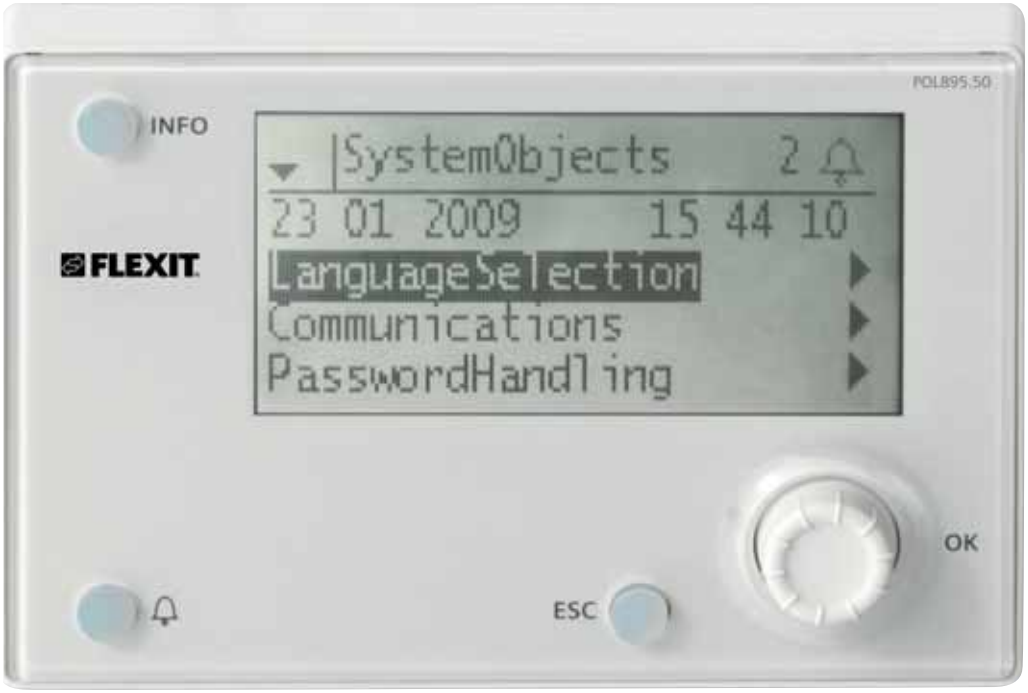
112140E-03
2016-01

CS2000 Automatic control V2



User Guide

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This user guide only applies to software version V2.x
To view current software version:
Start page > Main menu > System Overview > Versions > Flexit.ahu = V2.x

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1. Introduction

1.1. Document description

This document describes the main functions of the CS2000 automatic control and is divided into different sections for different parts of the system. If you only want to make basic settings to start the ventilation unit, there is a special section describing the startup procedure. If you require more detailed information, select the relevant section in the document.

All electrical connections must be carried out by qualified electricians.

1.2. Highlighted boxes

A number of different text boxes are used in the document to draw the user's attention to various things. This may be anything from pure information text to particularly important details to ensure that the system is not used incorrectly. Here is a brief description of the various boxes:

WARNING! When a text is highlighted like this, it means that personal injury or serious damage to the equipment may result if the instructions are not followed.

NB! When a text is highlighted like this, it means that the equipment may be damaged or function poorly if the instructions are not followed.

RESTART

> EXAMPLE

Italicised text boxes show examples

A table looks like this	
with various values	with various values
with various values	with various values

1.3. System overview

1.3.1. *System structure*

The control system is divided into two subgroups:
1. One part that is located in the ventilation unit's switching space
2. One part that is located in a separate control cabinet on the outside of the ventilation unit.

1.
Terminal blocks for incoming feed Fuse for automatic control and fans (not electric heating coil)

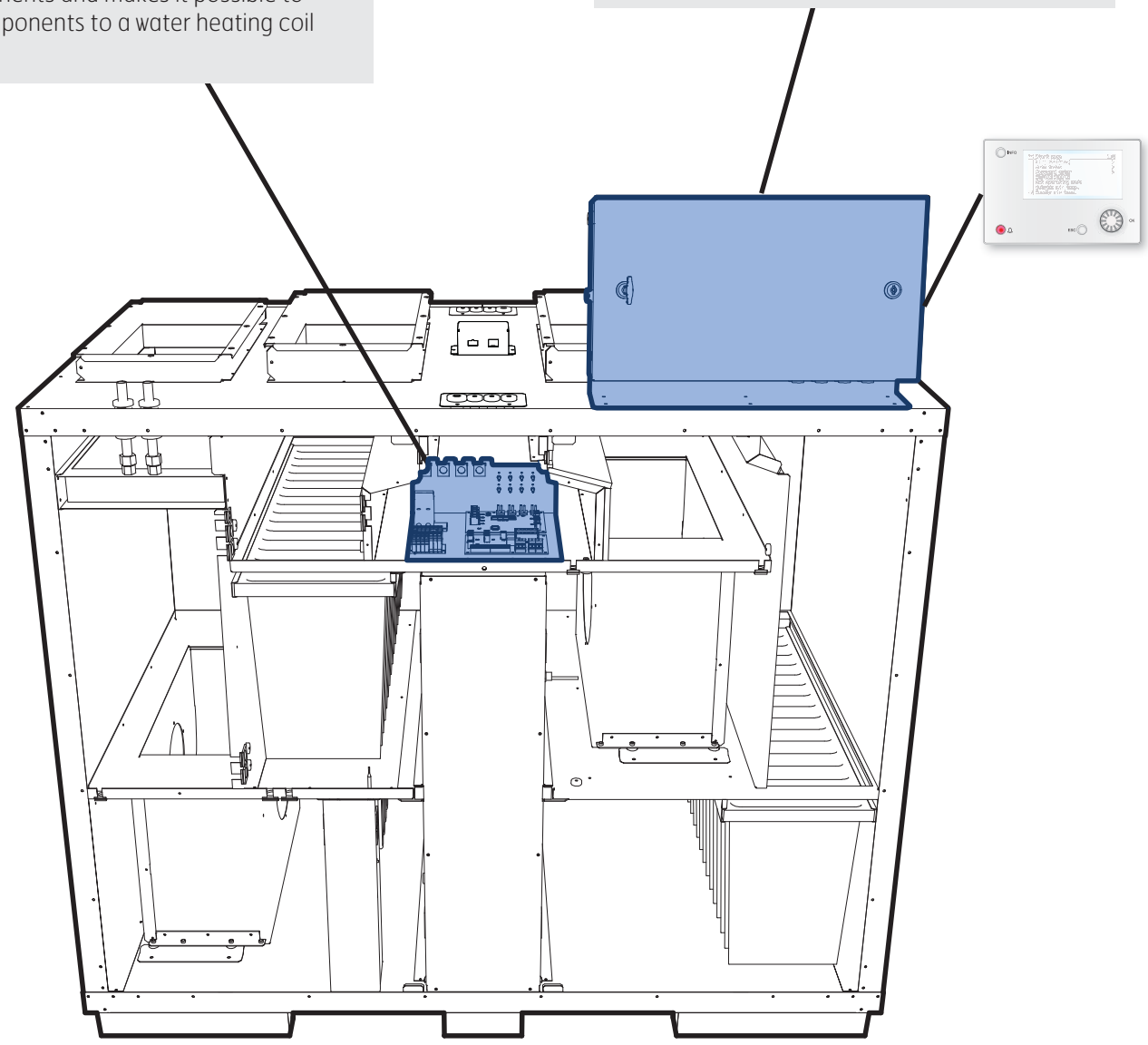
Modbus extender – a communication card that connects the ventilation unit's components to the control unit via data communication

Power supply board – a circuit board that distributes the power supply to the ventilation unit's components and makes it possible to connect components to a water heating coil

2.
Control unit – the overall control system of the ventilation unit

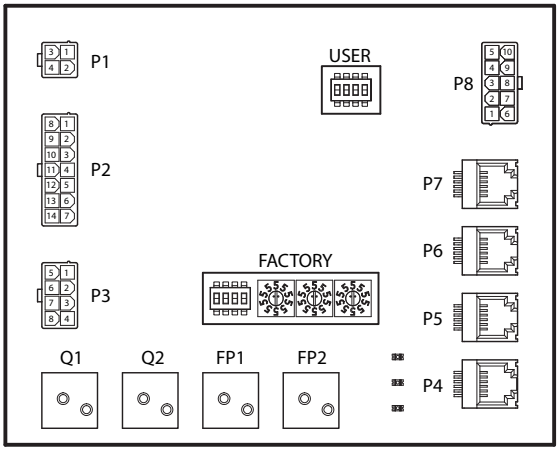
Terminal board – a circuit board with terminal blocks for connection of additional components and accessories

HMI – the control panel used to communicate with the control unit



1.3.2. *Ventilation unit's switching space*

Modbus extender



It is a communication card that connects the ventilation unit's components to the control unit.

The card has a number of dipswitches called 'USER' that are used to configure the unit, depending on the type of heating coil installed.

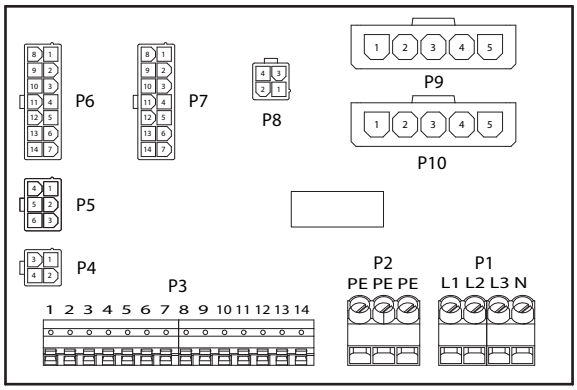
Dipswitch no.	ON	OFF
1	Heating coil	No heating coil
2	Electric heating coil	Water heating coil
3	-	Must be OFF
4	-	Must be OFF

The second dipswitch and the rotary switches marked 'FACTORY' are factory-set and must not be changed.

The card's components have the following functions.

Component	Function
P1	Power supply
P2	Control signals to heating coil
P3	Control signals to rotor and temperature sensor
P4	Communication connection
P5	Communication connection
P6	Communication connection
P7	Communication connection
P8	Control signals to fans
Q1	Differential pressure monitor for flow measurement on supply air fan
Q2	Differential pressure monitor for flow measurement on extract air fan
FP1	Differential pressure monitor for supply air filter
FP2	Differential pressure monitor for extract air filter

Power supply board



It is a circuit board that distributes the power supply to the components of the ventilation unit (not the electric heating coil) and control cabinet. There is also a terminal block for the components required to regulate a water heating coil.

The board's components have the following functions.

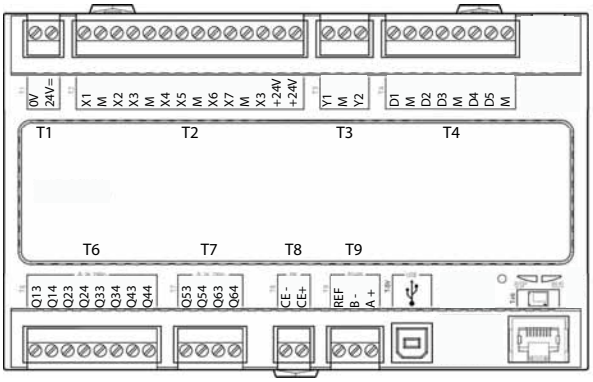
Component	Function
P1	Terminal block for power supply
P2	Terminal block for protective earth (PE)
P3	Terminal block for water heating coil
P4	Power supply to modbus extender
P5	Power supply to control cabinet
P6	Control signals to heating coil
P7	Control signals to heating coil
P8	Power supply to rotor control
P9	Power supply to supply air fan
P10	Power supply to extract air fan

Terminal block P3 has the following signals:

Block no.	Function
1	Valve motor - G0
2	Valve motor - 24V+
3	Valve motor - G0
4	Valve motor - control signal 0-10V
5	G0 (for F10 or B5)
6	Overheating thermostat F10
7	Return water sensor B5
8	No connection
9	N
10	Pump motor - relay contact
11	Pump motor - relay contact
12	L
13	N
14	L

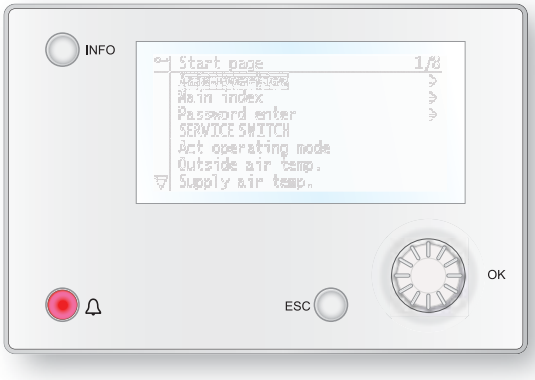
1.3.3. *Ventilation unit's control cabinet*

Control unit



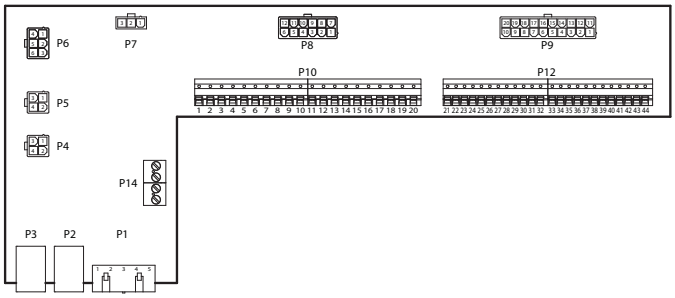
The ventilation unit's control unit This is where the control panel (HMI) and sensors and other components of the ventilation unit are connected. It is also possible to connect an SD memory card to back up or reload configuration settings and parameters for the system.

