GB

EXcon Instructions

DEX3000 Control system

Original instructions

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EXHAUSTO

1. Product information

Symbols and terms

Prohibition symbol

Failure to observe instructions marked with a prohibition symbol may result in serious or fatal injury.

Danger symbol

Failure to observe instructions marked with a danger symbol may result in personal injury and/or damage to the unit.

Scope of the instruction manual

This instruction manual is for use with EXHAUSTO DEX-type air handling units, hereinafter called EXcon. For accompanying accessories and additional equipment, please see the product guidelines for the specific item.

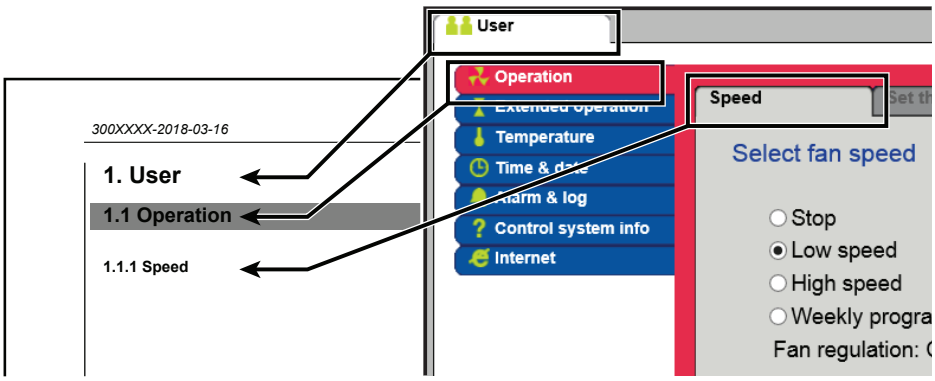
The instruction manual must be fully observed to ensure personal safety and the safety of others, and to protect equipment and ensure the correct operation of the DEX unit. EXHAUSTO A/S accepts no liability for accidents caused by a failure to use the product in accordance with the manual's instructions and specifications.

Screen images

In this instruction manual there are screen displays which are meant to help the user and indicate where on the web interface the user is currently. These screen displays are examples and settings, which will usually not be identical to the used DEX unit's settings on this web user interface.

Headers/web user interface

This guidance is structured such that the section headers correspond to the tabs on the web user interface.
See example below:



1.1 Application

The EXcon control system controls and monitors the DEX unit functions.
EXcon can be operated via:

- Touch control panel (simple operation and settings)
- PC browser (advanced operation, settings and configuration)

This allows the following applications:

- A local PC can be connected to the DEX unit.
- The DEX unit can connect to a local area network (LAN) and be controlled by a PC connected to the LAN.
- The DEX unit can be connected to the internet and accessed by external PCs.

Browser

The EXcon web user interface can be used via:
- Explorer 10 and 11
- Chrome
- Edge
- Firefox

1.1.1 Browsing history

The **Temporary internet files** folder (or cache) is used by the web browser to save content from websites on the computer's hard drive, so that they can be displayed quickly.
This cache means that the web browser only has to retrieve the content that has changed since the website in question was last displayed, instead of retrieving all of a site's content every time it is to be displayed.

Delete browsing history

Step	Action
1	Start Web browser
2	Click on the **Functions** tab and select **Internet settings**
3	Click on **delete...**
Keep data for favourite websites: ● If the address on the EXcon web user interface is added as a **Favourite**, it may **not** be ticked. **Temporary internet files and website files:** ● **Must** be ticked.	
4	Click on **Delete** when the required data has been selected.

2. Operation and passwords

2.1 User interfaces

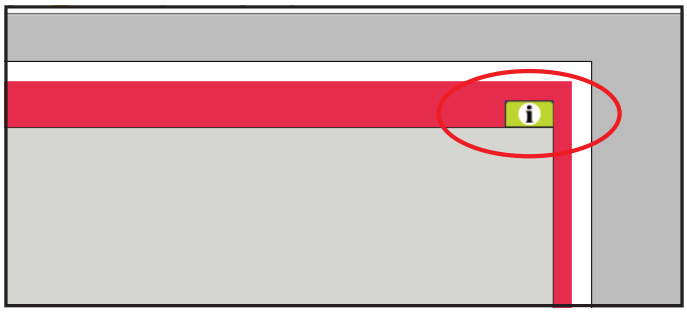
2.1.1 Online user interface

The web user interface permits setup and control of all functions in the DEX unit. Depending on requirements and user type, users may log in on one of three user levels, with corresponding passwords and rights.

Log-in procedure

1. Open a browser
2. Enter the IP address of the DEX unit *(see – Communication Setup)*
3. Enter a username and password.*(see Passwords)*

On pages which offer help, the help functions are opened and closed by clicking the **I** button in the top right-hand corner.



2.1.2 HMI Touch control panel

The HMI permits adjustment of the basic functions. The HMI can be mounted on the DEX unit or in the room as room control.
For changes to settings and operation with the HMI, see the EXcon HMI Touch instructions.

2.1.3 Modbus

Configuration and operation via Modbus is performed with the configuration program selected by the user.
For more information and a list of parameters, see the **Modbus protocol.**

2.1.4 BACnet

Configuration and operation via BACnet is performed with the configuration program selected by the user.
For more information and a list of parameters, see the **BACnet protocol.**

2.2 Passwords

2.2.1 Online user interface

A login at a higher level also gives access to the underlying level's menus.

The following login and password are factory settings on the web user interface:

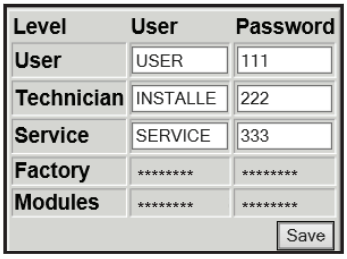
Niveau (Level)	User name	Password
Bruger (User)	USER	111
Technician	INSTALLER	222
Servicing	SERVICE	333
Factory	Contact EXHAUSTO	
EXcon modules	Contact EXHAUSTO	

Letters in the password are case-sensitive.

Change password

It is possible to change the username and password for User Level on the web user interface. For more information, see under: **User > Internet > Login**

To change the password for Technician and Service levels you will need to log in at Factory Level. Contact EXHAUSTO for more information.

Step	Action	Screen image
1	Log in via a web browser at Factory Level: **Factory > Settings > Login.**	
2	Enter a username and password for the levels that are needed to be changed, max. 8 characters.	
3	Press **Save** to save the settings.	

2.2.2 HMI Touch control panel

There are no access levels for operating the HMI.
However, a LOGIN code is required for resetting to factory settings, and for configuration and settings for certain parameters.

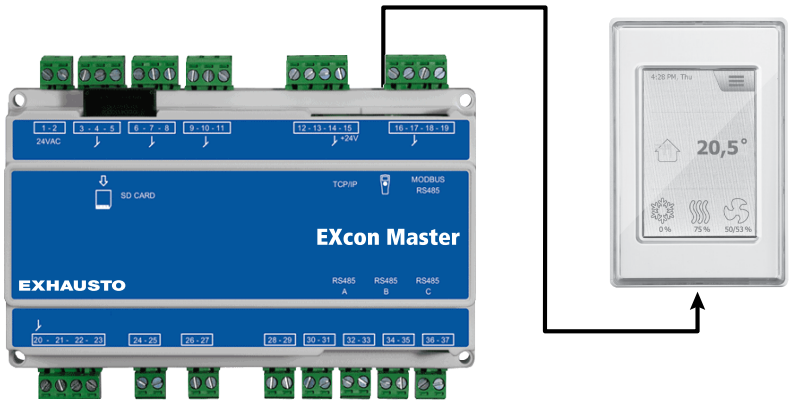
Contact EXHAUSTO for more information.

3. Communication setup

3.1 HMI Touch control panel

Connect HMI Touch control panel

Check that the cable between the HMI and the EXcon Master is correctly connected as shown below.



1. Turn on the Master
2. Check that the HMI display has lit up
3. Wait about 30 seconds until the control system is ready

At least one active alarm will often appear on the HMI display when starting up the Master.
Remove alarms by pressing **ESC**.

3.1.1 Set language

NB:

Language settings can be changed without knowledge of the LOGIN code.

Step	Action
1	Press the HMI menu icon in the top right-hand corner of the home page.
2	Select **Settings**, and then **Language**
3	Mark the desired language and return to the home page.

3.1.2 Set IP address

To allow communication between the Master and a directly connected PC, the Internet settings must be entered.
The Master be set to for either **Static** or **DHCP** IP address via the HMI.

For further information, see **Configuration of communication**.

NB:

Changes to IP address settings can only be made by service technicians with knowledge of the LOGIN code.

Step	Action
1	Press the HMI menu icon in the top right-hand corner of the home page.

Step	Action
2	Select **Communication**
3	Mark one of the parameters which it is wished to change.
4	To set the chosen parameter,enter the LOGIN code and select ✓.

3.2 Updating of software

3.2.1 Software updating with HMI Touch panel

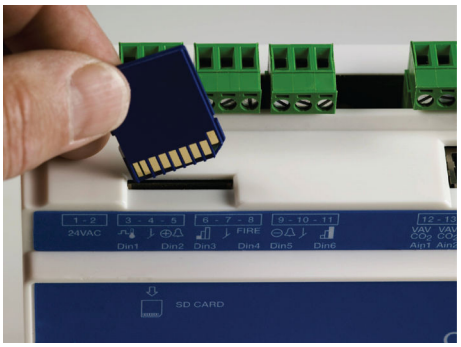
Use SD card

In the event of DEX unit software needing to be updated, it is done via an SD card.
Follow the sequence below to update the software.

NB! All settings that are already saved in the software are kept.

NB:

Software updates should only be made by service technicians with knowledge of the LOGIN code.

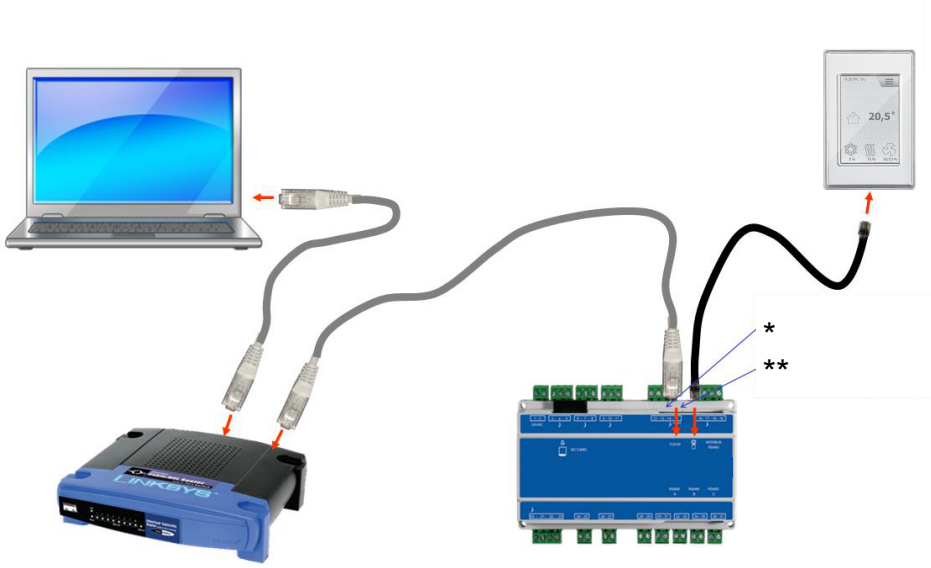
Step	Action	NB:
1	Copy 3 files (.tar. + gz and .crc.file) to an SD card.	The files must be placed in the root directory on the SD card and not in sub-directories.
2	Ensure that the Master is powered up.	
3	Ensure that the HMI is connected	Check that there is light on the display.
4	Place the SD card in the card reader in the Master.	
5	Click on the HMI menu's icon in the top right-hand corner of the home page and select **Updating**.	SD card found. Please wait...
6	Select ✓ and enter the LOGIN code if updating is required.	Updating is running. Please wait...
it is very important that the UPDATING PROCESS IS COMPLETED before clicking on the screen again When the updating process is complete, the screen will automatically revert to the home page.		

3.3 Configuration of communication

3.3.1 Configuration WITH router

If communication is configured WITH router on the TCP/IP network, the PC is automatically assigned an IP address by the network or router. Using the HMI, set the IP address to **DHCP**

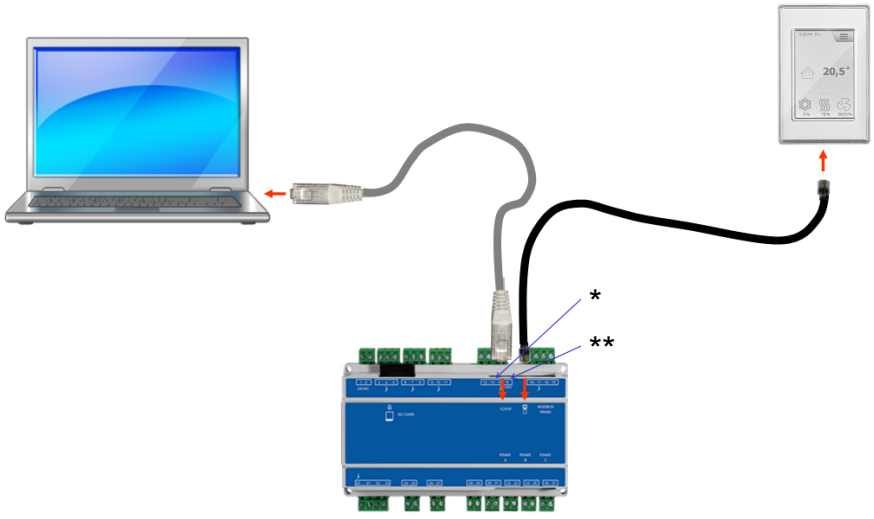
*Yellow LED: Lights up when LAN connection is OK
** Green LED: Flashes when communication is active.



3.3.2 Configuration WITHOUT router

If communication is configured WITHOUT router, the PC must be set to **Static** IP address. Using the HMI, also set the IP address to **Static** and set the required IP address (e.g. 192.168.1.100).

*Yellow LED: Lights up when LAN connection is OK
** Green LED: Flashes when communication is active.



For Windows 7 users

Step	Action
1	Select **Network and sharing centre** on the control panel.
2	Under the menu on the left-hand side, select **Edit network card settings.**
3	Right-click on the **LAN connection** icon, and select properties. If it asks for administrator password, contact the system administrator.
4	Mark TCP/IPv4 (Internet Protocol Version 4), select properties.
5	Select Use following IP address and enter the IP address which the network card is to have (e.g 192.168.1.100). The IP address may not be the same as set in the control system, but must be in the same network mask. **NB!** Be aware that it is the wired network card that is to be configured.
6	Press OK to end.

For Windows 8 and 10 users

Step	Action
1	Start Internet Explorer.
2	Check whether Internet Explorer is set up for Proxy server: Select **Functions >Internet settings > connections.**
3	Select **LAN settings.**
4	If the **Use a proxy server for LAN** field has been ticked, this must be removed. Click on **OK.**
5	Open **Control Panel > Network and Internet > Network and Sharing Centre > Edit settings for network card.**
6	Right-click on the LAN connection used and then on **properties.** If it asks for administrator password, contact the system administrator.
7	Mark**Internet protocol TCP/IP.**
8	Select **Properties.**
9	Select Use following IP address and enter the IP address which the network card is to have (e.g 192.168.1.100). The IP address may not be the same as set in the control system, but must be in the same network mask. **NB!** Be aware that it is the wired network card that is to be configured.
10	Press OK to end.

3.3.3 Start Web browser

Control of the DEX unit from the web user interface supports:

- Internet Explorer 10 and 11 (no compatibility display)
- Edge
- Chrome
- Firefox

Step	Action
1	Start the browser
2	Enter IP address in the address line and press **Enter**
When the Log-in image is displayed, the connection to EXcon Master has been created.	
	
3	Enter the Username/Password which gives access to the desired operation level. For further information, see **Web user interfaces** under **Access codes.**
4	Select language and press the Login button.
When you have logged in, the **User > Operation** tab will be displayed. Inactive tabs are shown with a grey background colour/grey text. They are activated depending on the settings made on the current or related pages.	

4. Starting up the DEX unit for operation

Warnings

Warnings

The Modbus connectors must not be connected or removed while the units are powered up. Both Modbus units must be switched off before making changes, otherwise the units may be damaged.

During commissioning, it may be necessary to work with the control system boxes open. Components in these boxes must only be touched with electrically-insulated tools.

Before doing any work on motor controls or motor cables and terminal boxes, the power supply must be switched off for at least five minutes to allow the capacitors to discharge.

Before commissioning begins

Before commissioning begins

- Check that the supply voltage is connected
- Log in to service level, see the **Passwords** section.

