94204E-04
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FLEXIT CS 1000

E **User Guide**
Automatics

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Contents

1 Overview

1.1 Short Description

Controllers for standardized ventilation applications.

- Control, indication and supervisory functions
- Temperature, pressure / flow sequences
- Lead-point sensor for winter and/or summer compensation
- Time scheduler program (weektime scheduler with 4 switching times per day)

1.2 Features

Control functions

- Four types of control
    1. Constant supply air temperature
    2. Room/extract control
    3. Differential temperature control
    4. Supply air control with compensation for the outdoor temperature.
- Minimum and maximum limitation of the supply air temperature
- Double setpoints: Comfort / Economy setpoints (temperature)
- Unoccupied heating and cooling modes
- Night purging function
- Setpoint shift via external signal
- Anti-icing controller for heat recovery (HR) equipment, patented solution
- Demand controlled ventilation
- Frost protection function for the air or water side
- Selectable P, PI, PD or PID control functions
- Electric or hot-water heater
- Cooling, modulating and / or single-stage switching
- Heat recovery with wheel heat exchanger and heat exchanger cross
- Pressure control or flow control

- Start/stop of the circulation pump according to load and outside temperature
- Fan overrun
- Pressure and flow control via modulating fan control
- Cooling
- Switching the controller via external or pushbutton
- Common alarm with one contact output (priority A and B)

Supervisory functions

- Operating unit (HMI) with 8-line display, each line with 20 characters
- Fire or smoke alarm input
- Air flow
- Frost in the air heater battery's water circuit
- Electric air heater battery, overload
- Fans, overload
- Filter alarm

1.3 CS 1000 Accessories

CC 1060 GSM-card

Art. no. 09370

Enables alarm sent via SMS

CC 1062 LON-card

Art. no. 09372

For use to communicate via LON

CC 1063 WEB/OPC-card

Art. no. 09373

For use to communicate via WEB or OPC

CC 1061 GSM-package (without GSM-card)

Additional equipment for GSM-card

Art. No. 09371

Siemens GSM-package:

- modem
- antenna cable
- antenna w/magnet foot
- transformer
- cable 0.8 m

CC 1040 Room Sencor

Art. no. 09368

CC 1041 Outdoor Sencor

Art. no. 09369

CC 1050 Pressure Censor

Art. no. 09367

0-3000 Pa

Impulse Switch for enhanced or prolonged operation

Art. no. 09364

SP 430 Pressure Regulator

Art. no. 09357

For external pressure adjustment

SP 435 Movement Censor

Art. no. 09358

For 24V

SP 450 Movement Censor

Art. no. 09390

For 230V

SP 440 CO_2 Detector

Art. no. 09359

SP 445 Smoke Detector (duct mounted)

Art. no. 09362

1.4 Notes on Safety

CS 1000 (ACX32.000/ALG) is designed exclusively for the control and supervision of ventilation units.

Use with other products

Only third-party products supplied with the CS 1000 by Flexit or recommended by Flexit may be integrated in the system without restrictions. Within the scope of the overall configuration, the user must observe all safety instructions released by the supplier of such products.
The connection or integration of third-party products not recommended by Flexit is possible, but such products must satisfy the safety requirements and other technical requirements as specified in the relevant product descriptions.

1.4.1 Requirements for Commissioning Engineers /Plant Operators

Qualified staff trained by Flexit must perform preparatory work on and commissioning of the CS 1000.
Persons who have been appropriately instructed by Flexit or Flexit representatives and whose attentions have been drawn to potential risks must perform operation of the CS 1000.

1.4.2 Active and Passive Safety

Active and passive safety are product related statuses: The safe status is ensured actively by the product itself (system safety, e.g. intrinsic safety designed into the system), or the product, has passive safety characteristics and has to rely on the safety that is to be constantly exercised when the product is used.

Active safety

Active safety of the CS 1000 is achieved through the following measures:

- Use of safe software (self-diagnosis, plausibility tests, warning of potential risks, shutdown in the case of serious system faults, data backup in the event of power failures, etc.)
- Safe construction

Passive safety

The passive safety of CS 1000 is enhanced through the following measures:

- Training of commissioning staff by Flexit to make certain that the system will be correctly used and in compliance with safety regulations.
- Instructing the operator, including detailed information on safety measures.

1.5 Environmental Info: Protection /Disposal

Environmental protection

Controller CS 1000 has no negative effect on the environment.

Disposal

The controller contains electrical and electronic components and must not be disposed of together with household garbage. **Local and currently valid legislation must always be observed!**

1.6 Abbreviations

AP	Operating point
B	Password for operating level
DIL-switch	Set of DIL switches grouped together as one component
E_S	End point of summer compensation
E_W	End point of winter compensation
F_S	Start point of summer compensation
FU	Frequency converter
F_W	Start point of winter compensation
HMI	Human Machine Interface (operator unit)
I	Password for information level
KP	Gain factor (P mode)
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MECH	Maximum Economy Changeover
NC	Normally Closed
NO	Normally Open
P	Password for parameter setting level
SA	Switching interval
SD	Switching differential
S_s	Extent of summer compensation at end point E_S
S_w	Extent of winter compensation at end point E_W
T_A	Outside temperature
TD	Derivative action time (D-mode)
TN	Integral action time (I-mode)
T_R	Room or extract air temperature
t	Time
t_{Pmin}	Minimum running time of circulating pump
w_c	Setpoint of cooling
w_R	Setpoint of room of extract air temperature
w_w	Setpoint of frost protection (frost alarm value)
w_z	Setpoint of supply air temperature
Y	Modulating control signal
Δp	Pressure differential
Δw	Setpoint shift

2 Handling

Installation

2.1 Installation Procedure

2.1.1 Controller

The CS 1000 is designed for installation in control panels and is mounted on DIN rail.

If voltages exceeding AC 29 V (e.g. AC 240 V) are accidentally applied to the low-voltage terminals, the controller will be damaged beyond repair!

A specific transformer for the power supply is required. It must not be connected to the sensors!

Make the electrical connections in the following order:
First the peripheral devices, then the supply voltage.

2.1.2 Fault Handling

In the event of a fault, start by checking the following:

- Power supply 24 V
- Correct connections of the terminals
- Correct connections of the peripheral devices
- Fault diagnosis with the help of the light emitting diodes on the unit front

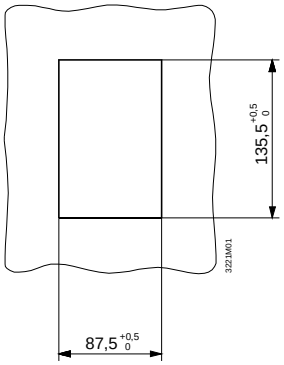
If the fault cannot be located and repaired following the list above, the controller must be replaced and the faulty part returned (via the supplier) to the factory.

2.1.3 CI 1000 Handterminal (HMI)

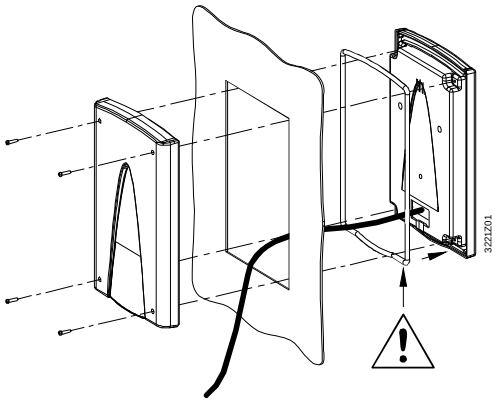
The handterminal has an opening at the rear for hanging the operator unit on the wall.

In the case of flush panel mounting of the handterminal, do as follows:

1. The panel cutout required is 135.5 x 87.5 mm.
The front dimensions of the unit result in 153.5 x 99.3 mm spacing.

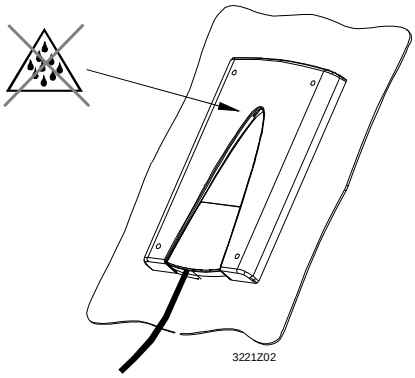


2. Connect the cable and pull it to the rear of the cutout.
Assemble the unit.



⚠ When fitting the unit, make certain that the seal is on the *front* of the housing!

3. Ensure that moisture cannot enter the opening at the rear of the unit!



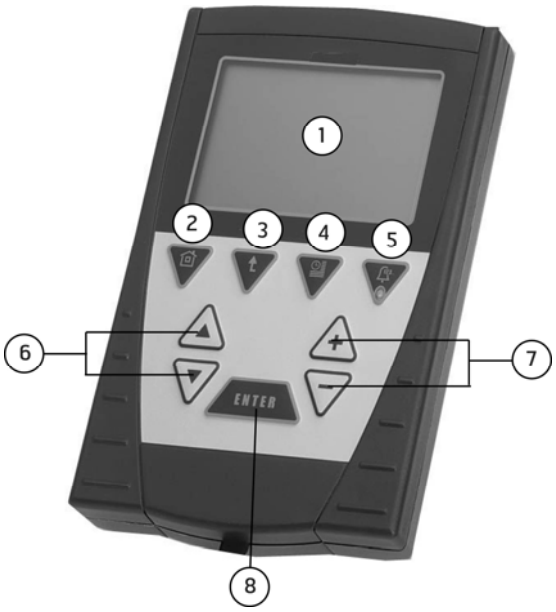
Note *For the technical data of the handterminal, refer to Data Sheet N3223en.*

2.2 Connection Terminals

Saphir IO	Function	IO Type	Connection Saphir
Relay outputs			
DO1	Pump/Heat stage2 electric battery	Digital	X3 (Pin 1,2,3)
DO2	Heat stage3 electric battery	Digital	X3 (Pin 4,5,6)
DO3	Fan start/stop-internal	Digital	X4 (Pin 1,2,3)
DO4	Outdoor air damper	Digital	X4 (Pin 4,5,6)
DO5	Cooling dx stage1	Digital	X5 (Pin 1,2,3)
DO6	Cooling dx stage2	Digital	X5 (Pin 4,5,6)
DO7	Alarm output priority A	Digital	X6 (Pin 1,2,3)
DO8	Alarm output priority B	Digital	X6 (Pin 4,5,6)
Analog Outputs			
AO1	Cooling	Analog (0 - 10 V)	X9 (Pin 1,3)
AO2	Water battery Valve modulating or Electrical Heating FULL Range indicator signal	Analog (0 - 10 V)	X9 (Pin 2,3)
AO3	Pulse width Modulating 0 or 10V (ON/OFF)	Analog (0 / 10V DC)	X9 (Pin 4,6)
AO4	Damper or rotor (Heat/Cool Recovery)	Analog (0 - 10 V)	X9 (Pin 5,6)
AO5	Supply air fan. Freq. Conv.	Analog (0 - 10 V)	X10 (Pin 1,3)
AO6	Extract air fan Freq. Conv.	Analog (0 - 10 V)	X10 (Pin 2,3)
AO7	Air volume indication extract air	Analog (0 - 10 V)	X10 (Pin 4,6)
AO8	Air volume indication supply air	Analog (0 - 10 V)	X10 (Pin 5,6)
Binary Inputs			
DI1	Heat exchanger cross: Thermostat aut. reset el. heating battery. With rotor: Rotor alarm	Digital	X7 (Pin 1,2)
DI2	Alarm external fire/smoke	Digital	X7 (Pin 3,4)
DI3	Alarm fan supply/extract	Digital	X8 (Pin1,2)
DI4	External start/stop	Digital	X8 (Pin 3,4)
Universal Inputs			
UI1	Extract/room temperature	Passive (Ni 1000)	X11 (Pin 1,2)
UI2	Supply air temperature	Passive (Ni 1000)	X11 (Pin 3,4)
UI3	Outside temperature	Passive (Ni 1000)	X11 (Pin 5,6)
UI4	Input external sensor extract (pressure or CO2)	Analog (0 - 10 V)	X11 (Pin 7,8)
UI5	Input external sensor supply (pressure or CO2)	Analog (0 - 10 V)	X11 (Pin 9,10)
UI6	With heat exchanger cross: Frost/ice sensor Temperature wire. With rotor: This is el. heating battery O/H	Analog	X11(Pin11,12)
Universal inputs			
UI7	Spare		X11 (Pin 13,14)
UI8	Filter guard supply air	Analog (0 – 10 V)	X12 (Pin 1,2)
UI9	Filter guard extract air	Analog (0 – 10 V)	X12 (Pin 3,4)
UI10	Input internal sensor extract	Analog (0 – 10 V)	X12 (Pin 5,6)
UI11	Input internal sensor supply	Analog (0 – 10 V)	X12 (Pin 7,8)
UI12	Forced operation (press button)	Digital	X12 (Pin 9,10)
UI13	Extended operation (press button)	Digital	X12 (Pin 11,12)
UI14	Fire thermostat from electrical battery	Digital	X12 (Pin 13,14)

Saphir IO	Function	IO Type	Connection Saphir
	Frost/ice sensor at water battery	Passive (Ni 1000)	
DIL Switches (inactive)			
DIL 1	After new application is loaded and running, DIL 1 must be moved from ON to OFF (with controller ON) to set all setpoints etc to manual, otherwise no changes will be possible from handterminal, its also sets the correct time delays for all the alarms. This is only needed after new application is loaded, for example in the factory, or during commissioning.	Digital (switch)	
DIL 2-4	No function	Digital (switch)	

2.3 Operating Elements ACX82.910/ALG



Legend

	Operating element	*Function*
1	LCD with 4/8 lines, each one with 20 characters	Display of actual values and settings
2	Home button	Resetting the cursor to the start page
3	Return button	Resetting the cursor by one menu
4	Start / Stop button	Toggle between Automatic / Off modes
5	Alarm button with integrated LED	Display and acknowledgement of alarms
6	Line selection buttons	Selection of menu/parameter/line
7	Setting buttons	Setting a value (+ / -) Horizontal cursor movement
8	ENTER button	Confirming change of value (setting)

2.4 General Information on Navigation

2.4.1 Levels

Data access is divided into 2 underlying levels:

- Operating level
- Parameter setting level

The end-user has access to the operating level:

Operating level

On the operating level, the end-user can read and change certain values without having to enter his password. In principle, this applies to current plant values and states, i.e. end-user parameters.

Parameter setting level

The HVAC engineer has access to the parameter setting level:

The end-user has no access to the parameter setting level. It is for exclusive use by the HVAC engineer and can only be accessed by entering the appropriate password. Entering this password gives access to the highest entry level, making it possible to read and change all values available on the operating level.

In this documentation, the terms ”End-user parameters” and ”HVAC engineer parameters” refer to the settings made via the so-called parameter names (with the exception of the scheduler). The basic settings (and the scheduler) do not have these names.

The parameter names are designations that describe the respective parameter and which often consists of individual abbreviations.

Examples.	`SuVolLoStp`	Supply volume low set point
	`EnblHtgUnoccupied`	Enabling unoccupied heating mode

The parameter names are accessed via the main menus and the submenus. After the parameter names, the values are given that can be read and changed.

The basic settings (and the scheduler) do not use proper parameter names, but lead via menus directly to the setting lines, i.e. to values that can be read and changed.

Note

In this documentation, the parameter names are given in `Courier` font type, in order to distinguish from the menus.

2.4.2 Menus

The parameter names or the setting lines are accessed via main menus (start page) and submenus. The structure is shown in section 2.4.4.
The order, in which the menus for the individual parameter names or setting lines are selected, is also described in the overview and description section. In the parameter overviews (section 2.4.10 for end-user parameters, and section 2.4.11 for HVAC engineer parameters) and in the description part (chapters 3-5), a line highlighted in gray provides information about the selected menus leading from the start page to the parameter names or setting lines.

In the parameter overview, this looks as follows:

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read*	*Change*	*Section*
Menu | **Configurate** | **Parameters** | **ForcedOperation** | `Parameter name`							
UI12 **ForcedRunTime**	***ForcedOperation***	0.0..12.0	H	1	P	P	

In the description, this looks as follow:

Settings **Menu** \| **Configuration** \| **Parameters** \| ForcedRunTime

Parameter name	*Setting range*	*Unit*	*Default value*
`ForcedRunTime`	0.0...12.0	h	1h

Note

Depending on the application, some of the parameters are not used, which means that they do not appear on the handterminal. The parameters listed and described in this documentation always appear in the same order. The menus are always displayed.

2.4.3 Passwords

The password function ensures data protection.
Each password consists of 4 digits assigned to 3 levels:

Password levels

Info password (I)	for the information level (no password entry required!)
Operator password (O)	for the operating level
Parameter setting password (P)	for the parameter setting level

Numeric code

The operator password and the parameter setting password use a factory-set numeric code: → Password level 2 and 4.

In addition, user-defined passwords can be entered:→ Password level 1 and 3.

The following numeric codes are used:

Password	Info password (I)	Operator password (O)		Parameter setting code (P)	
Level	0	1	2	3	4
Numeric code	0000	Not used		User-defined*	****

* Factory-setting 1000

Note

The password levels are hierarchically structured; For example, if password 3 is entered, everything can be read or written at password level 1 or 2.

User-defined password

The user-defined password is different from the default password and is intended for individual use. After entering the user or parameter setting level, the user can change the relevant password. For that purpose the line “Change Password” under menu “Password“ is to be used. The password level below the level used for entering the system can be changed. If a user gained access with password 2 he can change the user-defined password to level 1, but not to level 3.

The default password can be changed if the user selects level 2 or 4 by mistake, in place of 1 or 3 (user-defined passwords). To reactivate the default password the controller must be switched off and on again!

Overview:

Which level?	**Operating level**	**Parameter setting level**
For whom?	For end-user	For HVAC engineer
Code entry?	No	Yes
What can be done?	Reading and changing values	Reading and changing values
What can be read and changed at the different levels? Where is what described?	**End-user parameters:** Actual values, Setpoints, Alarms ➔ Chapter 4	**Basic settings:** Language selection, Daylight-saving time, HMI parameters ➔ Chapter 3 **HVAC engineer parameters:** ➔ Chapter 5

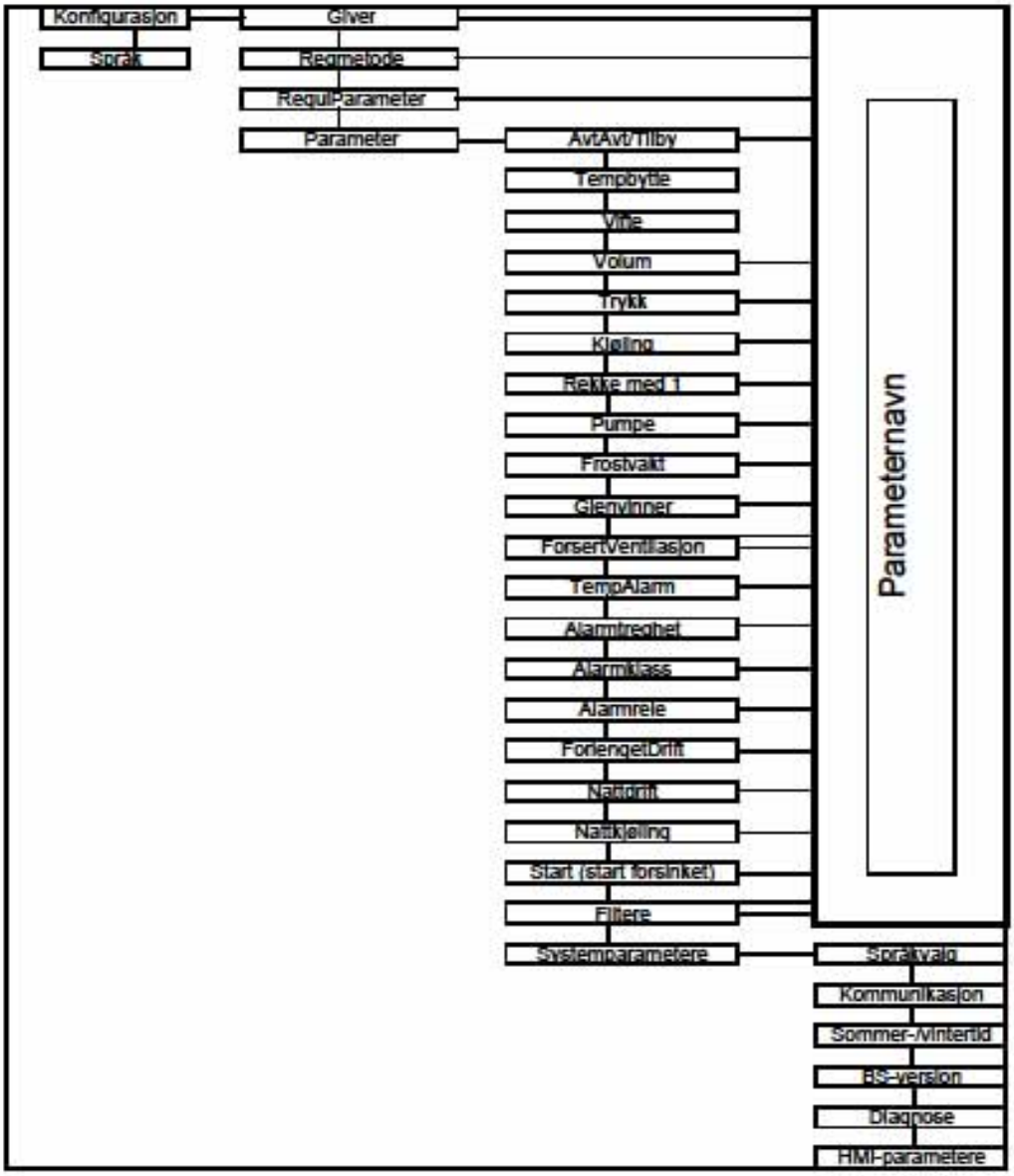
A: Basic setting
Operating level: Read and change
Description: Chapter 3 (incl. Password function)

B: End-user parameters
Operating level: Read and change
Description: Chapter 4

C: HVAC-engineer parameters
Parameter setting levels: Read and change
Decription: Chapter 5

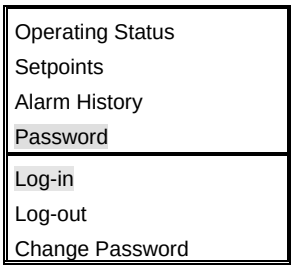
2.4.4

2.4.5 Overview of Menu Structure



2.4.6 Basic Settings for Navigation

The basic settings can be read on the information level and changed in the operating level. Basic settings include settings that apply to the plant. Navigation through the basic settings is explained using ”Language Selection” as example:



1. Enter the password:

   ➔ Press the line selection buttons ▲▼ until you reach ”Password” and confirm with ENTER .

