Viper Touch Flex+

Climate Controller

User Manual

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Big Dutchman

Software version 8.7

1 Declaration of Conformity

Manufacturer:	SKOV A/S
Address:	Hedelund 4, DK-7870 Roslev, Denmark
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This declaration of conformity is issued under the sole responsibility of the manufacturer.

Product:	Viper Touch series
Type, model:	Controller

EU directives:	2011/65/EU	RoHS Directive
	2014/30/EU	Electromagnetic Compatibility (EMC)
	2014/35/EU	Low Voltage Directive (LVD)

Standards:
EN 63000:2018
EN 61000-6-2:2019
EN 61000-6-4:2019
EN 62368-1:2024

We declare as manufacturer that the products meet the requirements of the listed directives and standards.

Location: Hedelund 4, DK-7870 Roslev

Date: 2024.11.01

Tommy Bak

CTO

Product and Documentation Changes

Big Dutchman reserves the right to change this document and the product herein described without further notice. In case of doubt, please contact Big Dutchman.

The date of change appears from the front and back pages.

IMPORTANT

Notes concerning alarm systems

Breakdowns, malfunctions or faulty settings may cause substantial damage and financial losses when regulating and controlling the climate in a livestock house. It is therefore essential to install a separate, independent alarm system that monitors the house climate concurrently with the climate and production controller. According to EU-directive No. 98/58/EU, an alarm system must be installed in all mechanically ventilated houses.

We would like to draw your attention to the fact that the product liability clause of general terms and conditions of sale and delivery specifies that an alarm system must be installed.

In case of an operating error or inappropriate use, ventilation systems can result in production losses or cause loss of lives among livestock.

We recommend that ventilation systems should be mounted, operated and serviced only by trained staff and that a separate emergency opening unit and an alarm system be installed as well as maintained and tested at regular intervals, according to terms and conditions of sale and delivery.

Installation, servicing and troubleshooting of all electrical equipment must be carried out by qualified personnel in compliance with the applicable national and international standard EN 60204-1 and any other EU standards that are applicable in Europe.

The installation of a power supply isolator is required for each motor and power supply to facilitate voltage-free work on the electrical equipment. The power supply isolator is not included.

Note

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2 Guidelines

This user manual deals with the daily operation of the controller. The manual provides fundamental knowledge about the functions of the controller that is required to ensure optimum use of it.

The user manual describes the general operation of the controller and all climate functions. A description of production functions can be found in the appurtenant user manual for production.

If a function is not used, e.g. **24-hour clock**, it is not shown in the user menus of the controller. The manual may therefore contain sections that are not relevant to the specific setup of your controller. See also *Technical Manual* or contact service or your dealer, if required.

3 Product description

Viper Touch Flex+ is a climate computer for controlling and monitoring the climate in the livestock house.

Viper Touch Flex+ regulates the climate based on up to 64 set levels. Each level can be adjusted via a matrix, which allows for an exact climate adjustment required by the user.

Viper Touch Flex+ can also control the climate in houses with batch production based on temperature, heat, and minimum and maximum level curves.

The controller has 6 main pages, which are adapted to poultry production and a menu page. The pages contain selected functions and views relevant to the daily work.

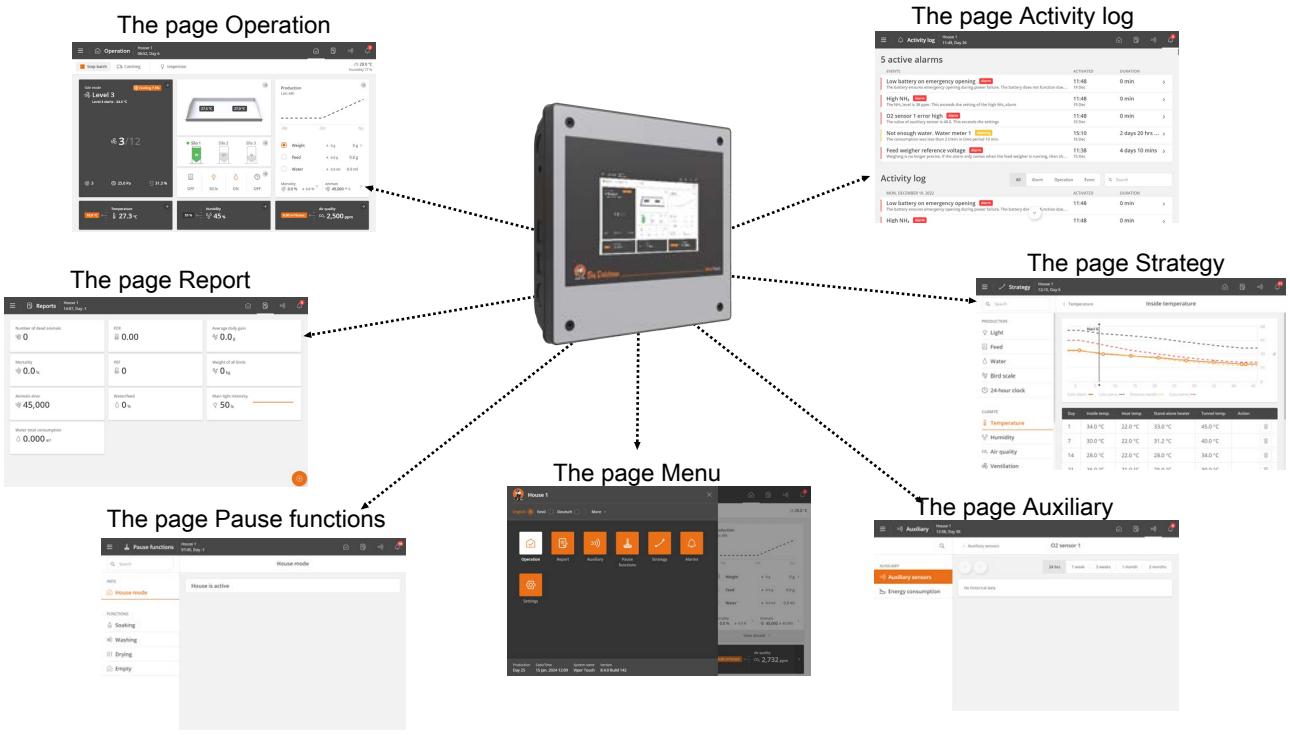
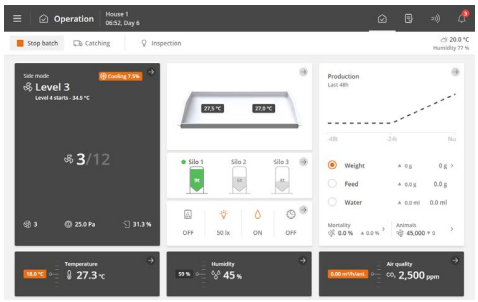
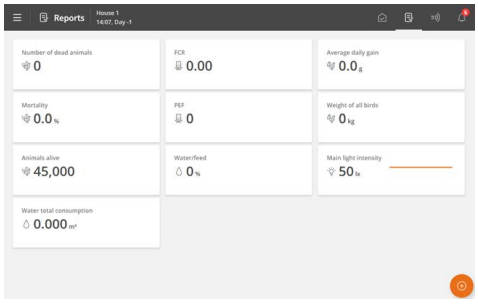