5. User settings

5.1 User parameters

The DEX unit can be set to accept changing requirements for temperatures, air changes, logging of alarms, etc. Many settings are entered once and for all, but others are intended for shorter periods. The EXcon web user interface creates a starting point for which parameters are described.

NB: There is a difference between levels on the user interfaces in terms of which parameters are available and where they are located.

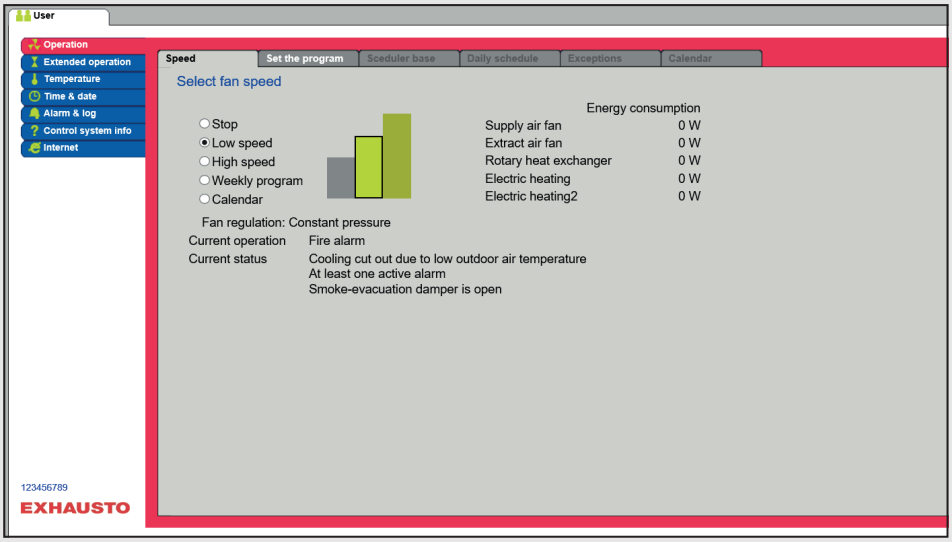
5.2 Operation

The **operation** parameters are used to determine the speed of air changes and the times for switching between the different speeds.

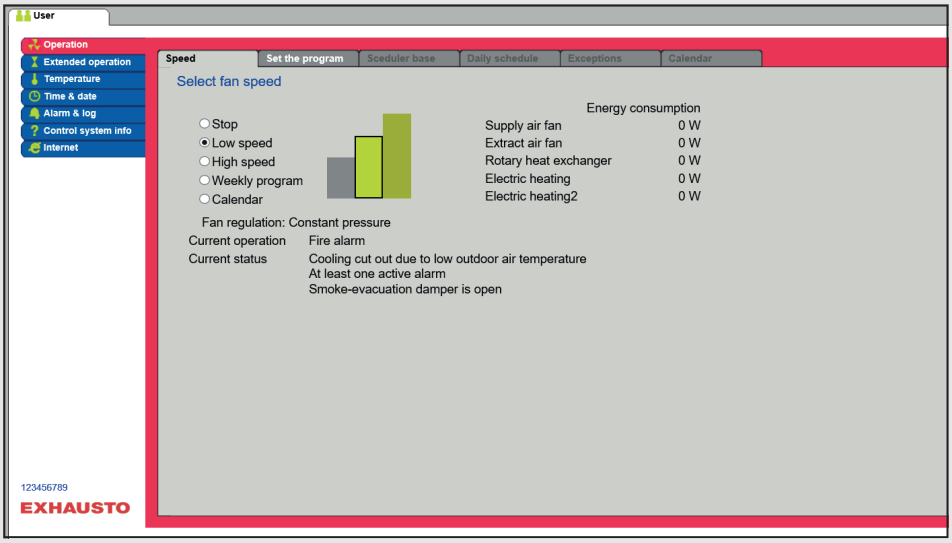
The DEX unit may be in one of four operating modes: stopped, low, medium or high speed.
It can be programmed to follow one of three weekly programs, or the calendar can be used for more detailed operating settings.

The current mode can be temporarily overridden by means of extended operation.

5.2.1 Speed

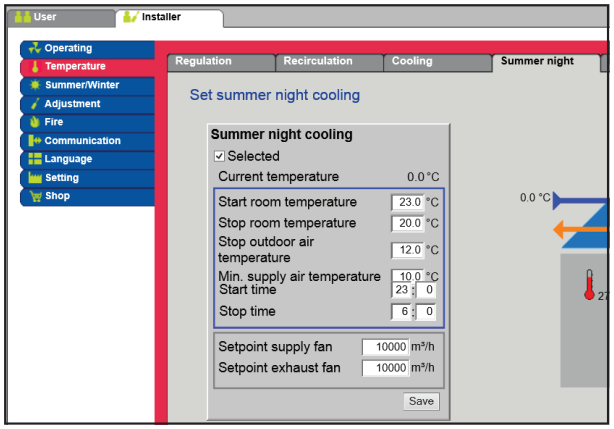


Select fan speed	
Stop	The DEX unit has stopped. ● Safety features er still active. ● Damper to the outside air is closed. **NB!** By using the **STOP** setting , it is possible to override/restart the DEX unit via the web user interface, HMI Touch control panel/manual terminal, BACnet or Modbus. During service and maintenance, the DEX unit must be stopped by: ● using the **Service stop** setting on the HMI Touch panel home page. or ● set to **SERVICE** under: User > **Fan operation** in the manual terminal.
Low speed	The DEX unit runs at a constant speed in accordance with the set parameters for **Low speed**. ● There is no access for setting operating times in the weekly program or calendar. If the **High speed** digital input is activated, the DEX unit will start and run for the set time. The time is set under: **Installer > Operations > External high.**
Medium speed	The DEX unit runs at a constant speed in accordance with the set parameters for **Medium speed**. ● There is no access for setting operating times in the weekly program or calendar. Note: In order to activate the **Medium speed** setting, the function must be selected under: **EXcon Modules > Configure > Settings**
High speed	The DEX unit runs at a constant speed in accordance with the set **High speed** parameters. ● There is no access for setting operating times in the weekly program or calendar.

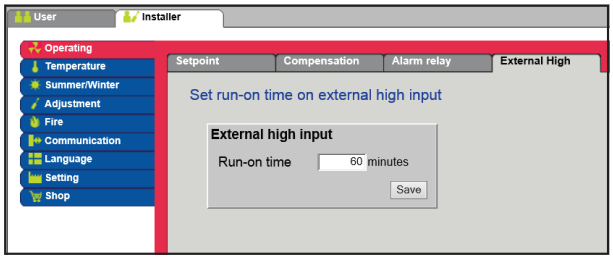


Select fan speed	
Weekly program	The DEX unit runs in accordance with the set weekly program. ● Access is permitted for setting operating times in the weekly program. Although the DEX unit may be stopped according to set weekly program, it can still start automatically according to the settings below.
Calendar	The DEX unit runs in accordance with the set calendar. ● Access is permitted for setting operating times in the calendar. Although the DEX unit may be stopped according to calendar settings, it can still start automatically according to the settings below.

Installer > Summer night

Settings	
If, under **Installer > Temperature > Summer night,** summer night cooling **is selected**, the DEX unit will start according to the set parameters for summer night cooling.	

Installer > External high

Settings	
If the **High speed** digital input is activated, the DEX unit will start and run for the set time. The time is set under: **Installer > Operations > External high.**	

5.2.2 Set the program

For access to this parameter, select **Weekly program** under: **Operation > Speed.** The settings will be overridden by any period of extended operation, or cancelled if the DEX unit is set to follow something other than the weekly program.
The parameter uses timelines, in which a maximum of four operating periods can be set per line. Each operating period indicates a time during which a requested operating mode is active.

Set weekly program
Whole week ● Operating at the same times on every day of the week.
Weekday & weekend ● Operation at the same times on Monday to Friday, with other times on Saturday-Sunday.
Day program ● Operating at individual times on every day of the week.

Click on the  symbol in the top right-hand corner for more information.

Calendar

The calendar function allow operating times to be set for a year or more.
An operating pattern can be set for normal operation of the unit.

At the same time, special operating modes in connection with planned holidays, public holidays or special opening days can be set.

The calendar function consists of four tabs:

- Basic program
- Daily schedule
- Exceptions
- Calendar

To use the calendar, all four tabs must be set.

Colours on buttons

For buttons in the parameters Daily schedule, Exceptions and Calendar, the following colour rules apply:

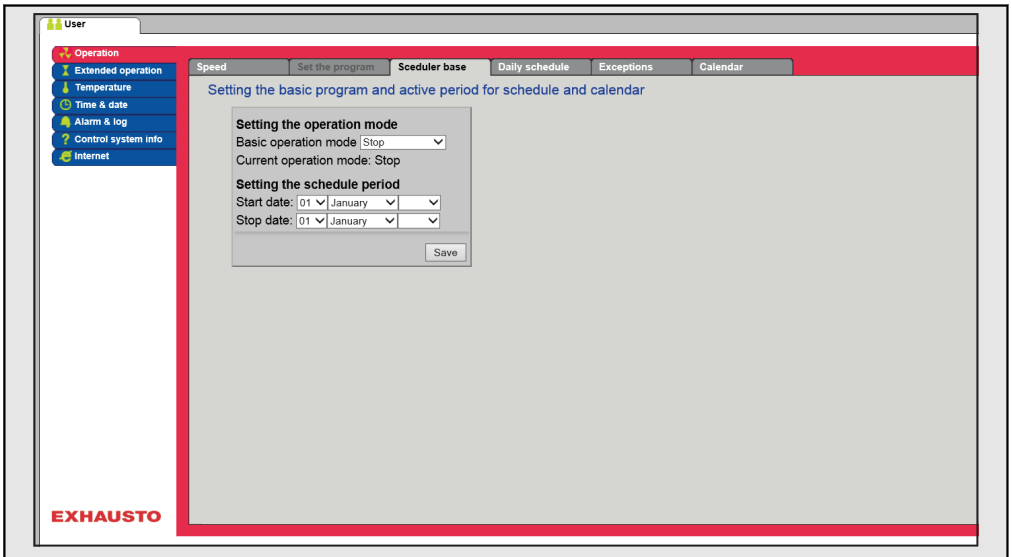
- Light grey - the button is active and can be set.
- Green - at least one activity has been set.
- Dark green - no activities have been set.

The settings will be overridden by any period of extended operation, or cancelled if the DEX unit is set to follow something other than the calendar.

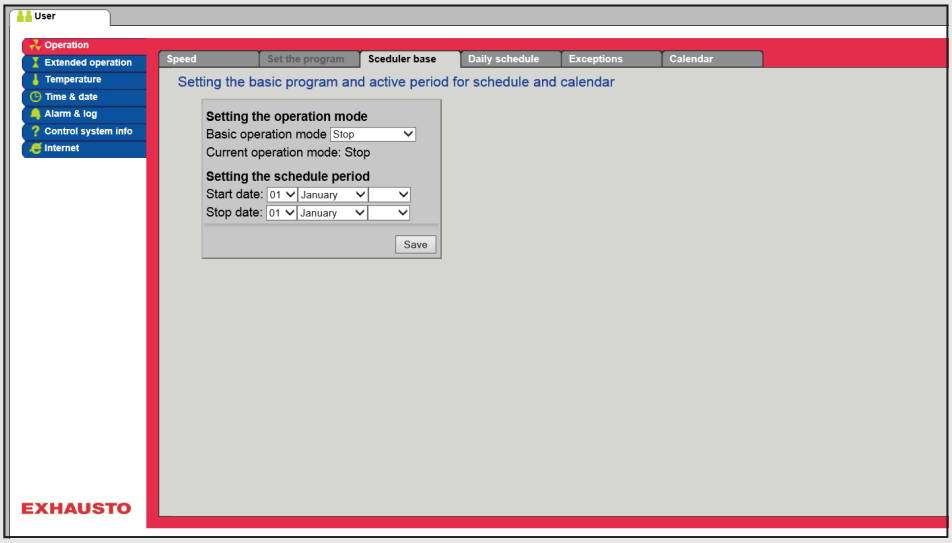
5.2.3 Basic program

For access to this parameter, **Calendar** must be selected under: **Operation > Speed.**

The basic program is used for setting the operating mode which the unit is to run, e.g. at night, in holiday periods or other stop periods.
The period for which the basic program is to run for is also set here.



Operating mode settings - basic operating mode	
Stop	The unit has stopped. Frost protection and other safety functions are active.
Low speed	The unit is in operation in accordance with Low Speed settings **(Installer > Operation > Set point)**
Medium speed	The unit is in operation in accordance with the settings for Medium Speed **(Installer > Operation > Set Point)**



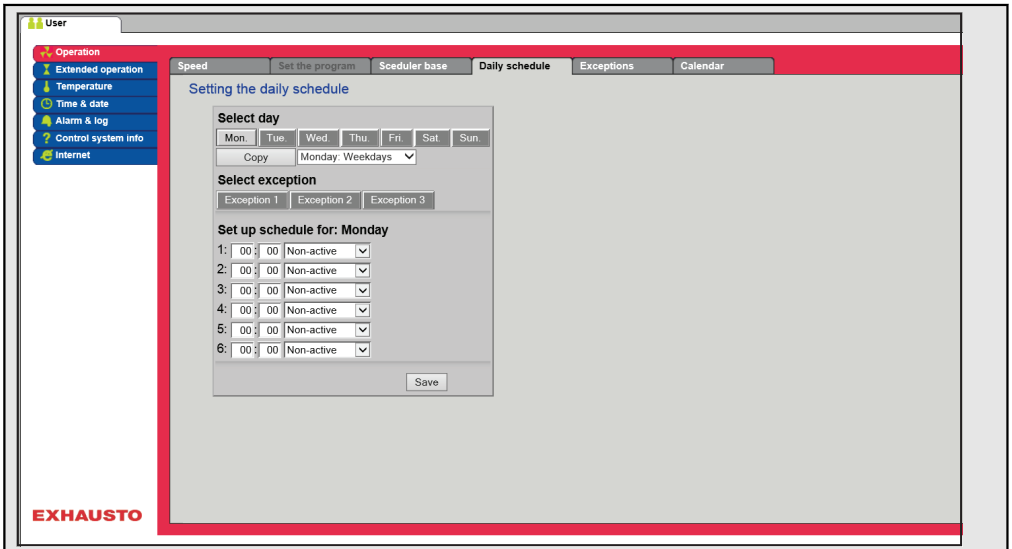
Operating mode settings - basic operating mode	
High speed	The unit is in operation in accordance with the settings for High Speed **(Installer > Operation > Set Point)**
Extended stop	The unit has stopped. Frost protection and other safety functions are active. The unit can be started - if the operating conditions are fulfilled for ● Summer night cooling ● Minimum night temperature - or by other override functions
Table for period settings	
Start date	The start and stop dates indicate the period when the settings in the **Daily schedule, Exceptions** and **Calendar** tabs are active. Outside the given period, the settings in **Basic operating mode** are automatically applied.
Stop date	
Press **Save** to save the settings.	

Click on the symbol in the top right-hand corner for more information.

5.2.4 Daily schedule

For access to this parameter, **Calendar** must be selected under: **Operation > Speed.**

The Daily schedule is used for setting the operating pattern laid down as standard in the periods where the unit is running normal operation.
It is subsequently possible to set up to three exceptions, in which the operating pattern deviates from normal operation.



Select day - Set up schedule	
Step	**Action**
1	Select day and set up schedule by setting operating times and modes. For a description of the possible operating modes, see the Chapter **Basic program**
	Repeat step 1 for each week day if different settings are desired for the different days.
2	Use the copy function if the same setting is desired for all the days of the week or weekdays. **NB! Even if the copy function is used, the days can later be individually changed if the same operating pattern is not desired.**
Select exception - Set up schedule	
1	Select exception and set up schedule by setting operating times and modes. For a description of the possible operating modes, see the Chapter **Basic program** **NB! As a rule, it is recommended to select the exceptions first which take up the shortest time, and leave the longer lasting exceptions to last.**
Press **Save** to save the settings.	

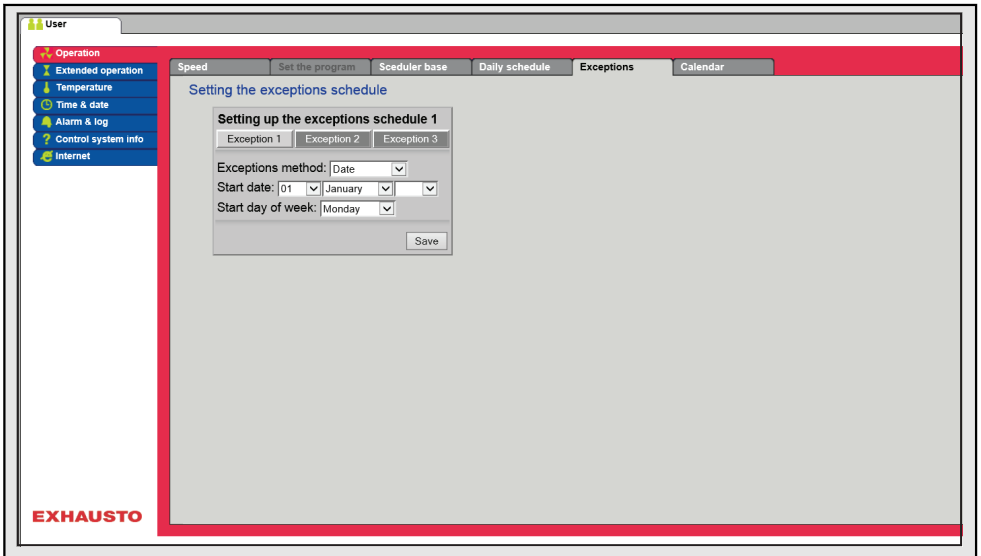
Click on the symbol in the top right-hand corner for more information.