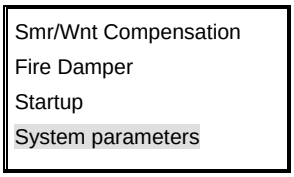
2. Select the line “Log-in“ and confirm with ENTER .

3. ➔ Press ENTER again: the first digit appears (0).

   ➔ Press buttons ▲▼ until you reach the first digit of the numeric code and confirm with ENTER .

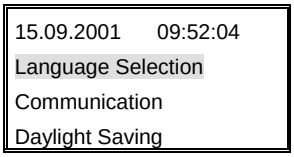
   ➔ Enter the remaining five digits in the same way.

   When the last digit is confirmed with ENTER, the cursor returns to the first line of the start page; The same thing happens if you enter the wrong password.

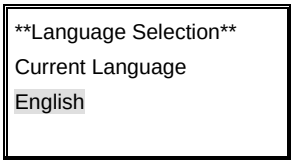


4. ➔ Press the line selection buttons ▲▼ until you reach ”System parameters” and confirm with ENTER

   ”System parameters” contains all the setting lines for the basic settings.



5. ➔ Select the required line with the buttons ▲▼ and confirm with ENTER



6. A value highlighted in black flashes (cursor position)
   If you want to change this value:

   ➔ Confirm with ENTER , select new value with buttons ▲▼ and confirm with ENTER

   If several values appear side by side: The cursor can be moved horizontally by pressing buttons ▲▼ .[1]

   When pressing the return button ▽ the cursor jumps back to the previous menu.
   When pressing the Home button ⌂ the cursor jumps back to the start page.

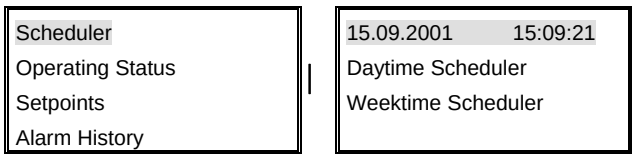
- A flashing value with a black dashed cursor:
  Shows cursor position. After confirming with ENTER , the value can be changed.
- A flashing value with no cursor:
  The value can be changed with the buttons ▲▼
- Moving the cursor horizontally:
- Use setting buttons ▲▼
  \+ = to the right / - = to the left

2.4.7 Overview of the Basic Settings

The listing of menu levels below (Time / Date, Language Selection, etc.) is the same as on the handterminal.

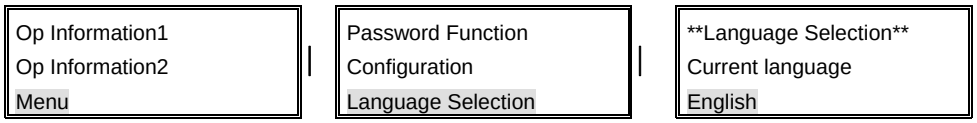
„↵“ symbol for ENTER with subsequent selection of the line with the line selection keys ▲▼.

Time / Date



Password: A
Setting: Day, month, year (dd.mm.yyyy)
Hours, minutes, seconds (hh.mm.ss)
Description: Section 4.1

Language selection

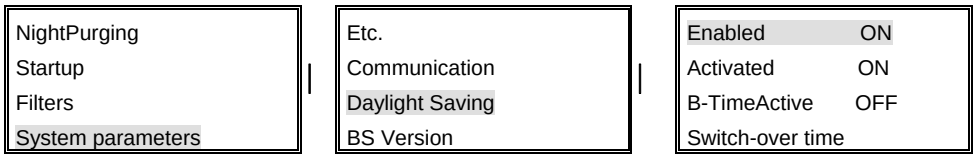


Password: B
Setting: Language
Description: Section 3.1

Communication

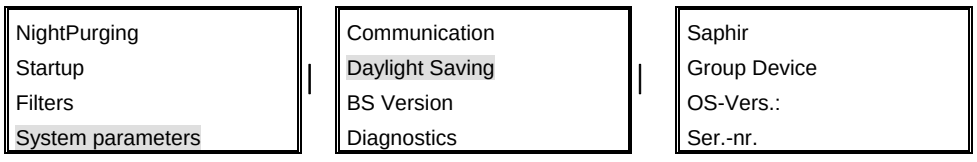
This line has no function in the ACX32.000/ALG

Daylight Saving



Password: B
Setting: Start, end daylight saving time
Start, end non-daylight saving time
Switch-over time
Description: Section 3.2

Operating program version



Password: B
Setting: None
Description: Section 3.3

Diagnostics

NightPurging	Communication	Overview
Startup	Daylight Saving	Loop times
Filters	BS Version	Plant info
System parameters	Diagnostics	

Password: B
Setting: Controller status and store / load factory settings
Description: Section 3.4

HMI parameters

NightPurging	Daylight Saving	HMI brightness
Startup	BS Version	HMI contrast
Filters	Diagnostics	Nb. Of columns
System parameters	HMI-parameters	Vertical Scroll

Password: B
Setting: All display-relevant settings
Description: Section 3.5

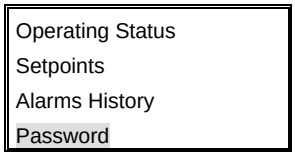
Password

Operating Status	Log-in	Log-in
Setpoints	Log-out	
Alarms History	Change Password	****
Password		

Setting: Input of password
Log-out
Change of password
Description: Section 3.6

2.4.8 Navigation Parameters for End-user and HVAC Engineer

”End-user parameters” can be read on the information level and changed via the operating level. ”HVAC engineer parameters” can be read and changed via the parameter setting level.



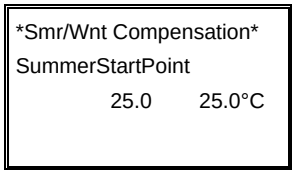
1. Enter the required password:
   ➔ Press the line selection buttons ▲▼ until you reach ”Password” and confirm with ENTER .

2. Select the line “Log-in“ and confirm with ENTER .

3. ➔ Press ENTER again: The first digit appears (0).
   ➔ Press the setting buttons ▲▼ to enter the first digit of the numeric code and confirm with ENTER .
   ➔ Enter the remaining five digits in the same way.

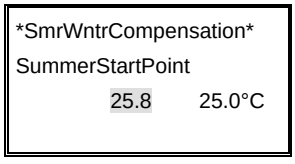
   When the last digit is confirmed with ENTER, the cursor returns to the first line of the start page; The same thing happens if you enter the wrong password.

4. Based on the overview, the menu tree, and by using the setting instructions in the description part, you reach the parameter names for the different menu levels.



5. ➔ Press the line selection buttons ▲▼ till you reach the respective menu(s) and confirm each one with ENTER until you reach the parameter names.

   *The last selected menu is displayed in parentheses with asterisks (*xyz*) on the top line.*



6. ➔ Change the value with the setting buttons ▲▼ and confirm with ENTER [2]

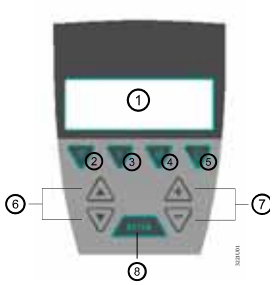
   If the value consists of several parts, press the buttons ▲▼ – after confirming the entry of the first part – to get to the next part of the value. Change the value and confirm it.
   When pressing the return button ↩ the cursor jumps back to the previous menu.
   When pressing the Home button ⌂ the cursor jumps back to the start page.

[2] Only the first value is changed (hand 25,8 25.0 °C). The second value adopts this value when the change has been confirmed. However, if the entered value exceeds the defined setting range, it is

automatically be adjusted by the second value (the second value will then apply). Therefore, 2 different values indicate that the setting range was exceeded when the entry was made.

- A flashing value with a black dashed cursor:
  Shows cursor position. After confirming with ENTER, the value can be changed.
- A flashing value with no cursor:
  The value can be changed with the buttons ▲ ▼
- Moving the cursor horizontally:
  Use setting buttons ▲ ▼
  + = to the right / - = to the left

2.4.9 Start / Stop Button (Service Switch)



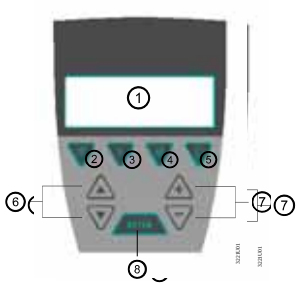
Pressing button (3) stops operation. This is indicated on the top line of Operation Info.

Operation Info Menu	* Service switch: Stop * Operating mode: Off * Fans: Off * Control type: Room

Pressing the button repeatedly, the Service switch (3) goes to auto, i.e. the unit starts if allowed by the time scheduler or control input.
This will activate the UnitOverride Alarm after the normal time delay (default 30min).

2.4.10 Alarm List

Description



The alarm list provides an overview of active alarms (alarms still due). A maximum of 15 alarms can be displayed.
To access the alarm list, you must press the alarms button (5) one time. By another pressing the red LED assumes a fixed light (incoming alarms will then generate a flashing red light). When an alarm has been taken care of, you press the button once more and exit the alarm list via the Home button (2). Then enter the alarms list again to see the current alarms status. The alarms list is not updated online, so you must exit and then re-enter the list in order to see the changes.

Alarms history, refer to section 4.97

Alarm point	Input	Description
A_Alarm	-	Common Alarm (Class A alarm active)
B_Alarm	-	Common Alarm (Class B alarm active)
LmSensorError	-	One or more temperature sensors out of range (open or short circuit)
LmHRCFrostAlarm	UI6 & UI7	Cross Heat exchanger frost condition
LmRotorGuardAla	DI1	Rotor heat exchanger not rotating
LmFireSmoke	DI2	Input for external fire/smoke alarm
LmFanCommonFaul	DI3	Overload, deviation alarm
LmTempAlarm	-	Adjustable temperature deviation of supply air temperature
LmFrostAlarm	UI14	Low temperature water battery
LmErrorSupplyFu	-	Flow control not at required setpoint
LmErrorExtractF	-	Flow control not at required setpoint
LmElecHtrO/H	(DI1 or UI6) & UI14	Fire or Overheating thermostats on electric battery (2 inputs)
LmHRC_EffAlarm	-	Heat recovery calculated efficiency below alarm limit (rotor or plate)
LmUnitOverRideA	-	Some component or whole unit is manually operated from the hand-terminal
LmSupFilter	UI8	Supply filter dirty
LmExtFilter	UI9	Extract filter dirty

2.4.11 Overview of End-user Parameters

Function	Parameter name	Range	Unit	Default value	Read [1]	Change [2]	Section
Operating information							
Service switch	ServiceSwitch	Auto / Stop					
External start stop	ExternalS	Auto/Stop			I	-	
Forced operation	ForcedOp	On/Off			I	-	
Extended op. (HMI Start stop)	ExtendedOp	On/Off					
Current operating mode	Op Mode:	Off / Eco / Comf			I	-	
Supply fan mode	SupFanMode:	PrsI,PrER,Cvol,CO2, PrEs		Cvol	I	-	
Extract fan mode	ExtFanMode	PrsI,PrER,Cvol,CO2, PrEs		Cvol	I	-	
Control type:	ContrlType:	Sup,Dif,Comp, Ext			I	-	
Actual set point	ActualSetp	-50...150.0	°C		I	-	
Outside temperature	OutTemp	-50...150.0	°C		I	-	
Supply air temperature	SupplyAirTemp	-50...150.0	°C		I	-	
Room or extract temperature	Room/ExtrTemp	-50...150.0	°C		I	-	
Heat recovery frost protection	HRCFrostTemp	-50...150.0	°C		I	-	
Water frost temperature	WaterFrostTem	-50...150.0	°C		I	-	
Output signal cooling battery	CoolingValve	0.0...100.0	%		I	-	
Output signal cooling DX1	DX1	Off, On			I	-	
Output signal cooling DX2	DX2	Off, On			I	-	
Heat recovery damper/rotor	HeatRecovery	0.0...100.0	%		I	-	
Heating valve	HeatValve	0.0...100.0	%		I	-	
Heating pump	HeatingPump	Off, On			I	-	
Pulse wide module, heater battery	PWMHtrBatt	0.0...100.0	%		I	-	
Electrical heater stage 2	ElecHeaterStage2	Off, On			I	-	
Electrical heater stage 3	ElecHeaterStage3	Off, On			I	-	
Actual set point supply air	ActualSetpSu	Flow => l/s Pressure => Pa	l/sl/s Pa		I	-	
Actual set point extract air	ActualSetpEx	Flow => l/s Pressure => Pa	l/s / Pa		I	-	
Pressure sensor supply air	l/s / Pa Su	Flow => l/s Pressure => Pa	l/s / Pa		I	-	
Pressure sensor extract air	l/s / Pa Ex	Flow => l/s Pressure => Pa	l/s / Pa		I I	- -	
Extended control signal supply	FlPrCO2Su	0.0...100.0	%		I	-	
Extended control signal extract	FlPrCO2Ex	0.0...100.0	%		I	-	
Supply fan output	FU SupplyFan	0.0...100.0	%		I	-	
Extract fan output	FU ExtractFan	0.0...100.0	%		I	-	
Actual pressure supply filter	SupFilterPres	0.0…500.0	Pa		I	-	
Actual pressure extract filter	ExtFilterPres	0.0…500.0	Pa		I	-	

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read*[1]	*Change*[2]	*Section*
Menu | Scheduler | Daytime Scheduler | Parameter name							
Switching point 1	T1	00:00...24:00 ---- / Actv		07.00	I I	O O	
Switching point 2	T2	00:00...24:00 ---- / Actv		17.00	I I	O O	
Switching point 3	T3	00:00...24:00 ---- / Actv			I I	O O	
Switching point 4	T4	00:00...24:00 ---- / Actv			I I	O O	
Menu | Scheduler | Weektime Scheduler | Parameter name							
Switching point 1	T1	00:00...24:00 ---- / Actv		06.00	I I	O O	
Switching point 2	T2	00:00...24:00 ---- / Actv		19.00	I I	O O	
Switching point 3	T3	00:00...24:00 ---- / Actv			I I	O O	
Switching point 4	T4	00:00...24:00 ---- / Actv			I I	O O	
Menu | Scheduler | YearTimeSchedu 1-5 | Parameter name							
Switching point 6	T6	00:00...24:00 ---- / Actv			I I	O O	
Switching point 7	T7	00:00...24:00 ---- / Actv			I I	O O	
Switching point 8	T8	00:00...24:00 ---- / Actv			I I	O O	
Switching point 9	T9	00:00...24:00 ---- / Actv			I I	O O	
Switching point 10	T10	00:00...24:00 ---- / Actv			I I	O O	
Menu | Operating Status | Control Input | Parameter name							
Extended operation	ExtendedOp	Off / On			I	–	4.3
Forced operation	ForcedOp	Off / On			I	–	4.4
External start stop	ExternalS	Auto / On			I	–	4.5
Modbus Config	Modbus Config	Auto / On			I	–	4.6
Menu | Operating Status | Actual Value | Parameter name							
Room/extract temperature	Room/ExtrTemp	-50...150.0	°C	–	I	–	4.7
Outside temperature	OutTemp	-50...150.0	°C	–	I	–	4.8
Supply air temperature	SupplyAirTemp	-50...150.0	°C	–	I	–	4.9
Water frost alarm temperature	WaterFrostTemp	-50...150.0	°C	–	I	–	4.10
Anti-icing protection temperature	HRCFrostTemp	-50...150.0	°C	–	I	–	4.11
Supply air Pressure	SupplyPressure	0.0 ...1000	Pa	–	I	–	4.12
Extract air Pressure	ExtractPressure	0.0 ...1000	Pa	–	I	–	4.13
Supply air Flow	SupplyVol	0.0 ...15	l/s	–	I	–	4.14
Extract air Flow	ExtractVol	0.0 ...15	l/s	–	I	–	4.15
Extended input supply	SupplyCO2	0.0...100.0	%		I		
Extended input extract	ExtractCO2	0.0...100.0	%		I		
Supply filter pressure	SupFilterPres	0.0 ...1000	Pa	–	I	–	4.16
Extract filter pressure	ExtFilterPres	0.0 ...1000	Pa	–	I	–	4.17
Heat recovery frost protection	HRCFrostTemp	-50...150.0	°C	–	I	–	
Menu | Operating Status | Outputs Digital | Parameter name							

Heating pump	HeatingPump	Off / On		–	I	P	4.18
Electric heater stage 2	ElecHeaterStage2	Off / On			I	P	4.19
Electric heater stage 3	ElecHeaterStage3	Off / On			I	P	4.20
Fans	Fans	Off / St1 / St2		–	I	P	4.21
Outside air damper	OutDamper	Off / On		–	I	P	4.22
Cooling step 1	DX1	Off / On		–	I	P	4.23
Cooling step 2	DX2	Off / On		–	I	P	4.24
Alarm priority A	A-Alarm	OK / alarm		–	I	P	4.25
Alarm priority B	B-Alarm	OK / alarm		–	I	P	4.26
Menu| Operating Status| Outputs ControlSignal| Parameter name							
Output signal cooling	CoolingValve	0.0...100.0	%	–	I	P	4.27
Output signal heat recovery	HeatRecovery	0.0...100.0	%	–	I	P	4.28
Output signal heat valve/battery	HeatValve	0.0...100.0	%	–	I	P	4.29
Output signal heat. Battery SSR	PWMHtrBatt	0.0...100.0	%	–	I	P	4.30
Freq.converter supply air	FU ExtractFan	0.0...100.0	%	–	I	P	4.31
Freq.coverter extract air	FU SupplyFan	0.0...100.0	%	–	I	P	4.32
Supply flow indication	SupFlowInd	0.0...100.0	%	–	I	P	4.33
Extract flow indication	ExtFlowInd	0.0...100.0	%	–	I	P	4.34
Menu| Operating Status| Service-run counter| Parameter name							
Service-run counter	Service-run counter	0.0... xxxx	h	–	I	P	4.35
Reset of counter	ResetCounter	No / Yes			I	P	4.36
Unit Total Hours	Unit Total Hours	0.0... xxxx	h	–	I	P	4.37
Menu| Operating Status| HRC Efficiency| Parameter name							
Current efficiency	HREffCalc	Off / On			I	–	4.38
Heat recovery efficiency	HRC Efficiency	0.0...100	%		I	–	4.39
Menu| Setpoints|ControlType| Parameter name							
Control type:	Extract/RomAir, SupplyAir, FRT, Comp			SupplyAir	I	–	4.40
Menu| Setpoints| MainController| Parameter name							
Current setpoint	ActualSetpoint		°C	–	I	–	4.41
Current measured value	ActualValue		°C	–	I	–	4.42
Refresh set point	Refresh Setpt				I		4.43
Comfort setpoint heating	HeatingComfort	10.0...40.0	°C	20.0	I	B	4.44
Comfort setpoint cooling	CoolingComfort	10.0...40.0	°C	22.0	I	B	4.45
Economy setpoint heating	HeatingEconomy	10.0...40.0	°C	18.0	I	B	4.46
Economy setpoint cooling	CoolingEconomy	10.0...40.0	°C	24.0		B	4.47
Minimum Temp between heating – cooling Comfort	MinComNzone	1.0..10.0	°C	2.0	P	P	4.48
Minimum Temp between heating – cooling Economy	MinEcoNzone	1.0..10.0	°C	4.0	P	P	4.48
Minimum Temp between Unoccupied heating and cooling	MinUnocNZone	1.0..10.0	°C	10.0	P	P	4.48
Menu| Setpoints| Min/Max SupplyAirTemp| Parameter name							
Supply air temperature	SupplyAirTemp		°C	-	I	–	4.49
Setpoint supply air	SupplyAirSetp		°C	-	I	–	4.50
Min supply air temperature	MinSupplyAirTemp	–	°C	15.0	I	B	4.51
Max supply air temperature	MaxSupplyAirTemp	–	°C	30.0	I	B	4.52
Compensation start winter	CompSAStartWinter	-30.0...20.0	°C	10.0	I	-	4.53
Compensation stop winter	CompSAStopWinter	-30.0...20.0	°C	-20.0	I	-	4.54
Compensation start summer	CompSAStartSummer	10.0...50.0	°C	20.0	I	-	4.55
Compensation stop summer	CompSAStopSummer	10.0...50.0	°C	30.0	I	-	4.56
Compensation summer difference	CompSASummerDiff	-10.0...10.0	K	-2.0	I	-	4.57
Compensation winter difference	CompSAWinerDiff	-10.0...10.0	K	2.0	I	-	4.58
Only text on HMI	WithDisplacementVent:						
Delta heating	DeltaHeating	-5.0...5.0	K	0.0	I	-	4.59
Delta Cooling	DeltaCooling	-5.0...5.0	K	0.0	I	-	4.60