HMI



The control panel on which all settings and readings take place. It has an 8-line graphic display and you navigate the menu tree using a dial that is turned. Selections are confirmed by pressing the same button.

Terminal board



It is a circuit board that connects the components to the control unit. External components such as dampers are connected to this board via the terminal blocks on the board.

The board's components have the following functions:

Component	Function
P1	Connection for power supply
P2	Data communication
P3	Data communication
P4	Connection for external pressure sensor (accessory)
P5	Connection for external pressure sensor (accessory)
P6	Connection for 24V transformer
P7	Data communication
P8	Connection for digital outputs
P9	Connection for control signals
P10	Terminal block for 230V signals
P12	Terminal block for control signals
P14	Terminal block for protective earth (PE)

Terminal board

Terminal block P10 has the following signals:

Block no.	Function
1	L
2	N
3	L (Outdoor air damper)
4	L1 (Outdoor air damper ON/OFF)
5	N (Outdoor air damper)
6	L (Exhaust air damper)
7	L1 (Exhaust air damper ON/OFF)
8	N (Exhaust air damper)
9	L (Fire damper)
10	L1 (Fire damper ON/OFF)
11	N (Fire damper)
12	Buzzer alarm IN
13	Buzzer alarm OUT
14	DX cooling/cooling pump IN
15	DX cooling/cooling pump OUT
16	L
17	Heating IN
18	Heating OUT
19	N
20	Not used

Terminal block P12 has the following signals:

Block no.	Function
21	Cooling - 0-10V [AO]
22	Cooling - G0
23	External control 1 [DI]
24	External control 1 - G0
25	External control 2 [DI]
26	External control 2 - G0
27	Fire/smoke [DI]
28	Fire/smoke - G0
29	Air quality - 0-10 [AI]
30	Air quality - G0
31	Heating - 0-10V [AO]
32	Heating - 24V+
33	Heating - G0
34	Fire damper open [DI]
35	Fire damper closed [DI]
36	Fire damper - G0
37	AUX damper - 0-10V [AO]
38	AUX damper - G0
39	Return water sensor B5 [AI] / Overheating thermostat F20 [DI]
40	G0
41	CE- [Data bus]
42	CE+ [Data bus]
43	Not used
44	Not used

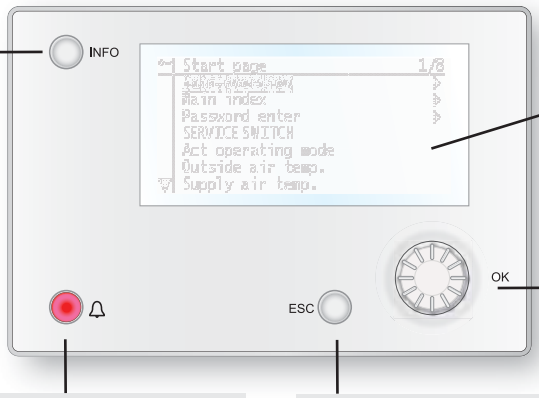
2. Getting started

2.1. HMI

A central element in the system is the HMI (control panel), where you can adjust settings and take readings. The control panel consists of an 8-line graphic display, indicator lamps and controls for the settings. Here is a short introduction to the control panel showing how to enter the initial settings in the system.

Info button
Press to go to Main index

- Off = Stop, cool down
- Green lamp, steady = Normal operation
- Flashing green = Starting, Night operation test, Night cooling or Night heating/night cooling.
- Orange lamp, steady = Emergency stop and alarm with stop
- Flashing orange = Fire damper in motion
- Alternating green/ orange = Manual operation



Display

Shows information

Dial

- Turn counterclockwise/ clockwise to go up/ down in menus or to change values.
- Press the button to enter a menu or change a value.
- Hold the button down to go directly to the login menu if the value you want to change requires login.

Alarm button

- Flashing red = alarm.
- Red lamp, steady = alarm acknowledged but remaining

ESC button

- Returns to the previous menu page
- Cancels current editing

2.2. Settings

2.2.1. *Introduction*

The first time the system is started, you need to go through some simple steps to ensure that the system will function.

If a heating coil has been installed in the ventilation unit and the associated settings have been made with dipswitches in the switching space in the unit, the automatic control system will be restarted automatically once to complete the operation. No extra action needs to be taken. It is simply necessary to wait until the system has restarted.

Then go through the following steps:

2.2.2. *Select language*

Five languages are supported in the system:

- English
- Norwegian
- Swedish
- Danish
- Finnish

English is selected as the factory setting. In order to change the language, authority level 2 at least is required (password 1000). The menu option for making the change is:

Main index > System overview > Language selection

2.2.3. *Set Time/Date*

To change the time and date, go to the menu option:

Main index > System overview

2.2.4. *Login*

In order to make changes to the system, it is normally necessary to log in. There are four authority levels in the system, and three of them are password protected. The level at which the user is currently logged in is shown by the number of keys in the top left hand corner of the display. The menus show more options or fewer, depending on the level at which you are logged in.

The following actions are possible at the different levels:

Level 1: No restrictions, no password required.
- Read rights to all menus except system parameters, configuration and detail menus.
- Read rights to alarm lists and alarm history.

Level 2: End user, password 1000.
- All rights as for level 1, plus:
- Read rights to all menus except configuration menus.
- Write rights to the most important setpoints (Setpoints/ Settings > Setpoints).
- Alarms and alarm history can be acknowledged and reset.

Level 3: System administrator, password 2000.
- All rights as for level 2, plus:
- Rights to all menus except I/O configuration and system settings.

Level 4: OEM, password given only in consultation with the Flexit service organisation.
- All rights as for level 3, plus:
- Rights to all menus and system settings.

You can change the standard password to your own password. At least authority level 3 is required. The menu option required is:

Main index> System overview > Password handling

2.3. Adjust setpoints

2.3.1. *Temperatures/Air flow*

The menu option for adjusting temperature setpoints and air flow is:

Main index > Unit > Setpoints/Settings

Temperature setpoints can be changed on lines three and four. Air flow values can be changed on lines five to ten. The default configuration in the unit is for constant air flow regulation.

2.4. Select method of regulation

2.4.1. *Extract air regulation*

Limits the supply air temperature in connection with pure room or extract air regulation so that sudden fluctuations are avoided when temperatures are too high or too low.

NB! Room regulation requires the installation of special room sensors

Setpoints/Settings

	Setpoints		
	All settings		>
	Timing program	Ec.St1	>
	Setp.comf.heat	20 °C	
	Setp.econ.heat	18 °C	
	Setp.TF step 1	100 l/s	
	Setp.TF step 2	300 l/s	
	Setp.TF step 3	500 l/s	
	Setp.FF step 1	100 l/s	
	Setp.FF step 2	300 l/s	
	Setp.FF step 3	500 l/s	

Activate the function on the menu selection:

Main index > Configuration > Configuration 1 > Tmp. control mode = Room or Exhaust

RESTART

Set parameters in the menu selection:

Main index > Unit> Temp control > Min/Max supply air regulation

2.5. Operating modes

The system can be set to run in various operating modes, and there are two alternative menu options that will lead to the required line on the menu:

Start page > Manual operation

Main index > Unit > Operating mode > Manual operation

Operating modes	
OFF	The unit is switched off.
AUTO	The unit is running in automatic mode and controlled according to the means of regulation and priorities that have been set
Temp.Fan	A number of different manual operating modes in which temperature and fan mode are combined freely, for example Comf.St2

2.6. Set the calendar and timing program

2.6.1. *General*

This section describes functions and settings for the timing program and calendars.

When no object with higher priority (for example Manual operation <> Auto) is activated, the system can be disconnected or the stages altered from the timing program. A maximum of six switch-over times can be specified per week.
The calendar stop overrides the calendar exception, which in turn overrides the normal timing program (only in operating mode). Up to 10 periods or exception days can be specified for each calendar.
NB! Both setpoints for fan steps and temperature setpoints (comfort /economy) are controlled by the timing program.

2.6.2. *Week schedule*

Parameter	Value	Function
Current value	---	Switching according to schedule.
Monday		Shows current command when the current day is Monday. The latest time that can be entered for a day is 23:59. Go to the day switching schedule for Mondays.
Copy schedule	– Mon to – Tu– Fr	Copy times for the timing program from Monday to Tuesday–Friday. – Passive (no copying). – Copying starts. Return to the display screen.
Tuesday		Same function as for Monday.
...		...
Sunday		Same function as for Monday.
Exception		Shows current command when the current day is an exception day. Go to the day switching schedule for exception days.
Period: Start Period:Start		(Only Authority level 3.) Start date for week schedule. *.*.00 means that the week schedule is always activated. ---> Activate week schedule.
Period: End Period:Start		(Only Authority level 3.) Start date and start time for inactivating week schedule.

2.6.3. *Day schedule*

Parameter	Value	Function
Current value	---	Switching according to the schedule when the current weekday is the same as the switching day.
Day schedule	– Passive – Active	Status for current week or exception day: – Current weekday (system day) is not the same as the switching day. – Current weekday (system day) is the same as the switching day.
Time-1		Special case: This time must not be changed, and must always be 00:00.
Value-1		Switching command for Time-1.
Time-2		Switching time 2. *:* ---> Time inactivated.
Value-2 ... Value-6		Analogue value 1.
Time-3 ... Time-6		Analogue time 2.

2.6.4. *Calendar (exceptions and stop)*

Exception days can be defined in the calendar. These can include specific days, periods or weekdays. Exception days override the weekly schedule.

Calendar exceptions
Switching follows the weekly schedule and the exceptions specified in the day schedule when a switching time is activated in the calendar exception.

Calendar stops
The system is turned off when the calendar stop is activated.

Parameter

Main index > Unit > Main overview > Time switch program > Calendar exceptions

Main index > Unit > Main overview > Time switch program > Calendar fix off

Parameter	Value	Function
Current value	– Passive – Active	Shows whether a calendar time is activated: – No calendar time activated. – Calendar time activated.
Val-x	– Date – Interval – Weekday – Passive	Specification of exception type: – A certain day (e.g. Friday). – A period (e.g. holiday). – A certain weekday. – Times are inactivated. This value must always be placed last, after the date.
- (Start) Date		– Val-x = interval: Enter the start date for the period. – (Val-x = date: Enter specific date.)
-End date		Val-x = interval: Enter the end date for the period. The end date must be later than the start date.
-Weekday		Val-x = only weekdays: Enter a weekday.

EXAMPLE: Val-x = Date

Only the time for (start) is relevant.

- *-(Start)Date = *,01.01.09*

Result: 1 January 2009 is an exception date.

- *-(Start)Date = Mo,*.*.00*

Every Monday is an exception day

- *-(Start)Date = *,*.Even.00*

All days in even months (February, April, June, August, etc.) are exception days.

EXAMPLE: Val-1 = Interval

The times for (Start)Date and End date are adjusted.

- *-(Start)Date = *,23.06.09 / -End date = *,12.07.09.*

23 June 2009 until end of 12 July 2009 are exception days (for example holidays).

- *-(Start)Date = *,23.12.00 / -End date = *,31.12.00*

*23–31 December are exception days every year. Time End date = *,01.01.00 will not work, because 1 January comes before 23 December.*

- *-(Start)Date = *,23.12.09 / -End date = *,01.01.10.*

23 December 2009 up to and including 1 January 2010 are exception days.

- *-(Start)Date = *,*.*.00 / -End date = *,*.*.00*

Warning! This means that the exception is always active! The system is constantly in exception mode or turned off.

EXAMPLE: Val-1 = Weekday

Val-1 = Weekday

The times for weekdays are adjusted.

- *Weekday = *,Fr,**

Every Friday is an exception day.

- *Weekday = *,Fr,Even*

Every Friday in even months (February, April, June, August, etc.) is an exception day.

- *Weekday = *,*,**

Warning! This means that the exception is always active! The system is constantly in exception mode or turned off.

2.7. Alarm handling

If an alarm has been triggered, it will be shown by the flashing alarm symbol. You can get more information by pressing the alarm button. To reset the alarm, press the alarm button twice and select Confirm/Reset and then Execute in the menu.

Alternatively, the alarm can be reset with the menu option:

Main index > Alarm handling

Then select Alarm Reset and Execute

3. Menu tree

When you log in, more options are visible in the menu tree. Be aware that this menu tree only shows the standard application and it might change when you reconfigure the controlling unit.