5.2.5 Exceptions

For access to this parameter, **Calendar** must be selected under: **Operation > Speed.**

Exceptions is used to set when exceptions 1-3 are to be active.

- Exception 1 has first priority
- Exception 2 has second priority
- Exception 3 has third priority



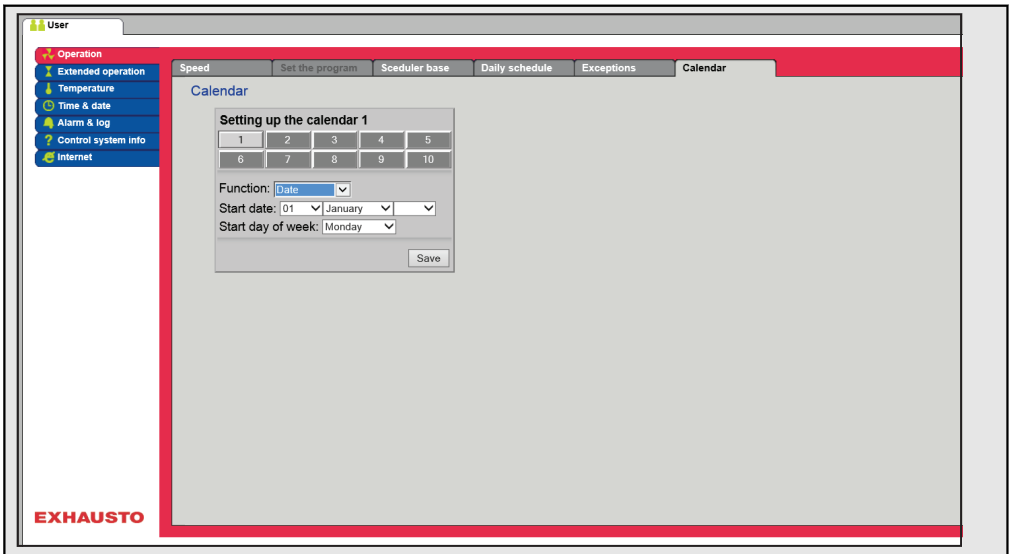
Select and set the exception method	
Not active	Exception has been deactivated and is not in use
Date	Exception is set to one particular date. ● Start date ● Start day of week **NB. It is important to set the day of the week correctly for the selected date.**
Date interval	Exception is active within the selected start/stop dates. ● Start date ● Stop date
Day of the week	Exception is active within the selected selected week in the selected month. ● Start date ● 1-7 = First week in the selected month ● 8-14 = Second week in the selected month ● 15-21 = Third week in the selected month ● 22-28 = Fourth week in the selected month ● 29-31 = Fifth week in the selected month ● Last 7 days = The last week in the selected month ● Every day = Every day in the selected month ● Start day of week The start day of the week indicates the day in the specified week on which the exception starts to be active.
Calendar	The exception is specified to follow the calendar as set in the **Calendar** parameter **NB. No more than one exception may be set using the Calendar exception method.**
Press **Save** to save the settings.	

Click on the  symbol in the top right-hand corner for more information.

5.2.6 Calendar

For access to this parameter, **Calendar** must be selected under: **Operation > Speed.**

Calendar is used to set when an exception is to be active, if calendar has been selected as the exception method.
Up to 10 periods or dates (calendar numbers) may be set for when the exception is to be active.



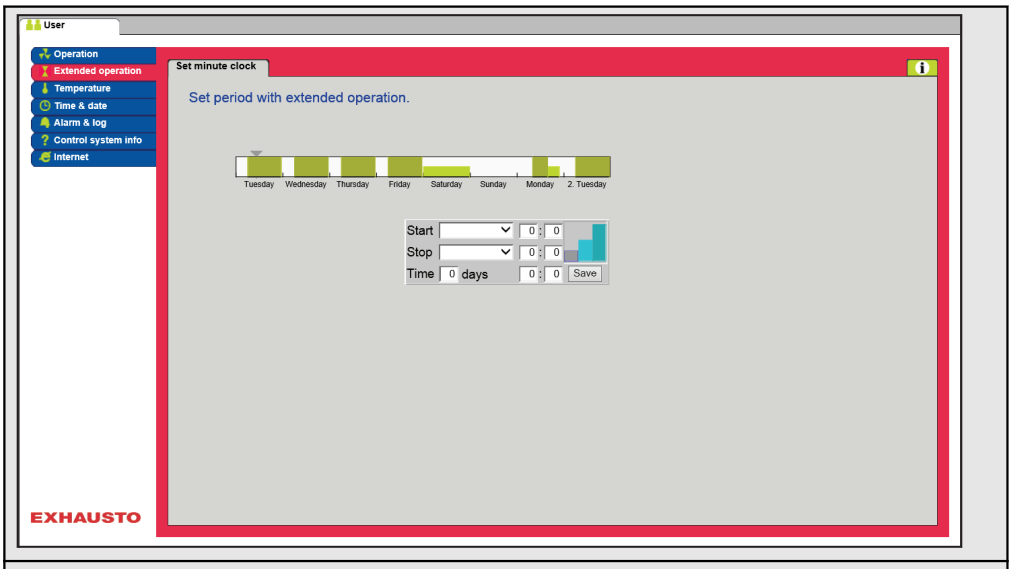
Select and set calendar number	
Not active	Calendar number has been deactivated and is not in use
Date	Calendar number is set to one particular date. ● Start date ● Start day of week **NB. It is important to set the day of the week correctly for the selected date.**
Date interval	Calendar number is active within the selected start/stop dates. ● Start date ● Stop date
Day of the week	The calendar number is active within the selected week in the selected month. ● Start date ● 1-7 = First week in the selected month ● 8-14 = Second week in the selected month ● 15-21 = Third week in the selected month ● 22-28 = Fourth week in the selected month ● 29-31 = Fifth week in the selected month ● Last 7 days = The last week in the selected month ● Every day = Every day in the selected month ● Start day of week The start day of the week indicates the day in the specified week on which the calendar number starts to be active
Press **Save** for each setup/calendar number before proceeding to the next number, in order to save the settings.	

Click on the symbol in the top right-hand corner for more information.

5.3 Extended operation

The parameter for the menu **Extended operation** is used to override the current operating mode in the DEX unit for a period of up to a week from the current time. When the period runs out, operation will automatically continue according to the weekly program or calendar.

5.3.1 Set minute clock



Set extended operation

Enter the values in the white fields or use the mouse/marker to select the period in the "bar".

Click on the symbol in the top right-hand corner for more information.

5.4 Temperature

The **Temperature** menu parameter is used to indicate the desired temperature which the DEX unit must maintain in the rooms served.

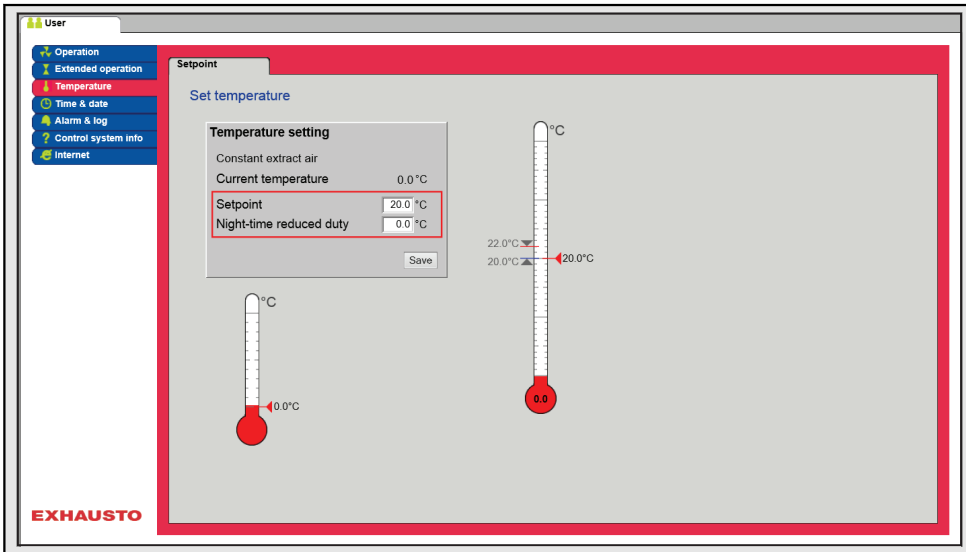
The temperature which the DEX unit attempts to maintain is regulated by the selected regulation mode. This is primarily done by regulation of heating/cooling coils or by recovery and by regulating the airflow.

5.4.1 Setpoint

Set the setpoint temperature for the selected regulation mode. Setpoint temperatures can be set for each of the four regulation modes:

- Constant supply air
- Constant extract air
- Constant room
- Constant supply/extract difference

NB: The desired regulation mode must be selected when setting the setpoint temperature. The regulation mode is selected under: **Installer > Temperature > Regulation.**

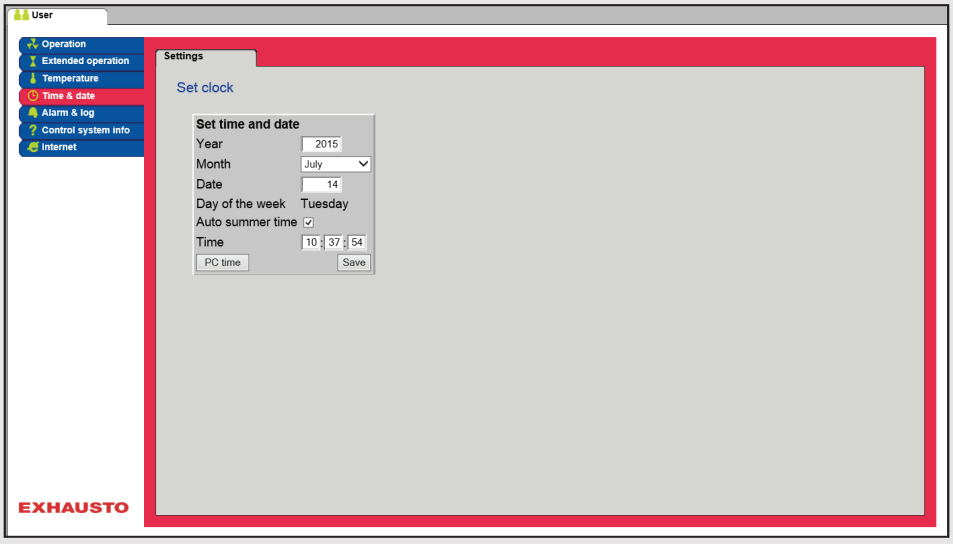


Set the temperature	
Setpoint	Set the setpoint for supply air temperature. Applies to the temperature regulations: ● Constant supply air ● Constant extract air ● Constant room
	Set the desired setpoint for differences between the supply air and extract air temperature. Applies to temperature regulation: ● Constant supply/extract difference
Night-time reduced duty	Set outdoor temperature for night-time reduced duty. Applies to the temperature regulations: ● Constant supply air ● Constant extract air ● Constant room
Night-time reduced duty is the number of degrees the EXcon control system allows the temperature setpoint to be raised/reduced by, before it starts to heat/cool to maintain the setpoint temperature. **NB!** Night-time reduced duty has no effect on: ● temperature regulation supply/extract difference ● **High** and **Medium** operating modes.	
Press **Save** to save the settings.	

5.5 Time and date

The parameters for the menus **Time and date** are used to set the control system clock. The clock is used for controlling the selected operating program and for logging alarms.

5.5.1 Settings



Set time and date	
Manual setting	• current year • current month • current date • select/deselect automatic summer/winter time changeover. • current time
Automatic configuration	• PC time: Retrieve current time and date from connected PC
Press **Save** to save the settings.	

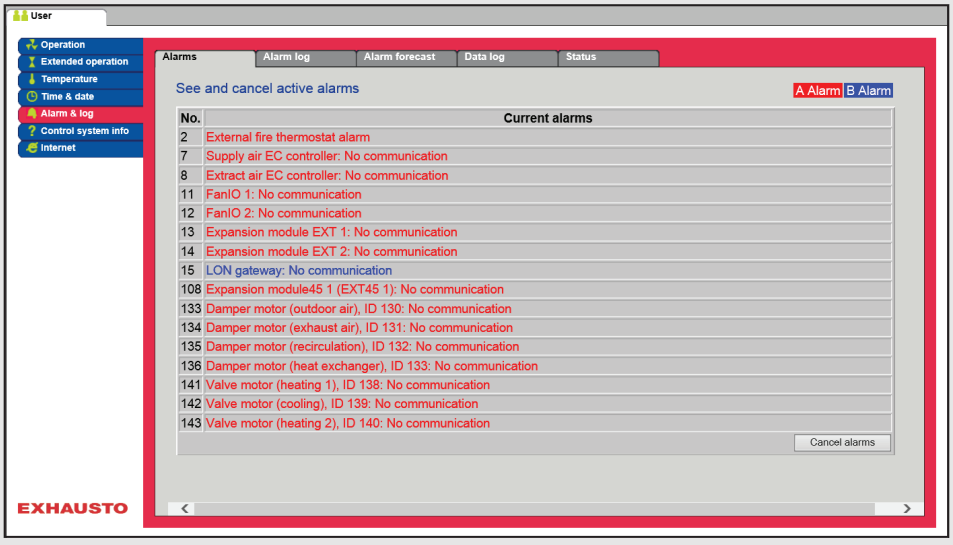
EXHAUSTO

5.6 Alarm and log

The parameters in the **Alarm and Log** menu are used to log alarms and operating data which have occurred since the last startup of the DEX unit. A log is kept of which alarms have occurred, which alarms are nearing their limit values and operating data history. The logged alarms can be reviewed via the web user interface or the HMI. If BACnet or Modbus are being used the logged alarms will also be available. Apart from current alarms, the online user interface also shows impending alarms and the logged operating data.

5.6.1 Alarms

Whether an alarm will activate a shutdown will depend on the type of alarm. A distinction is made between A alarms and B alarms, where A alarms activate a shutdown.

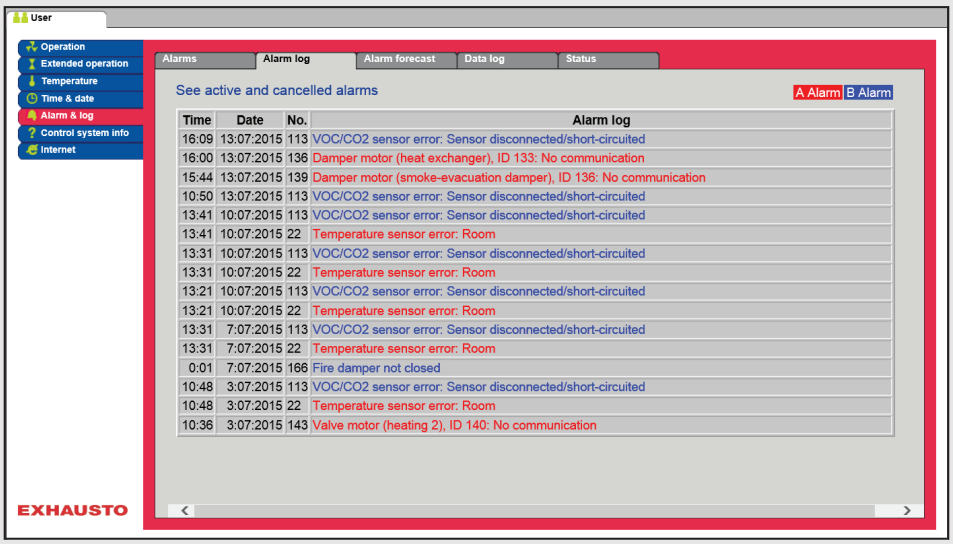


List of current alarms in the system.

- Red alarm text is A alarms
- Blue alarm text is B alarms

Press **Cancel alarms** to acknowledge alarms. The list and the active alarms which are still active are restored and displayed.