Delta Cooling	DeltaCooling	-5.0...5.0	K	0.0	I	-	4.60
Menu / Setpoints / SupFanMode / Parameter name							
Supply fan mode :	SupFanMode:	PrsI, PrER. Cvol, CO2, PrES	l/s / Pa		I	-	4.61
Menu | Setpoints | ExtFanMode | Parameter name							
Extract fan mode :	ExtFanMode:	PrsI, PrER. Cvol, CO2, PrES	l/s / Pa		I	-	4.62
Menu / Setpoints / VolController / Parameter name							
Actual flow setpoint supply air	ActualStpSu		l/s	-	I	-	4.63
Actual flow setpoint extract air	ActSetpEx		l/s	-	I	-	4.64
Current flow supply air	SupplyVol		l/s	-	I	-	4.65
Current flow extract air	ExtractVol		l/s	-	I	-	4.66
Supply volume low-speed setpoint	SuVolLoStp	0.0...10000	l/s	200	I	B	4.67
Supply volume high-speed setpoint	SuVolHiStp	0.0...10000	l/s	800	I	B	4.68
Extract volume low-speed setpoint	ExVolLoStp	0.0...10000	l/s	200	I	B	4.69
Extract volume high-speed setpoint	ExVolHiStp	0.0...10000	l/s	800	I	B	4.70
Menu / Setpoints / PressureController / Parameter name							
Pressure setpoint supply air	ActSetpSu	0.0...1000.0	Pa		I	-	4.71
Pressure setpoint extract air	ActSetpEx	0.0...1000.0	Pa		I	-	4.72
Current pressure supply air	SuPress	0.0...1000.0	Pa		I	-	4.73
Current pressure extract air	ExtractPress	0.0...1000.0	Pa		I	-	4.74
Supply pressure low setpoint	SuPressLoSt	0.0...1000.0	Pa	150.0	I	B	4.75
Supply pressure high setpoint	SuPressHiSt	0.0...1000.0	Pa	200.0	I	B	4.76
Extract pressure low setpoint	ExPressLoSt	0.0...1000.0	Pa	150.0	I	B	4.77
Extract pressure high setpoint	ExPressHiSt	0.0...1000.0	Pa	200.0	I	B	4.78
Supply volume limit	SupVolLimit	No/Yes			I	B	4.79
Supply volume min limit	SupMinLimit	0.0...2200	l/s	200	I	B	4.80
Supply volume max limit	SupMaxLimit	0.0...2200	l/s	800	I	B	4.81
Extract volume limit	ExtVolLimit	No/Yes			I	B	4.82
Extract volume min limit	ExtMinLimit	0.0...2200	l/s	200	I	B	4.83
Extract volume max limit	ExtMaxLimit	0.0...2000	l/s	800	I	B	4.84
Menu | Setpoints | CO2Controller | Parameter name							
CO2 setpoint supply air	ActSetpSuCO2	0.0...1000.0		-	I	-	4.85
CO2 setpoint extract air	ActSetpExCO2	0.0...1000.0		-	I	-	4.86
Current CO2 supply air	SupplyCO2	0.0...100.0	%	-	I	-	4.87
Current CO2 extract air	ExtractCO2	0.0...100.0	%	-	I	-	4.88
Supply CO2 low setpoint	SuCO2LoSt	0.0...100.0	%	50	I	B	4.89
Supply CO2 high setpoint	SuCO2HiSt	0.0...100.0	%	70	I	B	4.90
Extract CO2 low setpoint	ExCO2LoSt	0.0...100.0	%	50	I	B	4.91
Extract CO2 high setpoint	ExCO2HiSt	0.0...100.0	%	70	I	B	4.92
Supply low speed limit min	SuCO2LowSpMin	0…100	%	40	I	B	4.94
Supply low speed limit Max	SuCO2LowSpMax	0…100	%	80	I	B	4.95
Supply low speed limit min	SuCO2HiSpMin	0…100	%	40	I	B	4.96
Supply low speed limit Max	SuCO2HiSpMax	0…100	%	80	I	B	4.97
Extract low speed limit min	ExCO2LowSpMin	0…100	%	40	I	B	4.98
Extract low speed limit Max	ExCO2LowSpMax	0…100	%	80			
Extract low speed limit min	ExCO2HiSpMin	0…100	%	40			
Extract low speed limit Max	ExCO2HiSpMax	0…100	%	80			
Menu / AlarmHistory / Parameter name							
							4.99
Menu / Password / Parameter name							
Log-in	LogIn						4.100
Log-out	LogOut						4.101
Change of password	ChangePassword						4.102

[1] Read: Password that gives authorization to read the value

[2] Range: Password that gives authorization to change the value and/or change

2.4.12 Overview of HVAC Engineer Parameters

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read*[1]	*Change*[1]	*Section*
Menu| Configuration| Sensors| Parameter name							
Readjustment room temperature	RoomTempCorr	-5.0...5.0	K	0.0	P	P	5.1
Readjustment outside temperature	OutTempCorr	-5.0...5.0	K	0.0	P	P	5.1
Readjustment supply air temp.	SATempCorr	-5.0...5.0	K	0.0	P	P	5.1
Readjustment frost detector temp	WaterFrTmpCorr	-5.0...5.0	K	0.0	P	P	5.1
Readjustment anti-icing temp	HRCFroCorr	-5.0...5.0	K	0.0	P	P	5.1
Delay for changing value on HMI	l/s Pa Hyst	0…1000		14	P	P	5.1
Menu| Configuration| ControlMode| Parameter name							
Temperature control type	TempCtlrType	Comp/Ext/Sup/Disp		Sup	P	P	5.3
Type of air heater	HeatingRegister	Water / Elec		-	P	P	5.4
Number of electric heater steps	ElecHtrSteps	1 / 2 / 3		2	P	P	5.5
Cooling mode	CoolingMode	DXl/DXb/0-10		DXl	P	P	5.6
Type of heat exchanger	TypeOfHX	Rot/Plt		-	P	P	5.7
Type of supply fan control	SuppFanMode	PrsI/PrER/Cvol/CO2 /PrES		Cvol (Flow)	P	P	5.8
Type of extract fan control	ExtFanMode	PrsI/PrER/Cvol/CO2 /PrES		Cvol (Flow)	P	P	5.9
Number of external sensors	NumOfFanSensor	2/1-Sa/1-Ea		2	P	P	5.10
With 1 sensor: speed diff supp/ext	1Sens2ndFan%Diff	0.0...100.0	%	50	P	P	5.11
Internal pressure sensor max	IntPresSensMax	0.0...1000.0	Pa	500	P	P	5.12
External pressure sensor max	ExtPresSensMax	0.0...1000.0	Pa	300	P	P	5.13
Fire mode	FireMode	Off/ExtF/Norm		Off	P	P	5.14
Extract fan fire speed	ExtFanFireSpee	0.0…100.0	%	80	P	P	5.15
Menu| Configuration| ControlParameters| Parameter name							
For main controller	MainController	*KP* *TN*		4 500.0	P	P	5.16
For cooling controller	0-10VCoolingController	*KP* *TN* *TD*		-5.0 300.0 0.0	P	P	5.16
DX cooling controller	See section: ***Menu / Parameters / DX-Cooler***						
Heat recovery cooling controller	HRCCoolingCtlr	*KP* *TN* *TD*		-5.0 120.0 0.0	P	P	5.16
For heating battery water	0-10vHeatingController	*KP* *TN* *TD*		5.0 120.0 0.0	P	P	5.16
For heating battery electrical	ElecHeatingControll	*KP* *TN* *TD*		5.0 120.0 0.0	P	P	5.16
Pulse Width time	ElecPWMTime		s	30.0	P	P	
Minimum On Time for electrical battery	ElecMinOn		m	2.0	P	P	
Minimum Off Time for electrical battery	ElecMinOff		m	2.0	P	P	

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read*[1]	*Change*[1]	*Section*
For heat exchanger controller	HRHeatController	*KP*		10.0	P	P	5.16
		TN		120.0			
		TD		0.0			
Fans slow down controller	FansSlowDownCtlr	*KP*		10.0	P	P	5.16
		TN		120.0			
		TD		0.0			
For frost protection controller	FrostController	*KP*		20.0	P	P	5.16
		TN		0.0			
		TD		0.0			
For volume controller supply fan	VolContrSupply	*KP*		0.04	P	P	5.16
		TN		30.0			
		TD		0.0			
For volume controller extract fan	VolContrExtract	*KP*		0.04	P	P	5.16
		TN		30.0			
		TD		0.0			
For pressure controller supply air	PressureContrSupply	*KP*		0.03	P	P	5.16
		TN		30.0			
		TD		0.0			
For pressure controller extract air	PressureContrExtract	*KP*		0.03	P	P	5.16
		TN		30.0			
		TD		0.0			
CO2 supply controller	CO2SupController	*KP*		-0.30	P	P	5.16
		TN		30.0			
		TD		0.0			
CO2 extract controller	CO2ExttController	*KP*		-0.30	P	P	5.16
		TN		30.0			
		TD		0.0			
Menu| Parameters| Parameter name							
Auto change between Ex/Sup	AutoExt/SupC	No, Yes		No	P	P	5.17
Switching temp. Extract/Supply	Sa/EAAutoC/O	0.0...35.0	°C	17.0	P	P	5.18
Menu| Parameters| Fan| Parameter name							
Delayed extract fan start	ExhFanStartDly	0.0...180	sec	30.0	P	P	5.19
Delayed supply fan start	SupFanStartDly	0.0...180	sec	30.0	P	P	5.20
After blow time	FanOverrun	0.0...30.0	min	2.0	P	P	5.21
Fan slow for low supply temp	FanSlowforHeat	On/Off					5.22
K- factor supply fan	KfactSupply	0-1000		121	P	P	5.23
K-factor extract fan	KfactExtract	0-1000		121	P	P	5.24
Damper open time	DmprOpenTime	0…100	sec	15	P	P	5.25
Menu| Parameters| Vol| Parameter name							
Temp setpoint for compensate start	CompStartPoint	-35.0...35.0	°C	10.0	P	P	5.26
Temp setpoint for compensate stop	CompStopPoint	-35.0...35.0	°C	-20.0	P	P	5.27
Switching diff. supply low-speed	VolSuLoDelta	-1400.0...1400.0	l/s	0.0	P	P	5.28
Switching diff. Supply high-speed	VolSuHiDelta	-1400.0...1400.0	l/s	0.0	P	P	5.28
Switching diff. Extract low-speed	VolExLoDelta	-1400.0...1400.0	l/s	0.0	P	P	5.28
Switching diff. Extract high-speed	VolExtiDelta	-1400.0...1400.0	l/s	0.0	P	P	5.28
Vol. indication max for Vol. indicators AO7 & AO8	Vol Ind Max	0.0...1400.0	l/s	1400.0	P	P	5.29
Setpoint vol. alarm	VolAlarmSet	0.0…830.0	l/s	140	P	P	5.30

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read[1]*	*Change[1]*	*Section*
Menu| Parameters| Pressure| Parameter name							
Temp setpoint for comp start	CompStartPoi	-35.0...35.0	°C	10.0	P	P	5.32
Temp setpoint for comp stop	CompStopPoin	-35.0...35.0	°C	-20.0	P	P	5.33
Switching diff. supply low-speed	PressSuLoDelta	-500...500	Pa	0.0	P	P	5.34
Switching diff. supply high-speed	PressSuHiDelta	-500...500	Pa	0.0	P	P	5.34
Switching diff. extract low-speed	PressExLoDelta	-500...500	Pa	0.0	P	P	5.34
Switching diff. extract high-speed	PressExtiDelta	-500...500	Pa	0.0	P	P	5.34
Setpoint Pressure alarm	PressAlarmSet	0.0...1000.0	Pa	100.0	P	P	5.35
Menu| Parameters| Cooling | Parameter name							
Cooling mode	CoolingMode	DXl/DXb/0-10		DXl	P	P	5.37
Stage1 DX switches on above clg	1 On Offset	0.0..10.0	°C	0.7	P	P	5.38
Stage2 DX switches on above clg	2 On Offset	0.0..10.0	°C	1.5	P	P	5.39
Stage3 DX switches on above clg	3 On Offset	0.0..10.0	°C	2.3	P	P	5.40
Min off time	MinOffTime	0.0..15.0	Min	4.0	P	P	5.41
Min outside temp DX1 start	ClgStg1OATLim	0.0..40.0	°C	18	P	P	5.42
Min outside temp DX2 start	ClgStg2OATLim	0.0..40.0	°C	22	P	P	5.43
Min outside temp DX3 start	ClgStg3OATLim	0.0..40.0	°C	26	P	P	5.44
DX room temperature rise	DXRoomTRise	0.0..20.0	°C	5	P	P	5.45
Low limit treshold	LowLimThrsh	0.0…10	K	2	P	P	
Low limit timer	LowLimTimer	0.0…10	Min	2	P	P	
Min air volume DX start	MinVolDXStart	0.0…830.0	l/s	140	P	P	5.46
Minimum Temp between heating – cooling Comfort	MinComNzone	1.0..10.0	°C	2.0	P	P	5.47
Minimum Temp between heating – cooling Economy	MinEcoNzone	1.0..10.0	°C	4.0	P	P	5.47
Minimum Temp between heating – cooling Unoccupied	MinUnocNzone	1.0..20.0	°C	10.0	P	P	5.47
Menu| Parameters| Pump| Parameter name							
Pump exercise heating	PumpKickHeating	Off/On		On			5.49
Minimum runtime pump	MinRunTimePump	0.0...30	Min	5.0	P	P	5.50
Menu| Parameters| FrostWaterBattery| Parameter name							
Setpoint for min. running temperature	FrostSetpoin	10...40	°C	12.0	P	P	5.51
Setpoint for hot keeping	StandbySetpo	10...50	°C	25.0	P	P	5.52
Setpoint for frost alarm	FrostProtection	2.0...30.0	°C	8.0	P	P	5.53
Menu| Parameters| Heat Recovery | Parameter name							
Activation of cooling recovery	EnblCoolingRecovery	Off/On		On	P	P	5.55
Activation of efficiency measuring	HREffCalc	Off/On		Off	P	P	5.57
Alarm setpoint low efficiency	HREff Alm	0.0 – 100.0 %	%	50%	P	P	5.58
Activation of HR defrost	HRFrostSetpoint	-5.0 – 5.0	°C	-3.0	P	P	5.56
HRC frost reset	HRCFrostReset	0-30	k	2.0	P	P	5.56
Menu| Parameters| ForcedOperation| Parameter name							
Forced run time	ForcedRunTime	0.0…12.0	H	1	P	P	5.59
Supply forced air volume	SupForcedAirVol	0.0...1000	l/s	900	P	P	5.60
Extract forced air volume	ExtForcedAirVol	0.0...1000	l/s	900	P	P	5.61
Cancel forced operation	CancelForcedOp	No/Yes		No	P	P	5.62

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read*[1]	*Change*[1]	*Section*
Menu| Parameters| TempAlarm| Parameter name							
Delay of temperature alarm	DtTempAlarm	0.0...180.0	Min	60.0	P	P	5.63
Deviating temperature alarm	TempAlarmSet	0.0...10.0	°C	10.0	P	P	5.64
Blocking of temp. alarm summer	SummerDisableAl	Off/On		On	P	P	5.65
Menu| Parameters| AlarmsDelays| Parameter name							
Error on supply fan	DtError SupplyFu	0.0...600	Sec	60.0	P	P	5.66
Error on extract fan	DtErrorExtractFu	0.0...600	Sec	60.0	P	P	5.66
Common fault on fan	DtFanCommonFault	0.0...600	Sec	60.0	P	P	5.66
Manual operating	DtUnitOverRideAlarm	0.0...600	Min	30.0	P	P	5.66
Delay efficiency alarm	DtHRC-EffAlarm	0.0...180	Min	30.0	P	P	5.66
Delay frost alarm heat recovery	DtHRCFrostAlarm	0.0...600	Min	15	P	P	5.66
Menu| Parameters| AlarmClass| Parameter name							
Wheel HX rotation	RotorGrdCls	B/A		B	P	P	5.67
Common fault on fan	FanComFltCls	B/A		A	P	P	5.67
Error on supply fan	SupFanErrCls	B/A		B	P	P	5.67
Error on extract fan	ExhFanErrCls	B/A		B	P	P	5.67
Temperature Alarm	TempereatureCls	B/A		B	P	P	5.67
Sensor(s) out of range	SensorErrCls	B/A		A	P	P	5.67
Water Frost protection	WaterFrostCls	B/A		A	P	P	5.67
Heat Recovery unit frost	HRCFrostCls	B/A		B	P	P	5.67
Menu| Parameters| AlarmInputs| Parameter name							
Common fault on fan input config.	FanComFltDir	NO / NC		NC	P	P	5.68
FireSmoke input config.	FireSmokeDir	NO / NC		NO	P	P	5.68
Menu| Parameters| ExtendedOperation| Parameter name							
Extended run time	ExtendRunTime	0.0…12	H	1			5.69
Cancel extended operation	CancelExtendOp	No / yes		No			5.70
Menu| Parameters| UnoccupiedMode| Parameter name							
Activation of unoccupied heating	EnblHtgUnoccupied	Off/On		Off	P	P	5.72
Activation of unoccupied cooling	EnblClgUnoccupied	Off/On		Off	P	P	5.73
Room setpoint unoccupied heating	LimitHtgUnoccupied	0.0...40.0	°C	15.0	P	P	5.74
Room setpoint unoccupied cooling	LimitClgUnoccupied	0.0...40.0	°C	30.0	P	P	5.75
Min. runtime for unoccupied cooling	MinRunTime	0.0...720	Min	30.0	P	P	5.76
Delay before test	DelayBeforeTest		Min	350	P	P	5.77
Menu| Parameters| NightPurging| Parameter name							
Activation of night purging	EnblNightPurging	Off/On		Off	P	P	5.79
Room setpoint	RoomSetpoint	0.0...40.0	°C	22.0	P	P	5.80
Minimum outside temperature	MinOutTemp	0.0...40.0	°C	20.0	P	P	5.81
Hysteresis	Hysteresis	1.0...10.0	K	4.0	P	P	5.82
Delta	OnDelta	1.0...10.0	K	4.0	P	P	5.83
Minimum night purging time	MinRunTime	0.0...720	Min	30.0	P	P	5.84
Delay before test	DelayBeforeTest	0.0...720	Min	350.0	P	P	5.85
Menu| Parameters| StartUp| Parameter name							
Delay of extract fan start	ExhFanStartDly	0.0...180	sec	30.0	P	P	5.87
Delay of supply fan start	SupFanStartDly	0.0...180	sec	30.0	P	P	5.88

Function	*Parameter name*	*Range*	*Unit*	*Default value*	*Read*[1]	*Change*[1]	*Section*
Preheating time	PreheatingTime	0.0 – 600.0	Sec	30.0	P	P	5.89
Start delay after power failure	PowerUpStartDelay	0.0 – 900.0	Sec	0.0	P	P	5.90
Menu| Parameters| Filters| Parameter name							
Supply filter alarm	SupFiltAlm	0.0…500	Pa	250			5.94
Extract filter alarm	ExtFiltAlm	0.0…500	Pa	250			5.95
Filter sensor max value	FiltSensMax	0.0…1000	Pa	500			5.96
Menu| Parameters| SystemParameters| Parameter name							
See section 2.4.6							

1 Password that gives authorization to read the value and/or change it

Info password (I)	for the information level (no password entry required!)
Operator password (B)	for the operating level
Parameter setting password (P)	for the parameter setting level

3 Description of Basic Settings

3.1 Language Selection

Description

The language selection can be extended to meet individual customer needs.

Setting

Menu | Configuration | Parameters | System Parameters | Language selection |
Setting line

3.2 Daylight Saving Time

Description

”Daylight Saving Time” defines the two points in time when changeover takes place from winter time to summer time, and vice versa. The standard setting is for Central European time.

Settings

Menu | Configuration | Parameters | System Parameters | Summer/wintertime |
Setting lines

The following lines defines the 2 points in time changeover from winter- to summertime, and vice versa, takes place. The standard setting is the Central European:
Saving Time»:

Activated
Line Activated (Off / On) shows whether summertime is active.

B-TimeActive
Line B-TimeActive (Off / On) shows that the B-time is active when changing to the normal time.

Changeover Time
When making the changeover to summertime, the changeover time is added. For the changeover to wintertime, it is subtracted.

Month (Mon)
Enter the month that defines the start (S) and the end (E) of the summertime.

Weekday (WDay)
Enter the weekday when changeover takes place.

Offset (Ofs)
To calculate the days of changeover, enter the number of days (WDay) from the end or start of the relevant month.
A negative number denotes the number of days entered until the end of the month. A positive number denotes the number of days entered from the start of the month. Zero means that no changeover will take place.