Figure 1: In addition, by selecting the different elements of the pages, there is access to underlying functions and data from the front pages.



The page **Operation**

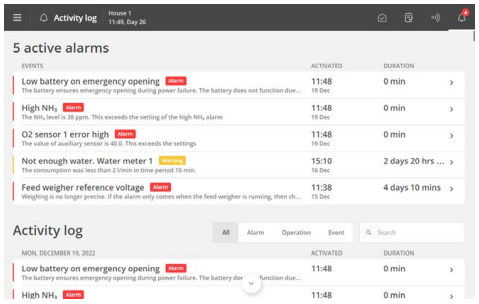
The page is the main page view where the functions that must be used for daily operation are gathered.



The page **Report**

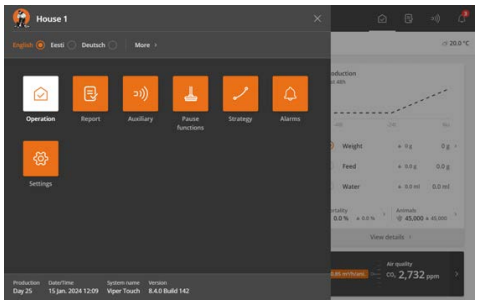
The page can be set up according the user's wishes to contain cards with key values showing current data.

It can thus be used to collect values that must be read daily and collect data to be reported.



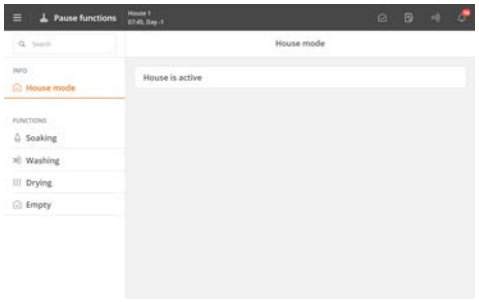
The page **Activity log**

The page displays a log of all recorded alarms, operations of the controller and events.



Menu button

The button gives access to language selection and to a collection of shortcuts to the various pages.



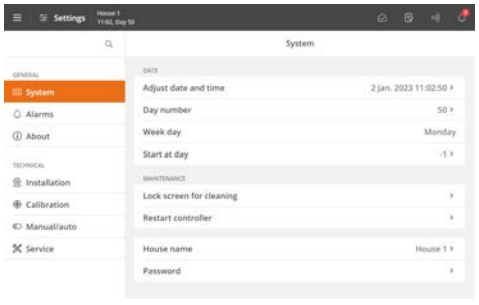
| The page **Pause functions**

The page gives access to functions designed partly to facilitate the activities you must carry out in the house to clean it and prepare it for the next batch and partly to ensure the air change and temperature in the house while it is empty.

| The page **Strategy**

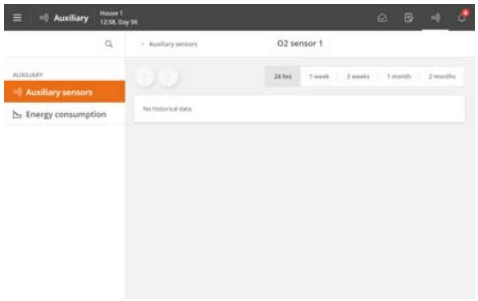
The page gives access to determination of the desired production strategy, which must be repeated from batch to batch.

These are, for example, program settings, references, and batch curves.



| The page **Settings**

The page provides access to general settings and alarm limits.



The page **Auxiliary**

The page gives access to graphical displays of historical data from various types of additional equipment (auxiliary sensors and energy meters).

The page is only displayed if additional equipment is installed.

4 Operating instructions

4.1 Operation

Each page is composed by different types of cards that provide information about the operation and quick access to operation.

From the top bar of the page, there are shortcut buttons that allow you to switch between the main pages **Operation** (**C**), **Report** (**D**)**, Auxiliary** (**E**) and **Activity log** (**F**).

A The icon and name of the page.

B The house name, time, and possibly week and day number.

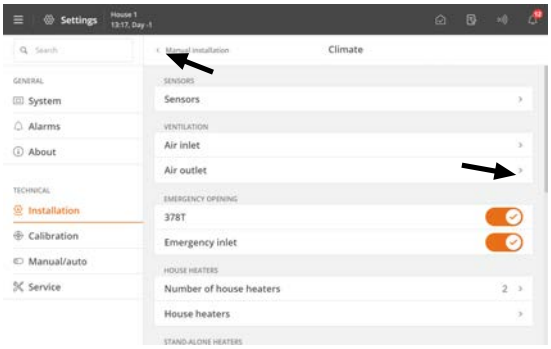
C The **Operation** page provides an overview and the ability to operate the functions most needed for your daily work.

D The **Reports** page shows the key values the user wants on the page.

E The **Auxiliary** page displays the consumption figures and auxiliary equipment status (if installed).