Nivå 1

- A punctuation signalises that there is more options if you enter that choice

Nivå 2

-

Nivå 3

-

Nivå 4

-

Start page

- Main index
- Main overview

Manual operation
Operating mode
Outside air temp
Supply air temp
Exhaust air temp

Main index

- Password enter
- Unit
- Global functions
- Alarm handling
- Integrations
- System overview
- Overview IO config/ rawvalues
- Configuration

Main overview

Act operating mode
- Fault

- Time switch program
- Outside air temp
- Exhaust air temp
- Supply air temp
- Outs air damper cmd
- Extr air damper cmd
- Actual fan step
- Act sply fan stpt
- Act sply outp value
- Sply fan outp sign
- Supply air flow
- Act exh fan stpt
- Act exh fan value
- Exh fan outp signal
- Exhaust air flow

Act controlles tmp
Supply

- Act heating stpt
- Hrec outp signal

Start page

Main index

- Password enter
- Unit
- Global functions
- Alarm handling
- Integrations
- System overview
- Overview IO config/ rawvalues
- Configuration

Unit

- Main overview
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- Outputs
- Operating mode
- Setpoints/settings
- Damper control
- Fan control
- Temp control
- Loop controllers
- Operating hours

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- Enable manual alarm
- Anable comm test
- Communication test
- Alarm Snap Shot - SD
- Archive
- Archiv Enable
- Trendarchiv Export
- Set I/O To

Alarm handling

- Alarm aknowledge
- Danger (A)
- Critical (A)
- Low (B)
- Warning (C)
- Alarm outp 1 select
- Alarm output 1
- Modbus comm
- Trendarchiv Full
- Com module changed
- Snap Shot memory full
- IO extension module
- IO extension bus
- Comm module 1
  - Comm failure
  - State
- Comm module 2
  - Comm failure
  - State
- Comm module 3
  - Comm failure
  - State

Integrations

- Energy meter EM24
  - Settings
  - Inputs
- Room units
  - Settings
  - Inputs
- Flexit MB-Extender
  - Settings

- Reset required

System overview/ System objects

- Restart
- Language selection
- Communications
- Save/Load
- Archive
- Alarm snapshot
- Diagnostic
- Password handling
- Daylight saving time
- HMI
- Versions
- Plant info
- Target
- Diag object handler

Overview IO config./ rawvalues

- Temperatures
- Pressures /flows
- Digital inputs
- Digital alarms
- Outputs damper
- Outputs fans
- Outputs tmp control
- Outputs alarm

Configuration

Configuration by
- Configuration 1
- Configuration 2
- Config. IO's
- Check config IO's
  - Doubled
  - Not configured

Start page ▶ Main index ▶ Unit

Unit

- Main overview
- Inputs
- Outputs
- Operating mode
- Setpoints/settings
- Damper control
- Fan control
- Temp control
- Loop controllers
- Operating hours

Main overview

Act operating mode
- Fault
- Time switch program
- Outside air temp
- Exhaust air temp
- Supply air temp
- Outs air damper cmd
- Extr air damper cmd
- Actual fan step
- Act sply fan stpt
- Act sply outp value
- Sply fan outp sign
- Supply air flow
- Act exh fan stpt
- Act exh fan value
- Exh fan outp signal
- Exhaust air flow
  - Act controlles tmp
  - Supply
- Act heating stpt
- Hrec outp signal

Inputs

- Temperatures
- Pressure/flows
- Digital inputs
- Digital alarms

Outputs

- Digital outputs
- Analog outputs

Operating mode

Actual
Operating State
Manual operation
- Time switch program

From BMS
- External control

Power up delay

Setpoint/Settings

- All settings
- Time switch program

Comfort htg stpt
Economy htg stpt
Sply fan st 1 stpt
Sply fan st 2 stpt
Sply fan st 3 stpt
Exh fan st 1 stpt
Exh fan st 2 stpt
Exh fan st 2 stpt

Damper control

Off delay by fan off
- Damper

Fan control

- Supply fan
- Exhaust fan
- Actual fan step
- Disable high speed
- Op hours settings

Temp control

- Act controlled tmp
- Tmp setpoints
- Heat recovery

Loop controllers

- Supply fan
- Exhaust fan
- Heat recovery

Operating hours

Supply fan
Reset
Exhaust fan
Reset
- Fan settings

- Energy meter EM24
  - Settings
  - Inputs
- Room units
  - Settings
  - Inputs
- Flexit MB-Extender
  - Settings
- Reset required

▼

Flexit MB-Extender

- Modbus Address
- Baudrate
- Stopbit
- ModbusParity
- Warn
- Device Mode
- IO/-Type
- Heater mode
- Type of heater
- Actual value
- Filter prs 1
- Filter prs 2
- Air Flow1
- Air Flow2
- K-Value
- Zero point Cal. Pressure
- Temp sensor 1
- Temp sensor 2
- Temp sensor 3
- Act. Fan Output 1
- Fan 1 Speed
- Fan 1 Alarm
- Act. Fan Output 2
- Fan 2 speed
- Fan 2 alarm
- Act. Rotor Output
- Act. Heater Output
- Rotor sense
- Thermostat
- Heater State

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- Restart
- Language selection
- Communications
- Save/Load
- Archive
- Alarm snapshot
- Diagnostic
- Password handling
- Daylight saving time
- HMI
- Versions
- Plant info
- Target
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▼

Language selection
HMI language
Alarm snapshot
Save-SD
Modem
SMS language

Communication overview
- Comm.module overview
- Restart
- Process bus
- TCP/IP
- Modbus
- LON
- Modem
- SMS
- IO extension bus

Save/Load
Settings save - SD
Sett. saving done
Set aplli.default
Settings load - SD
Conf load SD done
Restart required
Sett. service load
Sett. factory load
Sett. service save
Sett. factory save
A-snapshot save - SD
Archive save - SD
Archive
Trace save - SD
BSP load

Archive
- State
- Nbr. Actual objects
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- Reconfigure
- Stop
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Alarm snapshot
- Entry 01-35
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- Reset
Internal temp.
Operating hours
Cycle time reset
Cycle time actual
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MSR failure
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MSR started up
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Password handling
Logn in
Log off
Change user password
Change service password
Change factory password

Daylight saving time
Enable
Active
B-time actime
Time
Start month
Start week day
Start offset
Start hour
Start delay
End month
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End offset
End hour
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UTC-difference

HMI
HMI language
Reset time
Brightness: inbuilt
Contrast: inbuilt
Message durat.:inb.
- Advanced

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Application info
Flexit
STD_AHU_v207
dato
BSP version
Process bus
-serial number
-device family
- device variant
- version

Plant info
[Customer]
Standardapplikation
yyyy-mm-dd
Name
Adress
Town
Advanced

Target
Imperial unit-system
BSP version
BSP load
Restart counter
Reset
Internal temp.
Operating hours
Target name
Reset required
Modbus termination
Advanced

Diag object handler
Actual objects
Act. object memory
Act. int. memory
COV act. clients
ALH act clients
Valid objects
Version
Data check sum
Max objects
Max object memory
Max int. memory
COV max. clients
ALH max. clients

Configuration by
- Configuration 1
- Configuration 2
- Config. IO's
- Check config IO's
  - Doubled
  - Not configured

▼

Configuration 1
General:
- Extension modules
- Fire alarm
- Filter alarm
- Filter analog
- Emergency stop
- Alarm ackn input
- Su/Wi input
- TSP function
- TSP steps
- Ext control outputs
- Alarm outputs

Sensors:
- Room tmp sensor
- Exh air tmp sensor
- Supply tmp sensor
- Outs air tmp sensor

Functions:
- Damper
- Exhaust fan
- Fan control mode
- Tmp control mode
- Hrec damper
- Heat recovery
- Heating
- Electrical heating
- Cooling
- Heating 2
- El Heating 2
- Cooling 2
- Fire damper
- External setpoint
- Configuration 1

Reset required!!

Configuration 2
- Night cooling
- Tmp start
- Boost
- Tmp start/OSSTP blk
- Damper fdbk
- Fan steps freq conv
- Fan steps type
- Fan alarm
- Fan fdbk
- Fan deviation alarm
- Fan comp room tmp
- Fan comp air qual
- Fan comp outs tmp
- Fan htg/clg
- Fan Eng. Unit
- Tmp stpt selection
- Deviation alarm tmp
- Su/Wi comp tmp
- Hrec frost protect
- Hrec(pump) cmd
- Heat recovery alarm
- Hrec clg recovery
- Hrec efficiency
- Auxiliary input
- Aux tmp sensor
- Aux TSP output
- Aux A output fan
- Aux op mode indicat
- Configuration 2
- Reset required!!

Configuration IO's
- Temperatures
- Pressures / flows
- Digital inputs
- Digital alarms
- Outputs damper
- Outputs fans
- Outputs tmp control
- Outputs alarm
- Configuration IO's
- Reset required!!

Check config IO's
- Not config IO
- Not conf IO pos.
- Doubled config IO
- Doubles config IO's

4. System settings

4.1. Time/Date

To change the time and date, go to the menu option:

Main index > System overview

Authority level 1 is sufficient to make changes.

4.2. Language

Five languages are supported in the system:

- English
- Norwegian
- Swedish
- Danish
- Finnish

English is selected as the factory setting. In order to change the language, authority level 2 at least is required. The menu option for making the change is:

Main index > System overview > Language selection

4.3. Password

There are four authority levels in the system, and three of them are password protected.

The following actions are possible at the different levels:

Level 1: No restrictions, no password required.
- Read rights to all menus except system parameters, configuration and detail menus.
- Read rights to alarm lists and alarm history.

Level 2: End user, password 1000.
- All rights as for level 1, plus:
- Read rights to all menus except configuration menus.
- Write rights to the most important setpoints (Setpoints/Settings > Setpoints).
- Alarms and alarm history can be acknowledged and reset.

Level 3: System administrator, password 2000.
- All rights as for level 6, plus:
- Rights to all menus except I/O configuration and system settings.

Level 4: OEM, password given only in consultation with the Flexit service organisation.
- All rights as for level 4, plus:
- Rights to all menus and system settings.

You can change the standard password to your own password. At least authority level 3 is required. The menu option required is:

Main index > System overview > Password handling

4.4. Summer/Winter time

The switchover from summer time to winter time can be adjusted. However, no change is normally required here. Times given are in Central European Time (CET).
At least authority level 3 is required to make changes.
The menu option required is:

Main index > System overview > Daylight saving time

5. General settings

5.1. Regulator

Main index > System overview > Target

Parameter	Value	Function
Imperial unit system	• Passive • Active	Select the unit of measurement system. • Metric standard. • British standard.
BSP version		The process unit's operating system.
Reset counter		Display the number of restarts of the process unit; it is possible to zero the counter.
Internal temperature		Internal process unit temperature.
GUID unit		Unique global process unit ID.
GUID application		Unique global application ID.
GUID HMI		Unique global control panel ID.
GUID Web HMI		Unique global web interface ID.
GUID OBH		Unique global ID number for OBH. bin files (Object Handler).
Serial number		The process unit's serial number.
UnitID	• 3 • 4	The process unit's ID number • POL636 process unit. • POL638 process unit.
Application protection	• Passive • Active	Shows whether the application is locked: • Unlocked • Locked NB! The standard application is always unlocked.
App. permit start	• Yes • No	Shows whether the application installed can be started on this process unit. An application with activated safety lock can, for example, only be used with a specific process unit.
Change settings		Go to the Process unit settings page
Unit name	---	Change the process unit name on the bus (TCP/IP name and USB name). Example of a standard name: POL638_128, where 128 is the last three digits in the MAC address).
Modbus termination	• Passive • Active	Activate termination resistance for MODBUS.

5.2. HMI

Main index > System overview > HMI

Parameter	Value	Function
Current language	• English • Norwegian • Swedish • Danish • Finnish	Shows current language and language options.
Logout time	3...30 [min]	The user is automatically logged out after a certain period of inactivity, and has to log in again.
Light: integrated	0...31	The brightness of the backlighting.
Contrast: integrated	0...31	The contrast of the backlighting.
Message time: integrated	2...15 [s]	Time for displaying an error message, for example when a setpoint outside the valid range is entered.
Alarm acknowl. level	1, 2, 3	The setting for the authority level required to acknowledge or reset an alarm.
Alarm format	---	Change the alarm display, for example via the control panel. Should be changed only by an experienced programmer and only after consulting the supplier.

6. Backup and program updates

When the system has been fully configured and the parameters have been set, it can be backed up to an SD memory card or reset using the data on the memory card.
Two different sets of parameters for a configured system can be backed up or reset. For example, you can back up the standard settings (Save factory settings) and adjusted settings (Save startup settings).

The options below can be selected only with the relevant authority level. This is done using menu option:

Main index > System overview > Save/Load

The regulator has a card slot for an SD memory card with max 2 GB capacity.

6.1. Save a configuration

After initiation and adjustment, the parameters and configurations can be saved to the SD card. For example, you can load these values on another process unit with the same basic configuration (operating system, application, control panel, HMI4Web and language/communication).

Location of SD memory card

Authority level 4 is required.

Procedure
1. Insert a blank SD memory card into the regulator.
2. Backup the values to the memory card.

Main index > System overview > Save/Load > Settings save - SD = Execute.

3. Wait until:

Main index > System overview > Save/Load > Sett. saving done

Standard settings (Factory settings) and adjusted settings (Startup settings) are handled in the same way.

6.2. Load a configuration

Procedure:
1. Insert the memory card into the regulator.
2. Load the values from the memory card.

Main index > System overview > Save/Load > Settings load - SD = Execute.

3. Wait until:

Main index > System overview > Save/Load > Conf. load SD done = Yes.

4. Restart the process unit:

Main index > System overview > Save/Load > Restart = Execute

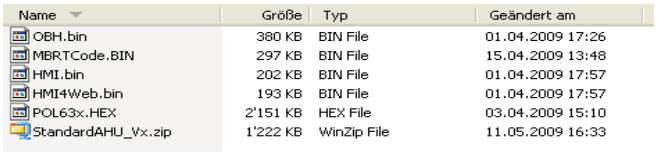
RESTART

Standard settings (Factory settings) and adjusted settings (Startup settings) are handled in the same way.

6.3. Loan an application or software

Preconditions:
- The (uncompressed) files must be in the root folder of the SD memory card.
- The files must have the names shown in the screen below.