Example

Date of changeover	Month (Mon)	Weekday (WDay)	Number (Ofs)
Last Sunday in March	March	Sunday	-1
Last Sunday in October	October	Sunday	-1

Changeover time (Hou)
Entry of the time of day at which changeover takes place.

Display on the handterminal

According to the following settings list:

	Display	Description	Setting range	Default value[1]
Start of summer time (S)	Mon	Month for changeover to summer time	01...12	03
	WDay	Weekday on which changeover takes place	Mo...Su	Su
	Ofs	*Negative value:* Number of days entered under WDay, counted from the end of the month *Positive value:* Number of days counted from the beginning of the month.	-5...+5	-1
	Hou	Time of day for changeover	0.0...23.59	02
End of summer time (E)	Mon	Month for changeover to winter time	01...12	10
	WDay	Weekday on which changeover takes place	Mo...So	So
	Ofs	*Negative value*: Number of days entered under Wday(?), counted from the end of the month *Positive value:* Number of days counted from the beginning of the month.	-5...+5	-1
	Hou	Time of day for changeover	0.0...23.59	03
	Enable	Release of daylight saving time	Off / On	On

[1] The standard setting if the Central European Time

Note

For detailed information about the daylight saving hour settings, refer to the Basic Documentation CE2P3695en.

3.3 BS Version (Operating Software)

Description

Display of the current version of the operating software.
(No settings possible)

3.4 Diagnostics

Description

In this menu, you can read information for internal diagnostics, etc.

Settings

System Parameters | **Diagnose** | **Overview**
| **Loop Times**
| **Application Info**

Overview

OS-Vers:	Shows operating system version
Ser.-Nr:	Shows serial number
Proc.unit:	Type of controller, e.g. ACX32
Comport 1:	Type of communication board mounted in place 1
Comport 2:	Type of communication board mounted in place 1
MSR Error	Number of errors in program loop
MSR Error type	Type of error in program loop
MSR Started	1=Yes 0=No
ResetFactoryset	Reset to factory settings. NB! Restart required for the new values to Be active.
SaveFactoryset	Saves all current settings and factory settings. NB! The process unite will restart after this function

Loop Times

Act LoopTime	Current loop time
Med LoopTime	Average loop time
Min LoopTime	Minimum loop time
Max LoopTime	Maximum loop time
Reset LoopTime	Resets all loop-time values

Application Info

Shows information about application version and updates

3.5 HMI Parameters (CI 1000)

Description

The operating unit can be controlled via "HMI Parameters". Under ”HMI Parameters”, the following parameters are available in the order listed.

Settings

System Parameters | **HMI Parameters** | **HMI brightness** | Setting lines
| **HMI contrast** | Setting lines
| **etc.**

HMI Brightness

The background lighting changes depending on the value entered:
0 = dark / 31 = bright (Recommendation: 30)

HMI Contrast

More or less contrast between text and background:
0 = weak / 31 = strong (Recommendation: 10)

Nb. of Columns

Indicates the number of columns the display can show.
(No setting possible)

Vertical Scroll
Indicates the number of lines that can be scrolled vertically.
(No setting possible)

Horizontal Scroll
Indicates the number of lines that can be scrolled horizontally.
(No setting possible)

New Page
The value indicates whether, on completion of the HMI reset time, the start page is called up.
0 = no switching back; current page and password are maintained
1 = switching back to the start page; password is reset and must be reentered

Message Duration
Indicates in seconds how long a fault message is displayed (in the case of erroneous input).

HMI Reset
Indicates in minutes how long, after the last input, authority of operation is valid.
0 = no switching back; current page and password are maintained
1...60 = time in minutes to the reset

HMI Auto Delay
Value changes are adopted by pressing the setting buttons «+/-» in entry mode. If one of the buttons is kept depressed, the Auto Repeat mode will be activated on completion of the delay time entered.
0 = no delay time
1...3 = delay time in seconds

HMI Auto Repeat
If the Auto Repeat mode is active, the rate of resolution will change after the value entered has elapsed.
0 = system controls the rate; The rate is reduced when the button is kept depressed.
1...3 = Rate in seconds for value change

3.6 Password

Description

The menu ”Password” contains the following lines:

Log-in
Entry of the 4-digit password. Access to the individual menus is dependent on the selected password level.

Log-out
The password will be reset and the backlighting switched off.

Change Password
A user-defined password can be entered. It is possible to change the password level that is lower than the password level at which the system was entered. This means that if the entry was made with password 2, the user-defined password on level 1 can be changed, but not password 3.

The default password can be changed if the user selected level 2 or 4 by mistake in place of 1 or 3 (user-defined passwords). To reactivate the default password, the controller must be switched off and on again.

4 Description of End-user Parameters

4.1 Date/Time

Description

When accessing menu «System Parameters», the cursor flashes by the date field. According to predefined navigation criteria, you can enter the date (dd.mm.yyyy) and the time of day (hh.mm.ss) on this setting line.
It is possible to terminate the activation of prolonged operation mode in case of unforeseen operation during start-up, servicing or other incidents.

Setting

System Parameters | Setting line

4.2 Scheduler

The CS 1000 features a scheduler with four independent switching times per day (daytime scheduler) and two optional departures per week (weektime scheduler).

4.2.1 Daytime Scheduler

Description

Under «Daytime Scheduler», 4 independent switching times can be entered. To be set is the time of day, the fan speed and the relevant setpoint pair (Economy / Comfort). The table below gives the operating mode to be entered with a fan using a frequency converter.

Code input

Fan with frequency converter		
Room setpoint	**Fan speed**	**Operating mode**
Off	Off	Off
Economy	1	Ec1
Economy	2	Ec2
Comfort	1	Co1
Comfort	2	Co2

Note !

Ec1 and Ec2 have *different* fan speed but *same* temperature setpoint.
Co1 and Co2 have *different* fan speed but *same* temperature setpoint.

Example

Example of a daytime schedule with using a frequency converter:

Switching action	**Switching time**	**Code**	**Release**
T1	08:00	Co2	Actv
T2	11:30	Co1	Actv
T3	14:00	Co2	Actv
T4	20:00	Off	Actv

Note

The daytime schedule applies to all weekdays. Using operating line «Weektime Scheduler», it is possible to enter 6 departures from the daytime schedule.

Settings

Menu | **Scheduler** | **Daytime scheduler** | Setting lines

When making the setting, it must be observed that enabling of a switching time (..../ Actv) takes place only **after** the values are set, although the cursor first stops at this setting.

4.2.2 Weektime Scheduler

Description

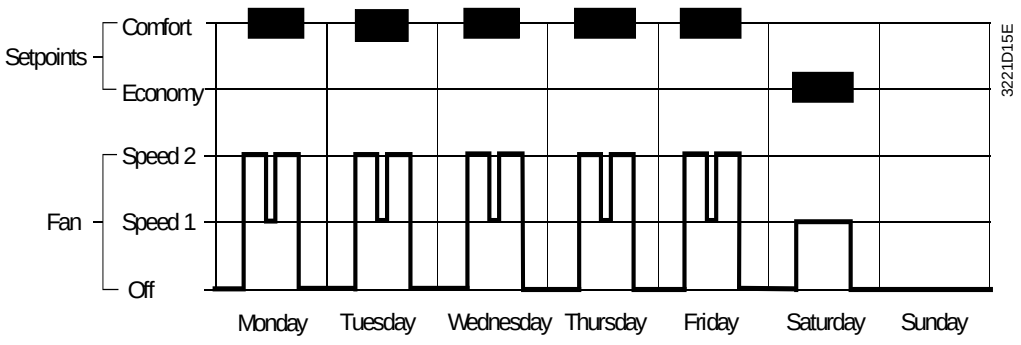
The weektime scheduler is used to enter a maximum of 6 deviances from the daytime schedule.

Example

Selection of a weektime schedule with a 2-speed :

Switching action	Day of switching ON	Time of day ON	Day of switching off	Time of day OFF	Mode	Release
T1	Sa	08:00	Sa	20:00	Ec1	Actv
T2	Su	08:00	Su	20:00	Off	Actv
T3	Mo	08:00	Mo	20:00	Ec1	--------
T4	Tu	08:00	Tu	20:00	Off	--------
T5	We	08:00	We	20:00	Ec1	--------
T6	Th	08:00	Th	20:00	Off	--------

Graphic presentation of the scheduler using the 2 examples daytime scheduler and weektime scheduler:



Settings

Menu | **Scheduler** | **Weektime Scheduler** | Setting lines

When making the setting, please observe that enabling (..../ Actvl) a switching action takes place only **after** selecting the weekday (Mo...Su), the time of day (hours / minutes), the relevant setpoint pair (Economy / Comfort), and the fan speed (Off, 1, 2), although the cursor first stops at this setting.

A switching action is defined by the day and the time of day that switching on / off take place. When the switching action is completed, the daytime scheduler becomes active again.

4.2.3 Year Time Scheduler 1-5

Description

The Year time scheduler is used to enter a maximum of 5 departures from the daytime schedule.

Example

Selection of a year time schedule with a 2-speed fan:

Switching action	Date ON	Time of day ON	Mode	Date OFF	Time of day OFF	Release
T1	04.11	12.00	Ec1	12.11	12.00	Actv
T2	13.12	12.00	Off	20.12	12.00	Actv
T3	13.12	12.00	Off	20.12	12.00	--------
T4	13.12	12.00	Off	20.12	12.00	--------
T5	13.12	12.00	Off	20.12	12.00	--------

Settings

Menu | **Scheduler** | **YearTimeSchedul 1-5** | Setting lines

4.2.4 Year Time Scheduler 1-5

Description

The Year time scheduler is used to enter a maximum of 5 deviances from the daytime schedule.

Example

Selection of a year time schedule with a 2-speed fan:

Switching action	Date ON	Time of day ON	Mode	Date OFF	Time of day ON	Release
T6	04.11	12.00	Ec1	12.11	12.00	--------
T7	13.12	12.00	Off	20.12	12.00	--------
T8	13.12	12.00	Off	20.12	12.00	--------
T9	13.12	12.00	Off	20.12	12.00	--------
T10	13.12	12.00	Off	20.12	12.00	--------

4.3 Extended Operation

Description

One signal comes from a closed pulse; here you can read the actual status on extended operation ON or OFF.

It is possible to terminate the prolonged runtime, in case of unforseen activity during startup or servicing.

Display

Menu | Operating Status | Control input | `Emergency stop`

Parameter name	*Setting range*
`ExtendedOp`	On / Off

4.4 Forced Operation

Description

One signal comes from a closed pulse; here you can read the actual status on forced operation ON or OFF.
It is possible to cancel the activation of the forced operation mode, in case of accidental operation during commissioning (?) servicing etc.

Setting

Menu | Operating Status | Control input | `ControlInputs`

Parameter name	*Setting range*
`ForcedOp`	On / Off

4.5 External Stop

Description

A switch can be connected to control input where you can read the actual status on extended stop; Automatic or On

Setting

Menu | Operating Status | Control input | `ControlInputs`

Parameter name	*Setting range*
`ExternalS`	On / Auto

4.6 Start Stop

Description

Here you can read the actual status on start/stop button on display (HMI-panel); stop or automatic.

Setting

Menu | Operating Status | Control input | `ControlInputs`

Parameter name	*Setting range*
`ExternalS`	On / Auto

4.7 Modbus Config

Description

Here you can read the actual status on modbus; stop or automatic.

Setting

Menu | Operating Status | Control input | `Modbus Config`

Parameter name	*Setting range*
`Modbus Config`	On / Auto

4.8 UI1 Room or Extract Temperature

Description Display of the actual room value or extract temperature.

Setting **Menu** | **Operating Status** | **Actual Value** | Extr/RoomTemp

Parameter name	*Display range*	*Unit*
Extr/RoomTemp	-50.0...150.0	°C

4.9 UI3 Outside Temperature

Description Display of outside temperature value.

Setting **Menu** | **Operating Status** | **Actual Value** | OutTemp

Parameter name	*Display range*	*Unit*
OutTemp	-50.0...150.0	°C

4.10 UI2 Supply air temperature

Description Display of the actual value of the supply air temperature.

Setting **Menu** | **Operating Status** | **Actual Value** | SupplyAirTemp

Parameter name	*Display range*	*Unit*
SupplyAirTemp	-50.0...150.0	°C

4.11 UI14 Water Frost Temperature

Frost temperature The frost protection function is only used if the ventilation unit is equipped with a hot water battery. The frost detector is connected to input UI4. Parameter WaterFrost-Temp then displays the current temperature from the frost detector.

Setting **Menu** | **Operating Status** | **Actual Value** | FrostTemp

Parameter name	*Display range*	*Unit*
WaterFrostTemp	-50.0...150.0	°C

4.12 UI6 HRC Frost Temperature

Description

Display of the actual value of the extract air / anti-icing temperature.

Setting

Menu | **Operating Status** | **Actual Value** | HRCFrostTemp

Parameter name	*Display range*	*Unit*
HRCFrostTemp	-50.0...150.0	°C

4.13 UI11 Supply air pressure

Description

Display of the actual value of the supply air pressure.

Setting

Menu | **Operating Status** | **Actual Value** | Supply Pressure

Parameter name	*Display range / Unit*
Supply Pressure	0.0...1000 Pa

4.14 UI10 Extract air pressure

Description

Display of the actual value of the extract air pressure.

Setting

Menu | **Operating Status** | **Actual Value** | Extract Pressure

Parameter name	*Display range / Unit*
Extract Pressure	0.0...1000 Pa

4.15 UI11 Supply Air Flow

Description

When selecting the flow control it is calculated by use of the actual pressure value and an adjustable factor.
The actual measurement range for the supply flow is 0.0...1000 l/s

Setting

Menu | **Operating Status** | **Actual Value** | SupplyVol

Parameter name	*Display range / Unit*
SupplyVol	0.0...10000 l/s

4.16 UI10 Extract Air Flow

Description

When setting the flow control, the flow is calculated by use of the actual pressure value and an adjustable factor.
The actual measurement range for the extract flow is 0.0...10000 l/s

Setting

Menu | **Operating Status** | **Actual Value** | SupplyVol

Parameter name	*Display range / Unit*
ExtractVol	0.0...10000 l/s

4.17 UI8 Supply Filter Pressure

Description

Indicates actual pressure value, supply filter.

Setting

Menu | **Operating Status** | **Actual Value** | SupFilterPres

Parameter name	*Display range / Unit*
SupFilterPres	0.0...1000 Pa

4.18 UI9 Extract Filter Pressure

Description

Indicates actual pressure value, extract filter

Setting

Menu | **Operating Status** | **Actual Value** | SupFilterPres

Parameter name	*Display range / Unit*
ExtFilterPres	0.0...1000 Pa

Operating Status - Outputs - Digital

4.19 DO1 Pump in Heating Circuit

Description

Displays the operating state of the circulation pump in the heating circuit. If the unit has got an electrical battery this will be stage 2.

Setting

Menu | **Operating Status** | **Outputs** | **Digital** | Pump/Heating

Parameter name	*Display range*
Pump/Heating	Off / On

4.20 DO1 ElecHeaterStage2

Description

Displays the operating state of the electric heater battery stage 2.

Setting

Menu | **Operating Status** | **Outputs** | **Digital** | ElecHeaterStage2

Parameter name	*Display range*
ElecHeaterStage2	Off / On

4.21 DO2 ElecHeaterStage3

Description

Displays the operating state of the electric heater battery stage3.

Setting

Menu | **Operating Status** | **Outputs** | **Digital** | ElecHeaterStage2

Parameter name	*Display range*
ElecHeaterStage3	Off / On

4.22 D03 Fan Start/Stop

Description Common start/stop signal to the fans.

Setting **Menu** | **Operating Status** | **Outputs** | **Digital** | `Fan`

Parameter name	*Display range*
`Fan`	Off / On

4.23 DO4 OutDamper

Description Displays the operating state of the outside air damper. The damper opens at start of the unit.

Setting **Menu** | **Operating Status** | **Outputs** | **Digital** | `OutDamper`

Parameter name	*Display range*
`OutDamper`	Off / On

4.24 DO5 DX1

Description Displays the operating state of the DX1 (cooling).

Setting **Menu** | **Operating Status** | **Outputs** | **Digital** | `Cooling`

Parameter name	*Display range*
`DX1`	Off / On

4.25 DO6 DX2

Description Displays the operating state of the DX2 (cooling).

Setting **Menu** | **Operating Status** | **Outputs** | **Digital** | `Cooling`

Parameter name	*Display range*
`DX2`	Off / On

4.26 DO7 Alarm Priority A

Description Displays the operating state of the output for common fault alarm A. The output is activated when there is a remaining unattended "A alarm".

Setting **Menu** | **Operating Status** | **Outputs** | **Digital** | `AlarmPriority_A`

Parameter name	*Display range*
`AlarmPriority_A`	Off / On

4.27 DO8 Alarm Priority B

Description

Displays the operating state of the output for common fault alarm B. The output is activated when there is a remaining unattended "B alarm".

Setting

Menu | **Operating Status** | **Outputs** | **Digital** | `AlarmPriority_B`

Parameter name	*Display range*
`AlarmPriority_B`	Off / On

General description of the alarm function

The alarm outputs for the 2 parameters `AlarmPriority_A` and `AlarmPriority_B` serve the overall plant for supervisory operation. The individual plant faults are combined in the common fault and displayed as an alarm with priority A or B. The common fault message indicates that there is a fault in the plant, but does not say which one it is. In the event of an alarm or if the handterminal is incorrectly operated, the LED next to the alarm button on the handterminal flashes.

Note

An audible or optical alarm can be connected to the alarm outputs (DO7 / DO8).

Assignment

Alarm priority list:

Alarm Text	Input	Pri.	Description
A_Alarm	-	-	Common Alarm (Class A alarm active)
B_Alarm	-	-	Common Alarm (Class B alarm active)
LmSensorError	-	A	One or more temperature sensors out of range (open or short circuit)
LmHRCFrostAlarm	UI6 & UI7	B	Heat exchanger cross frost condition
LmRotorGuardAla	DI1	B	Rotor heat exchanger not rotating
LmFireSmoke	DI2	*	Input for external fire/smoke alarm
LmFanCommonFaul	DI3	B	Overload, deviation alarm
LmTempAlarm	-	B	Adjustable temperature deviation of supply air temperature
LmFrostAlarm	UI14	A	Low temperature inside water battery
LmErrorSupplyFu	-	B	Flow control not at required setpoint
LmErrorExtractF	-	B	Flow control not at required setpoint
LmElecHtrO/H	(DI1 or UI6) & UI14	B	Fire or Overheating thermostats on electric battery (2 inputs)
LmHRC_EffAlarm	-	B	Heat Recovery, calculated efficiency below alarm limit (rotor or plate)
LmUnitOverRideA	-	B	Some component or whole unit is manually operated from the handterminal
LmSupFilter	UI8	B	Supply filter dirty
LmExtFilter	UI9	B	Extract filter dirty

* Fire / smoke alarm priority depends on choice of action on fire, if no action then priority = B, if stop or full extract then priority = A

Difference

The differences between the 2 types of alarm are as follows:

Priority A	Priority B
• Plant shuts down • Must be manually acknowledged, and the plant is then switched on again	• As soon as the fault is no longer present, the deactivated plant element resumes operation. The fault is no longer indicated under menu alarm, even if the LCD continues to flash. The alarm must now be manually acknowledged
• Display under `AlarmPriority_A`	• Display under `AlarmPriority_B`

An alarm is acknowledged by pressing the alarm button on the handterminal. It may take a few seconds until flashing stops.
When another alarm class is displayed within parentheses, it means that the alarm class can be changed. Refer to section 5.51

Operating Status - Outputs – ControlSignal

4.28 AO1 Cooling Valve

Description

Display of the output signal for cooling valve.

Setting

Menu | **Operating Status** | **Outputs** | **ControlSignal** | `CoolingValve`

Parameter name	*Display range*	*Unit*
`CoolingValve`	0.0...100.0	%

4.29 AO4 Heat Recovery

Description

Displays the output signal of the heat recovery damper or rotor.

Setting

Menu | **Operating Status** | **Outputs** | **ControlSignal** | **HeatRecovery**

Parameter name	*Display range*	*Unit*
`HeatRecovery`	0.0...100.0	%

4.30 AO2 Heat Valve

Description

Displays the output signal of the electrical battery or water battery

Setting

Menu | **Operating Status** | **Outputs** | **ControlSignal** | `HeatValve`

Parameter name	*Display range*	*Unit*
`HeatValve`	0.0...100.0	%

4.31 AO3 PWM Heater Battery

Description Displays the output signal of the heater battery, 0 or 10V (ON or OFF).

Setting **Menu** | **Operating Status** | **Outputs** | **ControlSignal** | PWMHtrBatt

Parameter name	*Display range*	*Unit*
PWMHtrBatt	0.0...100.0	%

4.32 AO6 Output for Frequency Converter Extract Air

Description Displays the current output frequency for the extract air fan.

Setting **Menu** | **Operating Status** | **Outputs** | **ControlSignal** | FU ExtractFan

Parameter name	*Display range*	*Unit*
FU ExtractFan	0.0...100.0	%

4.33 AO5 Output for Frequency Converter Supply air

Description Displays the current output frequency for the supply air fan.