F The **Activity log** page displays active alarms and a complete log of operations, events, and alarms.

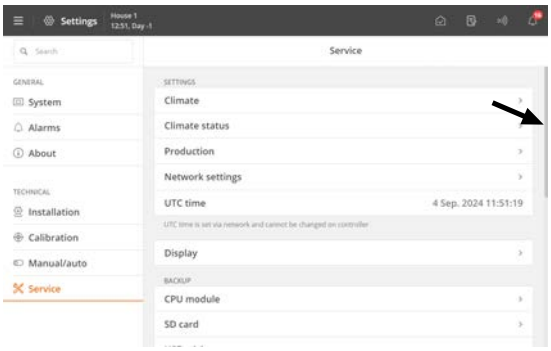
G The menu button gives access to language selection (see section Selection of language [▶ 12]) and other pages: **Pause functions**, **Strategy** and **Setting**.



Navigation menus provide access to sub-menus.

> The right arrow displays a sub-menu.

< The left arrow in the upper left corner allows you to take one step back in the menu.



Scroll

If the page is higher or wider than the display, you can scroll.

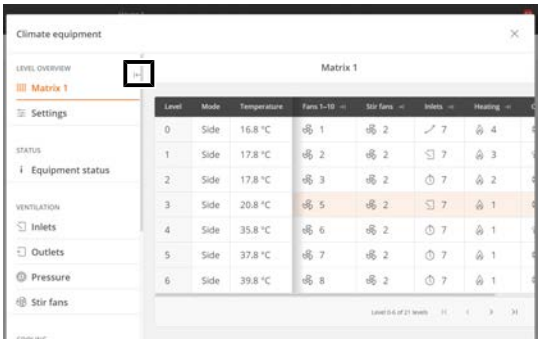
This is shown in the display as scroll bar.

Scroll by sliding your finger over the display.

7" display

Scrolling options are shown as arrows or scroll bars.

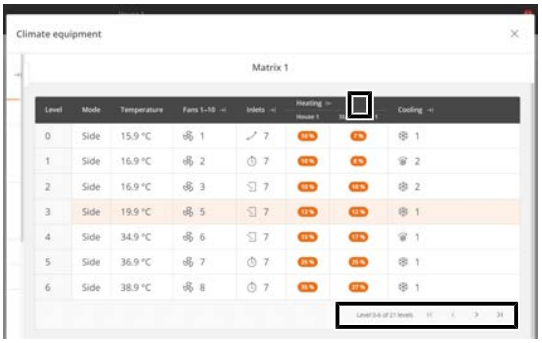
Scroll by pressing the arrows or letting your finger slide across the display.



Matrix

Close the menu by pressing |← so that the matrix fills the entire screen.

Open the menu by pressing →| to access the navigation in the menu.



At the bottom, you see how many levels there are on the current page and how many levels there are in total.

Press < > to switch one page at a time.

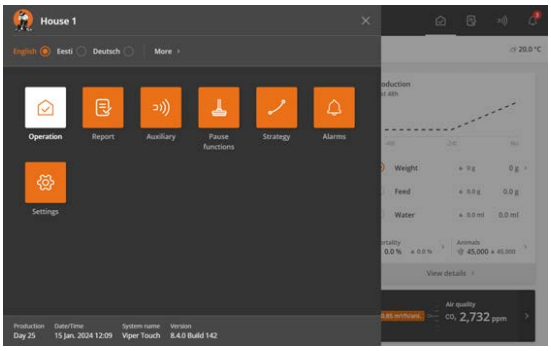
Press |< >| to switch to the first or last page of level.

For the installed devices, these arrows appear |← →|.

Press →| to open settings for each device.

Press |← to close the settings.

4.1.1 Selection of language



Press the ☰ Menu button.

A dot indicates the selected language.

Press **More** if the requested language is not displayed.

Select the language from the list. Press **Confirm**.

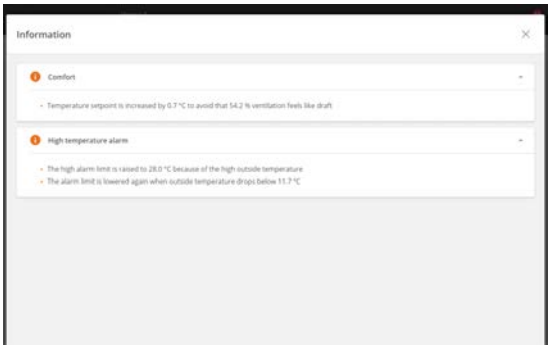
Note that function names (such as 24-hour clocks, water meters, and programs the user can name) are not translated into the selected language.

The factory setting for the names is English.

4.1.2 Information card

The information card is meant to give the daily user a better understanding of how the controller is working right now.

The information is available on pages with the icon .



Press to view more details.

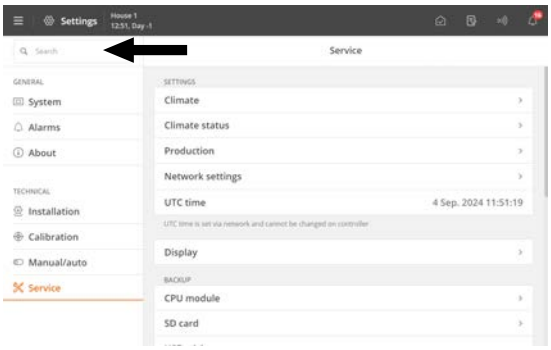
The following is described for selected control areas:

- The current status.
- The reason for the current adjustment.
- What the next step in adjustment will be.

4.1.3 Search in menus

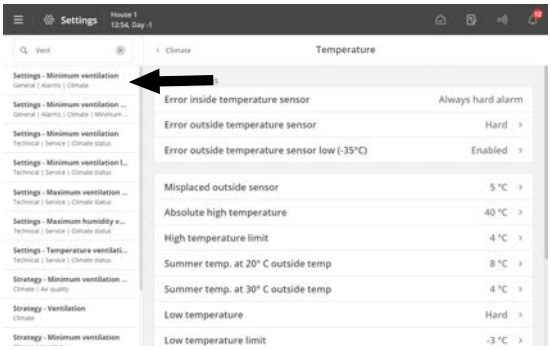
It is easy to search for the individual functions of the controller. There are search fields on the pages: **Auxiliary, Pause functions, Strategy,** and **Settings**.