5.6.2 Alarm log

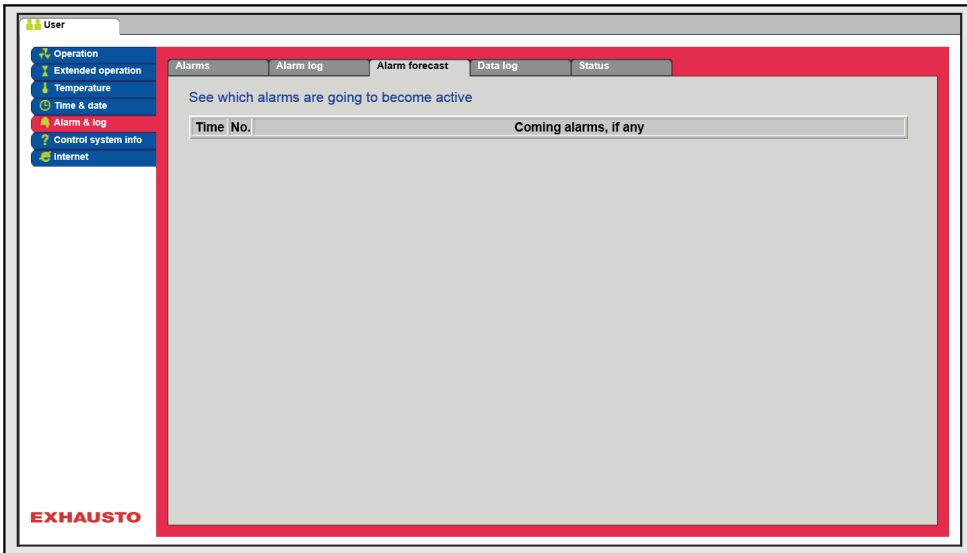


List of the last 16 alarms which have appeared in the system.

- Time and date of alarms is shown.

5.6.3 Alarm forecast

Alarms approaching the set limit values are shown in the **Alarm view** tab. If the limit values are exceeded, these alarms are moved to the list of current alarms and the alarm log is updated.

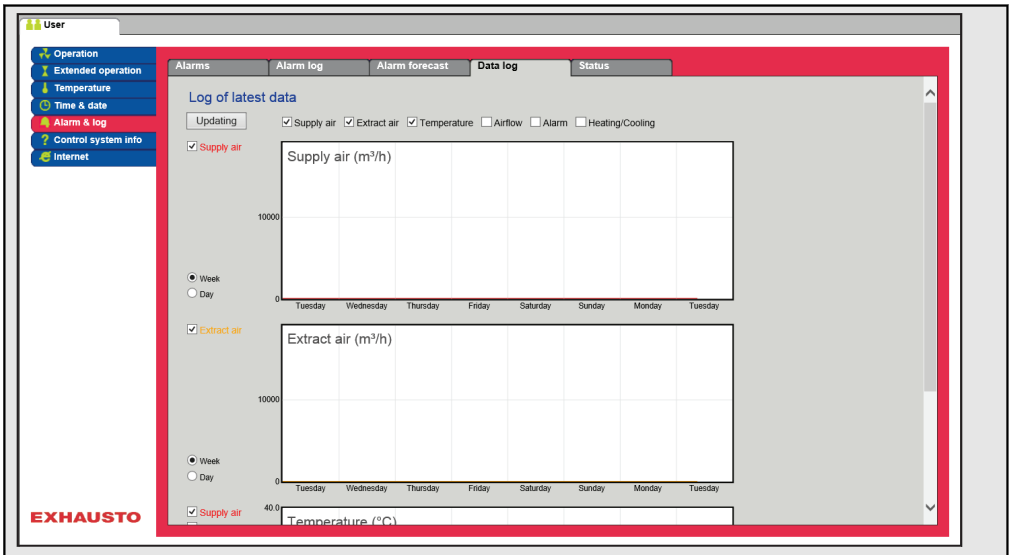


List of alarms which are approaching the set limit values

Example:
If the pressure drop over a filter goes over the set alarm value, the alarm will be delayed for the set time period and shown on this list.
If the pressure drop is still above the set value after the set time period, the alarm is deleted from this list and shown on the **Alarms** list.

For more information about A and B alarms, alarm limits and alarm delays, see the document **Alarm summary - EXcon control system**

5.6.4 Datalog



The DEX unit's values are stored in a log database for one week

The desired groups for display can be selected by ticking them off:

- Supply air (m^3/h) or (Pa) in case of pressure control
- Extract air (m^3/h) or (Pa) in case of pressure control
- Temperature (°C)
- Airflow (m^3/h)
- Active alarms (number)
- Heat/Recovery/Cooling (%)

Within each group the desired values for display can be selected.

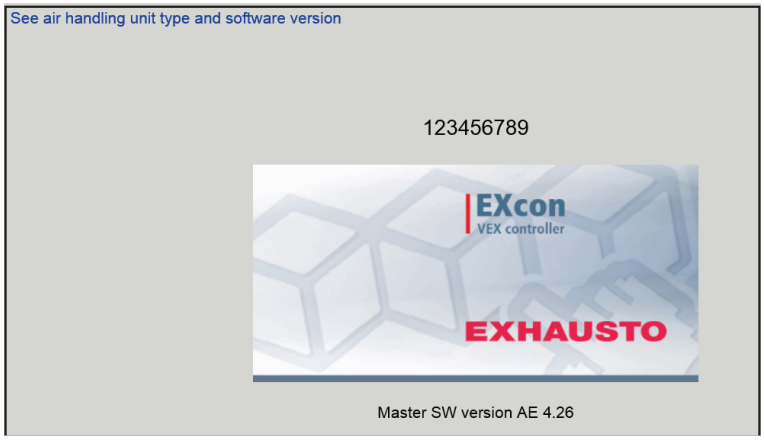
Select **Week** or **Day** to show log values from last week or the last 24 hours.

Click the display window with the left mouse key for enlarged scale display.

5.7 About the control system

The parameter in the **About the control system** menu contains information about which software version is controlling the DEX unit.

5.7.1 Version



- The name and software version number of the DEX unit control system are displayed.
- This must be quoted in connection with technical support.

The name of the unit is written in the 'Unit name' field under **Factory > Factory > Retrieve/Save**

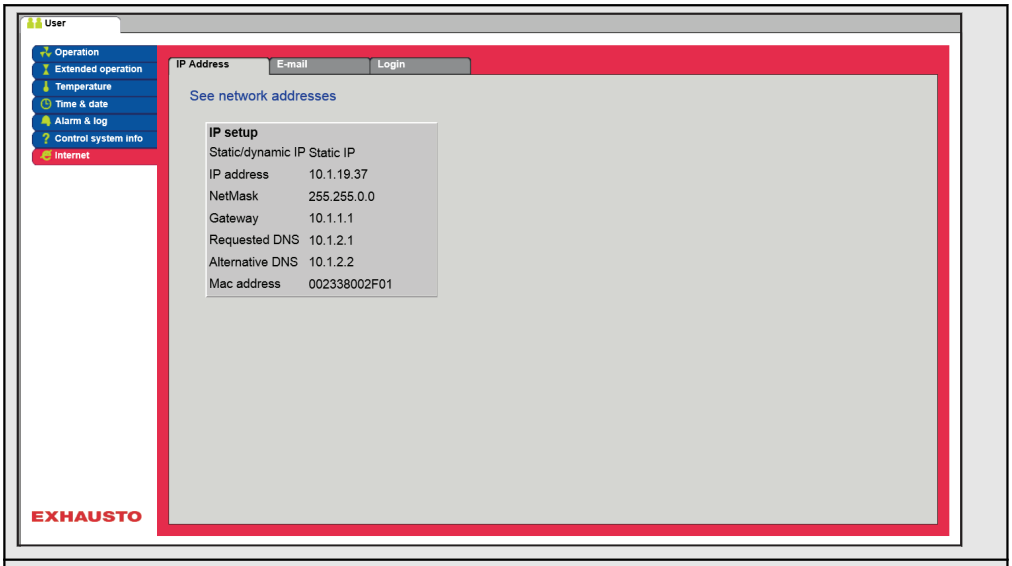
5.8 Internet

The parameters in the **Internet** menu make it possible to view the IP address set-up, set up email communication and to change the login.

5.8.1 IP Address

This parameter shows the current IP address and the settings used for communication with the DEX unit via a network.

- Changing this will require access at installer level on the online user interface.
- The parameter can be changed on the HMI Touch control panel with the LOGIN code.

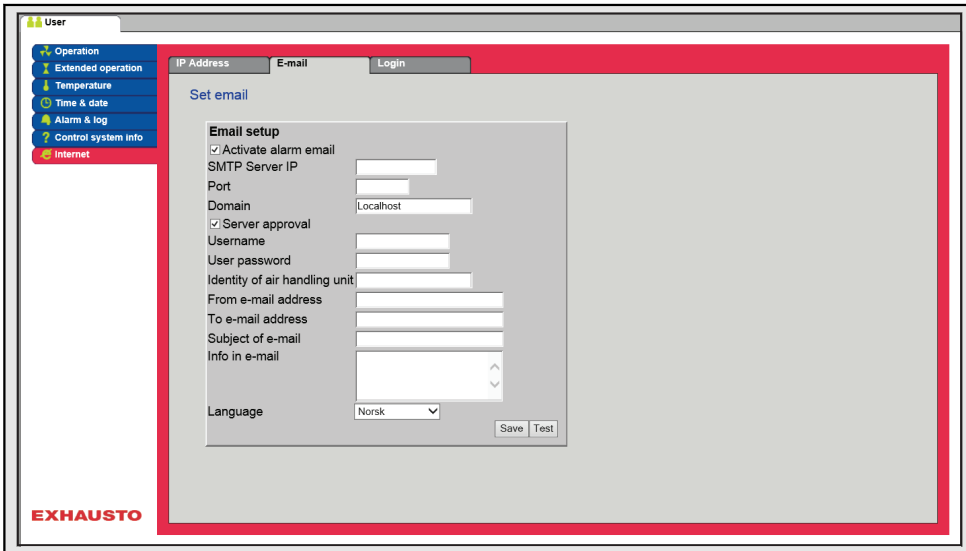


See network addresses - IP setup	
Static/Dynamic IP	Shows whether static or a dynamic IP address is used.
IP Address	Shows the IP address assigned to the DEX unit.
Netmask	Shows the subnet mask to which the DEX unit is linked.
Gateway	Shows the gateway address the DEX unit is using.
Requested DNS	Shows the primary name server the DEX unit is using.
Alternative DNS	Shows the secondary name server the DEX unit is using.
Mac Address	Shows the hardware address for the electronics in the DEX unit.

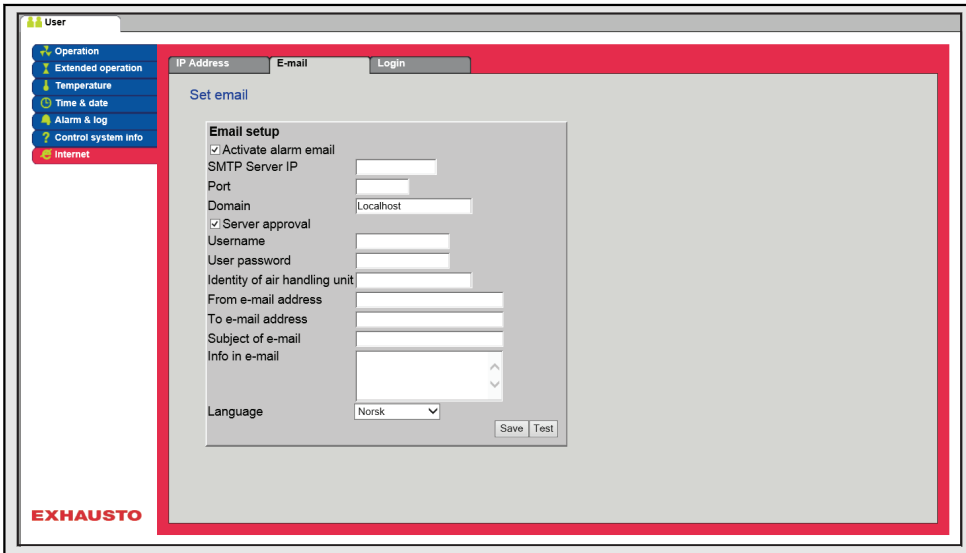
5.8.2 Email

This parameter is used for setting up email communication from the DEX unit.

- Email is sent automatically to the contact person if errors arise on the DEX unit.
- The parameter can be set only via the online user interface.



Settings	Values	Description
SMTP server IP	xxx.xxx.xxx.xxx	Indicate the address on the SMTP server for sending e-mails. The address can be obtained from the network administrator or provider. If access requires the address to be set up on the SMTP server, mark the **Server approval** field.
Port	Port 25 is standard	State port number for the SMTP server.
Domain	Optional	Enter the domain name for Excon control system.
Server godkendelse	To/From	Indicate whether approval is required for logging into the SMTP server.
User name	abc... [79 characters]	Enter user name for the DEX unit on the SMTP server.
User password	abc... [79 characters]	Enter password for SMTP server.
Unit ID	abc... [79 characters]	A description of the plant/DEX unit, e.g., its location.
From email adresse	abc@abc.abc [79 characters]	Enter sender's address.
To email address	abc@abc.abc abc1@abc1.abc1; .. [80 characters]	Enter recipients' addresses. Where several recipients are entered, these should be separated by semicolons (;).
Email subject	abc... [79 characters]	Enter email subject, e.g., **ventilation unit error in building 2**
Info in the email	abc... [364 characters]	Enter longer text message, describing, e.g., where the DEX unit is located, passwords, location of access keys, contact persons, telephone numbers, special circumstances, etc.

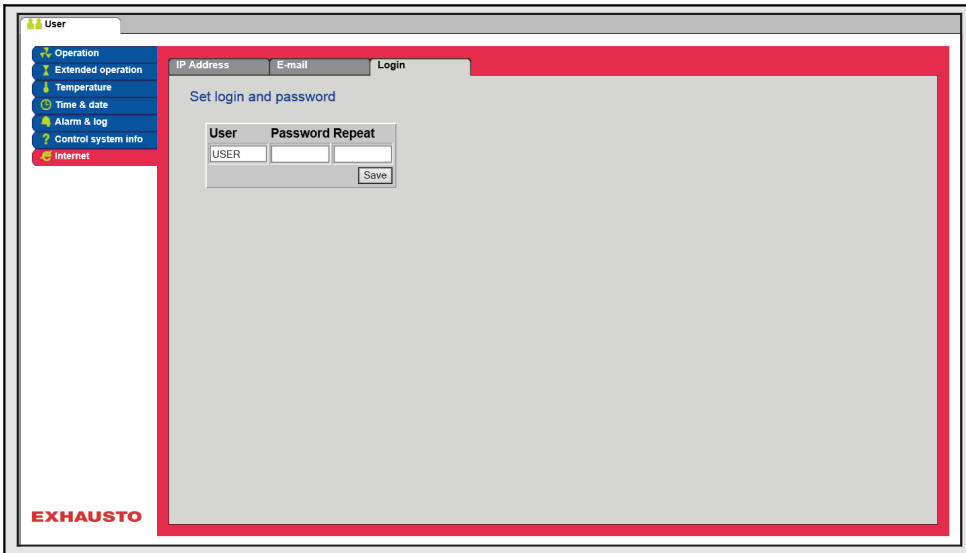


Settings	Values	Description
Language	Danish, English, German, Swedish, Norwegian, Spanish, French, Polish, Russian, Italian, Dutch, Finnish.	Select language of text in messages sent from the DEX unit.

Press **Save** to save the settings.
Press **Test** to test the email configuration or send a test email.

5.8.3 Login

This parameter is for changing the password used to log into the DEX unit.



Set login and password

- Enter a password of minimum eight characters and with small and capital letters, as well as numbers and special symbols.
- The parameter can be set only via the online user interface.

6. Installer settings

6.1 Installer parameters

When installing the DEX unit there are a number of parameters which need setting up to meet the required functions. These are parameters which the ordinary user seldom or never needs to know about. The installer should review and set these parameters at the time of installation.

The online user interface is the starting point for the parameters described.

NB: There is a difference between user interfaces in terms of which parameters are available and where they are located.

6.2 Regulation methods

6.2.1 Airflow regulation

Method	Description
Constant VOC/CO_2	The CO_2 content in the air is held constant at the set CO_2 volume (ppm). A minimum and maximum airflow are defined. A difference between the supply and extract airflow may be incorporated. Requires CO_2 sensor
Constant motor speed	The speed of the fans is controlled individually according to the entered setpoints.

6.2.2 Temperature regulation

Method	Description
Constant supply air temperature	The supply air temperature is held constant at the set value.
Constant extract air temperature	The extract air temperature is held constant at the set value. Minimum and maximum supply air temperatures can be set.
Constant extract/supply air difference	The supply air temperature is held constantly lower than the extract air temperature at the set temperature difference. Min. and maxi. supply air temperature can be configured.