Setting **Menu** | **Operating Status** | **Outputs** | **ControlSignal** | FU SupplyFan

Parameter name	*Display range*	*Unit*
Fu SupplyFan	0.0...100.0	%

4.34 AO8 Supply Flow Indication

Description Displays the current output frequency for the supply air fan.

Setting **Menu** | **Operating Status** | **Outputs** | **ControlSignal** | SupFlowInd

Parameter name	*Display range*	*Unit*
SupFlowInd	0.0...100.0	%

4.35 AO7 Extract Flow Indication

Description Displays the current output frequency for the extract air fan.

Setting **Menu** | **Operating Status** | **Outputs** | **ControlSignal** | ExtFlowInd

Parameter name	*Display range*	*Unit*
ExtFlowInd	0.0...100.0	%

4.36 Service-run Counter

Description

The parameter Service`RunCounter` shows the total number of fan operating hours since the controller was reset.

Setting

Menu | **Operating Status** | **Service-run counter** | `ServiceCounter`

Parameter name	*Display range*	*Unit*
`Service-run counter`	0.0... entire upper display range	h

4.37 Reset of Service-run Counter

Description

The parameter `ResetCounter` can be used to reset the fan operating hours counter.

Setting

Menu | **Operating Status Service-run counter** | `ResetCounter`

Parameter name	*Display range*
`Reset serv Counter`	Yes / No

Note

The Service-run counter can be reset directly on this level after entering password 1.

4.38 Hours-run Counter

Description

The parameter `HoursRunCounter` shows the total number of fan operating hours since the controller was first commissioned.

Setting

Menu | **Operating Status** | **Service-run counter** | `OperationCounter`

Parameter name	*Display range*	*Unit*
`Unit Total Hours`	0.0... entire upper display range	h

4.39 Activation of HRC Efficiency Measuring

Description

This parameter can be used to activate efficiency measuring of the heat recovery circuit. For more information, refer to section 5.53

Setting

Menu | **Operating Status** | **HR Efficiency** | `Enbl Efficiency:`

Parameter name	*Display range*
`Enbl Efficiency:`	On / Off

4.40 Efficiency

Description

Display of actual efficiency value.

Setting

Menu | **Operating Status** | **HR Efficiency** | `HR Efficiency`

Parameter name	*Display range*	*Unit*
`HR Efficiency`	0.0...100	%

4.41 Control Type

Description

Display of selected control type.

Setting

Menu | **Setpoints** | ControlType:

Parameter name	*Setting range*	*Default value*
`ControlType:`	Ext, SupplyAir, Dif, Comp	SupplyAir

4.42 Actual Setpoint

Description

Displays the setpoint currently valid for the main sensor.

Setting

Menu | **Setpoints** | **MainController** | ActualSetpoint

Parameter name	*Display range*	*Unit*
ActualSetpoi	-50.0...150.0	°C

4.43 Actual Value

Description

Displays the current measured value for the main sensor.

Setting

Menu | **Setpoints** | **MainController** | Actual value

Parameter name	*Display range*	*Unit*
Actual value	-50.0...150.0	°C

4.44 Refresh Setpoint between Heating and Cooling

Description

After changing setpoint value for cooling or heating you must choose refresh from the menu to be allowed to change others values, Refresh Setpoint.

Setting

Menu | **Setpoints** | **MainController** | Refresh Setpt

Parameter name
Refresh Setpt

4.45 Setpoint for Heating Comfort

Description

The set temperature for periods of time when the rooms are occupied. This is the room temperature level to be maintained in Comfort **heating** mode.

Setting

Menu | **Setpoints** | **MainController** | HeatingComfort

Parameter name	*Setting range*	*Unit*	*Default value*
HeatingComfo	10.0...40.0	°C	20.0

4.46 Setpoint for Cooling Comfort

Description

The set temperature for the periods of time when the rooms are occupied. This is the room temperature level to be maintained in Comfort **cooling** mode. **The temperature must be at least 2°C higher than the heating comfort setpoint in order to provide a neutral "dead" zone between cooling and heating.**

Setting

Menu | **Setpoints** | **Rum** | CoolingComfort

Parameter name	*Setting range*	*Unit*	*Default value*
CoolingComfo	10.0...40.0	°C	22.0

4.47 Setpoint for Heating Economy

Description

The set temperature for the periods of time when the rooms are not occupied. This is the room temperature level to be maintained in Economy **heating** mode.

Setting

Menu | **Setpoints** | **MainController** | HeatingEconomy

Parameter name	*Setting range*	*Unit*	*Default value*
HeatingEcono	10.0...40.0	°C	18.0

4.48 Setpoint for Cooling Economy

Description

The set temperature for periods of time when the rooms are not occupied. This is the room temperature level to be maintained in Economy **cooling** mode. **The temperature must be at least 2°C higher than the heating economy setpoint in order to provide a neutral "dead" zone between cooling and heating.**

Setting **Menu** | **Setpoints** | **MainController** | CoolingEconomy

Parameter name	*Setting range*	*Unit*	*Default value*
CoolingEcono	10.0...40.0	°C	24.0

4.49 Minimum Neutral Zone Values

Description These values specify the minimum neutral zones for Unoccupied, economy and comfort heating and cooling setpoints.
If a setpoint is changed causing the other setpoints to be less than the neutral zone away, then the other setpoints will automatically be changed to maintain the neutral zone. Note that the neutral zone can be larger than this value.

These values can be changed after entering password level Engineer

Setting **Menu** | **Setpoints** | **MainController** | CoolingEconomy

Parameter name	*Setting range*	*Unit*	*Default value*
MinComNZone	1.0…10.0	°C	2.0
MinEcoNZone	1.0…10.0	°C	4.0
MinUnocNZone	1.0...20.0	°C	10.0

Setpoints Min/Max SupplyAirTemp

4.50 SupplyTemp

Description Display of the currently valid value for the supply air temperature.

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | SupplyTemp

Parameter name	*Display range*	*Unit*
SupplyAirTemp	-50.0...150.0	°C

4.51 Setpoint Supply Air Temperature

Description Displays the current setpoint for the supply air temperature.

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | SupplySetp

Parameter name	*Display range*	*Unit*
SupplyHtgStp	-50.0...150.0	°C

4.52 Minimum Temperature Supply Air Setpoint

Description The minimum supply air temperature allowed during operation.

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | MinSupplyTemp

Parameter name	*Setting range*	*Unit*	*Default value*
MinTemp SU	10.0...40.0	°C	16.0

4.53 Maximum Temperature Supply Air Setpoint

Description The maximum supply air temperature allowed during operation.

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | MaxSupplyTemp

Parameter name	*Setting range*	*Unit*	*Default value*
MaxTemp SU	10.0...40.0	°C	30.0

4.54 CompSAStartWinter

Description Starts temperature winter compensation

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | CompSAStartWinter

Parameter name	*Setting range*	*Unit*	*Default value*
CompSAStartWinter	-30.0...20.0	°C	5.0

4.55 CompSAStopWinter

Description Stops temperature winter compensation

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | CompSAStopWinter

Parameter name	*Setting range*	*Unit*	*Default value*
CompSAStopWinter	-30.0...20.0	°C	-20.0

4.56 CompSAStartSummer

Description Starts temperature summer compensation

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | CompSAStartSummer

Parameter name	*Setting range*	*Unit*	*Default value*
CompSAStartSummer	0.0...50.0	°C	25.0

4.57 CompSAStoptSummer

Description Stops temperature summer compensation

Setting **Menu** | **Setpoints** | **Min/Max SupplyAirTemp** | CompSAStopSummer

Parameter name	*Setting range*	*Unit*	*Default value*
CompSAStopSummer	0.0...50.0	°C	30.0

4.58 CompSASummerDiff

Description

Maximum basic setpoint shift (total shift).
Sets the desired temperature reduction from the temperature setpoint during high outdoor temperature.

Setting

Menu | **Setpoints** | **Min/Max SupplyAirTemp** | CompSASummerDiff

Parameter name	*Setting range*	*Unit*	*Default value*
CompSASummerDiff	-10…10.0	°C	-2.0

4.59 CompSAWinterDiff

Description

Maximum basic setpoint shift (total shift).
Sets the desired temperature increase from the temperature setpoint during low outdoor temperature.

Setting

Menu | **Setpoints** | **Min/Max SupplyAirTemp** | CompSAWinterDiff

Parameter name	*Setting range*	*Unit*	*Default value*
CompSAWinterDiff	-10…10.0	°C	2.0

4.60 DeltaHeating

Description

The delta heating is used in displacement ventilation.
Adjustment of max difference between supply and room/extract temperature during heating.

Setting

Menu | **Setpoints** | **Min/Max SupplyAirTemp** | DeltaHeating

Parameter name	*Setting range*	*Unit*	*Default value*
DeltaHeating	-5...5	K	0.0

4.61 DeltaCooling

Description

The delta cooling is used in displacement ventilation.
Adjustment of max different between supply and room/extract temperature during cooling.

Setting

Menu | **Setpoints** | **Min/Max SupplyAirTemp** | DeltaCooling

Parameter name	*Setting range*	*Unit*	*Default value*
DeltaCooling	-5...5	K	0.0

4.62 SupFanMod

Description Displays selected control type for the supply fan.

Setting **Menu** | **Setpoints** | SupFanMod

Parameter name	*Setting range*	*Unit*	*Default value*
SupFanMod	PrsI,PrER,Cvol,CO2,PrES	Pa, l/s	Cvol

4.63 ExtFanMod

Description Displays selected control type for the extract fan.

Setting **Menu** | **Setpoints** | ExtFanMod

Parameter name	*Setting range*	*Unit*	*Default value*
ExtFanMod	PrsI,PrER,Cvol,CO2,PrES	Pa, l/s	Cvol

Setpoints VolController

4.64 Current Setpoint Supply Air Flow

Description Displays the currently valid setpoint for the supply airflow.

Setting **Menu** | **Setpoints** | **VolController** | ActualStpSu

Parameter name	*Unit*
ActualStpSu	l/s

4.65 Current Setpoint Extract Air Flow

Description Displays the currently valid setpoint for the extract airflow.

Setting **Menu** | **Setpoints** | **VolController** | Act Setp Ex

Parameter name	*Unit*
ActualStpEx	l/s

4.66 Current Supply Air Flow

Description Displays the current flow in the supply air.

Setting **Menu** | **Setpoints** | **VolController** | SupplyVol

Parameter name	*Unit*
| SupplyVol	l/s

4.67 Current Extract Airflow

Description Displays the current flow in the extract air.

Setting **Menu** | **Setpoints** | **VolController** | ExtractVol

Parameter name	*Unit*
ExtractVol	l/s

4.68 Flow Setpoint for Low-speed Supply Air

Description Flow setpoint for low-speed operation of supply air fan.

Setting **Menu** | **Setpoints** | **VolController** | SuVolLoStp

Parameter name	*Unit*	*Default value*
SuVolLoStp	l/s	500

4.69 Flow Setpoint for High-speed Supply Air

Description Flow setpoint for high-speed operation of supply air fan.

Setting **Menu** | **Setpoints** | **VolController** | SuVolHiStp

Parameter name	*Unit*	*Default value*
SuVolHiStp	l/s	1500

4.70 Flow Setpoint for Low-speed Extract Air

Description Flow setpoint for low-speed operation of extract air fan.

Setting **Menu** | **Setpoints** | **VolController** | ExVolLoStp

Parameter name	*Unit*	*Default value*
ExVolLoStp	l/s	500

4.71 Flow Setpoint for High-speed Extract Air

Description Flow setpoint for high-speed operation of extract air fan.

Setting **Menu** | **Setpoints** | **VolController** | ExVolHiStp

Parameter name	*Unit*	*Default value*
ExVolHiStp	l/s	1500

4.72 Current Setpoint Supply Air Pressure

Description Display of the currently valid setpoint for the supply air pressure.

Setting **Menu** | **Setpoints** | **PressureController** | AcualStpSu

Parameter name	*Display range*	*Unit*
AcualStpSu	0.0...1000	Pa

4.73 Current Setpoint Extract Air Pressure

Description Displays the currently valid setpoint for the extract air pressure.

Setting **Menu** | **Setpoints** | **PressureController** | ActStpEx

Parameter name	*Display range*	*Unit*
ActStpEx	0.0...1000	Pa

4.74 Current Supply Air Pressure

Description Displays current supply air pressure.

Setting **Menu** | **Setpoints** | **PressureController** | SupplyPress

Parameter name	*Display range*	*Unit*
SupplyPress	0.0...1000	Pa

4.75 Current Extract Air Pressure

Description Displays current extract air pressure.

Setting **Menu** | **Setpoints** | **PressureController** | ExtractPres

Parameter name	*Display range*	*Unit*
ExtractPres	0.0...1000	Pa

4.76 Pressure Setpoint for Low-speed Supply Air

Description Pressure setpoint for low-speed operation of supply air fan.

Setting **Menu** | **Setpoints** | **PressureController** | SuPressLoSt

Parameter name	*Setting range*	*Unit*	*Default value*
SuPressLoSt	0.0...1000	Pa	150

4.77 Pressure Setpoint for High-speed Supply air

Description Pressure setpoint for high-speed operation of supply air fan.

Setting **Menu** | **Setpoints** | **PressureController** | SuPressHiSt

Parameter name	*Setting range*	*Unit*	*Default value*
SuPressHiSt	0.0...1000	Pa	200

4.78 Pressure Setpoint for Low-speed Extract air

Description Pressure setpoint for low-speed operation of extract air fan.

Setting **Menu** | **Setpoints** | **PressureController** | ExPressLoSt

Parameter name	*Setting range*	*Unit*	*Default value*
ExPressLoSt	0.0...1000	Pa	150

4.79 Pressure setpoint for high-speed extract air

Description Pressure setpoint for high-speed operation of extract air fan.

Setting **Menu** | **Setpoints** | **PressureController** | ExPressHiSt

Parameter name	*Setting range*	*Unit*	*Default value*
ExPressHiSt	0.0...1000	Pa	200

4.80 Supply Volume Limit

Description If you want minimum volume limit on

Setting **Menu** | **Setpoints** | **PressureController** | SupVolLimit

Parameter name	*Setting range*	*Unit*	*Default value*
SupVolLimit	Yes/No		No

4.81 Supply Min. Limit

Description Minimum supply volume.

Setting **Menu** | **Setpoints** | **PressureController** | SupMinLimit

Parameter name	*Setting range*	*Unit*	*Default value*
SupMinLimit	0.0…9000	l/s	400

4.82 Supply Max. Limit

Description Maximum supply volume limit.

Setting **Menu** | **Setpoints** | **PressureController** | SupMaxLimit

Parameter name	*Setting range*	*Unit*	*Default value*
SupMaxLimit	0.0…9000	l/s	5000

4.83 Extract Volume Limit

Description For use if you only want a minimum volume limit on.

Setting **Menu** | **Setpoints** | **PressureController** | ExtVolLimit

Parameter name	*Setting range*	*Unit*	*Default value*
ExtVolLimit	Yes/No		No

4.84 Extract Min. Limit

Description This is the minimum extract volume limit.

Setting **Menu** | **Setpoints** | **PressureController** | ExtMinLimit

Parameter name	*Setting range*	*Unit*	*Default value*
ExtMinLimit	0.0…9000	l/s	400

4.85 Extract Max. Limit

Description Maximum extract volume limit.

Setting **Menu** | **Setpoints** | **PressureController** | ExtMaxLimit

Parameter name	*Setting range*	*Unit*	*Default value*
ExtMaxLimit	0.0…9000	l/s	5000

4.86 Current Setpoint Supply Air CO2

Description Displays the currently valid setpoint for the supply air CO2.

Setting **Menu** | **Setpoints** | **CO2Controller** | AcualStpSu

Parameter name	*Display range*	*Unit*
AcualStpSuCO2	0.0...3000	

4.87 Current setpoint extract air CO2

Description Displays the currently valid setpoint for the extract air CO2.

Setting **Menu** | **Setpoints CO2Controller** | | ActStpEx

Parameter name	*Display range*	*Unit*
ActStpExCo2	0.0...3000	

4.88 Current supply air CO2

Description Displays current supply air CO2.

Setting **Menu** | **Setpoints** | **CO2Controller** | SupplyCO2

Parameter name	*Display range*	*Unit*
SupplyCO2	0.0...100	%

4.89 Current Extract Air CO2

Description Displays current extract air CO2.

Setting **Menu** | **Setpoints** | **CO2Controller** | ExtractCO2

Parameter name	*Display range*	*Unit*
ExtractCO2	0.0...100	%

4.90 CO2 Setpoint for Low-speed Supply Air

Description CO^2 setpoint for low-speed operation of supply air fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | SuCO2LoSt

Parameter name	*Setting range*	*Unit*	*Default value*
SuCO2LoSt	0.0...3000	ppm	600

4.91 CO2 Setpoint for High-speed Supply Air

Description Pressure setpoint for high-speed operation of supply air fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | SuCO2HiSt

Parameter name	*Setting range*	*Unit*	*Default value*
SuCO2HiSt	0.0...3000	ppm	900

4.92 CO2 Setpoint for Low-speed Extract Air

Description CO^2 setpoint for low-speed operation of extract air fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | ExCO2LoSt

Parameter name	*Setting range*	*Unit*	*Default value*
ExCO2LoSt	0.0...3000	ppm	600

4.93 CO2 Setpoint for High-speed Extract Air

Description CO^2 setpoint for high-speed operation of extract air fan.

Setting **Menu** | **Setpoints** | **CO^2Controller** | ExCO2HiSt

Parameter name	*Setting range*	*Unit*	*Default value*
ExCO2HiSt	0.0...3000	ppm	900

4.94 Supply, Lowest limit for low speed

Description Lowest air volume at low speed, supply fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | SuCO2LowSpMin

Parameter name	*Setting range*	*Unit*	*Default value*
SuCO2LowSpMin	0…100	%	40

4.95 Supply, highest limit for low speed

Description Highest air volume at low speed, supply fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | SuCO2LowSpMax

Parameter name	*Setting range*	*Unit*	*Default value*
SuCO2LowSpMax	0…100	%	80

4.96 Supply, lowest limit for high speed

Description Lowest air volume at high speed, supply fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | SuCO2HiSpMin

Parameter name	*Setting range*	*Unit*	*Default value*
SuCO2HiSpMin	0…100	%	40

4.97 Supply, highest limit for high speed

Description Highest air volume at high speed, supply fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | SuCO2HiSpMax

Parameter name	*Setting range*	*Unit*	*Default value*
SuCO2HiSpMax	0…100	%	80

4.98 Extract, Lowest limit for low speed

Description Lowest air volume at low speed, extract fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | ExCO2LowSpMin

Parameter name	*Setting range*	*Unit*	*Default value*
ExCO2LowSpMin	0…100	%	40

4.99 Extract, highest limit for low speed

Description Highest air volume at low speed, extract fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | ExCO2LowSpMax

Parameter name	*Setting range*	*Unit*	*Default value*
ExCO2LowSpMax	0…100	%	80

4.100 Extract, lowest limit for high speed

Description Lowest air volume at high speed, extract fan.

Setting **Menu** | **Setpoints** | **CO2Controller** | ExCO2HiSpMin

Parameter name	*Setting range*	*Unit*	*Default value*
ExCO2HiSpMin	0…100	%	40

4.101 Extract, highest limit for high speed

Description

Highest air volume at high speed, extract fan.

Setting

Menu | **Setpoints** | **CO2Controller** | ExCO2HiSpMax

Parameter name	*Setting range*	*Unit*	*Default value*
ExCO2HiSpMax	0…100	%	80

AlarmHistory

4.102 Alarms history

Description

Displays the last 15 alarms, active alarms as well as alarms responded to. The time when the alarm was registered is displayed, too.

Setting

Menu | **AlarmHistory**

Password

4.103 Log-in

Description

Login with password for access to installation parameters. See also section 3.6 and section 2.4.63 Navigation basic settings.

Setting

Menu | **Password** | Log-in

Parameter name	*Factory setting*
Log-in	1000

4.104 Log-out

Description

Log-out to prevent unauthorized access to installation parameters. See section 3.6.

Setting

Menu | **Password** | Log-out

Parameter name
Log-out

4.105 Change Password

Description

Change of the currently valid password. You can only change those passwords, which have a lower level or the same level as the one you are logged in to.. See section 3.6.

Setting

Menu | **Password** | Change Password

Parameter name
Change Password

5 Description of HVAC Engineer Parameters

Configuration Sensors

5.1 Calibration of Measured Values

Description

A number of disturbance factors can distort the display of measured values. If the temperature displayed does not agree with the temperature measured with the sensor, the display can be readjusted.

