starts to open when 700ppm CO2 level exceeded
400**40**	High limit SP for the CO2 control	500 … 2000	500 … 2000ppm	1250	VAV is fully open when 1250ppm CO2 level exceeded