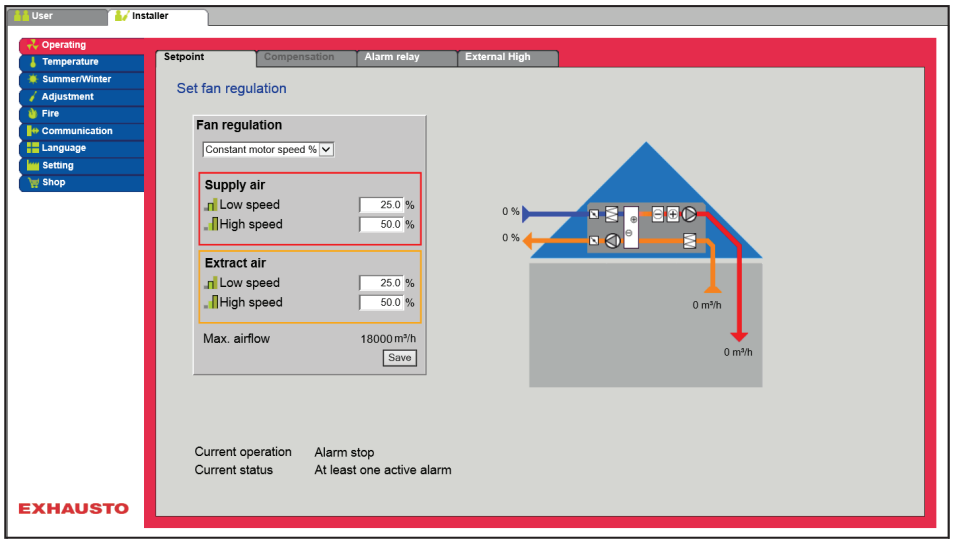
6.3 Operation

6.3.1 Setpoint - Fan control

This parameter in the **Operations** menu indicates the setpoints for regulating the fans. The online user interface shows the current operation and alarm status together with the settings. The current values for airflows generated by the DEX unit are also shown.

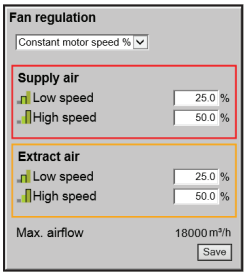
6.3.2 Constant motor speed %

- The speed of the fans is controlled individually according to the entered set-points for the revolutions per minute.



Prerequisite for set-up

- EXcon Modules > Configure > Settings: **Normal** must be selected.



Fan regulation (supply/extract air):

- Low speed: Set the desired setpoint for fan speed in % in case of at low speed
- High speed: Set the desired setpoint for fan speed in % in case of at high speed

Click on **Save** to save the settings.

6.3.3 Constant VOC/CO2 without airflow measurement

Constant VOC/CO2 without airflow measurement

VOC/CO2 regulation
The room's VOC/CO2 content is regulated by adjusting the airflow on the fans' speed.

- With increasing VOC/CO2 in the room, the speed of the fans and the airflow/air exchange towards the maximum set speed (%).
- In the event of falling VOC/CO2 in the room, the speed of the fans is reduced and the airflow/air exchange towards min. set speed (%).

Fan regulation Constant VOC/CO2

- The function is used to maintain a constant/maximum VOC/CO2 level in a room or extract air duct.
- At a VOC/CO2 level above the set value in the setpoint, the extraction will increase by modulation to the maximum speed.
- At a VOC/CO2 level below the set value in the setpoint, the extraction will be reduced by modulation to the minimum speed.
- The supply airflow follows the exhaust airflow with a set offset.

Supply air

- Enter the desired offset for supply airflow.

Extract air

Extract air speed	Choose the setpoint
Low speed	Set the desired setpoint for ppm level in extraction at 'Low' speed
Medium speed	Set the desired setpoint for ppm level in extraction at 'Medium' speed
High speed	Set the desired setpoint for ppm level in extraction at 'High' speed
Min. Speed	Setpoint for minimum speed on extract air fan [Set. range: 10% -> 50%]
Max. speed	Setpoint for maximum speed on exhaust air fan [Setting range: 10% -> 100%]

6.3.4 Electric heating coil without airflow measurement

Monitoring of the electric heating coil

To protect the electric heating coil against overheating and the consequent fire hazard, it is protected by two different fuse systems.

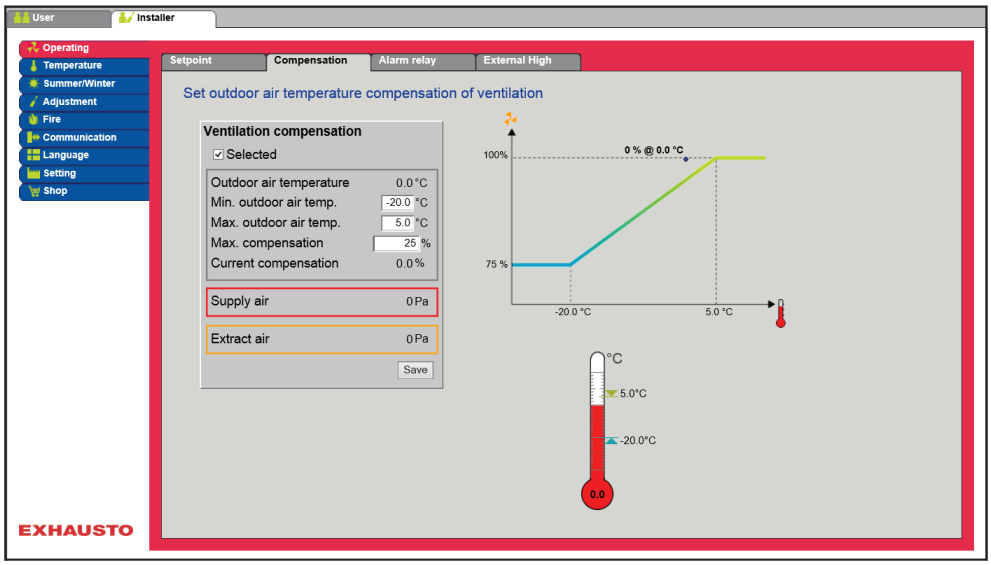
The following is a description of the two fuse systems.

Monitoring of the electric heating coil against overheating and a stuck contactor, i.e. it is connected even though it has received a cut-out signal. Overheating protection in the electric heating coil is connected in series with a closing contact on the contactor, and the serial connexion is connected to digital input 'Heating coil fault'. 'Electric heating coil – overheating alarm' is triggered if the input is open when electrical heating is connected (superheat*thermostat)*and 'Contactor hanging' is triggered if the input is closed when heating should have been disconnected. To ensure that there is air flow through the electric heating coil before power is applied, an airflow switch/pressure switch connected to a digital input 'All Electric heating batteries, airflow OK' is used.

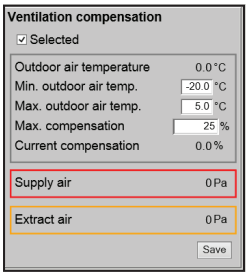
- Operation of electric heating coils will not be released as long that this input is not activated if there is no airflow measurement on the unit.

6.3.5 Compensation

This parameter in the **Operation** menu allows compensation for fan speed depending on the outdoor temperature.



- Where outdoor air temperature is falling, the fan speed may be lowered in accordance with the entered curve.
- The entered setpoint will be offset according to the entered compensated setpoint when the outdoor air temperature is within the set compensation curve.
- The outdoor air temperature is measured with an outdoor air temperature sensor or a sensor in the outdoor air intake.



Ventilation compensation:

- Min. outdoor air temperature: Set the outdoor temperature for full compensation
- Max. outdoor air temperature Set the outdoor temperature for start compensation setpoint for duct pressure at high speed
- Max. compensation: Maximum setpoint reduction as a % at minimum outdoor air temperature

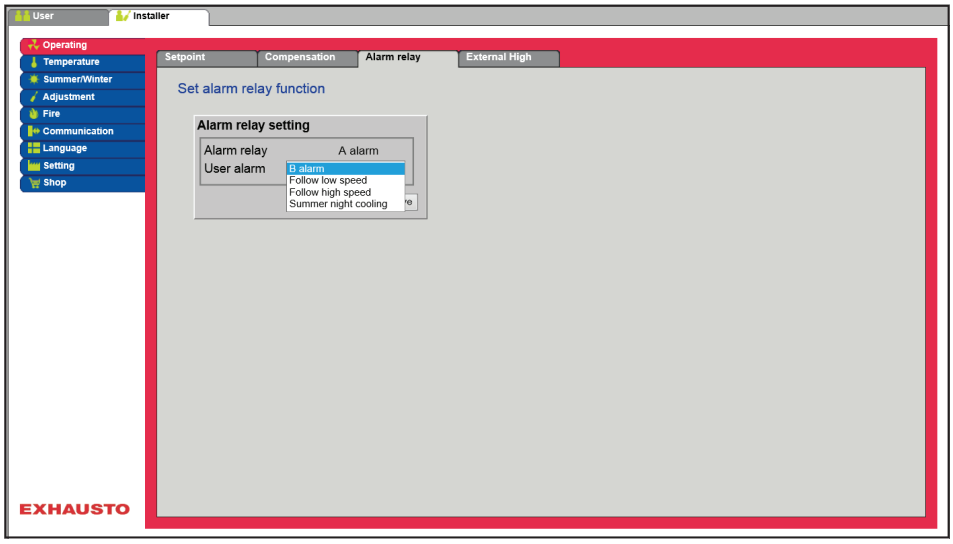
Press **Save** to save the settings.

6.3.6 Alarm relay

With this parameter in the **Operation** menu it is possible to select to which function the alarm relay **User Alarm** should be set. The EXcon system has two digital outputs of which one is always configured to follow the A-alarms.

Alarm relay functions

- In addition to alarms, alarm relay functions can also be used to monitor the operation of e.g. an extra fan.



Alarm relay setting

- The two digital outputs are configured under **EXcon Modules > Configure > Digital in/out.**

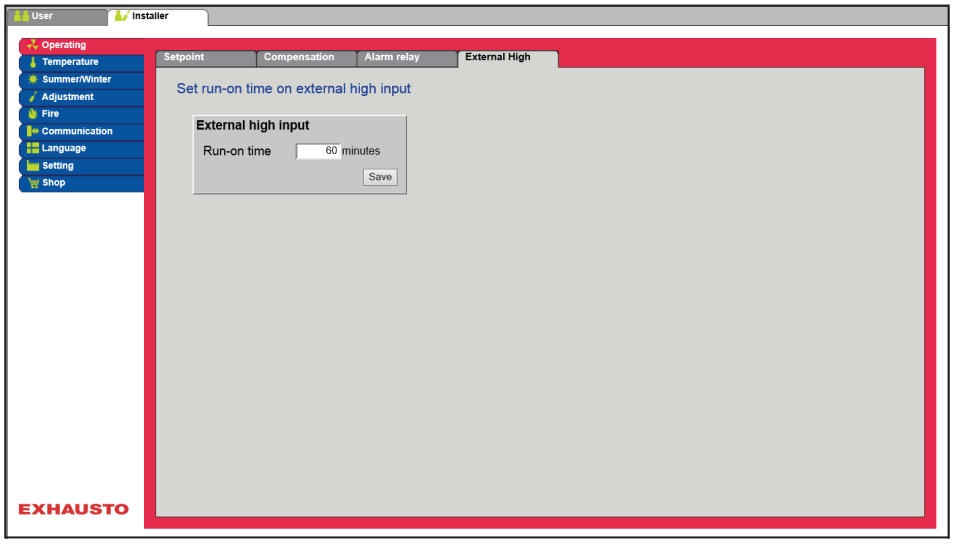
B Alarm	The digital output configured for the B alarm relay follows B alarms.
Follow low speed	The digital output configured for the B alarm relay follows low speed. The A alarm relay is activated by both A alarms and B alarms.
Follow high speed	The digital output configured for the B alarm relay follows high speed. The A alarm relay is activated by both A alarms and B alarms.
Summer night cooling	The digital output configured for the B alarm relay follows summer night cooling. The A alarm relay is activated by both A alarms and B alarms.

Press **Save** to save the settings.

6.3.7 External High

With this parameter in the **Operation** menu, It is possible to increase the fan speed temporarily for a limited period of time.

- If the DEX unit has stopped, activation of the digital input will start the DEX unit at high speed for the set period of time.
- If the DEX unit is operating at low speed, it will change to high speed for the set period of time.
- If the DEX unit is already at high speed in relation to the set weekly program, it will remain at high speed for the set time.
- A alarms always have a higher priority.



Prerequisite for set-up

- The digital input is configured to the function under: **EXcon Modules > Configure > Digital in/out** - **High speed**.

External high input

- Run-on time: Set the time that the DEX unit is to run at high speed.

Press **Save** to save the settings.

6.4 Temperature

6.4.1 Regulation

This parameter in the **Temperature** menu can be used for controlling and regulating the temperature. The temperature can be set to perform regulation according to the following operating modes:

- Constant supply air
- Constant extract air
- Constant room
- Constant supply air/extract air difference

External setpoint

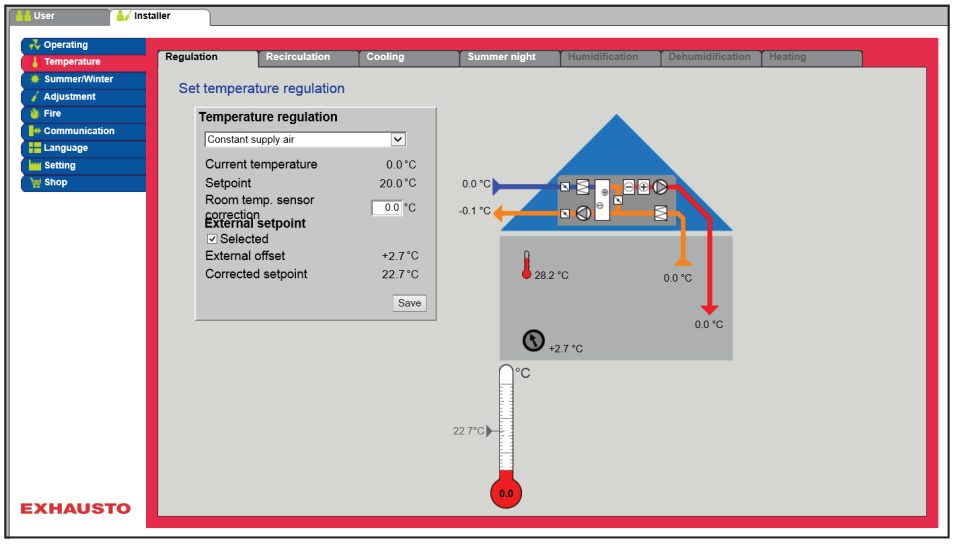
External setpoint allows the entered setpoint for the supply air temperature to be offset +/-5°C by means of a setpoint setter at an external location, e.g. in the room.

Mark in order to see:

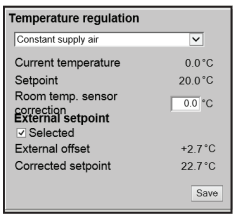
- Shown only when the **Temp. setpoint offset** input is configured under: **EXcon modules > Configure > Analogue in/out.**

NB! Cannot be selected in the regulation mode Constant supply/extract air difference.

Constant supply air



- Temperature is regulated according to constant supply air temperature, as measured by the sensor in the supply air duct.
- The setpoint for supply air temperature is set under:**User > Temperature > Set-point.**

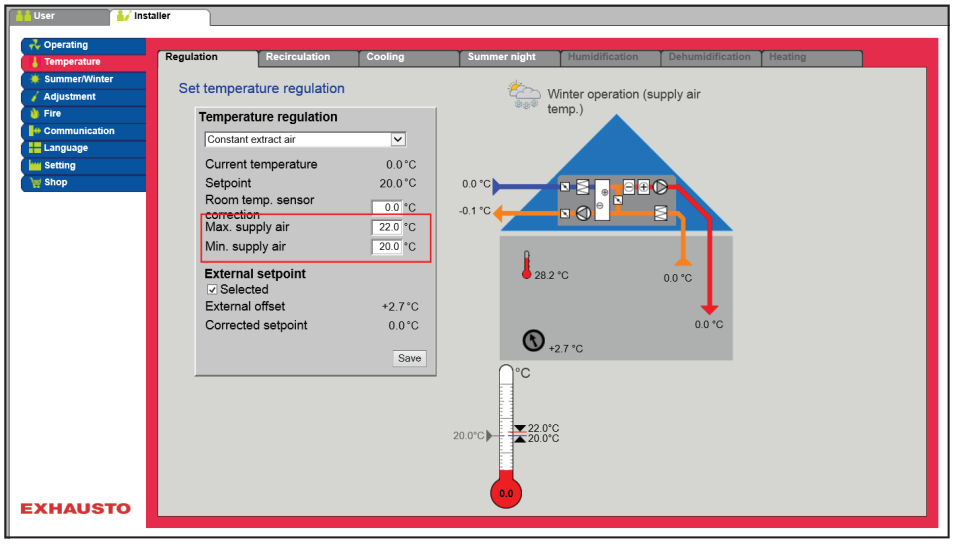


Temperature regulation:

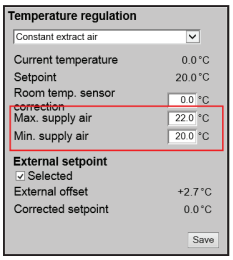
- Room temperature sensor correction: Set correction value for the room temperature sensor Settings range +/-3°C.