Files on SD card



Name	Größe	Typ	Geändert am
OBH.bin	380 KB	BIN File	01.04.2009 17:26
MBRTCode.BIN	297 KB	BIN File	15.04.2009 13:48
HMI.bin	202 KB	BIN File	01.04.2009 17:57
HMI4Web.bin	193 KB	BIN File	01.04.2009 17:57
POL63x.HEX	2'151 KB	HEX File	03.04.2009 15:10
StandardAHU_Vx.zip	1'222 KB	WinZip File	11.05.2009 16:33

Procedure
1. Insert the memory card into the regulator.
2. Switch off the regulator.
3. Press the button in the hole next to the regulator's status screen with a thin object so that a clicking sound is heard, and keep the button pressed down.
4. Switch on the regulator.
5. Wait until the LED flashes red and green.
6. Release the button.
7. Wait until the LED goes out.
8. Switch off the regulator.
9. Switch on the regulator.

6.4. Error diagnosis - Snapshot

For troubleshooting, the status of the ventilation unit just before the alarm was triggered can be studied afterwards by means of export to an SD card. Authority level 4 is required.

Procedure
1. Insert a blank SD memory card into the regulator.
2. Backup the error diagnosis to the memory card.

Main index > System overview > Save/Load > A-snapshot save - SD= Execute.

3. Wait until:

Main index > System overview > Save/Load > A-snapshot save - SD = Yes.

A file has now been generated on the SD card that can be read from a PC.

7. General functions

7.1. Operating modes

There are a number of different operating modes, depending on the functions activated in the system. To see the current operating mode, go to the menu option:

Main index > Unit > Operating mode

7.1.1. *Operating modes - Change*

The system can be set to run in various operating modes, and there are two alternative menu options that will lead to the required line on the menu:

Start page > Manual operation

Main index > Unit > Operating mode > Manual operation

7.1.2. *Operating modes - Monitor*

There are a number of different operating modes, depending on the functions activated in the system. To see the current operating mode, go to the menu option:

Main index > Unit > Operating mode

Operating modes	
OFF	The unit is switched off.
AUTO	The unit is running in automatic mode and controlled according to the means of regulation and priorities that have been set
Temp.Fan	A number of different manual operating modes in which temperature and fan mode are combined freely, for example Comf.St2

Parameter	Value	Function
Current	• Off • On/Comf. • Economy • N/A • Osstp • Nighttime cooling • Support operation • Test temp. • Damper motion • Fire • Stop • Cool down • Startup	Operating mode: • Switched off. • Comfort operation (comfort temperature setpoint) • Economy operation (economy temperature setpoint) • Extra operating mode; not used. • Optimum start (activated optimisation function). • Nighttime cooling activated. • Support operation; heating or cooling activated. • Temperature test activated for updating of duct sensor temperature. • Fire damper test. • Fire mode (function dependent on the parameter setting for fire mode). • System stopped and locked (process unit in start phase, configuration not done, alarm class danger, emergency stop). • Cooling down. • System's start routine activated.
Manual operation	• Auto • Off • Step 1 • Step 2 • Step 3	Manual operation via control panel (possible only when Timing program function <> Step+Temp). • Auto mode: The system can be switched on via the timing program, nighttime cooling, etc. • System switched off. • System operation in step 1 (uses setpoint step 1 for analogue outputs). • System operation in step 2 (uses setpoint step 2 for analogue outputs). • System operation in step 3 (uses setpoint step 3 for analogue outputs). • Manual operation via control panel (possible only when Timing program function = Step+Temp).
Manual operation	• Auto • Off • Econ.St1 • Comf.St1 • Econ.St2	• Auto mode: The system can be switched on via the timing program, nighttime cooling, etc. • System switched off. • System in economy operation in step 1 (uses setpoint step 1 for analogue outputs). • System in comfort operation in step 1 (uses setpoint step 1 for analogue outputs).
Manual operation	• Comf.St2 • Econ.St3 • Comf.St3	• System in economy operation in step 2 (uses setpoint step 2 for analogue outputs). • System in comfort operation in step 2 (uses setpoint step 2 for analogue outputs). • System in economy operation in step 3 (uses setpoint step 3 for analogue outputs). • System in comfort operation in step 3 (uses setpoint step 3 for analogue outputs).
Timing program	• Off • Step 1... Step 3	Shows current command for timing program (only if Timing program function = Step). Goes beside the parameter setting for timing program.
Timing program	• Off • Econ.St1... Econ.St3 • Comf.St1... Econ.St1	Shows current command for timing program (only if Timing program function = Step+Temp). Goes beside the parameter setting for timing program.
From BMS	• Auto • Off • Step 1 • Step 2 • Step 3 • Auto	Shows command from BMS (only if Timing program function <> Step+Temp). The value can be set via the control panel even if communication is inactive. • Auto mode: The system can be switched on via the timing program, nighttime cooling, etc. • System switched off. • System operation in step 1 (uses setpoint step 1 for analogue outputs). • System operation in step 2 (uses setpoint step 2 for analogue outputs). • System operation in step 3 (uses setpoint step 3 for analogue outputs). • Shows command from BMS (only if Timing program function = Step+Temp). The value can be set via the control panel even if communication is inactive. • Auto mode: The system can be switched on via the timing program, nighttime cooling, etc. • System switched off. • System in economy operation in step 1 (uses setpoint step 1 for analogue outputs).

Parameter	Value	Function
From BMS	• Off • Econ.St1 • Comf.St1 • Econ.St2 • Comf.St2 • Econ.St3 • Comf.St3	• System in comfort operation in step 1 (uses setpoint step 1 for analogue outputs). • System in economy operation in step 2 (uses setpoint step 2 for analogue outputs). • System in comfort operation in step 2 (uses setpoint step 2 for analogue outputs). • System in economy operation in step 3 (uses setpoint step 3 for analogue outputs). • System in comfort operation in step 3 (uses setpoint step 3 for analogue outputs).
External control	• Auto • Off • Step 1 • Step 2 • Step 3	Shows current command from external control • Auto mode: The system can be switched on via the timing program, nighttime cooling, etc. • System switched off. • System operation in step 1 (uses setpoint step 1 for analogue outputs). • System operation in step 2 (uses setpoint step 2 for analogue outputs). • System operation in step 3 (uses setpoint step 3 for analogue outputs). • Goes beside the parameter setting for external control.
Room unit operating mode	• Auto • Comfort • • Standby • Economy	Shows current command from room unit • Auto mode: The system can be switched on via the timing program, nighttime cooling, etc. • System in comfort operation. • System switched off. • System in economy operation.
Nighttime cooling	---	Nighttime cooling (free cooling). Goes beside the parameter setting for nighttime cooling.
Support operation	---	Starts nighttime support operation. Goes beside the parameter setting for support operation.
Boost	---	Optimum start of the system. Goes beside the parameter setting for optimum start.
Power up delay	0...36000 [s]	Delayed start after restart of the process unit.

7.2. Timing program

7.2.1. *General*

To use the timing program, the function must be activated. This is done via the menu option:

Main index > Configuration > Configuration 1 > TSP function <> No

The settings for the function are then set under the menu option:

Main index > Unit > Operating mode > Time switch program

Parameter	Value	Function
Schedule	– Off – Step1... Step3	Current operating mode from the timing program if Timing program function <> Step+Temp. Goes beside the parameter setting for timing program.
Schedule	– Off – Econ.St1... Econ.St3 – Comf.St1... Comf.St3	Current operating mode from the timing program if Timing program function = Step+Temp. Goes beside the parameter setting for timing program.
Calendar exception	– Passive – Active	Calendar for holidays and weekends. Times set in the schedule for exceptions are activated when days selected in the calendar are active. Goes beside the parameter setting for timing program.
Calendar stop	– Passive – Active	Extra calendar for switching off the system. Goes beside the parameter setting for extra calendar.

7.2.2. *Settings*

This section describes functions and settings for the timing program and calendars.

When no object with higher priority (for example Manual operation <> Auto) is activated, the system can be switched off or the steps changed via the timing program. A maximum of six switch-over times can be specified per week.

The calendar stop overrides the calendar exception, which in turn overrides the normal timing program (only in operating mode). Up to 10 periods or exception days can be specified for each calendar.

NB! Both setpoints for fan steps and temperature setpoints (comfort /economy) are controlled by the timing program.

Week schedule

Parameter	Value	Function
Current value	---	Switching according to schedule.
Monday		Shows current command when the current day is Monday. The latest time that can be entered for a day is 23:59. Go to the day switching schedule for Mondays.
Copy schedule	– Mon to – Tu– Fr	Copy times for the timing program from Monday to Tuesday–Friday. – Passive (no copying). – Copying starts. Return to the display screen.
Tuesday		Same function as for Monday.
...		...
Sunday		Same function as for Monday.
Exception		Shows current command when the current day is an exception day. Go to the day switching schedule for exception days.

Calendar (exceptions and stop)

Exception days can be defined in the calendar. These can include specific days, periods or weekdays. Exception days override the weekly schedule.
Calendar exceptions
Switching follows the weekly schedule and the exceptions specified in the day schedule when a switching time is activated in the calendar exception.
Calendar stop
The system is turned off when the calendar stop is activated.

Parameter

Main index > Unit > Main overview > Time switch program > Calendar exceptions

Main index > Unit > Main overview > Time switch program > Calendar fix off

Day schedule

Parameter	Value	Function
Period: Start Period:Start		(Only Authority level 3.) Start date for week schedule. *,* *.00 means that the week schedule is always activated. ---> Activate week schedule.
Period: End Period:Start		(Only Authority level 3.) Start date and start time for inactivating week schedule.
Current value	---	Switching according to the schedule when the current weekday is the same as the switching day.
Day schedule	– Passive – Active	Status for current week or exception day: – Current weekday (system day) is not the same as the switching day. – Current weekday (system day) is the same as the switching day.
Time-1		Special case: This time must not be changed, and must always be 00:00.
Value-1		Switching command for Time-1.
Time-2		Switching time 2. *: * ---> Time inactivated.
Value-2 ... Value-6		Analogue value 1.
Time-3 ... Time-6		Analogue time 2.

Parameter	Value	Function
Current value	• Passive • Active	Shows whether a calendar time is activated: No calendar time activated. Calendar time activated.
Val-x	• Date • Interval • Weekday • Passive	Specification of exception type: • A certain day (e.g. Friday). • A period (e.g. holiday). • A certain weekday. • Times are inactivated. This value must always be placed last, after the date.
(Start)Date		• Val-x = interval: Enter the start date for the period. • (Val-x = date: Enter specific date.)
End date		Val-x = interval: Enter the end date for the period. The end date must be later than the start date.
Weekday		Val-x = only weekdays: Enter a weekday.

EXAMPLE: Val-x = Date

Only the time for (start) is relevant.

- *-(Start)Date = *,01.01.09*

Result: 1 January 2009 is an exception date.

- *-(Start)Date = Mo,*.*.00*

Every Monday is an exception day

- *-(Start)Date = *,*.Even.00*

All days in even months (February, April, June, August, etc.) are exception days.

EXAMPLE: Val-1 = Interval

The times for (Start)Date and End date are adjusted.

- *-(Start)Date = *,23.06.09 / -End date = *,12.07.09.*

23 June 2009 until end of 12 July 2009 are exception days (for example holidays).

- *-(Start)Date = *,23.12.00 / -End date = *,31.12.00*

*23–31 December are exception days every year. Time End date = *,01.01.00 will not work, because 1 January comes before 23 December.*

- *-(Start)Date = *,23.12.09 / -End date = *,01.01.10.*

23 December 2009 up to and including 1 January 2010 are exception days.

- *-(Start)Date = *.*.*.00 / -End date = *.*.*.00*

Warning! This means that the exception is always active! The system is constantly in exception mode or turned off.

EXAMPLE: Val-1 = Weekday

Val-1 = Weekday

The times for weekdays are adjusted.

- *Weekday = *,Fr,**

Every Friday is an exception day.

- *Weekday = *,Fr,Even*

Every Friday in even months (February, April, June, August, etc.) is an exception day.

- *Weekday = *,*,**

Warning! This means that the exception is always active! The system is constantly in exception mode or turned off.

8. Configuration

On delivery, the ventilation unit is configured and ready. Normally, therefore, no adjustments need to be made to the configuration.

However, the addition of accessories and other equipment may require a change to the configuration.
Where necessary, there is a more detailed description in this manual or with the accessory.
This section is, therefore, intended more as general information.

The configuration includes the following three steps:
- Configuration 1
- Configuration 2
- Configuration with inputs and outputs

Carry out these three steps in this order.

Preparations
Select Start page > Log in --->
Enter the password for level 3:
Select Main index > Configuration --->
Start configuration

8.1. Configuration menu

Configuration
Main index > Configuration

Configuration		
Configuration via	HMI	>
Configuration 1	Done	>
Configuration 2	Done	>
Config. In/outputs	Done	
IO config. control		>
Duplicated	OK	
Not configured	OK	

8.1.1. *Configuration via*
There are two options under this item:

HMI:
The system is configured step by step via the control panel.

Precondition:
A list of all inputs and outputs, showing available inputs and outputs and the I/O positions to be used. You also need to know the type of sensor used. This is the normal mode that must be selected to start the unit.

Download:
You can load a preconfigured system using the Climatix Factory Tool or an SD memory card.

NB! It is important for this setting to be correct. Otherwise the system cannot be configured as desired.

Warning! It is not possible to switch from HMI Config to loading while the system is active. This results in all outputs being closed immediately and the process unit being reset!

The regulator must be restarted after loading!