Effects

- Parallel displacement of the sensor's characteristics by the adjusted value
- The respective actual value parameters display the readjusted temperature

Settings

Menu | **Configuration** | **Sensors** | `RoomTempReadjust`
| `OutsideTempReadjust`
| `SupplyAirTempReadjust`
| `FrostTempReadjust`
| `HR FrostTempReadjust`
| `l/s Pa Hyst`

	Parameter name	*Setting range*	*Unit*
Room temperature	`RoomTempReadjust`	-5.0...5.0	K
Outside temperature	`OutsideTempReadjust`	-5.0...5.0	K
Supply air temperature	`SupplyAirTempReadjust`	-5.0...5.0	K
Extract air temperature	`ExtractAirTempReadjust`	-5.0...5.0	K
Frost temperature	`FrostTempReadjust`	-5.0...5.0	K
Anti-icing temperature	`HR FrostTempReadjust`	-5.0...5.0	K
Hysteresis on display delay	`l/s Pa Hyst`	0.0...200	

Configuration ControlMode

5.2 Configuration of Control Function

Description

Here is where you adapt the controller to different types of control. This is done via selection of main sensor - room sensor, extract air sensor or supply air sensor.
Selection of room sensor or extract air sensor automatically results in cascade control;
Selection of supply air sensor results in constant supply air control.
In other words, 4 different control modes can be selected:
The following temperature regulation can be selected:

1. Constant supply air temperature
2. Room/extract control
3. Differential temperature control
4. Supply air control compensated for the outdoor temperature

5.2.1 Control mode 1, Constant Supply Air Temperature

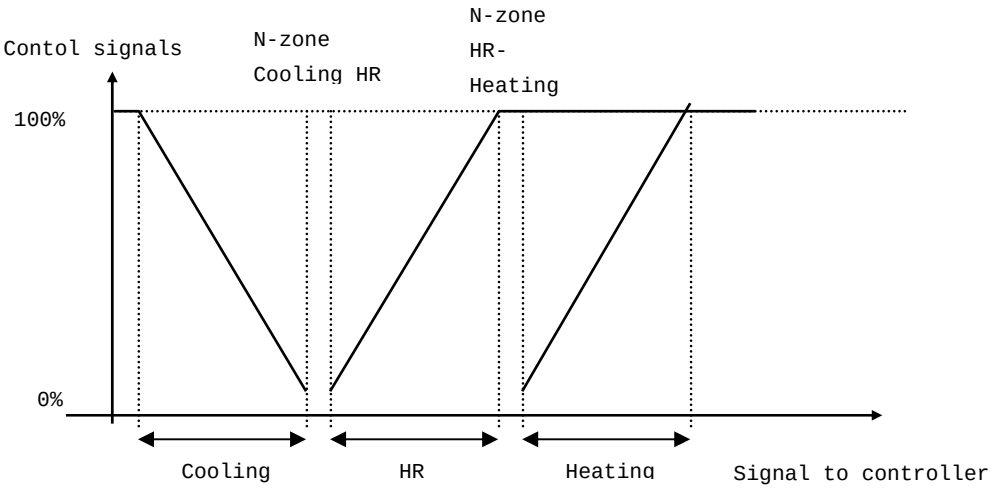
Description

Controlling the following three functions regulates the supply air temperature:

* Heat Recovery, HR
* Heating (electrical or water battery)
* Cooling

if there is constant supply air control, the desired temperature is maintained without considering the extract/room temperature.
You can select the air volume reduction at low supply air temperature (if the heater battery does not provide enough heat). Then the fans will slowly ramp down to low speed settings.

Plant diagram

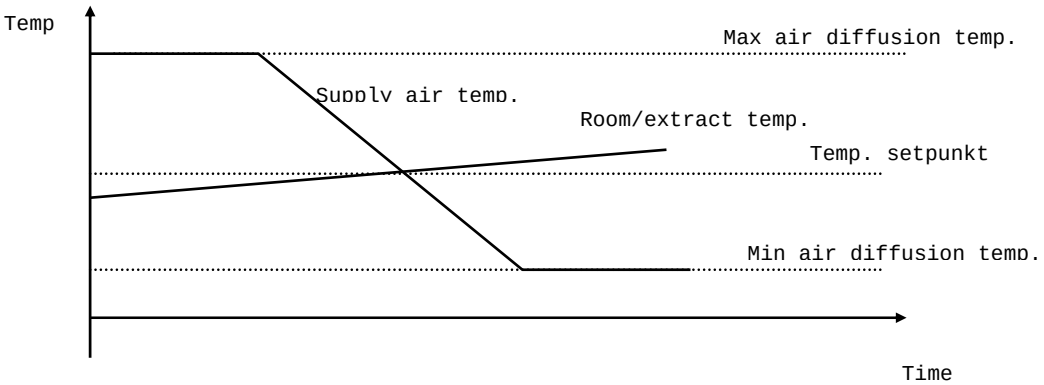


5.2.2 Control Mode 2, Room or Extract Control

Description

During room/extract control, the incoming air temperature is regulated according to the temperature measured in the room, or extract air and the setpoint for the room/extract air temperature. To ensure comfort you can set the Min/Max. values for the incoming air temperature. If the temperature of the incoming air goes down to the Min setting, the automatic controls will attempt to regulate the supply air temperature according to this value.

Plant diagram

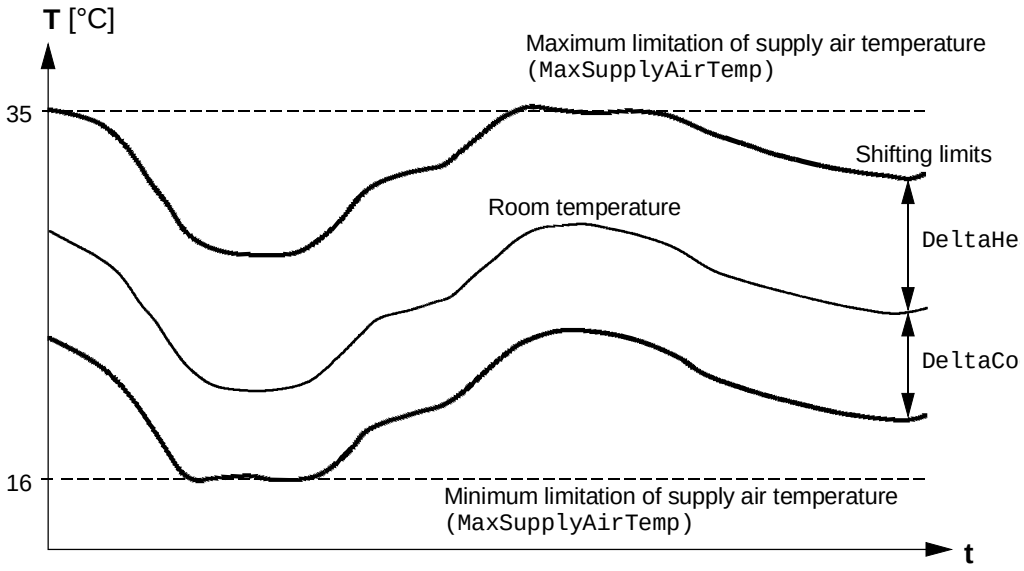


5.2.3 Control mode 3, Differential Temperature Control

Description

The temperature of the supply air will be regulated by sensing the room temperature with a temperature difference. During differential temperature control you can set a temperature difference between the extract and supply air temperature and a min/max. supply air temperature.

Function diagram

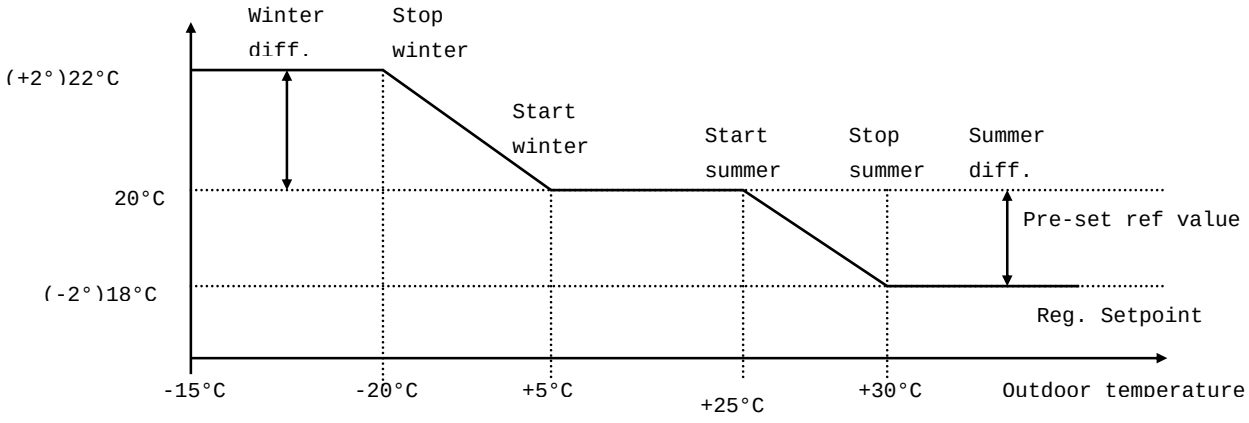


5.2.4 Control mode 4, Supply Air Control Compensated for the Outdoor Temperature

Description

In this case you can set a reference value for low and high outdoor air temperature. You can select air volume reduction at low supply air temperature (if the heater battery does not provide sufficient heat).

Plant diagram



5.3 Selection of Type of Control Mode

Description

Selection of type of control mode. The following temperature regulation can be selected:

1. Constant supply air temperature
2. Room/extract control
3. Differential temperature control
4. Supply air control compensated for the outdoor temperature (?)

Setting

Menu | **Configuration** | **ControlMode** | TempCtlrType

Parameter name	*Setting range*	*Default value*
TempCtlrType	Sup/Dif/Comp/Ext	Supply air

5.4 Selection of Type of Air Heater Battery

Description

Selection of the type of air heater battery to be uses, water or electrical battery

Setting

Menu | **Configuration** | **ControlMode** | HeatingBattery

Parameter name	*Setting range*	*Default value*
HeatingBattery	Water/Electr	Water

5.5 Selection of Number of Electrical Steps

Description

Selection of the number of air heater steps 1-2 or 3 .

1 step: 1 group controlled only by Pulse Width Modulating (On/Off)

2 steps: The electrical battery is divided into two groups relatively: 1-1. The first group is always controlled by Pulse Width Modulating 0 or 10V (ON/OFF) signal between stages. The second group has a binary OFF/ON control.

3 steps: The electrical battery is divided into three groups, relatively: 1-1-2. The first group is always controlled by Pulse Width Modulating 0 or 10V (ON/OFF) signal between stages. The last two groups have a binary OFF/ON control

Example:

The electrical battery is divided into three groups, relatively: 1-1-2. A 15.0 kW heater battery is then divided into: (15.0/4 =) 3.75 – 3.75 – 7.5 [kW]. The first group is always controlled by Pulse Width Modulating 0 or 10V (ON/OFF) signal between stages. The last two groups have a binary OFF/ON control

For heat control:

1. 0….100% Pulse Width Modulating
2. Group two actuated. 0% Pulse Width Modulating
3. 0….100% Pulse Width Modulating (On/Off) (group 2 actuated).
4. Group three actuated. 0% Pulse Width Modulating
5. 0….100% Pulse Width Modulating (On/Off). (group 3 actuated).
6. Group two actuated. 0% Pulse Width Modulating
7. 0….100% Pulse Width Modulating (On/Off) (groups 2 and 3 actuated).

Setting

Menu | Configuration | ControlMode | ElecHtrSteps

Parameter name	*Setting range*	*Default value*
ElecHtrSteps	1 / 2 / 3	2

5.6 Selection of Type of Cooling Mode

Description

Select from the menu if you want:

0-10 V control (ice water)
DX- cooler binary (cooler battery divided into 2 different groups)
DX- cooler linear (cooler battery divided into 2 equal groups)

0-10 V control (ice water)

Controlled from a 0-10 V signal where 10 V is maximum cooling demand.

DX cooler binary (cooler battery divided into 2 different groups):

The cooler battery is divided into 2 groups, relatively: 1-2. The intention is to delivery one cooling machine that covers 1/3 of the desired cooling effect and one cooling machine that provides 2/3 of the desired cooling effect.

Both the outdoor temperature and the extract/room temperature regulate the machines.

For example:

- DX-1 starts when the outdoor temperature is 18°C and the difference between this and the extract air is 0.75°C.
- DX-2 starts and DX-1 stops when the outdoor temperature is 23°C and the difference between this and the extract air is 1.5°C
- DX-1 starts again (DX-1 and DX-2 running) when the outdoor temperature is 28°C and the difference between this and the extract air is 2.25°C

It is possible to set △T between each DX stage in the menu.

At the same time it is necessary to have a time function at these outputs – these must be OFF for at least 4 minutes before switching on.

Refer also to Section 4.2.5.

DX- cooler linear (cooler battery divided into 2 equal groups)

The cooler battery is divided into 2 groups, relatively: 1-2. The intention is to deliver one cooling machine that covers 1/2 of the desired cooling effect and another that also provides 1/2 of the desired cooling effect.

Both the outdoor temperature and the extract/room temperature regulate the machines.

For example:

- DX-1 starts when the outdoor temperature is 18°C and the difference between this and the extract air is 0.75°C.
- DX-2 starts and DX-1 remains on when the outdoor temperature is 23°C and the difference between this and the extract air is 1.5°C

At the same time it is necessary to have a time function at these outputs – these must be OFF for at least 4 minutes before switching on.

Refer also to Section 4.2.5.

Common to DX cooler:

The cooler will start if the outdoor temperature is high enough for the cooler to start (18°C) and the extract temperature exceeds the setpoint. If we now assume that the outdoor temperature remains stable at 19°C but that the extract temperature gradually increases, we would like the next stage to be actuated when the extract temperature reaches 5°C (adjustable) above the setpoint even if the outdoor temperature remains at 19°C.

Common factors:

The following must apply for cooling to function:

- Temperature above a pre-set value (N-zone) between heating and cooling
- For DX machine there must be 3 minutes between each start

- The air volume must be above the minimum setting (DX-start)
- Heat Recovery (HR) output at 0% (0 V)
- Exercising

The cooler will run when the above criteria are met. If the set point has been set to 20°C and the end zone to 3°C, the cooler will start at 23°C and switch off when the main sensor registers a temperature below 20°C. If there is extract control (strongly recommended) you can set the minimum temperature of the supply air to avoid pressure. It is recommended that you set this value to stop the cooler switching on/off too often (increases the life time of the cooler).

Setting **Menu | Configuration | ControlMode |** CoolingMode

Parameter name	*Setting range*	*Default value*
CoolingMode	1-10/DXb/DXl	DXl

5.7 Selection of Heat Recovery Type

Description Selects the type of heat recovery to be used. The alternatives are rotor or cross heat exchanger.

Setting **Menu | Configuration | ControlMode |** TypeOfHX

Parameter name	*Setting range*	*Default value*
TypeOfHX	Rot/Plt	Rot

5.8 Selection of Supply Fan Mode

Description Selection of the type of supply fan control to be used. The alternatives are:

- **PrsI** = Control using internal pressure sensors (Pressure)
- **ExRg** = This is when external regulator / controller is used that sends a 0-10v signal into the Saphir that is sent straight out again to the fan control (with or without limiting) The external regulator could be VAV or CO2 or anything as long as it gives 0-10v. The setpoint is set on the external device (not on the handterminal). In this mode the limiting of the fans, using the internal pressure (vol) sensors can be activated.
- **Cvol** = Control using internal pressure sensors (Constant Air Volume)
- **CO2** = Only when CO2 SENSORS (not regulator) are used and connected to the Saphir. Setpoints (in % not ppm) are set on the handterminal; the Saphir does control. CO2 sensors are connected to the external sensor connections on the Saphir. The limiting of the fans using the internal pressure (vol) sensors can be used with this mode. Setpoints (including limiting setpoints etc) are set in menu:- Setpoints:CO2Controller
- **PrES** = this is when pressure SENSORS (not regulator) are used and connected to the external sensor connections on the Saphir. Setpoints are set on the handterminal; control is done by the Saphir. Pressure sensors are connected to the external sensor connections on the Saphir. The limiting of the fans using the internal pressure (vol) sensors can be used with this mode. Setpoints (including limiting setpoints etc) are set in menu:- Setpoints: PressureController

Setting **Menu | Configuration | ControlMode |** SuppFanMode

Parameter name	*Setting range*	*Default value*
SuppFanMode	Prsl/ExRg/CvolCO2/ PrES	CVol

5.9 Selection of extract fan mode

Description

Selection of the type of extract fan control to be used. The alternatives are:

- **Prsl** = Control using internal pressure sensors (Pressure)
- **ExRg** = This is when external regulator / controller is used that sends a 0-10v signal into the Saphir that is sent straight out again to the fan control (with or without limiting) The external regulator could be VAV or CO2 or anything as long as it gives 0-10v. The setpoint is set on the external device (not on the handterminal). Using this mode the limiting of the fans, using the internal pressure (vol) sensors can be activated.
- **Cvol** = Control using internal pressure sensors (Constant Air Volume)
- **CO2** = This is when CO2 SENSORS (not regulator) are used and connected to the Saphir. Setpoints (in % not ppm) are set on the handterminal, the Saphir does control. CO2 sensors are connected to the external sensor connections on the Saphir. The limiting of the fans using the internal pressure (vol) sensors can be used with this mode. Setpoints (including limiting setpoints etc) are set in menu:- Setpoints:CO2Controller
- **PrES** = This is when pressure SENSORS (not regulator) are used and connected to the external sensor connections on the Saphir. Setpoints are set on the handterminal; the Saphir does control. Pressure sensors are connected to the external sensor connections on the Saphir. The limiting of the fans using the internal pressure (vol) sensors can be used with this mode. Setpoints (including limiting setpoints etc) are set in menu:- Setpoints: PressureController

Setting

Menu | **Configuration** | **ControlMode** | EtFanMode

Parameter name	*Setting range*	*Default value*
ExtanMode	Prsl/ExRg/CvolCO2/ PrES	CVol

5.10 Number of external fan sensors

Description

Selection of number of fan sensors (pressure or CO^2). The alternatives are 2, 1-Sa, 1-Ea. This allows selection of the number of sensors used in the unit, generally used for external sensors.

- 2 = Both sensors fitted, and each fan will follow its own sensor.
- 1-Sa = Means only the supply sensor is fitted, and the extract fan will follow the supply fan signal +/- xx% (See 5.11 below)
- 1-Ea = Means only the extract sensor is fitted, and the supply fan will follow the extract fan signal +/- xx% (See 5.11 below)

Setting

Menu | **Configuration** | **ControlMode** | NumOfSensors

Parameter name	*Setting range*	*Default value*
NumOfSensors	2/1-Sa/1-Ea	2

5.11 With one sensor- second fan % difference

Description

With only one external fan sensor (pressure or CO2 .
The % difference works as follows: 100% means the second fan will run at the same speed as the lead fan, 50% means at half the speed, 200% means at twice the speed. Default value is 100% (same speed).

Setting

Menu | **Configuration** | **ControlMode** | 1Sens2ndFan%Diff

Parameter name	*Setting range*	*Default value*
1Sens2ndFan%Diff	0.0…200	200

5.12 Internal pressure sensor maximum

Description

The maximum limit for Internal pressure sensor (Pa).

Setting

Menu | **Configuration** | **ControlMode** | IntPresSensMax

Parameter name	*Setting range*	*Default value*
IntPresSensMax	0.0…1000	300

5.13 External pressure sensor maximum

Description

The maximum limit for external pressure sensor (Pa).

Setting

Menu | **Configuration** | **ControlMode** | ExtPresSensMax

Parameter name	*Setting range*	*Default value*
ExtPresSensMax	0.0…1000	300

5.14 External CO2 sensor maximum

Description

The maximum limit for external CO2 sensor (ppm).

Setting

Menu | **Configuration** | **ControlMode** | CO2SensMax

Parameter name	*Setting range*	*Default value*
CO2SensMax	0.0…9999	2000

5.15 Fire mode

Description

If there is an external fire alarm you can choose for the unit to do the following.

- Off = Full stop – damper closed (standard)
- ExtF = Extract air fan at speed specified, supply air fan stopped
- Norm = Normal operation

Setting

Menu | **Configuration** | **ControlMode** | FireMode

Parameter name	*Setting range*	*Default value*
FireMode	Off/ExtF/Norm	Off

5.16 Extract fan fire speed

Description

If you have selected ExtF in menu 5.14 (Extract air fan high speed, supply air fan stopped) then here you select the speed for extract fan

Setting

Menu | **Configuration** | **ControlMode** | ExtFanFireSpee

Parameter name	*Setting range*	*Default value*
ExtFanFireSpee	0.0…100	80

Configuration ControlParameters

5.17 Control parameter settings

Description

The controller is matched to the controlled system with the following parameters:

- Proportional factor KP
- Integral action time TN
- Working point AP / derivative action time TD

The control mode can be selected: P, PI, PD or PID.

Connection between KP and P- band: P-band=100/KP

Proportional factor KP:
Proportional factor calculation:

$$KP = \frac{\text{Max. output - min. output}}{\text{Proportional bands (P)}}$$

Max. output - min. output is usually equals 100.
KP should be negative at cooling sequence.

Too small P-band (P) results in oscillation.
When oscilliating the P-bands are increased to gain stability. It the P-band becomes too large it will result in overstability and deviations.

Integral action time TN:
If the Integral time (TN) = 0 we have a Proportion regulator. This will always have a deviation between real value and setpoint. With integrated time the deviation will gradually become less and move towards 0. An incrase of the TN will result in a slower responding regulator . A reduction of the TN will speed up the regulator.

Working point AP:
Factor used with cascade regulator to decide change of setpoint for supply air in relation to deviations on setpoints for room/extract.

Derivative action time TD:
This is used for slow regulating loops like for instance room regulation.

Settings

Menu | **Configuration** | **ControlParameters** | Main controller
| Etc.