A search across the pages is performed.



Use the search field to the left to search in menus.

Enter at least 3 characters to search.



The result is shown below the search field. The path for the individual menus is also shown, for example, under Settings: **General | Alarms | Climate**.

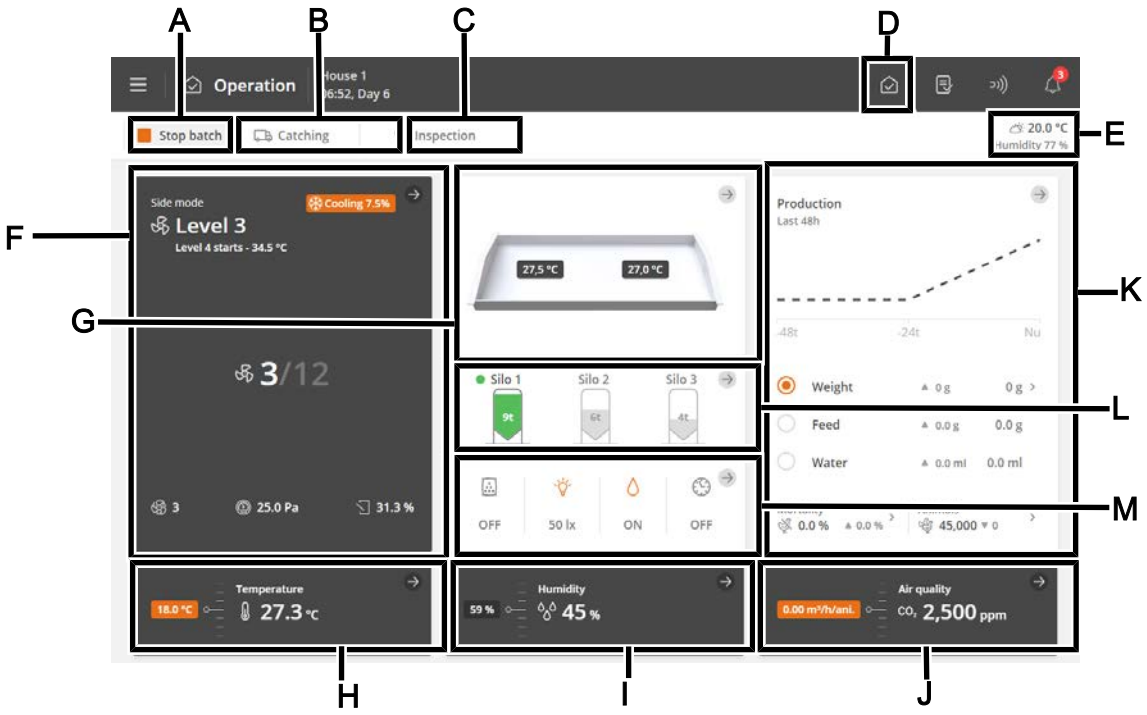
Press a search result to go directly to that menu.

Press the X in the search field to remove the search results again.

4.2 Operation

The Operation page is adapted to the different production types: broilers, breeders, or layers. It contains views and settings relevant for the daily work.

Below is an example of the Operations page for broilers.



A The function button **Stop batch/Start batch**. See the section House mode Active house - Empty house [▶ 43].

B The function button **Catching function**. The function is designed to alter the air change in the house in connection with all or some animals leaving the house. See section Catching [▶ 42].

C The function button **Inspection** for manually activating the inspection light.

D **Shortcut to the main page Operation**.

E View of outside temperature and outside humidity.

F Status view for the climate control and access to the ventilation equipment menus and setup of a matrix.

The card also provides a shortcut for manual control of the climate equipment. This is intended for situations where equipment must be stopped.

G View of the current inside temperature of the individual climate sensors.

H Temperature settings. See section Temperature [▶ 30].

I Humidity settings. See section Humidity [▶ 31].

J The ventilation functions CO_2. See section Air quality [▶ 37].

K View the development of key figures for animal weight, feed, and water consumption over the past 2 days. In addition, the view of calculated mortality and the current number of animals and shortcuts for recording the number of animals, the number of dead and moved animals.

The view also provides a shortcut to details with information and settings options.

L Status view for silo content. The views provide a shortcut to recording of feed supplies and settings options for silo.

M Status view for climate and production functions controlled by time programs. The view provide an overview of all programs and appurtenant settings, and for status and settings for production equipment.