8.1.2. *Configuration 1*

If adjustments are needed, 'Configuration 1' is the first step in the configuration.

- Configuration is done sequentially, which means that it is not possible to skip any options.
- Configuration 1 must have been completed and the process unit have been restarted before you continue with Configuration 2.

Start:
If necessary: Enter the password for level 3:

Start page > Password enter

Then:

Main index > Configuration > Configuration 1

NB! The ventilation unit is supplied fully configured and does not normally need to be changed.

Parameter	Value	Function
Expansion modules	No	Only the process unit's inputs and outputs are used.
	One	One expansion module is connected via address 1. Dipswitches 5 and 6 on the module must be set to On.
	Two	Two expansion modules are connected via addresses 1 and 2. Dipswitch 5 on module 1 and dipswitches 4 and 6 on module 2 must be set to On.
Fire alarm	No	No fire alarm.
	Alarm	External fire alarm such as smoke detectors, thermostat, fire alarm control centre, etc.
	Temp	Internal fire alarm via measurement of normal supply air and extract air temperature when both sensors are accessible. A fire alarm is triggered when one of the two temperatures reaches a specific value.
	Alarm+Temp	Both fire alarms.
Filter alarm	No	No filter alarm.
	Comb.	Supply air and extract air filter with common alarm input.
	Supply air	Input only for supply air filter alarm.
	Extract air	Input only for extract air filter alarm.
	Supply+Extract	Two separate filter alarm inputs for supply air and extract air filters.
Emergency stop	No	Input for emergency stop. If the signal on this input is TRUE, the system is switched off immediately. No alarm is triggered.
	Yes	
Alarm reset input	No	Input for acknowledging or resetting an alarm. Open alarms are acknowledged; closed alarms are reset.
	Yes	
SuWi input	No	Input for summer/winter switching. If the signal on this input is TRUE, summer compensation is selected.
	Yes	
Timing program function	No	No timing program.
	Step	Timing program with possible settings for fan steps (Off and Stx). The parameter Timing program step determines the number of possible steps.
	Step+Temp	Timing program with possible settings for fan steps and temperature regulation type (Off, Econ.x and Comf.x). The parameter Timing program step determines the number of possible steps. The temperature mode comfort or economy can be selected for each fan step. Comfort and economy operation have separate setpoints for temperature regulation.

Parameter	Value	Function
Timing program step		Activation of possible fan steps. This setting controls the number of setpoints for regulated fans.
	Step 1	Timing program function = Step ---> Possible settings for timing program: Off, St1. Timing program function = Step+Temp ---> Possible settings for timing program: Off, Econ1, Comf1.
	Step 2	Timing program function = Step ---> Possible settings for timing program: Off, St1, St2. Timing program function = Step+Temp ---> Possible settings for timing program: Off, Econ1, Econ2, Comf1, Comf2.
	Step 3	Timing program function = Step ---> Possible settings for timing program: Off, St1, St2, St3. Timing program function = Step+Temp ---> Possible settings for timing program: Off, Econ1, Econ2, Econ3, Comf1, Comf2, Comf3.
	Example 1	Timing program function = Step, Timing program step = Step 2. Fan regulation with two setpoints for St1 and St2. Temperature regulation with one setpoint for comfort operation.
	Example 2	Timing program function = Step+Temp, Timing program step = 3 Fan regulation with three setpoints for St1, St2 and St3. Temperature regulation with separate setpoints for economy and comfort operation. With Econ 2, the temperature setpoint for economy operation and fan setpoint St2 are used.
External control input	No	No external input for operating mode switching, timer, button, detector for external control, etc.
	One	One input (e.g. on/off).
	Two	Two inputs (e.g. Auto/Off/St1/St2).
Buzzer alarm output	No	No alarm output.
	One	One output (for example for priority alarms).
	Two	Two outputs (for priority and non-priority alarms).
External setpoint	No	No analogue input for connection of external setpoint or compensation for external setpoint.
	Volt	Input for 0–10 V DC signal.
	Ohm	Input for 0–2500 ohm signal.
	QAA27	Input for QAA27.
	BSG21	Input for BSG21 setpoint compensation.
Sensor:		
Temp. room sensor	None	Inputs for room temperature sensors. Select max, min, average or individual value for regulation for one or more sensors in Configuration 2.
	1 sensor	
	2 sensor	
	1 unit	
	1 sensor+1 unit	
	2 units	
Extract air temp. sensor	No	Input for extract air sensor.
	Yes	
	Yes+Max	If the system has been in operation for more than 5 minutes, the max temperature is saved when it is switched off; otherwise the actual temperature is saved. The setting is meaningful only if there is no room sensor and nighttime operation (for example nighttime cooling) without a temperature test is to be used. This setting should not be used with support operation. (Temperature test: the system is started briefly to update the duct sensor temperature.)
Supply air temp. sensor	No	Input for supply air sensor.
	Yes	
Outdoor temp. sensor	No	Input for sensor for outdoor air temperature.
	Yes	
	Yes+Max	If the system has been in operation for more than 5 minutes, the min temperature is saved when it is switched off; otherwise the actual temperature is saved. The setting is meaningful only if a sensor is fitted in the duct and nighttime support operation (for example nighttime cooling) is activated, or as a safety function for pump start at low outdoor air temperatures.

Parameter	Value	Function
Functions:		
Damper	No	No air damper.
	Comb.	Two air dampers with a common output.
	Supply air	Supply air damper with output.
	Outdoor+ Extract air	Two dampers with separate outputs.
Extract air fan		Extract air fan (supply air fan is always available and cannot be deactivated).
	None	No extract air fan.
	Separate	Extract air fan with separate output.
	Comb.	Extract air and supply air fans with common output.
Fan regulation type		Select fan and regulation type. The supply air fan slave and extract air fan slave settings cannot be used without an activated extract air fan. If the extract air fan is set as combined, only the settings Direct and Dir.fro can be used. The exact number of outputs depends on the number of steps and whether the extract air fan is activated. The number of inputs/outputs required is doubled if the fan has a separate output. The sensors that are required, for example pressure sensors, are also activated with this parameter.
	Direct	Up to three digital outputs each for direct-drive fans.
	Dir.fro	Up to three digital outputs each for frequency-regulated fans with fixed steps.
	Fixed freq.	One digital and analogue output each for frequency-regulated fans regulated via modulating analogue outputs (e.g. St1 = 2 V, St2 = 5 V, St3 = 8 V).
	Pressure reg.	One digital and analogue output and one analogue input each for frequency-regulated fans in pressure-regulated systems.
	Flow reg.	One digital and analogue output and one analogue input each for frequency-regulated fans regulated in flow-regulated systems.
	Supply air fan slave	One digital and analogue output each and three analogue inputs for frequency-regulated fans in pressure-regulated systems where the supply air fan is driven depending on the extract air fan.
	Extract air fan slave	One digital and analogue output each and three analogue inputs for frequency-regulated fans in pressure-regulated systems where the extract air fan is driven depending on the supply air fan.
Tmp control mode		Select the regulation algorithm for temperature regulation
	Supply air	Temperature regulation of supply air only.
	Room casc.	Cascade regulation of room and supply air temperature.
	Extract air casc.	Cascade regulation of extract and supply air temperature.
	Room SuWi	Cascade regulation of room and supply air temperature in summer; regulation of supply air temperature only in winter.
	Extract air SuWi	Cascade regulation of extract and supply air temperature in summer; regulation of supply air temperature only in winter.
	Room	Room regulation only.
	Extract air	Temperature regulation of extract air only.
Mixing damper		Heat recovery regulation with mixing damper.
	No	No mixing damper.
	Normal	Mixing damper with output signal 100% for full circulation.
	Inverted	Mixing damper with output signal 0% for full circulation.
Heat recovery		Select heat recovery regulation with rotating heat exchanger, plate heat exchanger or water heat exchanger.
	No	No heat recovery.
	Rotor	Rotating heat exchanger. One analogue output for regulation of rotating heat exchanger.
	Plate	Plate heat exchanger. One analogue output for regulation of regulating air damper.
	Water	Water heat exchanger. One analogue output for regulation of the valve.

Parameter	Value	Function
Heating	No	No heating circuit.
	Yes	Heating register without preheating. Analogue heating valve output.
	Yes+Preh.	Heating register with preheating. Analogue heating valve output.
Electric heating		Electric heating register and type of regulation.
	No	**No electric heating register available.**
	Analogue	Electric heating register with regulation via one analogue output.
	1Step	1-step electric heating register with regulation via one analogue and one digital output.
	2Step	2-step electric heating register with regulation via one analogue and two digital outputs.
	3Step	3-step electric heating register with binary regulation via one analogue and two digital outputs.
Cooling		Select cooling register and type of regulation.
	No	**No cooling register.**
	Water	One analogue output for cooling valve output
	DX 1step	One analogue and one digital output for 1-step regulation of DX cooling unit.
	DX 2step	One analogue and two digital outputs for 2-step regulation of DX cooling unit.
	DX 3step	One analogue and two digital (binary) outputs for 3-step regulation of DX cooling unit.
Extra heating	**No**	**No extra heating register.**
	Yes	Extra heating register without preheating. Analogue heating valve output.
	Yes+Preh.	Extra heating register with preheating. Analogue heating valve output.
Extra electric heating		Extra electric heating register and type of regulation.
	No	**No extra electric heating register available.**
	Analogue	Extra electric heating register with regulation via one analogue output.
	1Step	Extra 1-step electric heating register with regulation via one analogue and one digital output.
	2Step	Extra 2-step electric heating register with regulation via one analogue and two digital outputs.
	3Step	Extra 3-step electric heating register with binary regulation via one analogue and two digital outputs.
Extra cooling		Extra cooling register and type of regulation.
	No	No extra cooling register.
	Water	One analogue output for extra cooling valve output
	DX 1step	One analogue and one digital output for 1-step regulation of extra DX cooling unit.
	DX 2step	One analogue and two digital outputs for 2-step regulation of extra DX cooling unit.
	DX 3step	One analogue and two digital (binary) outputs for 3-step regulation of extra DX cooling unit.
Fire damper		Fire damper.
	No	**No fire damper.**
	Yes	One digital output and input each for fire damper regulation.
	Yes+FollUnit	One digital output and input each for fire damper regulation. The fire damper is opened when the unit starts and closed when the unit stops.
Configuration 1		With this parameter, the system is activated after parameter settings have been set, i.e. when Configuration 1, Configuration 2 and Config.In/Outputs have been set (value Ready).
	Not ready	The system is locked and cannot be started.
	Ready	The system is unlocked after the parameter settings have been set (value Ready for Configuration 2 and Config.In/Outputs), i.e. the system can be started.
Restart	Passive	The system must be restarted after parameter settings have been set in Configuration 1. Changed settings in Configuration 2 are implemented. After restart, the value is changed automatically from Execute to Passive.
	Execute	

8.1.3. *Configuration 2*

If there is a need for adjustments, subfunctions for some parts of the system can be set in Configuration 2.

Preconditions
Configuration 1 must have been completed, including restart of the regulator.

- Configuration is done sequentially, which means that it is not possible to skip any options.
- Configuration 2 must have been completed, including restart of the process unit, before you continue with Config.In/Outputs.

Start
If necessary: Enter the password for level 3:

Start page > Password enter

Then:

Main index > Configuration > Configuration 2

NB! The ventilation unit is supplied fully configured and does not normally need to be changed.

Parameter	Value	Function
Nighttime cooling	**No**	Free cooling. Precondition: Nighttime cooling can be selected only if a sensor for outdoor air temperature and a room or extract air sensor are available. Temperature motion is activated automatically if only one extract air sensor, which is set to not hold the values, is available. If the extract air sensor holds the values, the temperature is used to start nighttime cooling.
	Yes	
Support operation		Starts nighttime support operation. Precondition: The function can be selected only if a room or extract air sensor is available. Temperature motion is activated automatically if only one extract air sensor which holds the values is available. If the extract air sensor holds the values, the temperature is used for start.
	No	**The function is not available.**
	Heating	The function is available only for heating.
	Cooling	The function is available only for cooling.
	HeatingCooling	The function is available for heating and cooling.
Boost		Optimum start of the system with heating and cooling via separate setpoints. Precondition: The function can be selected only if a room or extract air sensor is available.
	No	**The function is not available.**
	Heating	The function is available only for heating.
	Cooling	The function is available only for cooling.
	HeatingCooling	The function is available for heating and cooling.
Support operation/ Osstp block		Block the air damper or extract air fan when the system is started optimally or via temperature delta. NB! This function is intended to be used in an emergency situation. **Warning! A regulating air damper must be in place and be open when the function is selected. Otherwise, the system may suffer damage.**
	None	**No blocking.**
	Damper	Air dampers remain closed.
	Dam+Fan	Air dampers remain closed and only the supply air fan is started.
Damper return	**No**	**No damper return.**
	One	Return for supply air damper (or common return for both dampers). Digital input for return.
	Two	Separate return for supply air and extract air dampers. Two digital inputs for return.