	Parameter name	*Variable*	*Default value*
Room controller (cascade controller)	MainController	KP	4.0
		TN	500.0
		AP	0.0
Cooling controller	0-10vCoolingController	KP	-5.0
		TN	300.0
		TD	0.0
DXCoolingCtlr	DXCoolingCtlr	KP	-5.0
		TN	300.0
		TD	0.0
Heat recovery Cooling controller	HRC Cooling Controller	KP	-5.0
		TN	120.0
		TD	0.0
Heating controller	0-10vHeatingControll	KP	5.0
		TN	120.0
		TD	0.0
Heating controller	ElecHeatControll	KP	5.0
		TN	120.0
		TD	0.0
Heat recovery HeatController	HRCHeatController	KP	10.0
		TN	120.0
		TD	0.0
Fan slow down controller	FanSlowDownCtlr	KP	10.0
		TN	120.0
		TD	0.0
Frost controller	FrostController	KP	20.0
		TN	0.0
		TD	0.0
Heat recovery ant-icing controller	HRC FrostController	KP	20.0
		TN	30.0
		TD	0.0
Supply airflow controller	VolControllerSupply	KP	0.04
		TN	30.0
		TD	0.0
Extract airflow controller	VolControllerExtract	KP	0.04
		TN	30.0
		TD	0.0
Supply air pressure controller	PressureControllerSupply	KP	0.03
		TN	30.0
		TD	0.0
Extract air pressure controller	PressureControllerExtract	KP	0.03
		TN	30.0
		TD	0.0
CO2 supply air controller	CO2SupController	KP	-0.30
		TN	30.0
		TD	0.0
CO2 extract air controller	CO2ExtController	KP	-0.30
		TN	30.0
		TD	0.0

Display range: entire lower and upper range, except the supply and extract air pressure controller
Unit: TN, AP and TD in seconds; AP in Kelvin (units are not displayed on the handterminal)

5.18 Auto change between extract and supply air

Description

You can choose to make this function active and the automatic controls will automatically switch between extract/room control and supply air control when the outdoor temperature reaches a pre-set temperature such as 17°C. If the outdoor temperature is above 17°C you can choose extract/room control. If it falls below 17°C you can choose supply air control. ΔT of 2°C is set before you need to change position (adjustable).
You should be in either supply or extract/room control for this to work.

Settings

Menu | **Configuration** | **Parameters** | **AutoCangeEx/Sup** | `AutoExt/SupC`

Parameter name	*Setting range*		*Default value*
`EnblValueCooling`	No / Yes		No

5.19 Sa/EAAutoC/O

Description

Setting of outdoor temperature for automatically switch between extract/room control and supply air.

Settings

Menu | **Configuration** | **Parameters** | **AutoCangeEx/Sup** | `SA/EAAutoC/O`

Parameter name	*Setting range*	*Unit*	*Default value*
`SA/EAAutoC/O`	0...25.0	°C	17

Parameters Fan

Description

The extract fan will not start until the DmprOpenTime has finished. However the Sup fan start is always delayed by the SupFanStrtDly time after when the extract fan is started regardless of the other timings.
If Pre-heating is required and the pre-heating time added to the DmprOpenTime (e.g. 30+15) is more than the ExhfanStrtDly then the extract fan will not start until the DamprOpenTime has finished.

5.20 Extract Fan start delay

Description

Setting of start delay for the extract fan.

Settings

Menu | **Configuration** | **Parameters** | **Fan** | DlyFanStart

Parameter name	*Setting range*	*Unit*	*Default value*
DlyFanStart	0.0...180.0	Sec	30

5.21 Supply Fan start delay

Description

Setting of start delay for the supply fan.

Settings

Menu | **Configuration** | **Parameters** | **Fan** | DlyFanStart

Parameter name	*Setting range*	*Unit*	*Default value*
DlyFanStart	0.0...180.0	Sec	45

5.22 Fan overrun

Description

In connection with electric air heater, the fans run for after blow (time setting) at a normal stop of unit. For fire alarm of switching of emergency stop, there is no after blowing.

Settings

Menu | **Configuration** | **Parameters** | **Fan** | `Overrun`

Parameter name	*Setting range*	*Unit*	*Default value*
`Overrun`	0.0 – 30	min	3

5.23 Fan slow because of low supply temperature

Description

You can select air volume reduction at low supply air temperature (if the heater battery does not provide sufficient heat).

Settings

Menu | **Configuration** | **Parameters** | **Fan** | `FanSlowforHeat`

Parameter name	*Setting range*	*Unit*	*Default value*
`FanSlowforHeat`	Off/On		Off

5.24 Setting of K factor

Description

An analog pressure sensor is used to control the respective fan. With flow control selected, the measured pressure value is converted (internally) to a flow.
The conversion is made using a K factor (setting) and the following formula:
1 / K factor * square root of measured pressure (in Pascal) = effective flow in l/s.

Settings

Menu | **Parameters** | **Parameter** | **Fan I** `KfactSupply` `KfactExtract`

Parameter name	*Setting range*	*Default value*
`KfactSupply`	0.0...	121
`KfactExtract`	0.0...	121

5.25 Damper open time

Description

Damper open time before extract fan is starting

Settings

Menu | **Configuration** | **Parameters** | **Fan** | `DmprOpenTime`

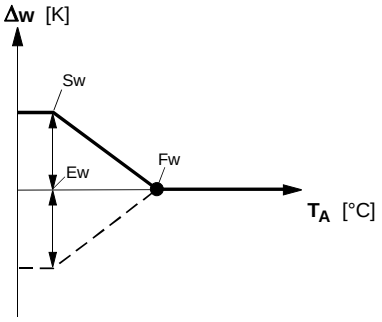
Parameter name	*Setting range*	*Unit*	*Default value*
`DmprOpenTime`	0…100	sec	15

5.26 Outside compensation of the flow

Description

Outside compensation is used for automatic compensation of the flow in relation to the current outside temperature. The basic setpoint for flow is then shifted as a function of the outside temperature.

Function diagram



Legend

F_S	Start point of summer compensation
E_S	End point of summer compensation
Sw	Delta (total shift) of flow at end point Ew
T_A	Outside temperature
Δw	Setpoint change

5.27 Starting temperature

Description

Setting of the start point (outside temperature) for outside flow compensation.

Settings

Menu | **Configuration** | **Parameters** | **Vol** | CompStartPoint

Parameter name	*Setting range*	*Unit*	*Default value*
CompStartPoint	-35.0....30.0	°C	10

5.28 End temperature

Description

Setting of the end point (outside temperature) for outside flow compensation.

Settings

Menu | **Configuration** | **Parameters** | **Vol** | CompStopPoin

Parameter name	*Setting range*	*Unit*	*Default value*
CompStopPoin	-35.0....30.0	°C	-20

5.29 Flow setpoint shift for the respective fan steps

Description

Maximum setpoint shift (total shift) for the respective fan steps.

Settings

Menu | **Configuration** | **Parameters** | **Vol** | VolSuLoDelta
VolSuHiDelta
VolExLoDelta
VolExHiDelta

Parameter name	*Setting range*	*Unit*	*Default value*
VolSuLoDelta	-270....270	l/s	0.0
VolSuHiDelta	-270....270	l/s	0.0
VolExLoDelta	-270....270	l/s	0.0
VolExHiDelta	-270....270	l/s	0.0

5.30 Flow indication max

Description

Specifies the max values of the Flow indication outputs AO7 & AO8

Settings **Menu** | **Configuration** | **Parameters** | **Vol** | `Flow Ind Max`

Parameter name	*Setting range*	*Unit*	*Default value*
`Flow Ind Max`	0...1400	l/s	690

5.31 Setting of low flow alarm

Description Setting of alarm limit for low flow.

Settings **Menu** | **Configuration** | **Parameters** | **Vol** | `VolAlarmSet`

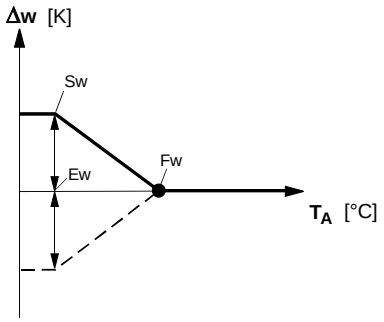
Parameter name	*Setting range*	*Unit*	*Default value*
`VolAlarmSet`	0.0...830.0	l/s	140

Parameters Pressure

5.32 Outside pressure compensation

Description Setting of the end point (outside temperature) for outside pressure compensation. Outside compensation is used for automatic compensation of the pressure in relation to the current outside temperature. The basic setpoint for pressure is then shifted as a function of the outside temperature.

Function diagram



Legend

F_S	Start point of winter compensation
E_S	End point of winter compensation
Sw	Delta (total shift) of flow at end point Ew
T_A	Outside temperature
Δw	Setpoint change

5.33 Starting temperature

Description Setting of the start point (outside temperature) for outside pressure compensation.

Settings **Menu** | **Configuration** | **Parameters** | **Pressure** | `StartPoint`

Parameter name	*Setting range*	*Unit*	*Default value*
`StartPoint`	-35.0....30.0	°C	10

5.34 End temperature

Description Setting of the end point (outside temperature) for outside pressure compensation.

Settings **Menu** | **Configuration** | **Parameters** | **Pressure** | `EndPoint`

Parameter name	*Setting range*	*Unit*	*Default value*
`EndPoint`	-35.0....30.0	°C	-20

5.35 Pressure setpoint shift for the respective fan steps

Description

Maximum setpoint shift (total shift) for the respective fan steps.

Settings

Menu | Configuration | Parameters | Pressure | `PressSuLoDelta`
`PressSuHiDelta`
`PressExLoDelta`
`PressExHiDelta`

Parameter name	*Setting range*	*Unit*	*Default value*
`PressSuLoDelta`	-500.0....500.0	Pa	0.0
`PressSuHiDelta`	-500.0....500.0	Pa	0.0
`PressExLoDelta`	-500.0....500.0	Pa	0.0
`PressExHiDelta`	-500.0....500.0	Pa	0.0

5.36 Setting of low pressure alarm

Description

Setting of alarm limit for low pressure.

Settings

Menu | Configuration | Parameters | Pressure | `PressureAlarmSet`

Parameter name	*Setting range*	*Unit*	*Default value*
`PressAlarmSet`	0.0....1000	Pa	100

Parameters DX/Cooling

5.37 DX-Cooler

Description

Select from the menu if you want:

0-10 V control (ice water)
DX- cooler binary (cooler battery divided into 2 different groups)
DX- cooler linear (cooler battery divided into 2 different groups)

0-10 V control (ice water)

Controlled from a 0-10 V signal where 10 V is maximum cooling demand.

DX cooler binary (cooler battery divided into 2 different groups):

The cooler battery is divided into 2 groups, relatively: 1-2. The intention is to delivery one cooling machine that covers 1/3 of the desired cooling effect and one cooling machine that provides 2/3 of the desired cooling effect.

Both the outdoor temperature and the extract/room temperature regulate the machines. For example:

- DX-1 starts when the outdoor temperature is 18°C and the difference between this and the extract air is 0.75°C.
- DX-2 starts and DX-1 stops when the outdoor temperature is 23°C and the difference between this and the extract air is 1.5°C
- DX-1 starts again (DX-1 and DX-2 running) when the outdoor temperature is 28°C and the difference between this and the extract air is 2.25°C

It is possible to set ΔT between each DX stage in the menu.

At the same time it is necessary to have a time function at these outputs – these must be OFF for at least 4 minutes before switching on.

DX- cooler linear (cooler battery divided into 2 equal groups)

The cooler battery is divided into 2 groups, relatively: 1-2. The intention is to deliver one cooling machine that covers 1/2 of the desired cooling effect and another that also provides 1/2 of the desired cooling effect.

Both the outdoor temperature and the extract/room temperature regulate the machines. For example:

- DX-1 starts when the outdoor temperature is 18°C and the difference between this and the extract air is 0.75°C.
- DX-2 starts and DX-1 remains on when the outdoor temperature is 23°C and the difference between this and the extract air is 1.5°C

It is possible to set ΔT between each stage in the menu.
At the same time it is necessary to have a time function at these outputs – these must be OFF for at least 4 minutes before switching on.

Common to DX cooler:
The cooler will start if the outdoor temperature is high enough for the cooler to start (18°C) and the extract temperature exceeds the setpoint. If we now assume that the outdoor temperature remains stable at 19°C but that the extract temperature gradually increases, we would like the next stage to be actuated when the exhaust temperature reaches 5°C (adjustable) above the setpoint even if the outdoor temperature remains at 19°C.
Common factors:
The following must apply for cooling to function:

- Temperature above a pres-set value (N-zone) between heating and cooling. Temperature between HeatingComfort/HeatingEconomy and CoolingComfort/Economic (Values put in MainController)
- For DX machine there should be at least 4 minutes between each start
- The air volume must be above the minimum setting (DX-start)
- Heat Recovery (HR) output at 0% (0V)
- Exercising?

The cooler will run when the above criteria are met. If the set point has been set to 20°C (HeatingComfort) and CoolingComfort set to 23°C (the end zone to 3°C), the cooler will start at 23°C and switch off when the main sensor registers a temperature below 20°C. If there is an extract control (strongly recommended) you can set the minimum temperature of the supply air to avoid cold draughts. It is recommended that you set this value low to avoid that the cooler switches On/Off too often (increases the life time of the cooler).

5.38 Selection of Cooling Mode

Menu | **Configuration** | **ControlMode** | CoolingMode

Parameter name	*Setting range*	*Default value*
CoolingMode	1-10/DXb/DXl	DXl

5.39 1 DX on Offset Stage 1

1 On Offset = Stage 1 DX switches on at this point if Extract air temp is 0.75°C higher then setpoint, subject to outside air temp limits see 5.39

Settings

Menu | **Configuration** | **Parameters** | **Cooling** | `1 On Offset`

Parameter name	*Setting range*	*Unit*	*Default value*
`1 On Offset`	0.0...10	°C	0.7

5.40 2 DX on Offset Stage 2

2 On Offset = Stage 2 DX switches on at this point if supply air temp is 1.5°C higher then setpoint, subject to outside air temp limits see 5.40

Settings **Menu | Configuration | Parameters | Cooling |** `1 On Offset`

Parameter name	*Setting range*	*Unit*	*Default value*
`2 On Offset`	0.0...10	°C	1.5

5.41 3 DX On Offset Stage 3

3 On Offset = Stage 3 DX switches on at this point if supply air temp is 2.25°C higher then setpoint, subject to outside air temp limits see 5.42

Settings **Menu | Configuration | Parameters | Cooling |** `1 On Offset`

Parameter name	*Setting range*	*Unit*	*Default value*
`3 On Offset`	0.0...10	°C	2.3

5.42 Time between each start

Description For DX machine there must have a break between each start

Settings **Menu | Configuration | Parameters | Cooling |** `MinOffTime`

Parameter name	*Setting range*	*Unit*	*Default value*
`MinOffTime`	1.0...15.0	M	4

5.43 Outdoor Temperature to Allow Cooling Start

Description Outdoor temperature that allows cooling start DX stage 1 or 0-10 V control (ice water) to go on

Settings **Menu | Configuration | Parameters | Cooling |** `ClgStg10ATL`

Parameter name	*Setting range*	*Unit*	*Default value*
`ClgStg10ATL`	0.0...35	°C	18

5.44 Outdoor Temperature DX On Stage 2

Description Outdoor temperature that allows DX stage 2 to go on

Settings **Menu | Configuration | Parameters | Cooling |** `ClgStg20ATL`

Parameter name	*Setting range*	*Unit*	*Default value*
`ClgStg20ATL`	0.0...35	°C	22

5.45 Outdoor Temperature DX On Stage 3

Description Outdoor temperature that allows DX stage 3 to go on

Settings **Menu | Configuration | Parameters | Cooling |** `ClgStg30ATL`

Parameter name	*Setting range*	*Unit*	*Default value*
`ClgStg30ATL`	0.0...35	°C	26

5.46 DX Start - Low Outdoor Temperature and High Extract Temperature

Description

The cooler will start if the outdoor temperature is high enough (18°C) and the extract temperature exceeds the setpoint. If we assume that the outdoor temperature remains stable at 19°C, and that the extract temperature gradually increases. We would like the next stage to be actuated when the extract temperature reaches 5°C (adjustable parameter = `DXRoomTRise`) above the setpoint even if the outdoor temperature remains at 19°C.

Settings

Menu | Configuration | Parameters | Cooling | `DXRoomTRise`

Parameter name	*Setting range*	*Unit*	*Default value*
`DXRoomTRise`	0.0...20	°C	5

5.47 Lowest temperature limit

Beskrivelse

If the sup air temp is less than ("min sup air temp" + LowLimThrsh) for longer than LowLimTimer (min) then 1 step DX will be switched off

Menu | Configuration | Parameters | Cooling | `LowLimThrsh`

Parameternavn	*Innstillingsområde*	*Enhet*	*Standardverdi*
`LowLimThrsh`	0,0...10	K	2

5.48 Time limit for low supply temperatur

Beskrivelse

If the sup air temp is less than ("min sup air temp" + LowLimThrsh) for longer than LowLimTimer (min) then 1 step DX will be switched off

Innstillinger

Menu | Configuration | Parameters | Cooling | `LowLimTimer`

Parameternavn	*Innstillingsområde*	*Enhet*	*Standardverdi*
`LowLimTimer`	0,0...10	Min	2

5.49 DX Min Vol

Description

This sets the minimum volume required on the supply fan to allow the cooling to Start (DX or water)
This is operational even in pressure mode and at all times when a supply INTERNAL pressure sensor is connected.

Settings

Menu | Configuration | Parameters | Cooling | `MinVolDXStart`

Parameter name	*Setting range*	*Unit*	*Default value*
`MinVolDXStart`	0…850	l/s	140

5.50 Minimum Neutral Zone Values

Description

These values specify the minimum neutral zones for Unoccupied, Economy and Comfort heating and cooling setpoints.

If a setpoint is changed causing the other setpoint to be less than the neutral zone away, then the other setpoint will automatically be changed to maintain the neutral zone. It should be noted that the neutral zone could be larger than this value.

These values can be changed after entering password level Engineer

Setting

Menu | **Setpoints** | **MainController** | CoolingEconomy

Parameter name	*Setting range*	*Unit*	*Default value*
MinComNZone	1.0…10.0	°C	2.0
MinEcoNZone	1.0…10.0	°C	4.0
MinUnocNZone	1.0...20.0	°C	10.0

Parameters Pump

5.51 Pumps

The circulation pump for the heating circuit is controlled to be in operation during wintertime and when the output signal to the heating valve AO2 > 0 V.
The circulation pump for the cooling circuit is controlled to be in operation whenever a cooling need is at hand.

5.52 Activation of Anti-seize Operation of Heating Pump

Description

Activates anti-seize operation (pump kick) for the heating circuit pump for in order to prevent that the pump seizes stops(?). Anti-seize(?) operation takes place every Monday at noon.

Settings

Menu | **Configuration** | **Parameters** | **Pump** | `PumpKickHeating`

Parameter name	*Setting range*	*Default value*
`PumpKickHeating`	Off / On	On

5.53 Setting Minimum Run-Time for the Pumps

Description

Parameter for setting of minimum run time for the cooling pump and the circulation pump for the heat circuit.

Settings

Menu | **Configuration** | **Parameters** | **Pump** | `MinRunTimePump`

Parameter name	*Setting range*	*Unit*	*Default value*
`MinRunTimePump`	0...30	min	5

Parameters FrostWaterBattery

5.54 Min. Temperature for Operating Air Heater (water)

Description

Setting of setpoint to prevent frost protection activation. In case of frost risk in the water battery, sensors in the return water control the valve actuator to open. This setpoint is activated when the unit is in operation.

Settings

Menu | **Configuration** | **Parameters** | **FrostWaterBattery** | `FrostSetpoint`

Parameter name	*Setting range*	*Unit*	*Default value*
`FrostSetpoint` [1]	10.0[1]...40.0	°C	12.0

5.55 Hot keeping of stopped air heater (water)

Description

When the unit is not operating, the temperature in the air heater is controlled to the set hot keeping setpoint in order to prevent frost formation and facilitate unit startup.

Setting

Menu | Configuration | Parameters | FrostWaterBattery | `StandbySetpo`

Parameter name	*Setting range*	*Unit*	*Default value*
`StandbySetpo`	10.0...50.0	°C	25.0

5.56 Setpoint Trigging of Frost Detector

Description

If the temperature drops below the frost alarm value, an A alarm will be activated and the unit will stop.

Setting

Menu | Configuration | Parameters | FrostWaterBattery | `FrosAlarmValue`

Parameter name	*Setting range*	*Unit*	*Default value*
`FrosAlarmValue`	2.0...30.0	°C	8.0

Parameters HRC

5.57 Heat Recovery

Heat Recovery – Flat Heat exchanger cross

The heat demand is be controlled by a 0-10 V signal which modulates the damper across the heat exchanger cassettes.
The bypass damper is closed at 10 V ,providing full recovery.
Defrosting the heat exchanger cassette:
This is done with the help of a patented system called *Thermoguard*
Description of Thermoguard:
The Thermoguard comprises two components – A temperature sensor and a humidity sensor.
The temperature sensor T comprises a passive Ni1000 element and as a result gives different resistance values at different temperatures.
The humidity sensor H also gives different resistance values at different levels of humidity.
Frosting is prevented using the following combinations:

- Temperature, T, < +1 °C and humidity, H, (< 800kΩ)
- Temperature, T, < -3 °C and no humidity, H, (> 1200kΩ)

Defrosting discontinues when the temperature in the cassette is increased by +2^{o}C (adjustable) from the frost position (+5 or –3).
Cables: 4 (2 from Ni1000 and 2 from humidity sensor)
The Thermoguard sensor is located in the cold corner of the heat exchanger cassette. When this occurs the control signal to the heat recovery unit shall be 0 V, i.e. full bypass.
The fan speed shall be the same during the entire defrosting period, providing that you have not selected fan reduction at too low supply air temperature.