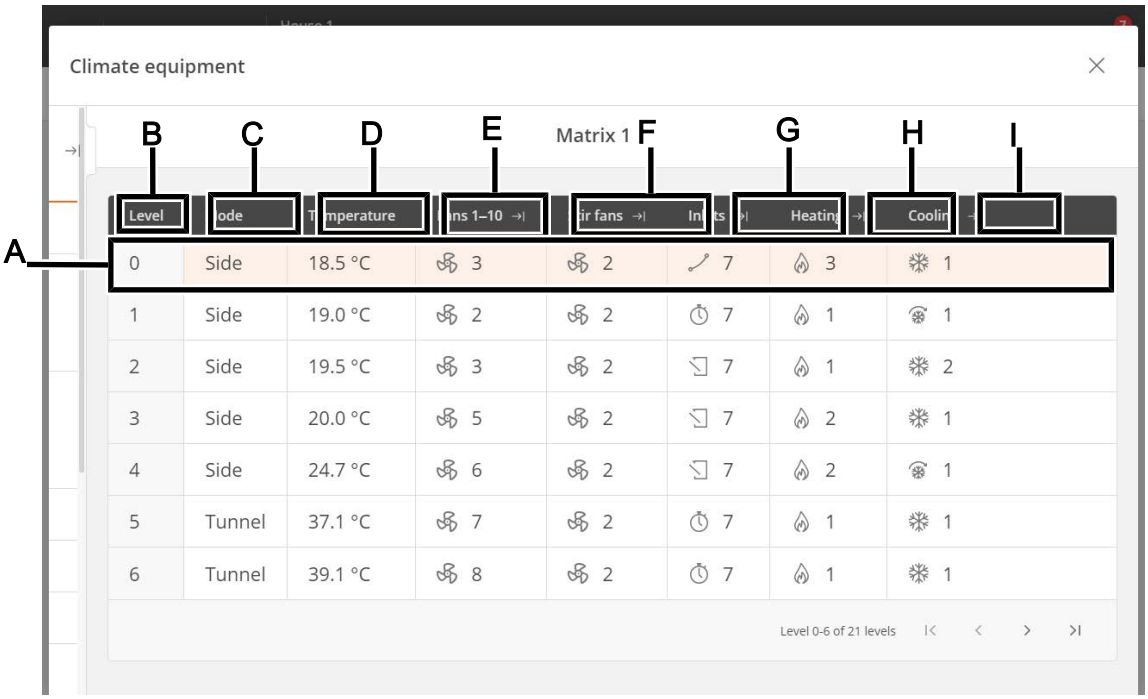
4.2.1 Matrix menu for levels

Operation | Climate equipment card **| Matrix**

The matrix provides an overview of the ventilation levels of the controller and access to setting each level.

The menu's size and structure depend on the controller's installation, e.g., fans, stir fans, heating, and cooling.

During installation, the number of matrix levels is determined. Up to 64 levels can be selected. The ventilation regulation can be set up with 2 matrices and the settings can be made independently of each other. Also, see the Technical Manual.



A Each row in the matrix corresponds to one level. The active level is highlighted.

By pressing a square in the columns, you get access to settings for the various functions. Changes remain highlighted until you exit the matrix.

B Level.

C Setting whether the level should be active as side or tunnel ventilation.

D Setting the **temperature** that activates the level.

When the temperature reaches the setting, the ventilation will switch to the level above when the temperature rises or below when the temperature drops.

E Display of the number of fans for the **air outlet** on each level. See also the section Outlet matrix [▶ 16].

F Display of the number of **stir fans** on each level. See the section Stir fan matrix [▶ 17]

G Display of the number of **air intakes** on each level. See the section Air inlet matrix [▶ 18]

H Display of the number of **heating** units or set heating requirements on each level. See the section Heating matrix [▶ 19]

I Display of the number of **cooling** units on each level. See the section Cooling matrix [▶ 19]

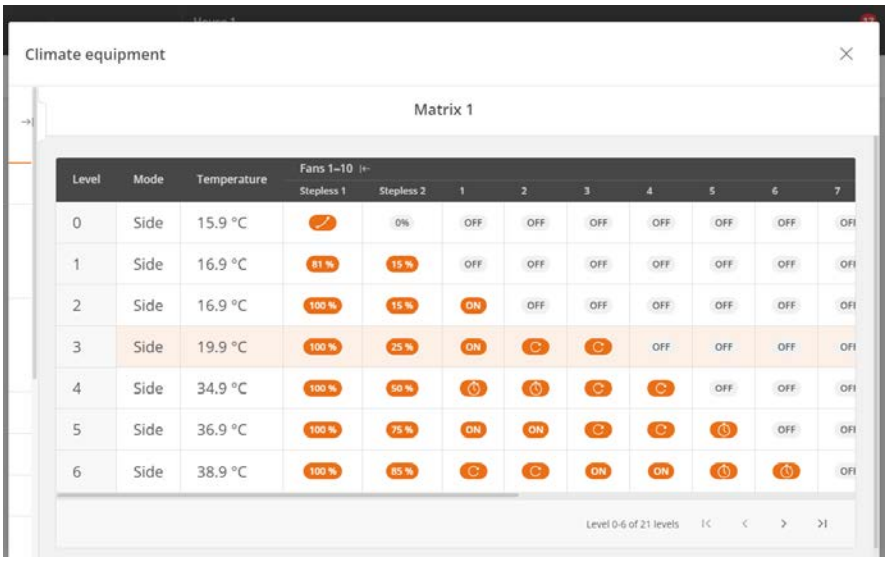
4.2.1.1 Minimum / Maximum level

Operation | Climate equipment card **| Setting | Level settings**

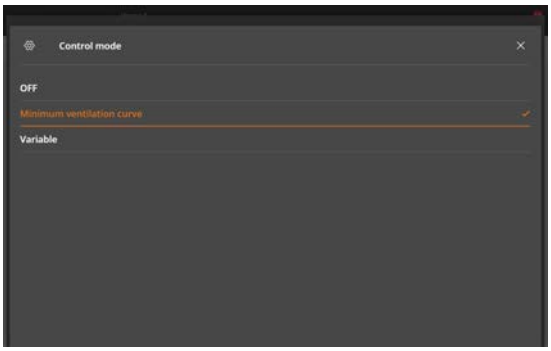
Minimum level	Setting a minimum level limit so the controller provides the house with enough airflow to ensure acceptable air quality, as a minimum. This function is particularly relevant in periods with cold weather when it is not necessary to ventilate to keep down the inside temperature.
Maximum level	Setting a limit for the maximum level. This feature may be relevant to use during very high outside temperatures, when ventilation using the entire capacity of the system may cause the inside temperature to exceed the required temperature. The feature can also prevent, for example, small animals from being exposed to too strong ventilation.

4.2.1.2 Outlet matrix

The air outlet must be set for each level and each fan separately. By default, all fans are set to OFF.



The first are stepless fans and the next are ON/OFF fans.



Stepless fan

Minimum ventilation curve. At level 0, the fans can run according to a minimum ventilation curve. See section Setting curves [▷ 25].

Variable. The stepless fan can regulate the motor performance and the flap opening. Setting of the desired ventilation requirement in percent.

ON/OFF fan

Cycle ventilation. The fan alternately runs and stops.

The total cycle time is calculated and displayed on the **Ventilation** card on the **Operation** page, when cycle ventilation is active.