Click on **Save** to save the settings.

Constant extract air



- Temperature is regulated according to constant extract air temperature, as measured by the sensor in the extract air duct.
- The setpoint for supply air temperature is set under:**User > Temperature > Set-point.**

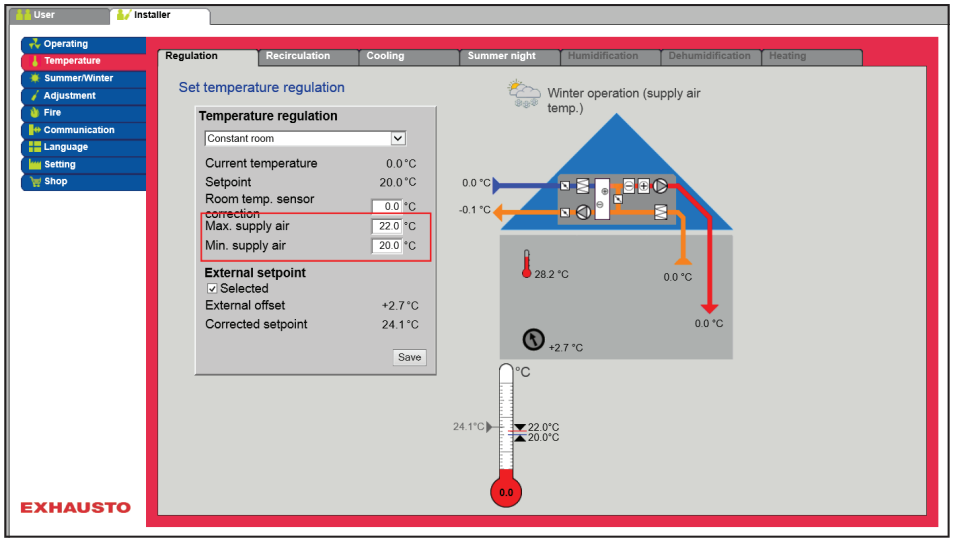


Temperature regulation:

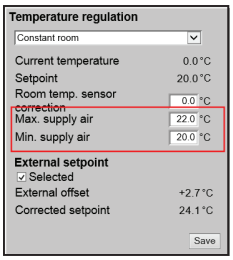
- Room temperature sensor correction: Set correction value for the room temperature sensor Settings range +/-3°C.
- Max. supply air: Set max. permitted temperature for supply air
- Min. supply air: Set min. permitted temperature for supply air

Click on **Save** to save the settings.

Constant room



- Temperature is regulated according to constant room temperature, as measured by the sensor in the room.
- The setpoint for supply air temperature is set under:**User > Temperature > Setpoint.**

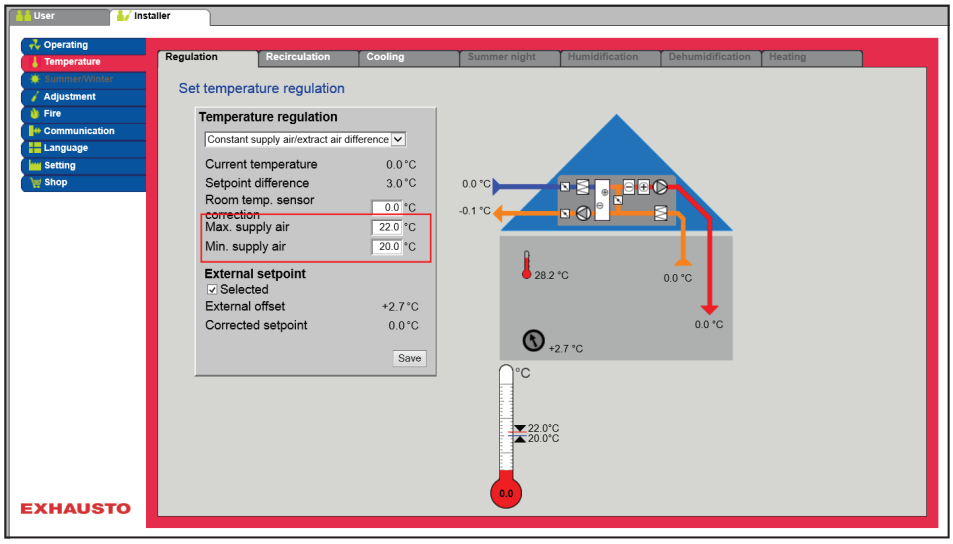


Temperature regulation:

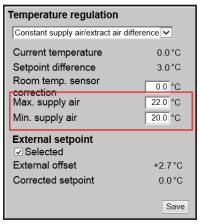
- Room temperature sensor correction: Set correction value for the room temperature sensor Settings range +/-3°C.
- Max. supply air: Set max. permitted temperature for supply air
- Min. supply air: Set min. permitted temperature for supply air

Click on **Save** to save the settings.

Constant supply/extract difference



- The temperature is regulated according to the difference between the supply air temperature and the extract air temperature.



Temperature regulation:

- Room temperature sensor correction: Set correction value for the room temperature sensor Settings range +/-3°C.
- Max. supply air: Set max. permitted temperature for supply air
- Min. supply air: Set min. permitted temperature for supply air

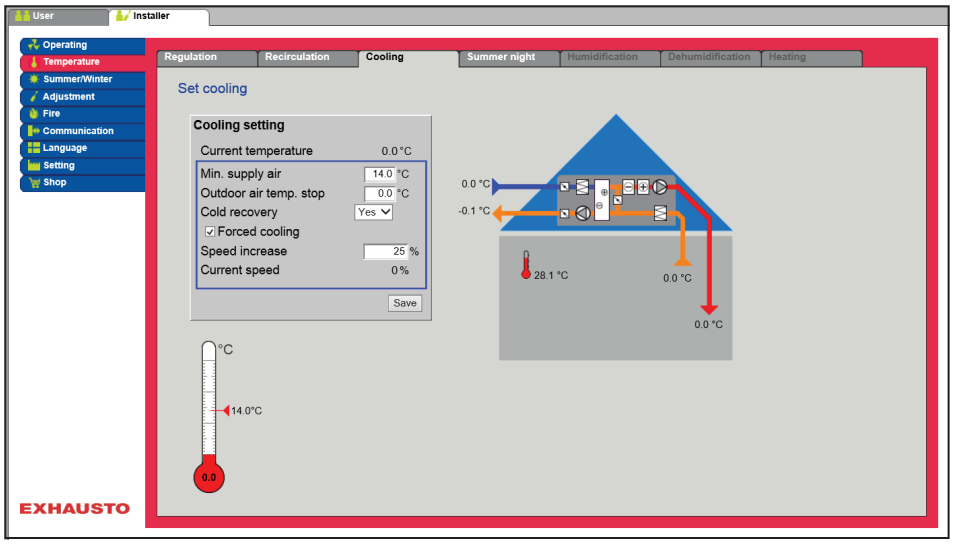
Press **Save** to save the settings.

External outdoor air temperature sensor

The external outside air temperature sensor is used in all functions where the outside air temperature is included in the EXcon control system and can replace the channel mounted outside air temperature sensor.
The external outside air temperature must be configured under: **EXcon modules > Settings > Temperature/Pressure > Outdoor air temperature** (external sensor).
To achieve the best measuring results, the sensor should be mounted on a north-facing wall.

6.4.2 Cooling

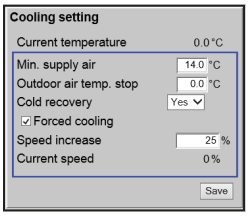
With this parameter in the **Temperature** menu, it is ensured that active cooling is only used under certain pre-set conditions.



Pre-conditions for setting

One of the following cooling types must be installed and configured:

- **DX cooling**
- **Water cooling**
- **Combi coil (change-over)**



Cooling setting:

- **Minimum supply air** : Setpoint for the minimum supply air temperature when cooling is active.
- **Outdoor temperature stop**: When outdoor temperature is below the entered setpoint, cooling stops.
- **Cooling recovery** Select Yes/No
- **Forced cooling**: When this option is selected, the airflow will be increased when cooling is active.
- **Speed increase**: The fan speed will increase by the entered percentage when cooling is active. Max. airflow has higher priority.

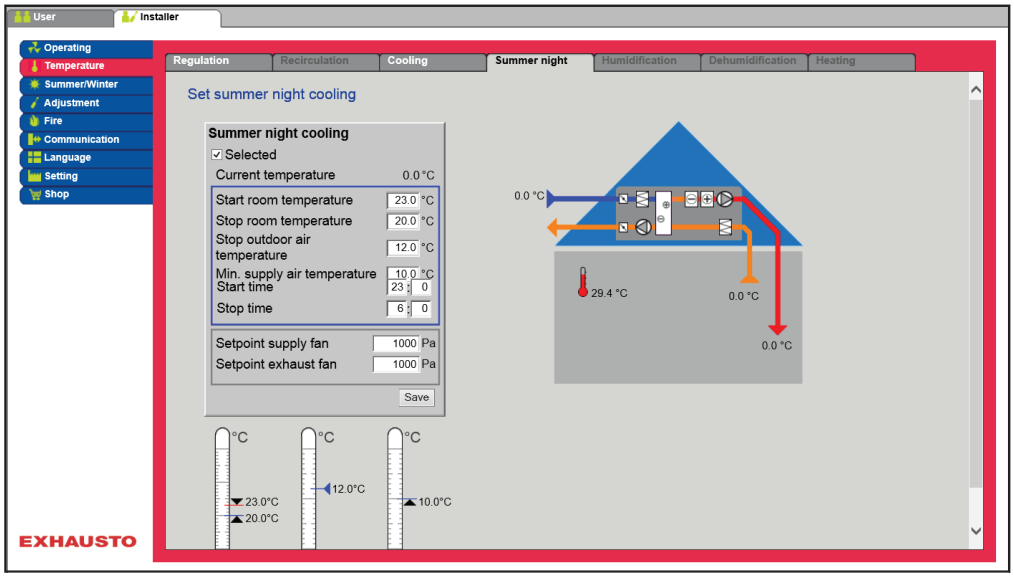
Press **Save** to save the settings.

6.4.3 Summer night (Free cooling)

With this parameter in the **Temperature** menu, a room may be cooled down with outdoor air without use of active cooling.

The **Summer night** function may only be selected if an outdoor air temperature sensor is mounted and configured and for the following temperature regulation modes:

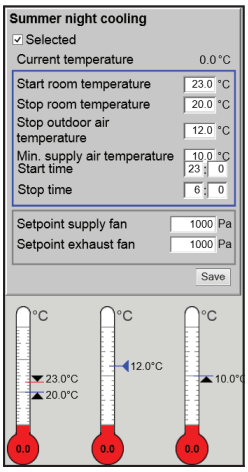
- Constant supply air
- Constant extract air
- Constant room



Pre-conditions

Summer night cooling is activated only if all the following settings are met:

- If there has been no heat from the heating coil for more than 60 minutes in total over the latest time period between 12.00 and 23.59
- Outdoor air temperature is above the set value **Outdoor stop temperature**
- Room temperature is above the set value **Start room temperature** .
- Outdoor air temperature must at least be >2 °C lower than the room temperature.



Summer night cooling:

- Start room temperature: Summer night cooling starts at a higher room temperature than the set value **Start room temperature**
- Stop room temperature: Summer night cooling stops at a lower room temperature than the set value **Stop room temperature**
- Stop outdoor air temperature: Summer night cooling stops at a lower outdoor air temperature than **Outdoor stop temperature**
- Min. supply air: Set the minimum temperature of the supply air when summer night cooling is active.

  The heat exchanger is used to ensure that minimum supply air can be maintained.
- Start time: Set the earliest time that summer night cooling may start. **Settings range: Hours 20.00 – 02.00**
- Stop time: Set the latest time that summer night cooling may stop. **Settings range: Hours 03.00 – 08.00**
- Setpoint supply air fan: Set the setpoint for supply air fan during summer night cooling
- Setpoint extract air fan: Set the setpoint for the extract air fan during summer night cooling

Click on **Save** to save the settings.

Summer night cooling with temperature sensor

When unit is configured with a room temperature sensor, it will continuously monitor the room temperature and start the DEX unit as needed within the set **Start/ Stop time**.

Summer night cooling without temperature sensor

If the unit is not configured with a room sensor, but only with a temperature sensor for extract air, the DEX unit will start up at the set **Start time.** The air handling unit will be in operation for 10 minutes when the current room/extract air temperature is measured.

If the conditions for summer night cooling are satisfied, the DEX unit will remain in operation until the stop conditions are satisfied.

If the conditions for summer night cooling are not satisfied, the DEX unit will stop after 10 minutes of operation. This start up is only done once, and occurs at the set **Start time**.

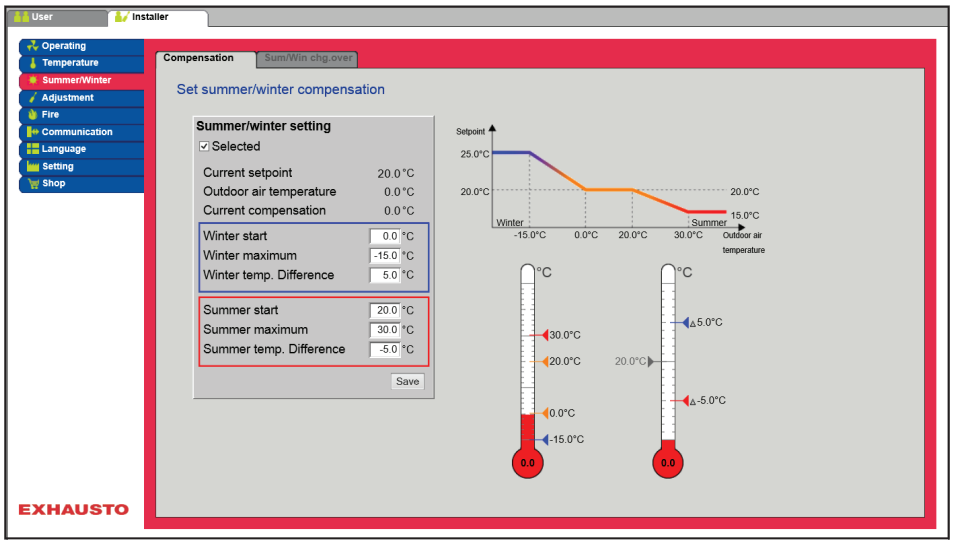
6.5 Summer/Winter

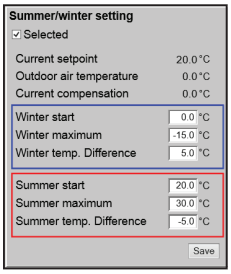
6.5.1 Compensation

With this parameter in the **Summer/winter** menu, it is possible for the selected temperature setpoint for supply air to be offset in relation to the outdoor temperature in summer and/or winter.

The function **Compensation** may only be selected with the following temperature regulation modes:

- Constant supply air
- Constant extract air
- Constant room





Summer/winter setting:

- **Summer/winter setting:** Select whether compensation is to be active by entering a tick.
- **Winter start**: Set the outdoor air temperature for when the winter compensation must begin.
- **Winter maximum**: Set the outdoor air temperature for when the winter compensation must be at maximum.
- **Winter temp. difference**: Set the number of degrees the setpoint temperature for supply air is increased in case of maximum winter compensation.
- **Summer start :** Set the outdoor air temperature for when the summer compensation must begin.
- **Summer maximum :** Set the outdoor air temperature for when the summer compensation must be at maximum.