Parameter	Value	Function
Flow display		Display of flow and possible output.
	No	The function is not available.
	Flowing	**Shows supply air and extract air flow (depending on what is activated). Analogue inputs are activated unless they have been activated via the fan regulation setting.**
Fan step type		Necessary fan regulation output that concerns settings for Fan regulation type, Timing program step and Dig.step freq.conv.
	Separate	Digital output for each step. Example: Fan regulation type = Direct / Timing program step = 2 / Extract air fan = Yes ---> 4 digital outputs: 2 each for step 1 and step 2, separated for supply air and extract air fans.
	Sep.Comb.	Separate outputs for the first step, common outputs for subsequent steps. Example: Fan regulation type = Pressure reg. / Timing program function = Step+Temp / Timing program step = 3 / Extract air fan = Yes / Dig.step freq.conv = 3. ---> 4 digital outputs: Step 1 as separate activation of frequency-regulated fans, two extra outputs that can be used (Dig.step freq.conv) for step 2 and step 3.
	Binary	The outputs for steps are binarily coded. The setting can be used for Fan regulation type = Direct or Dir.fro. Example: Fan regulation type = Direct / Timing program function = Step+Temp / Timing program step = 3 / Extract air fan = Yes ---> 4 digital outputs: 2 digital outputs each per fan (Step 1 = DO1 TRUE, Step 2 = DO2 TRUE, Step 3 = DO1 and DO2 TRUE).
Fan alarm		Inputs for fan alarm (e.g. thermojunction). Logical 1 = alarm.
	No	No alarm.
	Comb.	Digital input for common alarm.
	Supply air	Digital input for supply air fan alarm.
	Extract air	Digital input for extract air fan alarm.
	Supply+Extract	**Two digital inputs for supply air and extract air fan alarms.**
Fan return		Inputs for operating messages from fans (e.g. pressure current guard or relay contact). Logical 1 = activated fan.
	No	**No return.**
	Comb.	Digital input for common operating messages.
	Supply air	Digital input for operating messages for supply air fan.
	Extract air	Digital input for operating messages for extract air fan.
	Supply+Extract	Two digital inputs for operating messages for supply air and extract air fans.
Fan deviation alarm		Setpoint or actual value for monitoring pressure or flow. The alarm is triggered in the event of a deviation that remains for a certain period of time.
	No	**No monitoring**
	Supply air	Monitoring of supply air only.
	Extract air	Monitoring of extract air only.
	Supply+Extract	Monitoring of supply and extract air.
Room temp. fan comp.	**No**	Room temperature-dependent fan compensation. Precondition: Room or extract air sensor activated
	Yes	
Air qual. fan comp.	**No**	Air quality-dependent fan compensation. Activation of analogue sensor input
	Yes	
Room humidity fan comp.	**No**	Room air humidity-dependent fan compensation Precondition: Sensor for room air humidity activated.
	Yes	
Outdoor temp. fan comp.	**No**	Outdoor air temperature-dependent fan compensation. Precondition: Outdoor air sensor activated.
	Yes	

Parameter	Value	Function
Fan heating/cooling		The fan is used as heating or cooling sequence.
	No	**No sequential fan activation.**
	Heating	Fan activation only in connection with heating sequence.
	Cooling	Fan activation only in connection with cooling sequence.
	HeatingCooling	Fan activation in connection with both sequences
Temp. setpoint type		Predefined settings for temperature setpoints:
	Heating+Dz	Enter heating setpoint and dead zone. Setpoint for cooling = heating setpoint + dead zone.
	HeatingCooling	**Setpoints for heating and cooling are entered directly.**
	+/– HalfDz	Enter base setpoint and dead zone. Heating setpoint = base setpoint – half dead zone. Setpoint for cooling = base setpoint + half dead zone.
	Cooling Dz	Enter setpoint for cooling and dead zone. Heating setpoint = setpoint for cooling –dead zone.
Ext. setpoint function		Specifies whether an external setpoint is to be used as setpoint compensation or an absolute value. The value corresponds to the comfort setpoint, depending on the setting for Setpoint type temp. If the setting for Setpoint type temp. is HeatingCooling, the setpoint compensation corresponds to the heating setpoint, and the setpoint for cooling is calculated on the basis of the difference between the setpoints entered for heating and cooling.
	Comp.	Setpoint compensation.
	Main	**Main setpoint.**
Room temp. mix		Select the room temperature that is to be used for regulation if more than one temperature is available.
	Average	**Average.**
	Min	Lowest temperature.
	Max	Highest temperature.
	Room sensor 1	Room sensor 1.
	Room sensor 2	Room sensor 2.
	Room unit 1	Room unit 1 (not implemented)
	Room unit 2	Room unit 2 (not implemented)
Flowing Min/Max	**No**	Restriction of the highest/lowest supply air temperature, dependent on room temperature. Precondition: Cascade regulation activated. The function minimises draught caused by too high a difference between supply air and room temperature.
	Flowing	
Fan cooling sequence		Select the order for fan sequence and cooling sequence. Precondition: Fan heating/cooling activated.
	Fan–Cooling	**Fan sequence before cooling sequence.**
	Cooling–Fan	Cooling sequence before fan sequence.
Mixing damper sequence		Select the order for heating register and mixing damper for heating. Precondition: Heat recovery damper activated.
	Damper–Heating	**Mixing damper first.**
	Heating–Damper	Heating register first.
Temp. deviation alarm		Monitors setpoint/current value for temperature. The alarm is triggered in the event of a deviation that remains for a certain period of time.
	No	**No monitoring**
	Supply air	Monitoring of supply air only.
	Room	Monitoring of room temperature only.
	Supply+Room	Monitoring of supply air and room temperature.
Summer–Winter temp. comp.	**No**	Summer/winter compensation for temperature setpoint. Precondition: Sensor for outdoor air temperature must be available.
	Yes	

Parameter	Value	Function
Recovery frost protection	**No**	**No frost protection for heat recovery.**
	Guard	Frost protection via guard. Digital input for frost guard.
	Temp.	Frost protection via sensor. One analogue input for regulated frost protection via setpoint. Rotating heat exchanger and plate heat exchanger: extract air sensor, water heat exchanger: water sensor
	Temp+Guard	Frost protection via sensor and guard. One analogue input for regulated frost protection and one digital input for frost guard.
	Pressure	Frost protection via pressure sensor. One analogue input for regulated frost protection via setpoint.
	Pressure+Guard	Frost protection via pressure sensor and guard. One analogue input for regulated frost protection and one digital input for frost guard.
Recovery alarm	No	No alarm.
	Yes	**Alarm; activation of one digital alarm input: Logical 1 = alarm.**
Air quality damper comp.		Control the air quality of the mixing damper. Precondition: Mixing damper is activated.
	No	No effect.
	Yes	One analogue input for the air quality sensor unless it is already activated for fan compensation.
Cold recovery		Type of cold recovery.
	No	**No cold recovery.**
	Recov.	Cold recovery, for example via rotating heat exchanger.
	Damper	Cold recovery via mixing damper.
	Alarm+Return	Both methods activated.
Recovery efficiency		Calculation of heat recovery efficiency. Precondition: Heat recovery (e.g. rotating heat exchanger) must be activated and there must be a sensor for both outdoor air temperature and extract air.
	No	**No calculation of heat recovery efficiency.**
	Exhaust air	For calculation with extract air sensor: One analogue input for the extract air sensor unless the frost guard has been activated.
	Supply air	For calculation with the supply air sensor located immediately behind the heat exchanger: One analogue input for extra supply air sensor.
Frost guard, heating	No	No frost protection.
	Sensor	Frost protection via sensor. One analogue input for regulated frost protection via setpoint.
	Sens+2sp	**Frost protection via sensor and two setpoints. One analogue input for regulated frost protection via two setpoints for temperature maintenance and operation.**
	Guard	Frost protection via guard. Digital input for frost guard.
	Sens+Guard	Frost protection via sensor and guard. One analogue input for regulated frost protection and one digital input for frost guard.
	2sp+Guard	Frost protection via sensor, two setpoints and guard. One analogue input for regulated frost protection via two setpoints for temperature maintenance and operation, and one digital input for frost guard.
Pump, heating	No	No heat register pump.
	Yes	Heat register pump without pump motion. Digital pump output.
	Yes+Motion	**Heat register pump with pump motion. One digital pump output and activation of pump motion. Pump motion: The pump is started for a short time after having been idle for a long time. This prevents the pump from jamming.**
Pump alarm, heating	**No**	**Pump without alarm or return.**
	Alarm	Pump with alarm. Digital input for pump alarm. Logical 1 = alarm; pump immediately switched off.
	Return.	Pump with return. Digital input for return (logical 1 = activated pump).
	Alarm+Return	Pump with alarm and return. Two digital inputs for pump alarm and return.
Combi Coil		One register for heating and cooling with two or four pipe connections. Precondition: Waterborne heating and cooling activated. NB! Combi Coil uses only one (heating) output for pump regulation. The cooling pump must be activated if the pump is to start when cooling is required. Only alarm/return for the heat pump must be used.
	No	**No Combi Coil.**
	1 output	Combi Coil with one common output. Previously activated output for cooling valve is deactivated.
	2 outputs	Combi Coil with two separate outputs.

Parameter	Value	Function
Electric heating alarm	No	No alarm.
	Yes	**One digital alarm input is activated (logical 1 = alarm).**
Cooling pump	No	No water cooling pump.
	Yes	Water cooling pump without pump motion. Digital pump output.
	Yes+Motion	**Water cooling pump with pump motion. One digital pump output and activation of pump motion. Pump motion: The pump is started for a short time after having been idle for a long time. This prevents the pump from jamming.**
Cooling pump alarm	**No**	**Pump without alarm or return.**
	Alarm	Pump with alarm. Digital input for pump alarm. Logical 1 = alarm; pump immediately switched off.
	Return.	Pump with return. Digital input for return (logical 1 = activated pump).
	Alarm+Return	Pump with alarm and return. Two digital inputs for pump alarm and return.
DX cooling alarm	**No**	**DX cooling without alarm or return.**
	Alarm	DX cooling with alarm. Digital input for pump alarm. Logical 1 = alarm; pump immediately switched off.
	Return.	DX cooling with return. Digital input for return is activated (logical 1 = activated pump).
	Alarm+Return	DX cooling with alarm and return. Two digital inputs for alarm and return.
Ex. heating frost protection	No	No frost protection.
	Sensor	Frost protection via sensor. One analogue input for regulated frost protection via setpoint.
	Sensor+2sp	**Frost protection via sensor and two setpoints. One analogue input for regulated frost protection via two setpoints for temperature maintenance and operation.**
	Guard	Frost protection via guard. Digital input for frost guard.
	Sens+Guard	Frost protection via sensor and guard. One analogue input for regulated frost protection and one digital input for frost guard.
	2sp+Guard	Frost protection via sensor, two setpoints and guard. One analogue input for regulated frost protection via two setpoints for temperature maintenance and operation, and one digital input for frost guard.
Pump, Extra heating	No	No pump.
	Yes	Pump without pump motion. Digital pump output.
	Yes+Motion	**Pump with pump motion. One digital pump output and activation of pump motion. Pump motion: The pump is started for a short time after having been idle for a long time. This prevents the pump from jamming.**
Pump alarm, Ex. heating	**No**	**Pump without alarm or return.**
	Alarm	Pump with alarm. Digital input for pump alarm. Logical 1 = alarm; pump immediately switched off.
	Return.	Pump with return. Digital input for return (logical 1 = activated pump).
	Alarm+Return	Pump with alarm and return. Two digital inputs for pump alarm and return.
Ex. heating regulation		Setting for extra hot water register.
	Standalone	Hot water register is not integrated in the sequence. One extra analogue input for sensor (unless it is activated for Extra electric heating or Extra cooling).
	Sequence	**Integrated in the sequence for, for example, reheating. NB! Maximum one of the two extra registers for extra heating or extra electric heating can be integrated in the sequence.**
Extra electric heating alarm	No	No alarm.
	Yes	**One digital alarm input is activated (logical 1 = alarm).**
Ex. electric heating regulator.		Setting for extra electric heating register.
	Standalone	Electric heating register is not integrated in the sequence. One extra analogue input for sensor (unless it is activated for Extra heating or Extra cooling).
	Sequence	**Integrated in the sequence for, for example, reheating. NB! Maximum one of the two extra registers for extra heating or extra electric heating can be integrated in the sequence.**
Pump, Extra cooling	No	No extra water cooling pump.
	Yes	Water cooling pump without pump motion. Digital pump output.
	Yes+Motion	**Water cooling pump with pump motion. One digital pump output and activation of pump motion. Pump motion: The pump is started for a short time after having been idle for a long time. This prevents the pump from jamming.**

Parameter	Value	Function
Pump alarm, Ex. cooling	**No**	**Pump without alarm or return.**
	Alarm	Pump with alarm. Digital input for pump alarm. Logical 1 = alarm; pump immediately switched off.
	Return.	Pump with return. Digital input for return (logical 1 = activated pump).
	Alarm+Return	Pump with alarm and return. Two digital inputs for pump alarm and return.
Ex. DX cooling alarm	**No**	**Extra DX cooling without alarm or return.**
	Alarm	DX cooling with alarm. Digital input for pump alarm. Logical 1 = alarm; pump immediately switched off.
	Return.	DX cooling with return. Digital input for return is activated (logical 1 = activated pump).
	Alarm+Return	DX cooling with alarm and return. Two digital inputs for alarm and return.
Ex. cooling regulation		Setting for extra cooling register.
	Standalone	Cooling register is not integrated in the sequence. One extra analogue input for sensor (unless it is activated for Extra heating or Extra electric heating).
	Sequence	**Integrated in the sequence for, for example, extra cooling register.**
Fire damper return		Fire damper return.
	Closed	Only one return for closed position. Digital input.
	Clo+Op	**Two separate returns for open and closed positions. Two digital inputs.**
	Comb.	Two returns for open and closed positions, but only one signal. The syntax must be correct: 1->0->1 => closed-> closes/opens -> open. Digital input.
Aux. input	**No**	**No aux. input.**
	Input	Extra digital input for display only.
	Alarm	Extra digital input with alarm.
	Inp.+Alarm	Two extra digital inputs; one for display and one with alarm.
Aux. temp. sensor	**No**	**No extra analogue input.**
	Yes	Extra analogue input for connection of temperature display.
Aux. timing program	**No**	**No extra digital output.**
	Yes	One digital aux. output with separate timing program.
Aux. output signal	No	No extra analogue output.
	Yes	**Analogue aux. output that generates a 0–10 V signal, depending on current fan step.**
Aux. operating mode input	**No**	**No extra digital output.**
	Yes	An extra digital output, the status of which depends on the current operating mode (e.g. Comfort or Off).
Configuration 2		With this parameter, the system is activated after parameter settings have been set, i.e. when Configuration 1, Configuration 2 and Config.In/Outputs have been set (value Ready).
	Not ready	The system is locked and cannot be started.
	Ready	The system is unlocked after the parameter settings have been set (value Ready for Configuration 2 and Config.In/Outputs), i.e. the system can be started.
Restart	Passive Execute	The system must be restarted after parameter settings have been set in Configuration 2. Changed presets in Config.In/Outputs are applied. After restart, the value is changed automatically from Execute to Passive.