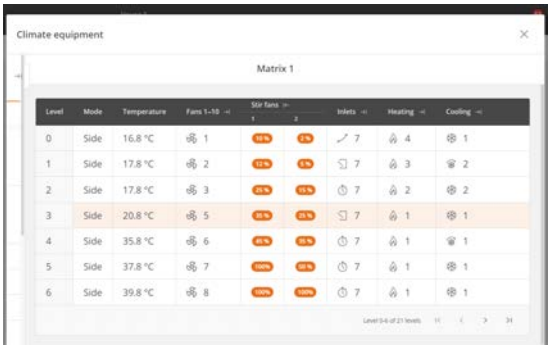
Requirement. Setting of ON-time in percent. If e.g.,a Requirement of 25 % is set, the fan will run for 75 seconds at a total cycle time of 300 seconds.

Rotate. The fan runs alternately with the other fans.

ON. The fan runs all the time.

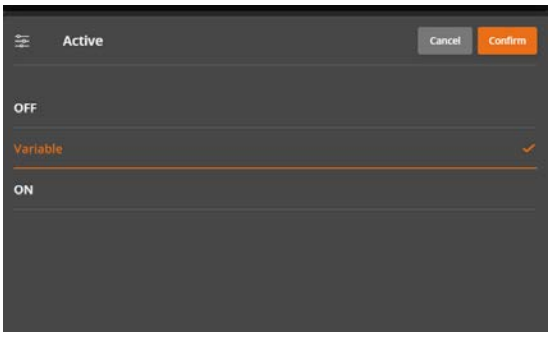
4.2.1.3 Stir fan matrix

A stir fan improves the air circulation and thus provides a more uniform temperature in the house.



Each level and each air stirrer must be set separately.

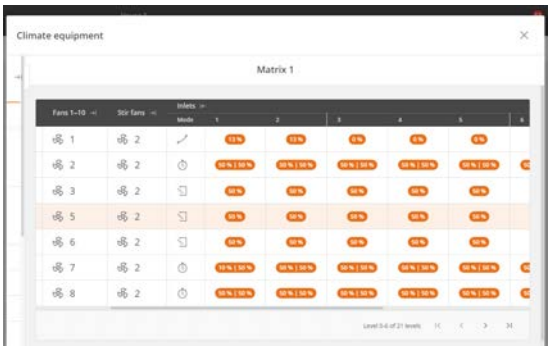
There are 2 ways of regulating a stir fan.



Variable. The stir fan runs up and down in performance by regulating the motor performance. Setting of the desired requirement in percent of maximum output.

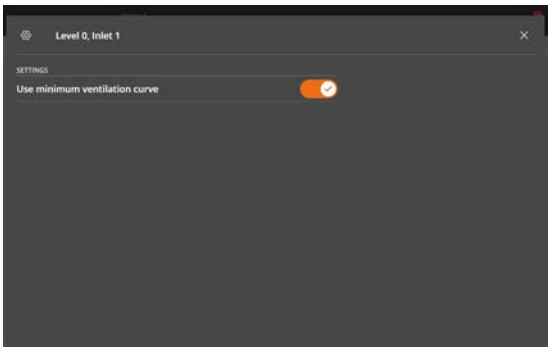
ON. The stir fan runs all the time.

4.2.1.4 Air inlet matrix



There are 3 ways of regulating a stir fan:

- Minimum ventilation
- Cycle
- Position



Minimum ventilation

At level 0, the air intake can be regulated as minimum ventilation.

Selection of the air inlets that must be part of minimum ventilation.

Cycle

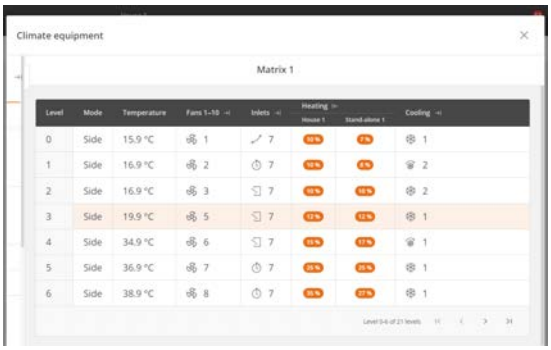
The air intake can be adjusted with different opening degrees for when the fan is ON or OFF.

Setting the degree of opening in percent for the air inlets.

Position

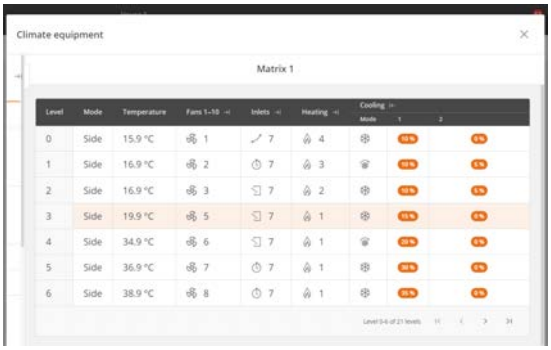
Setting the degree of opening in percent for the air inlets.

4.2.1.5 Heating matrix



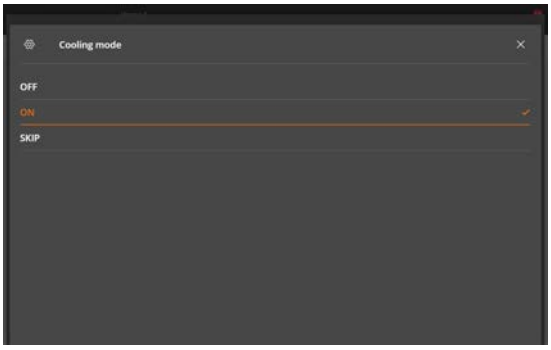
Setting the percentage of the heating capacity that should be active at the level.

4.2.1.6 Cooling matrix



There are 3 ways of regulating cooling.