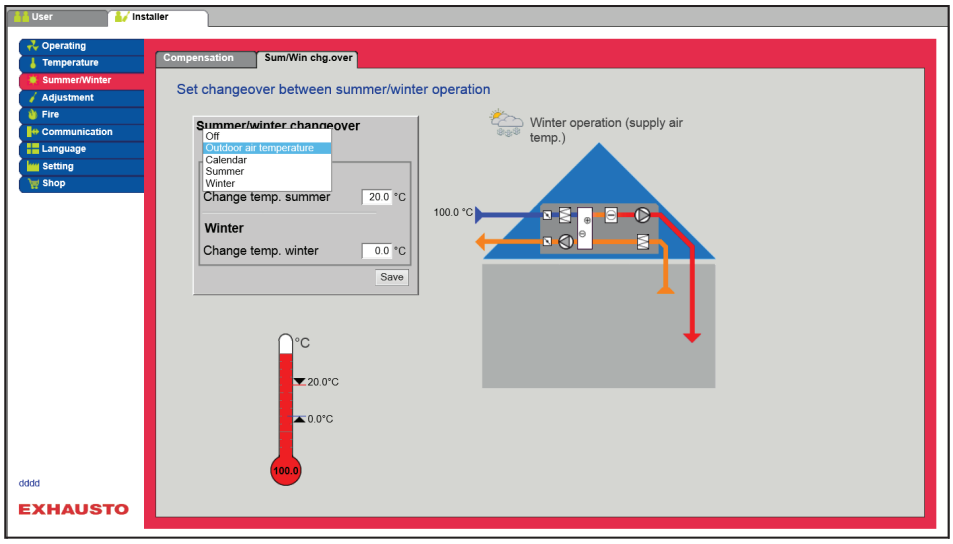
Press **Save** to save the settings.

6.5.2 Summer/winter changeover

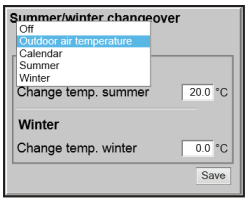
With this parameter in the **Summer/winter** menu, it is possible to select automatic switching between different operating modes depending on the outside air temperature, or according to the calendar.

The function **Summer/winter changeover** may only be selected with the following temperature regulation modes:

- Constant extract air
- Constant room



- The regulation mode switch between constant room temperature during winter operation and constant supply air temperature during summer operation.



Summer/winter changeover:

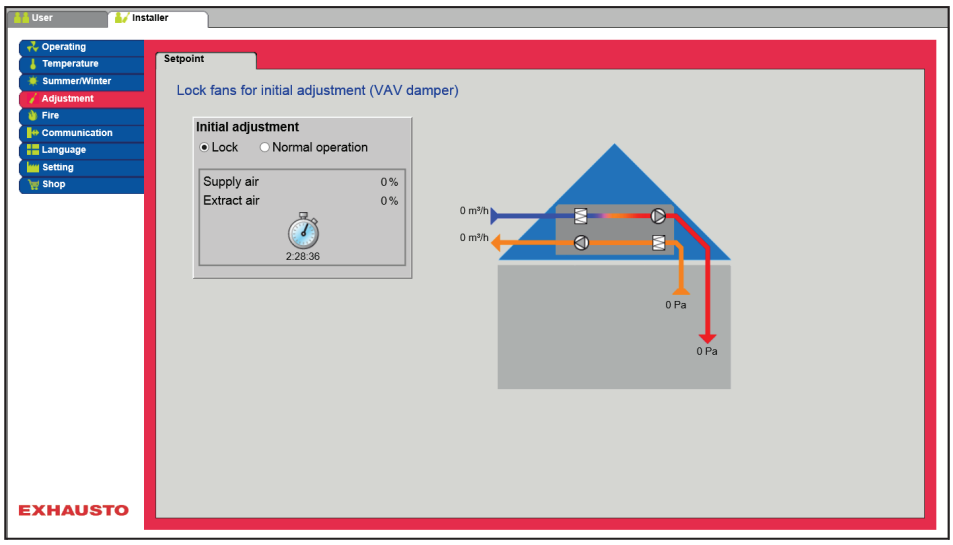
- **From :** No changeover between operating modes
- **Outdoor temperature**: speed: Set the desired setpoint for duct pressure at high speed
  - **Summer:** Regulation mode
  - **Winter:** Regulation mode
- **Calendar**: The regulation form changes between summer and winter operation in accordance with the set dates in the calendar.
- **Summer:** Constant summer operation (Room temperature)
- **Winter:** Constant winter operation (Supply air temperature)

Press **Save** to save the settings.

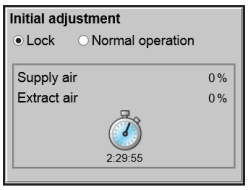
6.6 Initial adjustment

6.6.1 Setpoint

With this parameter in the **Adjustment** menu, it is possible to lock the fan/airflow during regulation work in connection with VAV installations.



- The speed is locked at the values entered under the **Fire** tab.



Initial adjustment:

- When selecting **Lock**, time limits can be selected by clicking the clock.
- The time can be adjusted between 2½ and 8 hours.
- The function is automatically cancelled when the time expires and the DEX unit returns to normal operation.

Safety: Frost protection of the heating coil is active – ordinary temperature regulation is not active.

6.7 Fire

6.7.1 Ventilation

This parameter in the **Fire** menu is a function used in case of fire alarm, e.g. from a central fire alarm unit (ABA) or smoke detectors.
The function can also be used for smoke evacuation and fireman's stop, if a 3-position selector is installed and configured.

Fire stop (fireman's stop)

The function is used in case of fire e.g. emergency stop or smoke detectors in the outdoor air duct.

Prerequisite for set-up

- EXcon Modules > Configure > Digital in/out: **Fire stop** must be configured.

When the input is activated/opened:

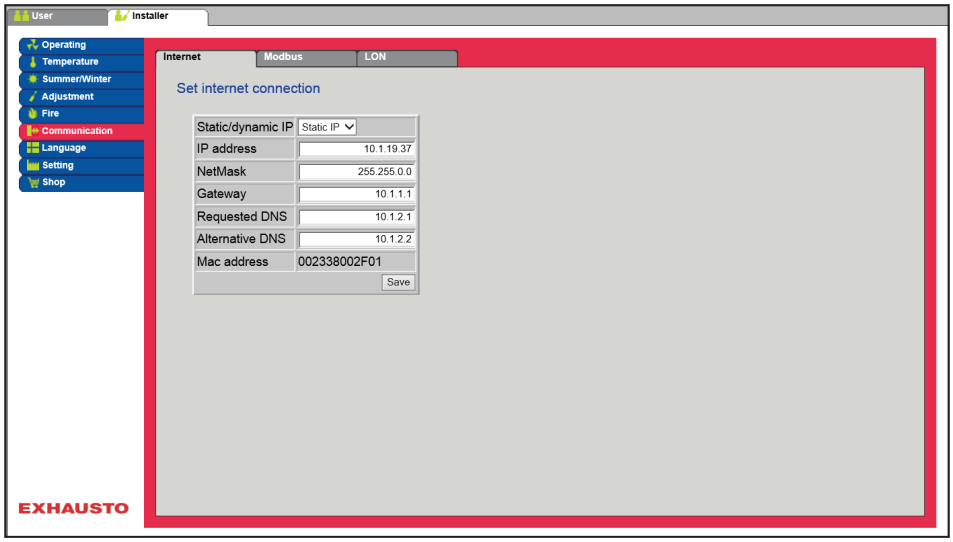
- the DEX unit stops.
- Any overrides and operating modes are cancelled.
- Heat recovery stops.
- No alarms are activated.
- If the DEX unit is in the fire damper test, this test stops.
- HMI and web user interface notify the **Current status**: **Ekstern brandstop**.

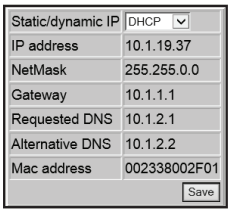
6.8 Communication

Internet - Modbus

The parameters in the **Communication** menu are used to set the Internet connection and external connection of Modbus or BACnet.

6.8.1 Internet

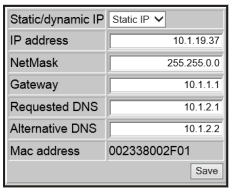




Internet connection DHCP

- Select DHCP. The IP address is allocated by the DHCP server on the local network or from the Internet.

Click on **Save** to save the settings.



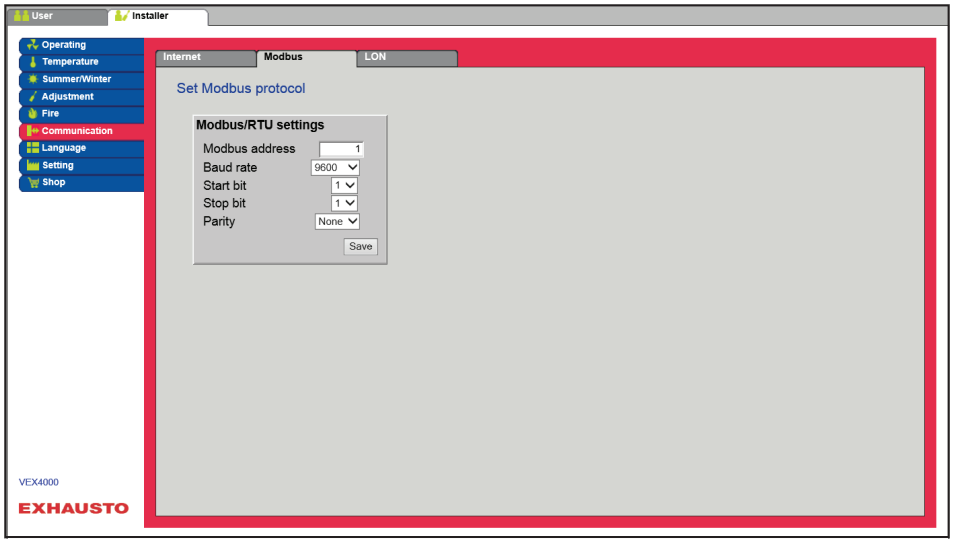
Internet connection Static

The installer will indicate the following communication parameters:

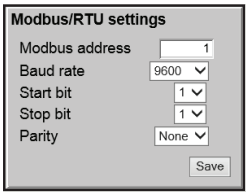
- IP address
- Netmask
- Gateway
- Requested DNS
- Alternative DNS

Click on **Save** to save the settings.

6.8.2 Modbus



- Settings for external Modbus RTU.
- Modbus RTU for external connection of Modbus for e.g. BMS unit.

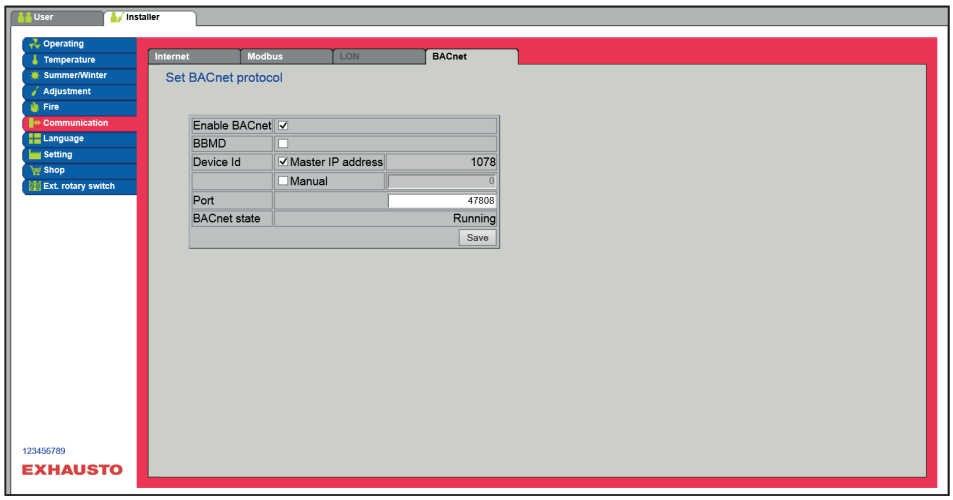


Set Modbus/RTU

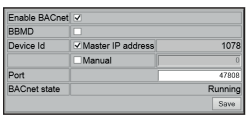
- Modbus address
- Baud rate **(9600, 19200, 38400 baud)**
- Start bit – Settings range: **1**
- Stop bit – Settings range: **1** or **2**
- Parity – Settings range: **None - Even - Odd**

Press **Save** to save the settings.

6.8.3 BACnet



- BACnet TCP/IP for external connection of BACnet to e.g. BMS/CTS systems.



Set BACnet TCP/IP

- Activate BACnet (Factory setting is "Active")
- Unit ID
  - Master IP address: The BACnet Object Identifier is formed from the Master IP address (see the BACnet protocol)
  - Manual setting of the BACnet Object Identifier
- Port – Setting of the BACnet Server port

Press **Save** to save the settings.

6.9 Language

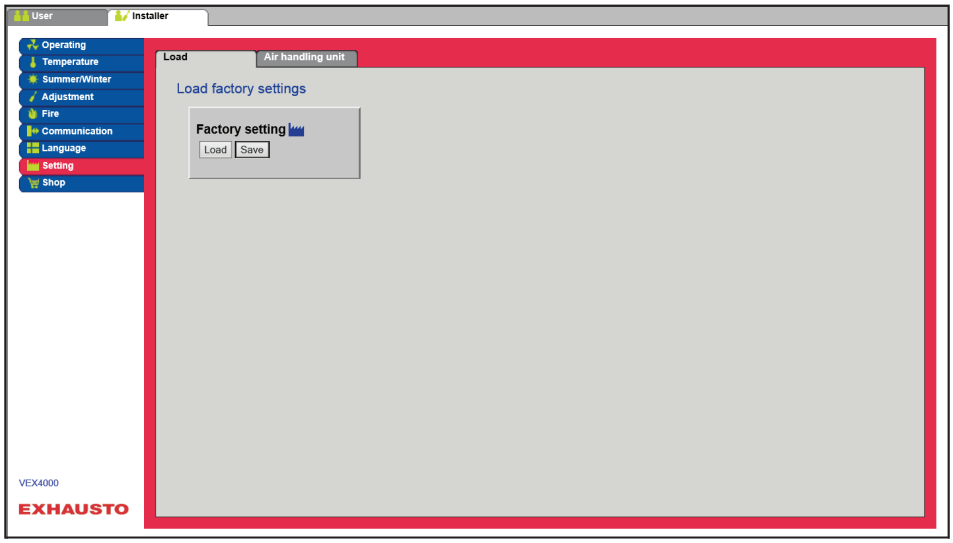
6.9.1 Set

In the **Language** menu the required language for the web user interface is selected.

Select the required language

6.10 Configuration

6.10.1 Download



- The factory settings input with the **Download** button are the factory settings saved under **EXcon modules > Factory> Download/Save**.

Download

With the **Retrieve** button, it is possible to download/reload the last saved settings on the control system.

Save

The **Save** button can be used to save the user and installer settings that have been defined in addition to the original EXHAUSTO factory settings
The settings are saved as a .txt file and can be saved on a hard disk, a server, a network, a USB stick or a standard SD card. The settings are also saved on the Master.

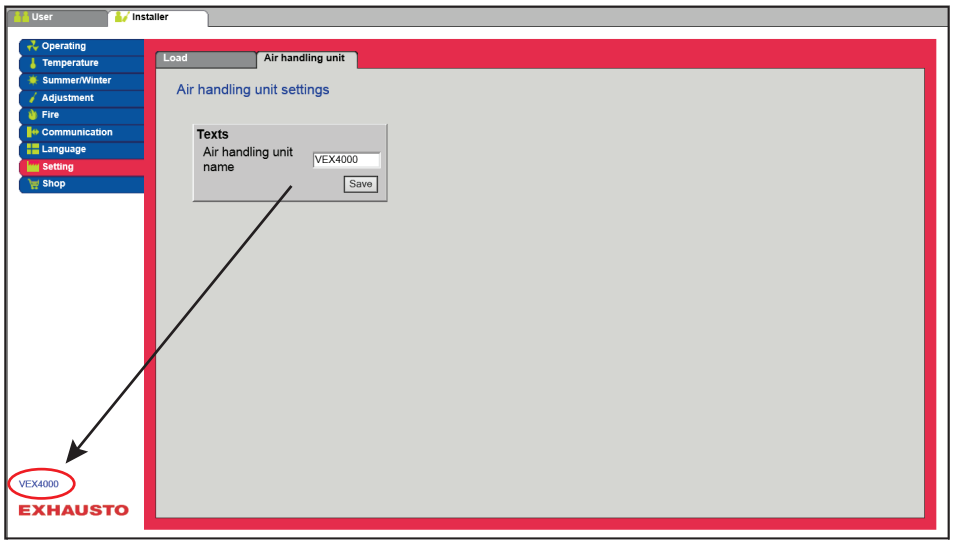
If the settings are saved on a standard SD card, it is possible to copy the saved settings to another Master by using the SD card reader.

To copy settings to a Master with an SD card, it is important that only this settings file is present on the SD card (the user_factory_settings.txt name may be used, but it must be a file with a .txt extension).

Only one .txt file may be present on the SD card. If updating programs (xxx.tar.gz and xxx.crc) are also present, these are the files which are copied to EXcon Master.

6.10.2 Air handling unit

With this parameter in the **Settings** menu, it is possible to name the unit/DEX unit.



- Enter the unit name in the white field and press **Save**.
- The selected name will appear in the bottom left-hand corner and in the login screen.

7. Service settings

7.1 Service parameters

During service on the DEX unit, it is possible to override, adjust and set up components, and see connections/plug connections on the Master, Fan IO and extension modules. The online user interface is the starting point for the parameters described.