8.1.4. *Configuration of inputs and outputs*

NB! The ventilation unit is supplied fully configured and does not normally need to be changed.

If there is a need for adjustments, subfunctions for some parts of the system can be set in Configuration 1, Configuration 2 and Configuration of inputs and outputs.

In Config.In/Outputs, a physical location is assigned to the inputs and outputs specified in Configuration 1 and Configuration 2. Parameter settings are also set for the relevant sensor conversion (e.g. Ni1000, Pt1000, 0–10 V = 0–1000 Pa).

Positions in regulator and expansion modules

- Regulator: All single-digit positions, for example X1.
- Modbus extender: xxxxx
- Expansion module 1: All positions X1x, DI1x, DO1x, AO1x, for example X11, DO14.
- Expansion module 2: All positions X2x, DI2x, DO2x, AO2x, for example X21, DO24.

Preconditions
Configuration 1 and Configuration 2 must be ready (the process unit must be restarted after each configuration).

Start
If necessary: Enter the password for level 3:

Start page > Password enter

Then:

Main index > Configuration > Configuration IO's

NB! The inputs and outputs in the expansion modules can be used if the module has been activated in Configuration 1.

Parameter	Value	Function
Temperatures		Go to the hardware configuration page for all temperature sensors.
Pressure/Flows		Go to the hardware configuration page for all pressure and flow sensors.
Humidity		Go to the hardware configuration page for all air humidity sensors.
Digital inputs		Go to the hardware configuration page for all digital inputs without alarm function.
Digital alarm		Go to the hardware configuration page for all digital inputs with alarm function.
Other		Go to the hardware configuration page for air quality sensors and setpoint compensation.
Damper outputs		Go to the hardware configuration page for supply air, extract air and fire dampers.
Fan outputs		Go to the hardware configuration page for fans.
Temp. control outputs		Go to the hardware configuration page for heating, cooling, heat recovery, etc.
Humidity outputs		Go to the hardware configuration page for humidification.
Aux. outputs		Go to the hardware configuration page for aux. functions.
Alarm outputs		Go to the hardware configuration page for both alarm outputs.
Config.In/Outputs		Activation of the system after parameter settings have been set, i.e. when Configuration 1, Configuration 2 and Config.In/Outputs have been set (value Ready).
	Not ready	The system is locked and cannot be started.
	Ready	The system is unlocked after the parameter settings have been set and can be started
Restart	Passive Execute	The system must be restarted after parameter settings have been set in Config.In/Outputs. Changed presets in Config.In/Outputs are implemented. After restart, the value is changed automatically back.

9. Cooling

9.1. Cooling

It is possible to choose between cold water register and DX cooling. The cold water register can be used with or without a pump (pump motion). The register for DX cooling has one step. The cooling registers are deactivated if the outdoor air temperature is too low and are forced off in connection with:

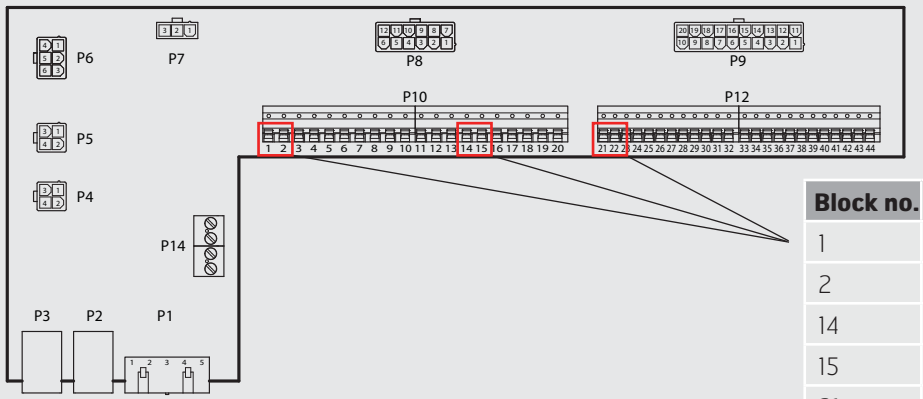
- Nighttime support operation for heating
- Nighttime cooling in summer

To have two steps in DX cooling, an extra expansion unit can be purchased as an accessory.

The accessory has art. no. 112439

9.1.1. *Installation*

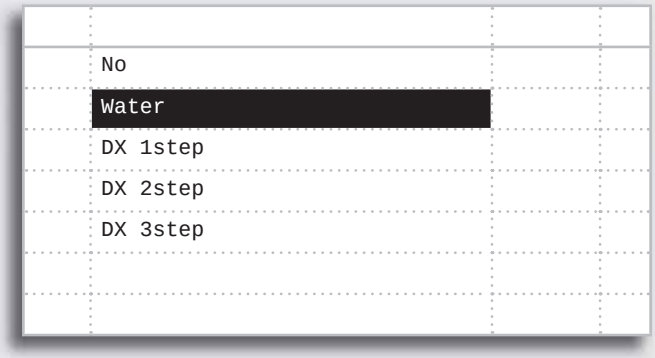
1



Block no.	Function
1	L
2	N
14	DX cooling/cooling pump IN
15	DX cooling/cooling pump OUT
21	Cooling - 0-10V [AO]
22	Cooling - GO

9.1.2. *Configuration - Cold water register*

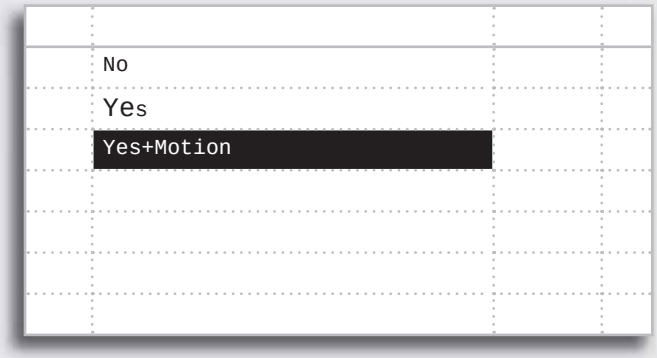
2 **Cold water register**
Main index > Configuration > Configuration 1 > **Cooling**



Area	Function
	No cooling function activated
	Cold water register activated
	One-step DX cooling activated
	Two-step DX cooling activated
	Three-step DX cooling activated

3 RESTART

4 **Cold water register**
Main index > Configuration > Configuration 2 > **Cooling pump**

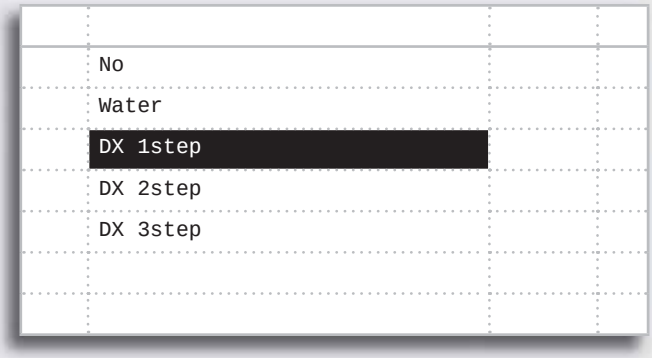


Area	Function
	No cooling register pump
	Cooling register pump without pump motion
	Cooling register pump with pump motion

5 RESTART

9.1.3. *Configuration - DX cooling*

2 **DX cooling**
Main index > Configuration > Configuration 1 > **Cooling**

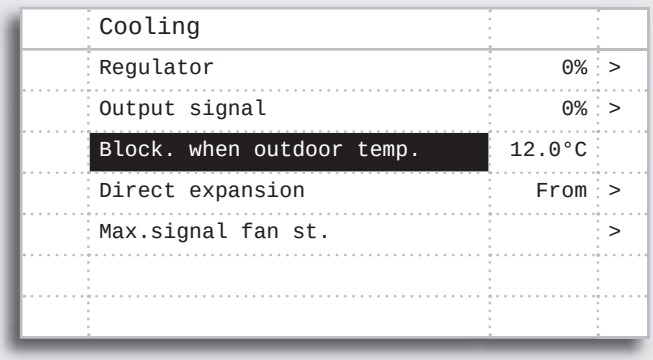


Area	Function
	No cooling function activated
	Cold water register activated
	One-step DX cooling activated
	Two-step DX cooling activated
	Three-step DX cooling activated

3 RESTART

9.1.4. *Parameters*

1 **Cooling - parameters**
<Main index > Unit > Temp control > **Cooling**



Area	Function
	Regulator
	Output signal
-64..+64°C	Block. when outdoor temp.
	Direct expansion
	Max.signal fan st.

1 Cooling – parameters

Main index > Unit > Temp control > Cooling > **Regulator**

	Cooling		
	Regulator output signal	0.0%	
	Current value	52.5	
	Setpoint	22.0°C	
	Activate	Passive	
	Error	Active	
	Status	Locked	
	Invert output signal	Passive	
	High limit	100.0	
	Low limit	0.0	
	Change settings		>

Area	Function
	Shows the current cooling regulator value
	Shows the current value for the cooling valve's output
-64..+64°C	Block. when outdoor temp.
	Direct expansion
	Max.signal fan st.

1 Cooling – parameters

Main index > Unit > Temp control > Cooling > Regulator > **Other settings**

	Cooling		
	Boost	-5.00	
	I-time	300 s	
	D-time	0 s	
	Out of operation	Passive	

Area	Function
-1000..1000	Shows the current cooling regulator value
0..18000	300 s
0..18000	0 s
Passive/ Active	Passive

1 Cooling – parameters

Main index > Unit > Temp control > Cooling > **Output signal**

	Cooling		
	Manual operation	21432%	
	Manual operation	Active	
	Current value	0.0%	
	Reliability	OK	
	Active priority	Def	
	Other settings		>
	Information		>
	Order of priority		>

Area	Function
-1000..1000	Shows the current cooling regulator value
0..18000	300 s
0..18000	0 s
Passive/ Active	Passive

1 Cooling – parameters

Main index > Unit > Temp control > Cooling > Output signal > **Other settings**

	Cooling		
	Alarm class, error	Low (B)	
	High limit	100.0%	
	Low limit	0 s	

Area	Function
-1000..1000	Shows the current cooling regulator value
0..18000	300 s
0..18000	0 s

10. Temperature regulation

10.1. Select method of regulation

10.1.1. *Select temperature regulation method*

All temperature regulation functions are selected under the menu option:

Main index > Configuration > Configuration 1

OBS! Room regulation requires the installation of special room sensors!

Extract air regulation

Limits the supply air temperature in connection with pure room or extract air regulation so that sudden fluctuations are avoided when temperatures are too high or too low.

Activate the function in the menu option:

Main index > Configuration > Configuration 1 > Tmp control mode = Room or Exhaust

RESTART

Set parameters in the menu option:

Main index > Unit> Temp control > Min/Max supply air regulation

RESTART

Summer/Winter compensation

Summer compensation: Adjustment of temperature setpoint (in relation to regulation, supply air, room air or extract air) in accordance with regulation for high outdoor air temperature in summer.
Winter compensation: Adjustment of temperature setpoint (in relation to regulation, supply air, room air or extract air) in accordance with regulation for low outdoor air temperature in winter.

Activate the function in the menu option:

Main index > Configuration > Configuration 1 > Tmp control mode = RmSplyC Su or ExSplyC Su

RESTART

and for supply air regulation in the menu option:

Main index > Configuration > Configuration 2 > SuWi comp.temp = Yes

RESTART

Set parameters in the menu options:

Main index > Unit > Temp control > Setpoints > Summer comp.

Main index > Unit > Temp control > Tmp Setpoints > Winter comp.

Combined room/extract air regulation with supply air regulation in winter

Setpoint compensation with winter operation for:
Tmp control mode = Room SuWi (cascade regulation of room and supply air in summer, pure supply air regulation in winter).
or
Tmp control mode = Extract air SuWi (cascade regulation of extract and supply air in summer, pure supply air regulation in winter).
The comfort setpoint is used for cascade regulation in summer (summer/winter switching).

In the winter, these room setpoints must be adapted to supply air regulation.

Precondition:
One of the regulation types Room SuWi and Extract air SuWi must be selected according to the Summer/Winter compensation regulation method.

Supply air compensation must then be selected in the menu option:

Main index > Configuration > Configuration 2 > Supply air temp.