- ON
- Requirements
- Ignore



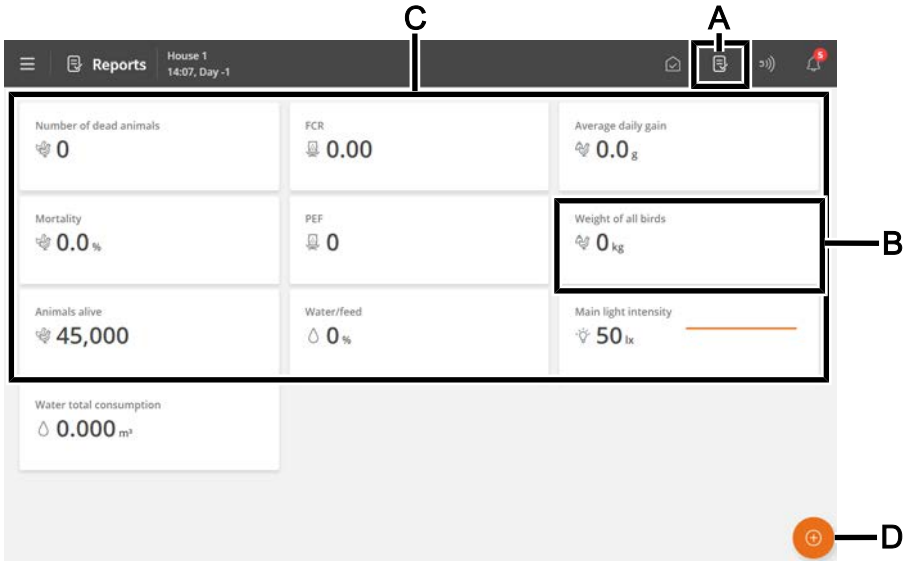
ON. At this level cooling is active all the time.

Skip. When the level rises, the cooling demand from the previous level is used. When the level drops, this cooling requirement is used. Is displayed in the matrix with the icon .

Requirement. Setting the percentage of the cooling system capacity that should be active at the level.

4.3 Report

The user can set up the page to include the key values that give the desired overview of climate and production values.



A Shortcut to the **Reports** page.

B Card with the key value. Each card can be set up to include up to 3 key values.

C The page displays a series of cards with selected key values for, for example, history and current values.

D Edit button. Gives access to choose between the desired key values.

E Tools for editing headlines or content on cards and moving or deleting cards.

First, press a tool and then make the desired change.

F Column header.

Press to name.

G Card with the key value.

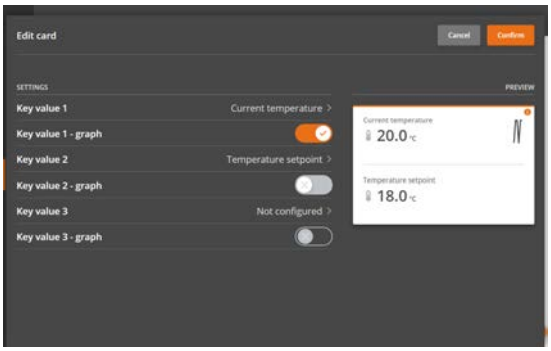
Press to change the key value and set up its view.

H Tool for adding a new card in the column.

Press to add a card and select the desired key value.

Cards with several key values

You can merge several cards to view up to 3 key values in one card.



Press the editing tool.

Press on the key value to be changed.

Select Key value 2 and select the key value to be displayed.

Select Key value 3, if required and select the key value to be displayed.

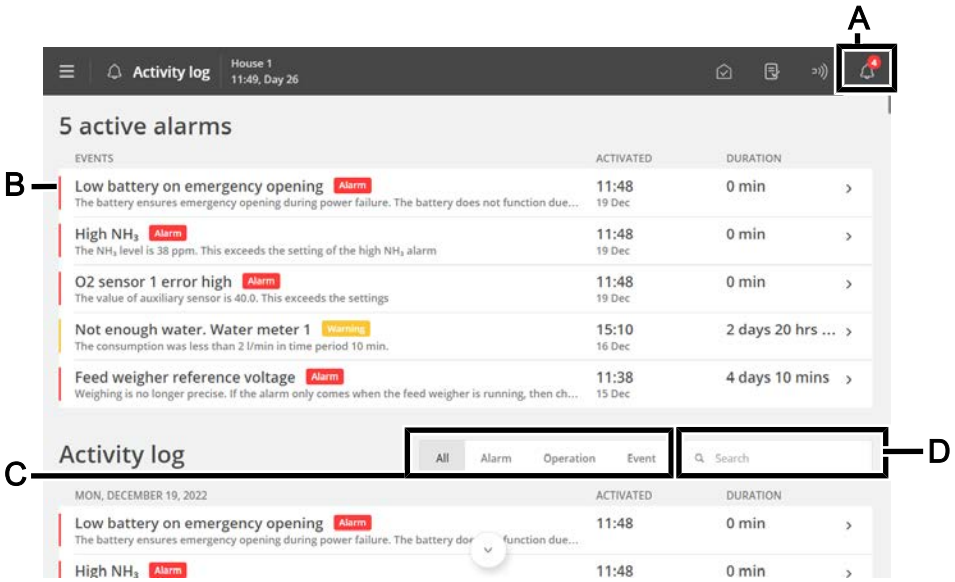
To the right a preview of the card is shown.

4.4 Activity log

The page displays a log of all recorded alarms, operations, and events.

Alarm status colors:

- Red – hard active alarm
- Yellow – soft active alarm (warning)
- Gray – deactivated alarm



A Shortcut to the page **Activity log**.

The icon for the Activity log indicates the number of active alarms as long as an alarm situation has not ceased.

B Each line shows an activity.

Press the activity line to see details, such as when an alarm was activated and acknowledged. Also, when a value/setting was changed.

Press **Close** to close the details screen again.

C Filtering options for the various types of activities:

All: shows all types

Alarm: shows alarms

Operation: shows the operation of the controller

Event: shows, for example, reset of the controller

D Search the field for the activity log.

Enter at least 3 characters to search. It is also possible to combine filtering and search.

Several alarms often follow each other because one defective function also affects other functions. For instance, a flap alarm can be followed by a temperature alarm as the controller cannot adjust the temperature correctly with a defective flap. Thus, the previous alarms allow you to follow an alarming course back in time to detect the error that caused the alarm.