Rotary Heat Recovery Units

The heat demand is controlled by a 0-10V signal that, in turn, controls the speed of the rotor. A rotation guard indicates whether rotation is in progress. It will also emit an alarm if there is a stop. There is also built-in exercising test. Starts once a day and runs for 1 minute at each start.

5.58 Activation of Cooling Recovery

Description

If the cooling recovery function is selected, VVX is set to 100% when there is a cooling demand and the outdoor air temperature is 1°C warmer than the extract air (value can be adjusted). The cooling recovery stops when the cooling demand ceases or the outdoor temperature is the same as the extract air temperature.

Settings

Menu | Configuration | Setpoints | Parameters | HRC | `EnblCoolRecovery`

Parameter name	*Setting range*	*Default value*
`EnblCoolRecovery`	Off / On	Off

5.59 Setpoint for Anti-icing Protection

Description

As an anti-icing protection of the plate(cross) heat exchanger, there is an integrated control function. A temperature sensor inside the plate(cross) exchanger is protecting the exchanger from icing.

When this occurs the control signal to the heat recovery unit shall be 0 V, i.e. full by-pass.

Setting

Menu | Configuration | Setpoints | Parameters | HR | `HR FrostSetpoint`

Parameter name	*Setting range*	*Unit*	*Default value*
`HR FrostSetpoint`	-5.0...5.0	°C	-3

5.60 Reset Anti-icing Function

Description

Defrost ends when temperature raises these values

Setting

Menu | Configuration | Setpoints | Parameters | HR | `HRFrostReset`

Parameter name	*Setting range*	*Unit*	*Default value*
`HRFrostReset`	-5.0...5.0	°C	2

5.61 Activation of Efficiency Measuring

Description

This parameter activates the function for measurement of the heat recovery circuit efficiency..

The measuring is effected via the return air, extract air and outside air temperatures. Measuring cannot be used when the extract air sensor if being used for anti-icing protection of water-based recovery.

Formula for calculation of efficiency: (Extract air – Return air) / (Extract air – Outside air) * 100

Conditions for calculation of efficiency to be executed:

- EA - Outside > 5°C
- Output signal HR > 99%
- Fans on
- Efficiency activated

Settings

Menu | Configuration | Setpoints | Parameters | HR | `Enbl Efficiency`

Parameter name	*Setting range*	*Default value*
`Enbl Efficiency`	Off / On	Off

5.62 Setpoint for Alarm Low Efficiency

Description

This parameter sets the setpoint for minimum efficiency.
If the efficiency drops below the setpoint and the above listed conditions (see Activation of efficiency measuring) are fulfilled, a B alarm is triggered after the set time delay.

Setting

Menu | **Configuration** | **Parameter** | **HR** | `Low Efficiency`

Parameter name	*Setting range*	*Unit*	*Default value*
`Low Efficiency`	0.0...100.0	%	50.0

5.63 Forced Run Time

Description

Using a pushbutton for forced operation.
Setting the air volume required for forced operation. When the forced ventilation signal is high, any setting for the fan control (e.g. Pressure control, VAV external, CO2) is ignored and the fans are set to Constant volume with the constant-volume forced set-point.

Settings

Menu | **Configuration** | **Parameters** | **ForcedOperation** | ForcedRunTime

Parameter name	*Setting range*	*Unit*	*Default value*
ForcedRunTime	0.0 – 12.0	H	1.0

5.64 Forced Air Volume Supply

Description

Using a pushbutton for forced operation.
Setting the air volume required for forced operation. When the forced ventilation signal is high, any setting for the fan control (e.g. Pressure control, VAV external, CO2) is ignored and the fans are set to Constant volume with the constant-volume forced set-point.

Settings

Menu | **Configuration** | **Parameters** | **ForcedOperation** | SupForcedAirVol

Parameter name	*Setting range*	*Unit*	*Default value*
SupForcedAirVol	0.0 – 7000	l/s	900

5.65 Forced Air Volume Extract

Description

Using a pushbutton for forced operation.
Setting the air volume required for forced operation. When the forced ventilation signal is high, any setting for the fan control (e.g. Pressure control, VAV external, CO2) is ignored and the fans are set to Constant volume with the constant-volume forced set-point.

Settings

Menu | **Configuration** | **Parameters** | **ForcedOperation** | ExtForcedAirVol

Parameter name	*Setting range*	*Unit*	*Default value*
ExtForcedAirVol	0.0 – 7000	l/s	900

5.66 Cancel Forced Operation

Description

This parameter is used to CANCEL the activation of the forced operation input.
The function is always enabled.

Settings

Menu | **Configuration** | **Parameters** | **ForcedRunTime** | `CancelForcedOp`

Parameter name	*Setting range*	*Default value*
`CancelForcedOp`	Yes/No	No

Parameters TemperatureAlarm

5.67 Alarm Delay of Temperature Alarm

Description

This parameter is used to set a common alarm delay time for temperature alarms set as B alarms. Not valid with electric battery, i.e. A alarm that stops the unit.

Settings

Menu | **Configuration** | **Parameters** | **TemperatureAlarm** | DtTempAlarm

Parameter name	*Setting range*	*Unit*	*Default value*
DtTempAlarm	0.0 – 600.0	min	60.0

5.68 Alarm Limit for Temperature Alarm

Description

This parameter is used to set the alarm limit for temperature alarms.

Settings

Menu | **Configuration** | **Parameters** | **TemperatureAlarm** | TemperatureAlarmSet

Parameter name	*Setting range*	*Unit*	*Default value*
TemperatureAlarmSet	0.0 – 10.0	°C	10.0

5.69 Blocking of Temperature Alarm

Description

With this parameter activated, temperature alarms will be blocked off during summer time. Summer time means temperatures above 15°C.

Settings

Menu | **Configuration** | **Parameters** | **TemperatureAlarm** | Block Alarm Summmer

Parameter name	*Setting range*	*Default value*
Block Alarm Summer	Off / On	On

Parameters Alarms

5.70 Alarm Delay Alarms

Description

The following parameters set an individual alarm delay time for the respective alarm points.

Settings

Menu | **Configuration** | **Parameters** | **Alarms** | DtErrorSupplyFu
| DtErrorExtractFU
| DtFanCommonFault
| DtUnitOverRideAlarm
| DtHRC effAlarm
| DtHRCFrostAlarm

Parameter name	*Setting range*	*Unit*	*Default value*
DtErrorSupplyFu	0.0 – 600.0	sec	300.0
DtErrorExtractFU	0.0 – 600.0	sec	300.0
DtFanCommonFaul	0.0 – 600	sec	60.0
DtUnitOverRideAlarm	0.0 – 600	min	30.0
DtHRC effAlarm	0.0 – 600	min	30.0
DtHRCFrostAlarm	0.0 – 60.0	min	1

5.71 Selection of Alarm Class

Description

These parameters are used to set an individual alarm class for the respective alarm points.
Selection of A alarm stops the unit when the alarm is activated.

Settings

Menu | Configuration | Parameters | AlarmClass

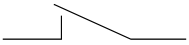
- RotorGrdCls
- ElecHtrO/HCls
- FanComFltCls
- SupFanErrCls
- ExhFanErrCls
- TemperatureCls
- SensorErrCls
- WaterFrostCls
- HRCFrostCls

Parameter name	*Setting range*	*Unit*	*Default value*
RotorGrdCls	B/A		B
ElecHtrO/HCls	B/A		A
FanComFltCls	B/A		B
SupFanErrCls	B/A		B
ExhFanErrCls	B/A		B
TemperatureCls	B/A		B
SensorErrCls	B/A		A
WaterFrostCls	B/A		A
HRCFrostCls	B/A		B

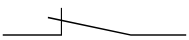
5.72 Setting of Contact Function for Alarm Inputs

Description

These parameters are used to select the operating action of the alarm inputs (NO for normally open or NC for normally closed).



NO (Normally Open)
The contact is normally open and is closed only in case of an alarm.



NC (Normally Closed)
The contact is normally closed and is opens only in case of an alarm.

Settings

Menu | Configuration | ContactFunction DI

- SmokeFireDir
- FanComFltDir

Parameter name	*Setting range*	*Unit*
Fire and smoke SmokeFireDir	NO / NC	NC
Common alarm Fans FanComFltDir	NO / NC	NC

5.73 Extended Operating Time via Button/timer

Description

This parameter sets the time.
When using a pushbutton for extended operation, this parameter is used to set the required run time.
When using a timer, this parameter must be set to 0, since the time function is then in the timer itself.

Settings

Menu | **Configuration** | **Parameters** | **ControlInput** | `ControlInput TimerTime`

Parameter name	*Setting range*	*Unit*	*Default value*
`ControlInput TimerTime`	0.0 – 12.0	H	1.0

5.74 Cancel Extended Operation

Description

This parameter is used to CANCEL the activation of Extended operation input.
This is in case of accidental operation of the extended input, for example during commissioning or servicing.
The function is always enabled.

Settings

Menu | **Configuration** | **Parameters** | **ForcedRunTime** | `CancelExtendOp`

Parameter name	*Setting range*	*Default value*
`CancelextendOp`	Yes/No	No

5.75 Unoccupied Mode

At the end of the occupancy time, the plant is switched off (scheduler off). Then, the room temperature will fall or rise, depending on the prevailing weather conditions and internal loads. The «Unoccupied heating mode» or «Unoccupied cooling mode» function is activated to ensure that no excessively low or high room temperatures will occur.

5.75.1 Unoccupied Heating Mode

Description

If the room temperature drops below the set limit value `(LimitHtgUnoccupied)`, «Unoccupied heating mode» is started. In that case, heating is provided until the room temperature lies 1 Kelvin above the limit value. If only extract air sensors are used, a startup takes place at night to determine if unoccupied heating is required.. A switch-on delay for repeated switching on (`MinOccupiedTime)` ensures that the plant does not switch on too often.

Effects

- Fan will be switched on
- Control air heater battery will be activated
- Output signal for cooling will be locked
- Operating action \, HR will be activated
- Control heat compressor will be activated

General conditions

- Room / Extract air temperature sensor connected
- Scheduler must be Off
- Enable parameter `(EnblHtgUnoccupied)` must be On
- Room temperature falls below the limit value `(LimitHtgUnoccupied)`
- Switch-on delay time `(MinOccupiedTime)` has elapsed

5.75.2 Unoccupied Cooling Mode

Description

If the room temperature rises above the set limit value (`LimitClgUnoccupied`), «Unoccupied cooling mode» is started. In that case, cooling is provided until the room temperature lies 1 K below the limit value. If only extract air sensors are used, a startup takes place at night to determine if unoccupied cooling is required. A switch-on delay for repeated switching on (`MinOccupiedTime`) ensures that the plant is not switched on too often. It is observed, even if the room temperature exceeds the limit value.

Effects

- Fan will be switched on
- Control air heater battery will be locked
- Cooling control is activated
- Operating action \, HR will be locked
- Control heating compressor will be locked

General conditions

- Room temperature sensor connected
- Scheduler must be Off
- Parameter for enabling (`EnblClgUnoccupied`) must be set to On
- Room temperature exceeds the limit value (`LimitClgUnoccupied`)
- Switch-on delay time (`MinOccupiedTime`) has elapsed

5.76 Activation Unoccupied Heating Mode

Description

This parameter is used to activate / deactivate the function unoccupied heating mode.

Settings

Menu | **Configuration** | **Parameters** | **UnoccupiedMode** | `EnblHtgUnoccupied`

Parameter name	*Setting range*	*Default value*
`EnblHtgUnoccupied`	Off/On	Off

5.77 Activation Unoccupied Cooling Mode

Description

This parameter is used to activate / deactivate the function unoccupied cooling mode.

Settings

Menu | **Configuration** | **Parameters** | **UnoccupiedMode** | `EnblClgUnoccupied`

Parameter name	*Setting range*	*Default value*
`EnblClgUnoccupied`	Off/On	Off

5.78 Limit Value for Unoccupied Heating

Description

This parameter is used to set the temperature limit values for start of the function unoccupied heating.

Settings

Menu | **Configuration** | **Parameters** | **UnoccupiedMode** | `LimitHtgUnoccupied`

Parameter name	*Setting range*	*Unit*	*Default value*
`LimitHtgUnoccupied`	0.0 – 20.0	°C	15.0

5.79 Limit Value for Unoccupied Cooling

Description

This parameter is used to set the temperature limit values for start of the function unoccupied cooling.

Settings

Menu | Configuration | Parameters | UnoccupiedMode | `LimitClgUnoccupied`

Parameter name	*Setting range*	*Unit*	*Default value*
`LimitClgUnoccupied`	20.0 – 50.0	°C	30.0

5.80 Minimum Run Time Unoccupied Mode

Description

This parameter is used to set a minimum run time for the function Unoccupied mode. It determines the minimum run time for each startup of unoccupied heating as well as unoccupied cooling.

Settings

Menu | Configuration | Parameters | UnoccupiedMode | `MinOccupiedTime`

Parameter name	*Setting range*	*Unit*	*Default value*
`MinOccupiedTime`	0.0 – 720.0	min	30.0

5.81 Delay before Test of Unoccupied Mode

Description

This parameter is used to set a delay before test of the function Unoccupied mode. When no room sensor is being used, the temperature must be measured via the extract air sensor. The unit therefore starts for a short time during the night in order to sense the extract air temperature. This is only done when unoccupied heating or cooling is activated.

Settings

Menu | Configuration | Parameters | UnoccupiedMode | `DelayBeforeTest`

Parameter name	*Setting range*	*Unit*	*Default value*
`DelayBeforeTest`	0.0 – 3600.0	min	350.0

Parameters NightPurging

5.82 Night Purging

Description

Night purging is used in the summer to save cooling energy by pre-cooling the rooms with cool outside air during the night. If only extract air sensors are used, a startup takes place at night to determine if night purging is required.

Note

Night purging should be operated for several hours per night, but for a minimum of one hour. However, the room temperature must not be allowed to fall below such a level that heating is required in the morning.

Effects

- Fan will be switched on
- Air heater battery will be locked
- Air cooler battery will be locked
- Operating action \ , HR will be locked

General conditions

Switch On Requirements:

- Room temperature sensor and outside sensor connected
- Parameter for activation of night purging be in position On
- Scheduler must be in position Off
- Outside temperature > minimum outside temperature
- Outside temperature < room temperature - delta (OnDelta)
- Room temperature > room temperature setpoint + Hysteresis (Only condition for switch-on, but no condition for switch-off!

Night purging will be activated under these conditions. If one of the general conditions is no longer met (with the exception of the last, which is only a switch-on requirement), night purging will be deactivated on completion of the minimum running time.

5.83 Activation

Description

Parameter for activation of night purging.

Settings

Menu | Configuration | Parameters | NightPurging | `EnblNightPurgin`

Parameter name	*Setting range*	*Default value*
`EnblNighPurging`	Off / On	Off

5.84 Room Setpoint

Description

Temperature that shall be attained in the rooms through night purging.

Settings

Menu | Configuration | Parameters | NightPurging | `RoomSetpoint`

Parameter name	*Setting range*	*Unit*	*Default value*
`RoomSetpoint`	0.0...40.0	°C	22.0

5.85 Minimum Outside Temperature

Description

The minimum outside temperature can disable the night purging function. This is the case when the outside temperature is lower than the value under parameter `MinOutTemp`.

Settings

Menu | Configuration | Parameters | NightPurging | `MinOutTemp`

Parameter name	*Setting range*	*Unit*	*Default value*
`MinOutTemp`	1.0...30.0	°C	20.0

5.86 Hysteresis

Description

A hysteresis is added to the room temperature setpoint as a switch-on but not switch-off requirement. The total must be greater than the actual room temperature.

Settings

Menu | Configuration | Parameters | NightPurging | `Hysteresis`

Parameter name	*Setting range*	*Unit*	*Default value*
`Hysteresis`	1.0...10.0	K	4.0

5.87 Delta

Description

If the outside temperature drops by the value of the differential (delta) entered below the room temperature , night purging will be activated, provided the limit values of room and outside temperature are reached.

Settings

Menu | Configuration | Parameters | NightPurging | `Delta`

Parameter name	*Setting range*	*Unit*	*Default value*
`Delta`	1.0...20.0	K	4.0

5.88 Minimum Running Time

Description

Minimum operating time of night purging to ensure the plant is not switched on and off too often.

Settings

Menu | Configuration | Parameters | NightPurging | `MinRunTime`

Parameter name	*Setting range*	*Unit*	*Default value*
`MinRunTime`	0.0...720.0	min	30.0

5.89 Delay Before Test

Description

This parameter is used to set a delay before test of the function Night Purging.
When no room sensor is being used, the temperature must be measured via the extract air sensor. The unit therefore starts for a short time during the night in order to sense the extract air temperature. This is only done when unoccupied heating or cooling is activated.

Settings

Menu | Configuration | Parameters | NightPurging | `DelayBeforeTest`

Parameter name	*Setting range*	*Unit*	*Default value*
`DelayBeforeTest`	0.0 – 3600.0	min	350.0

5.90 Startup

Description

The following parameter setting lines contain settings that are the most important when starting up a plant:

- Preheating time
- Start delay, extract and supply fans

5.91 Extract Fan Start Delay

Description

Setting of start delay for the extract fan.

Settings

Menu | **Configuration** | **Parameters** | **Fan** | DlyFanStart

Parameter name	*Setting range*	*Unit*	*Default value*
DlyFanStart	0.0...180.0	Sec	30

5.92 Supply Fan Start Delay

Description

Setting of start delay for the supply fan.

Settings

Menu | **Configuration** | **Parameters** | **Fan** | DlyFanStart

Parameter name	*Setting range*	*Unit*	*Default value*
DlyFanStart	0.0...180.0	Sec	30

5.93 Preheating Time

Description

Hot water air heater batteries are sensitive to frost. If the ventilation plant remains switched off at night and the outside temperature drops below freezing in the morning, the sudden intake of cold outside air on plant startup would cause the water in the coils to freeze within a short period of time. This problem is of particular importance in plants using on / off dampers. To prevent this, the heating circuit is flushed with hot water before the outside and extract air dampers are opened. The plant is switched on, first with the heating circuit pump D01 of the air heater battery and the heating valve opens depending on the current outside temperature during an adjustable time. The risk of freezing is thus eliminated and the plant is switched on to operate at the required level.

Effects

- Heating circuit pump will be activated
- Valve will be opened depending on the current outside temperature

General conditions

- Outside temperature sensor connected
- Preheating time (`PreheatingTime`)> 0.0 sec
- Outside temperature < 5 °C

Setting

Menu | **Configuration** | **Parameters** | **StartUp** | `PreheatingTime`

Parameter name	*Setting range*	*Unit*	*Default value*
`PreheatingTime`	0.0...600.0	s	30.0

5.94 Powerup Start Delay

Description

After a power failure, the power up start delay causes the ventilation plant to switch on again with a certain delay. Otherwise, the simultaneous switching on of *all* electrical loads in the building could produce overloads on the power network.

Setting

Menu | **Configuration** | **Parameters** | **StartUp** | `StartDelay PowerUp`

Parameter name	*Setting range*	*Unit*	*Default value*
`StartDelay PowerUp`	0.0...900.0	s	0.0

Parameters Filters

5.95 Filter

The pressure across the filters is normally displayed (extract and supply) so that you can set the alarm limit of the pressure. An alarm is actuated when the pressure exceeds the alarm limit.

5.96 Filter Alarm Supply

Description

Set the alarm limit of the pressure for supply filter

Setting

Menu | **Configuration** | **Parameters** | **Filter** | Sup`FilterAlarm`

Parameter name	*Setting range*	*Unit*	*Default value*
Sup`FilterAlarm`	0.0...500	Pa	250

5.97 Filter Alarm Extract

Description

Set the alarm limit of the pressure for extract filter.

Setting

Menu | **Configuration** | **Parameters** | **Filter** | Extr`FilterAlarm`

Parameter name	*Setting range*	*Unit*	*Default value*
Extr`FilterAlarm`	0.0...500	Pa	250

5.98 Filter Sensor Max Limit

Description

Set the max limit on the filter sensor.

Setting

Menu | **Configuration** | **Parameters** | **Filter** | Extr`FilterAlarm`

Parameter name	*Setting range*	*Unit*	*Default value*
Extr`FilterAlarm`	0.0...1000	Pa	1500

6 Applications

6.1 Selection of Application

Applications will be presented in the documentation as soon as it becomes available.

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The right to give notice of lack of conformity applies to this product in accordance with the existing terms of sale, **provided that the product is used correctly and maintained.** Filters are consumables.

The symbol on the product shows that this product must not be treated as household waste. It must be taken to a reception station for recirculation of electric and electronic equipment.
By ensuring the correct disposal of the equipment, you will contribute to preventing the negative consequences for the environment and health that incorrect handling may entail. For further information on recirculation of this product, please contact your local authority, your refuse collection company or the company from which you purchased it.

Notice of lack of conformity as a result of incorrect or defective installation must be submitted to the installation company responsible. The right to give notice of lack of conformity may lapse if the system is used incorrectly or maintenance is grossly neglected.