NB: There is a difference between user interfaces in terms of which parameters are available and where they are located.

7.1.1 IMPORTANT when servicing

⚠ **Do not open the service doors before the power has been disconnected at the isolation switch (OFF position), and the fans have stopped.**

NB: ⚠ **Before opening the doors, ensure that the DEX unit has stopped operating for at least five minutes, because the fans have run-on time.**

7.2 Air handling unit

Override

The **Override** function can be used to control the components for a given period of time. This can be used during service and maintenance tasks. For the function to be used, there may not be active alarms on the DEX unit.

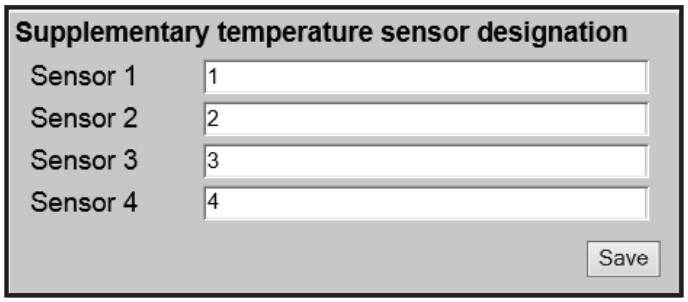
Override:

- Click on the component that must be overridden
- Mark **Override** to change from normal operation.
- Enter the value of the parameter that the component must be overridden with.
- Click on **Override** to activate/save the entered value.
- Click on the clock to set up the period of time for which the override must be active. (The clock begins with a period of time of 1 hour and it is increased with an interval of 1 hour for each click)

Override is terminated automatically when the time expires or by setting the control mode back to **Normal**.

Naming of additional temperature sensors

The additional sensors can be freely named with text/numbers. The name that is indicated here is also the name that appears on the status side under **Service > Unit > Status** and at the location under which the sensor inputs are configured: **EXcon modules > Configure > Temperature/Pressure**



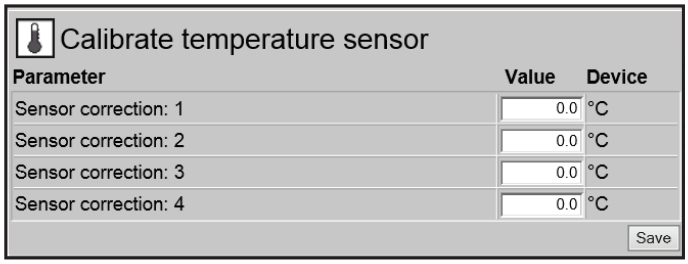
- Name the configured additional temperature sensors.

Press **Save** to save the settings.

Temperature sensor correction

Prerequisite for calibration

- EXcon modules > Configure > Temperature/Pressure: The sensors must be configured before they can be corrected.



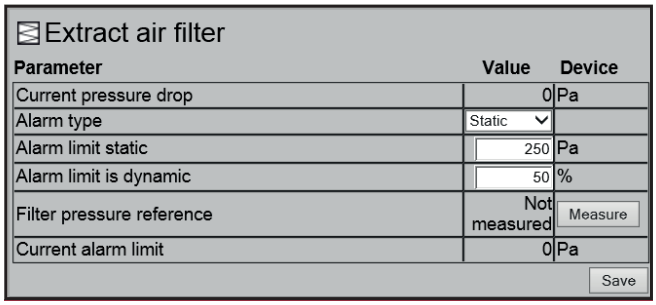
- Correct each of the temperature sensors individually. Settings range: -**3.5** to **+3.5 °C**

Press **Save** to save the settings.

7.2.1 Filters

Outdoor/extract air filter

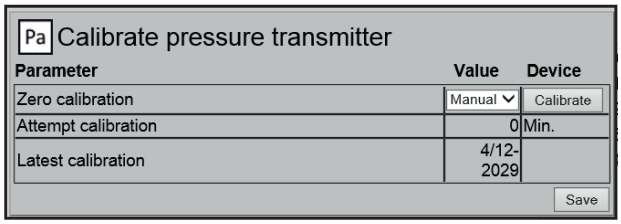
The settings below for filter monitoring with pressure transmitters are valid for both extract air and supply air filters, which can be set individually.



- **Alarm type:** Select alarm type
  - **Static**: A filter alarm (B-alarm) is given if the alarm limit that has been set in the **Alarm limit, static** is exceeded.
  - **Dynamic**: A filter alarm (B alarm) is given if the loss of pressure over the filter exceeds the set value in the **larm limit, dynamic** This is in relation to the measurement on a new filter.
- **Alarm limit, static:** Set the static alarm limit for allowed pressure loss over the filter. Alarm type must be set to **Static**.
- **Filter pressure reference:** During start-up of a new unit, or after change of filter, a new measurement of the filter must be conducted.

Press **Save** to save the settings.

7.2.2 Calibrate pressure transmitter



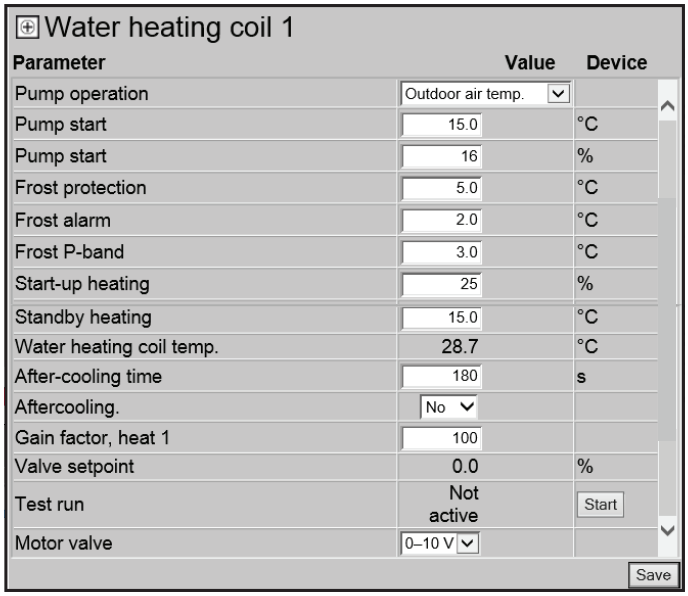
- **Zero calibration:**
  - **Manual**: Set to **Manual** and activate the Calibrate button. The unit stops temporarily and the zero calibration is performed.
  - **Auto:** Zero calibration is carried out automatically every time the unit is stopped.

Press **Save** to save the settings.

7.2.3 Heating

Water heating coil 1

The water heating coil is used to increase the temperature of the supply air if the recovered heat does not supply enough.



- **Pump operation:**
  - **Constant:** The pump runs constantly when there is tension on EXcon Master.
  - **Auto:** Pump operates with heating requirement
  - **Outdoor air temperature:** The pump runs when the outside air temperature falls **below** the set value in **Pump start** or when there is a heat requirement.
  - **Heating requirement:** The pump starts when the motor valve is opened more than the set value.

Pump motioning: If the pump has not been started for the last 24 hours, it will become motioned in 1 minute regardless of the heating requirement. This is to combat the pump getting stuck.

- **Pump start:** Set temperature for the pump to start. The pump starts at outdoor air temperatures below the set value. During pump operation, **Outdoor air temperature** must be selected.
- **Pump start:** Set values for the pump to start. The pump starts when the motor valve is opened more than the set percentage rate. During pump operation, **Heating requirement** must be selected.
- **Frost protection:** Set the temperature on return water from the heating coil where the motor valve must be 100% open. Opening of the motor valve begins when the temperature comes below the set value +**Frost P-band**.
- **Frost alarm:** Sets at which temperature a frost alarm must be given. Lower temperatures on return water from the heating coil than set value trigger the frost alarm.
- **Frost P band:** Set the temperature on the P band. Frost protection of the heating coil starts when the temperature falls below the set value + the set value in the parameter **Frost protection**.
- **Start-up heating:** Set the value for opening the motor valve during the start-up sequence. This overriding of the motor valve ceases when the start-up sequence is completed and the supply air fan has reached its setpoint for airflow.
- **Standby heating:** Set the minimum temperature for return water from the heating coil during standby. During standby/stop of the unit, the motor valve will ensure that the temperature does not reach below the set value.
- **Aftercooling time:** Set the aftercooling time of the heating coil.

In order to remove excess heat and thus avoid overheating of the heating coil, the fans continue to run in the set time (aftercooling time), after the heating coil has been disconnected.

- **Aftercooling:** Select whether aftercooling and thereby a possibility for set up of aftercooling time should be active. Yes/No.
- **Amplification factor heating 1:** Set the heating coil's gain factor. This factor strengthens the effect of the regulator, when it either increases or reduces the heat. When the value is 100, the factor is neutral.
- **Valve setpoint:** Displays the current valve position from 0 to 100%.
- **Test sequence:** Press **Start** to begin the test sequence of the valve motor. (Only applicable to the Belimo modbus valve motor).
- **Motor valve:** Set the motor valve's regulatory range. Always select 2-10V (DEX4000 standard)

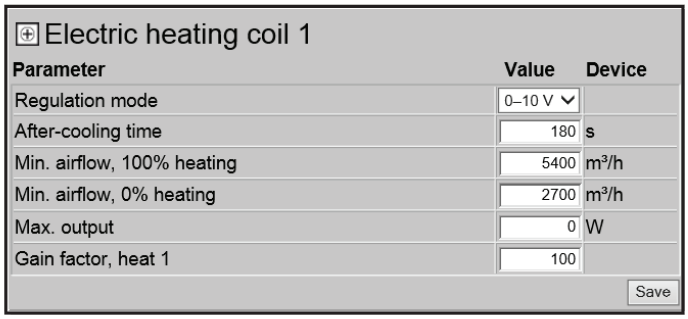
Press **Save** to save the settings.

Safety function

A return sensor is always connected to a water heating coil on the heating coil's outlet pipe in order to protect the heating coil from frost. When the temperature nears the set setpoint/minimum temperature for frost protection, the motorvalve opens so that the heat increases. If maximum heat input is not enough to maintain the minimum temperature for frost protection, a frost alarm is sounded on the heating coil and the valves stop.

Electric heating coil 1

The electric heating coil is used to increase the temperature of the supply air if the recovered heat does not supply enough.



- **Regulation mode:**
  - 0–10 V: Analogue heat regulation is connected to an analogue 0-10V output.
  - Single step: The electric heating coil is controlled with 1-step's On/Off (digital relay output)
  - Two step: The electric heating coil is controlled with 2-step's On/Off (digital relay output)
- **Aftercooling time:** Set the aftercooling time on the heating coil

When the airflow is reduced or stopped completely, there is a risk of overheating of the heating coil. During the aftercooling period, the heating coil is disconnected completely and the valves continue to run with regards to the set airflow setpoint. The set value indicates the time that is necessary to remove the excess heat from the heating coil.

- **Minimum airflow, 100% heating** Set the minimum airflow for 100% heating on the heating coil.
- **Minimum airflow, 0% heating:** Set the minimum airflow for 0% heating on the heating coil.
- **Max. output:** Set the maximum effect of the heating coil.
- **Amplification factor heating 1:** Set the heating coil's gain factor. This factor strengthens the effect of the regulator, when it either increases or reduces the heat. When the value is 100, the factor is neutral.

Press **Save** to save the settings.

Monitoring of the electric heating coil

The electric heating coil is protected against overheating using two overheating controls that are placed in the airflow between the heating elements.

External fire thermostat

The function is used in case of fire/smoke outside the building.

Prerequisite for set-up

- EXcon Modules > Configure > Digital in/out: **External fire thermostat** must be configured.

When the input is activated/opened:

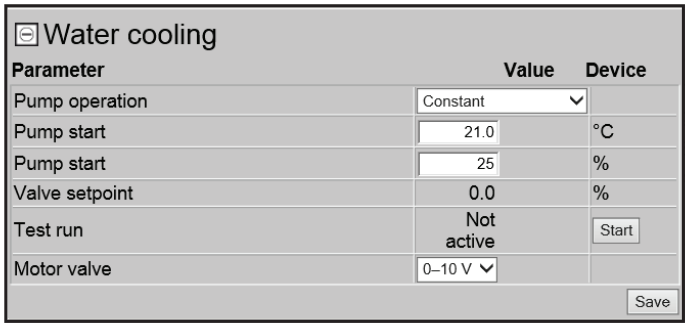
- The DEX unit stops
- Damper to the outside air closes
- An alarm is triggered

When the input is closed again, the DEX unit will start up in normal operation.

7.2.4 Cooling

Water cooling

Water cooling is configured to control an analogue valve in the water circuit via a 2-10V output that is configured. Start/Stop of a circulation pump in the cooling circuit via digital output. Alarm from a pump can be connected to ä digital input, **Cooling error** , which will trigger a pump alarm when the input is opened.



- **Pump operation:** Select parameter for pump operation
  - **Constant:** The pump runs constantly when there is tension on EXcon Master.
  - **Auto:** Pump operates with cooling requirement
  - **Outdoor air temperature:** The pump runs when the outside air temperature rises **above** the set value in **Pump start** or when there is a cooling requirement.
  - **Cooling requirement:** The pump starts when the motor valve is opened more than the set value.

Pump motioning: If the pump has not been started for the last 24 hours, it will become motioned in 1 minute regardless of the cooling requirement. This is to combat the pump getting stuck.

- **Pump start:** Set temperature for the pump to start. The pump starts when the outdoor air temperature is above the set value. During pump operation, **Outdoor air temperature** must be selected.
- **Pump start:** Set values for the pump to start. The pump starts when the motor valve is opened more than the set percentage rate. During pump operation, **Cooling requirement** must be selected.
- **Valve setpoint:** Displays the current valve position
- **Test run:** Press Start to begin the test sequence of the valve motor. (Only applicable in case of Belimo modbus valve motor)
- **Motor valve:** Set the motor valve's regulatory range. Always select 2-10V

Press **Save** to save the settings.

7.2.5 Heat recovery

Counterflow heat exchanger - with ice protection via temperature sensor.

Heat recovery: **Counterflow heat exchanger** - with ice protection via temperature sensor.

General

The damper(s) on the counterflow heat exchanger is/are controlled by a modulating 0–10V signal from the EX-Con system. Damper motor(s) on exchanger/bypass the damper must be modulating and 0-10V-controlled. The counterflow heat exchanger is protected against icing by the exhaust air temperature after the exhaust air has passed through the crossflow heat exchanger and has been registered.
If a pressure transmitter is configured above the heat exchanger, the protection against icing up of the exchanger is a set point for the pressure drop.

Ice protection

At temperatures below the set value + P-band, the bypass damper is overridden. modulating to 100% open. The outdoor air then passes the counterflow heat exchanger and the extract air from the room passes through the counterflow heat exchanger. Due to the relatively high room temperature, this function will result in the ice on the counterflow heat exchanger thawing.

- **Ice protection P-band** Temperatures below the set value + the set value in parameter "Ice protection" will override the bypass damper modulating to 100% open.
- **Amplification factor, counterflow heat exchanger:** Set the counterflow heat exchanger's amplification factor.
- **Damper counterflow heat exchanger *(Only applicable for Direct Modbus actuators)*** Expected damper position.
- **Test-run, by-pass damper *(Only applicable for Direct Modbus actuators)*** Press "Start" to start a test sequence of the connected Direct Modbus damper.
- **Alarm in case of low efficiency**
  Select whether an alarm must be given in the event of low efficiency
- **Efficiency correction factor**
  Set the efficiency calculation correction factor
- **Alarm level, efficiency**
  Set alarm limit for low efficiency alarm.
  In order for the alarm to be triggered, the system must be in the "Operation" status and the efficiency must be
  values below the set value and the "Low efficiency alarm" parameter must be set to "Yes"

7.2.6 Efficiency

EXcon control system automatically calculates the level of efficiency for the heat exchangers that are fitted and configured in the DEX unit. The level of efficiency (η) can be seen in connection with the heat exchanger on the status image under: **User > Alarm & Log > Status** or **Service > Unit > Status.**

Under certain circumstances the calculation will display large deviations:

- When the control signal for the recovery is lower than 5%, or the outside air temperature is higher than 10°C, the level of efficiency displays 0%.
- When the level of efficiency assumes values below the set level, and the control signal for heat recovery is 100%, an alarm will sound for: **Too low recovery**.

Calculation

The level of efficiency is calculated using the current measured temperatures. In order for the level of efficiency calculation to provide as accurate a picture as possible of the current level of efficiency, it is important that the sensors are placed correctly in the airflow. During calculation of the heat exchangers' level of efficiency, sensors are used that measure:

- Extract air temperature
- Exhaust air temperature
- Outdoor air temperature

The level of efficiency is calculated using the formula:

- Level of efficiency[%] = ((Extract air - Exhaust air) / (Extract air - Outdoor air)) * 100 + **Y**.

Y is a correction factor which indicates the heat that the exhaust fan emits into the air. **Y** can be set to values between 0 og 5%.

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