Set parameters in the menu option:

Main index > Unit> Temp control > Min/Max supply air regulation

10.1.2. *Select additional functions for temperature regulation*

There are a number of different additional functions that can be combined with the temperature regulation method selected. All are in the menu option:

Main index > Configuration > Configuration 2

10.1.2.1. Nighttime cooling

Activate the function in the menu option:

Main index > Configuration > Configuration 2 > Night cooling

RESTART

With nighttime cooling, the building is cooled at night using the cool outdoor air without any extra energy being added.

Nighttime cooling is activated under the following circumstances:

- The outdoor air temperature is higher than the limit set: Outdoor temp. > Min outdoor temp.
- The outdoor air temperature is lower than the difference between room temperature and switch-on delta: Outdoor temp. < Room temp. – Delta
- The room/extract air temperature is higher than the total of the room setpoint and hysteresis: Room temp. > Room setpoint + Hysteresis.

Nighttime cooling is deactivated under the following circumstances:

- Other start of unit

or

- Min operating time has been passed

and

- The outdoor air temperature is lower than the difference between room temperature and switch-off delta: Outdoor temp. > Room temp. – 1,

or

- The room temperature is lower than or equal to the room setpoint: Room temp. <= Room setpoint

NB! The function is deactivated if the sensor for room/extract air/outdoor air temperature is disconnected.

Set parameters in the menu option:

Main index > Unit > Operating mode > Nighttime cooling

10.1.2.2. Support operation

Activate the function in the menu option:

Main index > Configuration > Configuration 2 > Support operation

RESTART

Nighttime support operation prevents the building from being cooled or heated too much. This is regulated via a separate setpoint for heating and cooling. Heating and cooling can be activated separately.
The function can be implemented using an extract air sensor if there is no room sensor. However, configuration with the extract air sensor that holds the highest value should not normally be used as the support operation can then only start once.

Cooling requirements

Nighttime support operation for cooling requirements is activated when the following preconditions are met:

- Room temp. > Start cooling, and the min restart time has been passed

Switch-off is activated when:

- Room temp. < Start cooling – Hysteresis

Heating requirements

Nighttime support operation for heating requirements is activated when the following preconditions are met:

- Room temp. < Start heating, and the min restart time has been passed

Switch-off for heating requirements is activated when:

- Room temp. > Setpoint for heating + Hysteresis

NB! The function is deactivated if the sensor for room/extract air temperature is disconnected.

Set parameters in the menu option:

Main index > Unit > Operating mode > Support operation

10.1.2.3. Boost (optimisation)

Activate the function in the menu option:

Main index > Configuration > Configuration 2 > Boost

RESTART

Optimised start ensures a comfortable room temperature when the system is switched on normally. This is regulated via a separate setpoint for heating and cooling.

Heating and cooling can be activated separately.
The function can be implemented using an extract air sensor if there is no room sensor.

Cooling requirements
Optimised start for cooling requirements is activated when the following preconditions are met:
- Room temp. > Room setpoint + Hysteresis,

and
- Time before normal start via timing program < Prestart time

Switch-off is activated when:
- Room temp. < Room setpoint. The unit then switches to normal operation even if the normal start via the timing program has not occurred.

Heating requirements
Optimised start for heating requirements is activated when the following preconditions are met:
- Room temp. > Room setpoint – Hysteresis, and
- Time before normal start via timing program < Prestart time

Switch-off is activated when:
- Room temp. > Room setpoint. The unit then switches to normal operation even if the normal start via the timing program has not occurred.

NB! The function is deactivated if the sensor for room/extract air temperature is disconnected.

Set parameters in the menu option:

Main index > Unit > Operating mode > Support operation

10.1.2.4. Support operation/Osstp block
Activate the function in the menu option:

Main index > Configuration > Configuration 2 > Support operation/Osstp block

The function blocks the air damper or extract air fan when the system is started optimally or via temperature delta.

NB! This function is intended to be used in an emergency situation

11. Fan regulation

11.1. Select method of regulation

11.1.1. *Selection fan regulation method*
All fan regulation functions are selected under the menu option:

Main index > Configuration > Configuration 1 > Fan control mode

'Flow regulation' is selected by default.

NB! The options 'Direct' and 'Dir. fro' must not be used!

After each change, the system must be restarted.

RESTART

11.1.1.1. Fixed frequency
Frequency-controlled fans controlled with fixed steps via analogue outputs [%].

Set parameters in the menu option:

Main index > Unit > Setpoints/Settings

11.1.1.2. Pressure regulation
Pressure regulation with modulated frequency-controlled fans [Pa].

NB! Requires external pressure sensors that can be purchased as accessories

Set parameters in the menu option:

Main index > Unit > Setpoints/Settings

11.1.1.3. Flow regulation
Flow regulation with modulated frequency-controlled fans [Pa].

Air flow regulation with modulating frequency-controlled fans [l/s] (or other unit selected).

Set parameters in the menu option:

Main index > Unit > Setpoints/Settings

11.1.1.4. Supply air fan slave

The supply air fan is driven dependent on the extract air fan [Pa]/[l/s]. The extract air fan is pressure-regulated and the extract air flow is calculated so that the supply air fan is flow-regulated accordingly.

Set parameters in the menu option:

Main index > Unit > Setpoints/Settings

11.1.1.5. Extract air fan slave

The extract air fan is driven dependent on the supply air fan [Pa]/[l/s]. The supply air fan is pressure-regulated and the supply air flow is calculated so that the extract air fan is flow-regulated accordingly.

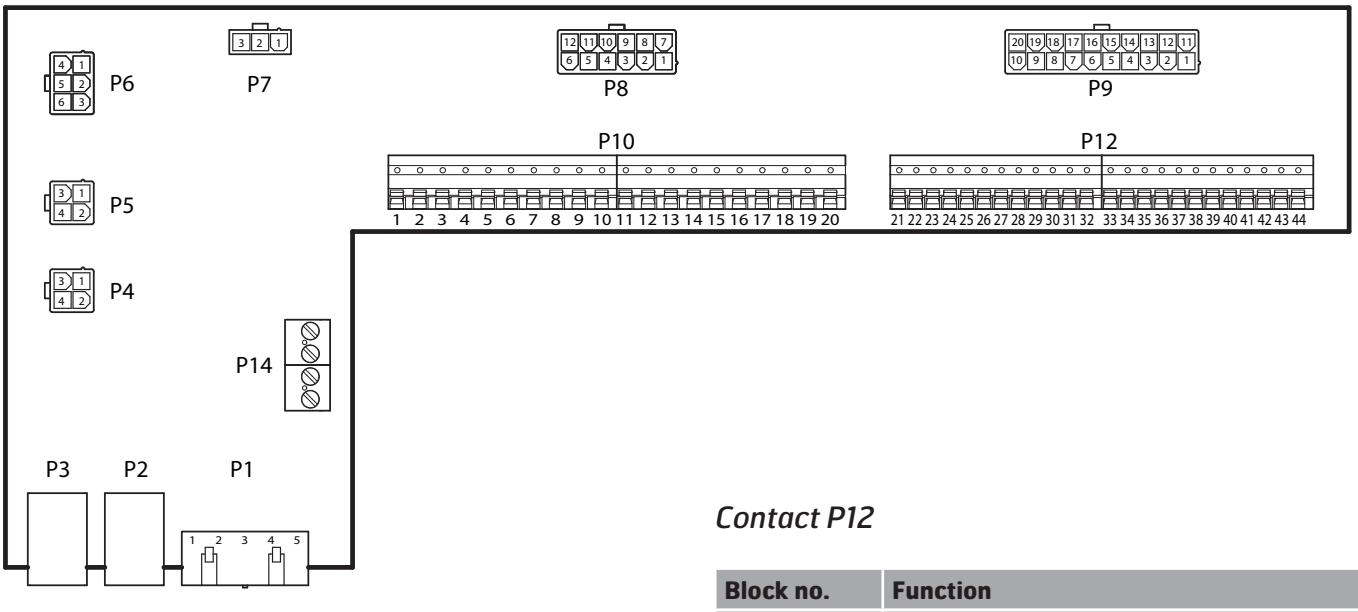
Set parameters in the menu option:

Main index > Unit > Setpoints/Settings

12. Connection of external equipment

12.1. General

External equipment is connected to the blocks in the control cabinet.
The P10 contact has connections for power current (230V)
The P12 contact has connections for low current (< 24V)



Contact P10

Block no.	Function
1	L
2	N
3	L (Outdoor air damper)
4	L1 (Outdoor air damper ON/OFF)
5	N (Outdoor air damper)
6	L (Exhaust air damper)
7	L1 (Exhaust air damper ON/OFF)
8	N (Exhaust air damper)
9	L (Fire damper)
10	L1 (Fire damper ON/OFF)
11	N (Fire damper)
12	Buzzer alarm IN
13	Buzzer alarm OUT
14	DX cooling/cooling pump IN
15	DX cooling/cooling pump OUT
16	L
17	Heating IN
18	Heating OUT
19	N
20	Not used

Contact P12

Block no.	Function
21	Cooling - 0-10V [AO]
22	Cooling - G0
23	External control 1 [DI]
24	External control 1 - G0
25	External control 2 [DI]
26	External control 2 - G0
27	Fire/smoke [DI]
28	Fire/smoke - G0
29	Air quality - 0-10 [AI]
30	Air quality - G0
31	Heating - 0-10V [AO]
32	Heating - 24V+
33	Heating - G0
34	Fire damper open [DI]
35	Fire damper closed [DI]
36	Fire damper - G0
37	AUX damper - 0-10V [AO]
38	AUX damper - G0
39	Return water sensor B5 [AI] / Overheating thermostat F20 [DI]
40	G0
41	CE- [Data bus]
42	CE+ [Data bus]
43	Not used
44	Not used

12.2. Outdoor air damper

Connection of outdoor air damper.

Block	Function
3	L - Constant 230V
4	L1 - 230V ON/OFF control
5	N - Constant N

No further configuration of the control unit is necessary

12.3. Exhaust air damper

Connection of exhaust air damper.

Block	Function
6	L - Constant 230V
7	L1 - 230V ON/OFF control
8	N - Constant N

No further configuration of the control unit is necessary

12.4. Fire damper

Connection of fire damper.

Block	Function
9	L - Constant 230V
10	L1 - 230V ON/OFF control
11	N - Constant N
34	Fire damper open [DI]
35	Fire damper closed [DI]
36	Fire damper G0 signal

The fire damper function must be activated in the control unit. This is done via the following menu option:

Main index > Configuration > Configuration 1 > Fire damper

This also activates the inputs for detecting whether the fire damper is open or closed. They are used for fire damper motion and inspection.

12.5. Buzzer alarm

Connection of signal for detecting a buzzer alarm.

Block	Function
12	Relay contact NO (closes on alarm)
13	Relay contact NO (closes on alarm)

The buzzer alarm is common to both A alarm and B alarm. No further configuration of the control unit is necessary

12.6. DX cooling/Cooling pump

Connection of signal for controlling the cooling machine.

Block	Function
14	Relay contact NO (closes if cooling is required)
15	Relay contact NO (closes if cooling is required)
21	Cooling 0-10V signal
22	Cooling G0 signal

The cooling function must be activated in the control unit. This is done via the following menu option:

Main index > Configuration > Configuration 1 > Cooling

If DX cooling is selected, the relay output is used to activate switch-on/off for a DX coil. (To connect several coils, an accessory must be connected to the control unit)

If water-based cooling is selected, the relay output is used to activate the pump for the cooling machine.

12.7. Heating ON/OFF

Connection of signal for controlling a heating coil.

Block	Function
17	Relay contact NO (closes if heating is required)
18	Relay contact NO (closes if heating is required)
31	Heating - 0-10V [AO]
32	Heating - 24V+ (24V supply)
33	Heating - G0

All configuration of heating control is done on the modbus card.

12.8. External speed control

Connection of signal(s) for controlling fan speed from external components.

Block	Function
23	External control 1 [DI]
24	External control 1 - G0
25	External control 2 [DI]
26	External control 2 - G0

Ext. control 1 - ON = Speed 1
Ext. control 2 - ON = Speed 2
Ext. control 1 & 2 - ON = Speed 3

It is possible to connect various types of switch/sensor that have pulse or fixed positions. By default the system is set for switches with fixed values. This can be changed via the menu option:

Main index > Unit > Inputs > Digital inputs

Then select the desired input and adjust it as required.

12.9. Fire/smoke detector

Connection of external fire/smoke detector.

Block	Function
27	Fire/smoke [DI]
28	Fire/smoke - G0

The function must be activated in the control unit.
This is done via the following menu option:

Main index > Configuration > Configuration 1 > Fire alarm

Then select 'Alarm'

RESTART

It is possible to connect various types of switch/sensor that have pulse or fixed positions. The contact function can also be changed. By default the control unit is set for switches with fixed values. This can be changed via the menu option:

Main index > Unit > Inputs > Digital inputs

Then select the desired input and adjust it as required.

12.10. Air quality

Connection of a sensor for air quality measurement.

Block	Function
29	Air quality - 0-10 [AI]
30	Air quality - G0

The function must be activated in the control unit. This is done via the following menu option:

Main index > Configuration > Configuration 2 > Fan comp air qual

RESTART

12.11. AUX Damper

Connection for control of an external damper.

Block	Function
37	AUX damper - 0-10V [AO]
38	AUX damper - G0

The output signal is affected, dependent on the speed of the ventilation unit. The function must be activated in the control unit. This is done via the following menu option:

Main index > Configuration > Configuration 1 > Aux. operating mode input

RESTART

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