See the description of alarms in the section Alarms [▶ 28].

4.5 Menu button

The menu button gives access to language selection and general settings pages.

A Menu button

B Displaying house name, day number, time, week number, if required, variant name, and software version.

C Select language. Access other languages under **More**.

Note that function names (such as 24-hour clocks, water meters), and programs the user can name are not translated into the selected language. The factory setting for the names is English.

D Shortcut to the page **Pause functions**.

The page is designed partly to facilitate the activities you must carry out in the house to clean it and partly to ensure the air change and temperature in the house while it is empty.

E Shortcut to the page **Strategy**.

The page provides access to the batch curves, which form the basis for controlling climate and production functions. See also the section Setting curves [▷ 25].

F Shortcut to the page **Settings**.

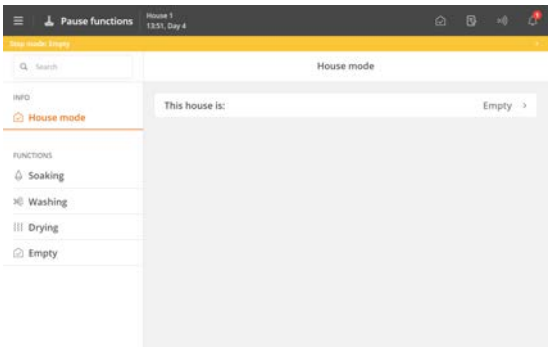
The page provides access to the user settings for **House info**, **Alarm settings,** and **Password**. See the sections System [▷ 26], Alarms [▷ 28], and Password [▷ 26].

In addition, you have access to the technical menus used for setup and service. See the Technical Manual.

4.5.1 Pause functions

The page gives access to functions designed partly to facilitate the activities you must carry out in the house to clean it and partly to ensure the air change and temperature in the house while it is empty.

- Soaking
- Washing
- Drying
- Empty



State

The controller can only activate the functions when the house status is **Empty**.

Empty house status is indicated at the top of the page by a colored bar.

When the time of a function is up, the controller will again regulate according to the settings for **Empty**.

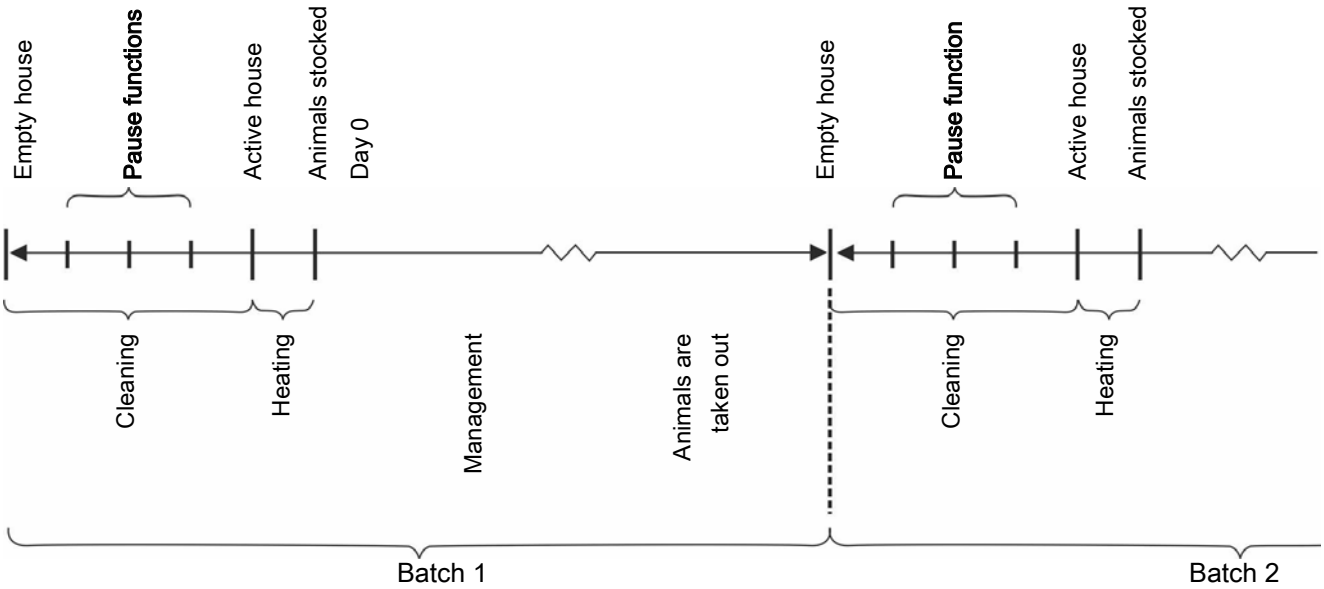


Figure 2: Setup example of Pause functions for batch production

Menu button | **Pause function** | **House status**

This house is:	Function selection menu (only displayed when the house status is **Empty**).
Function remaining time	When a function is activated, the set time counts down (only displayed when the house status is **Empty**).

Also see the section Pause functions [▶ 44] for a description of the various functions.

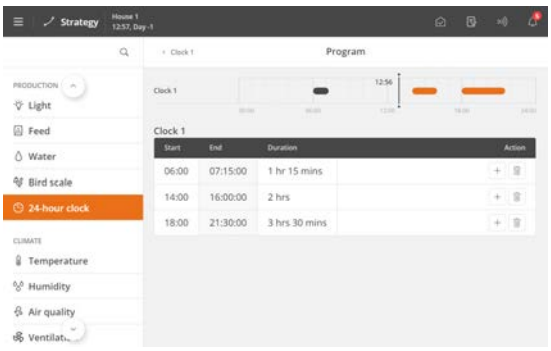
4.5.2 Strategy

The page provides access to the more constituent function settings that you typically do not need to change during a batch. The strategies are thus determined in light of the overall requirements for the production.

It is where batch curves for temperature and light are set up, sub-functions such as nozzle cleaning for cooling are selected, and limit value settings are made.

See the relevant section below for a description of the various functions.

Together with other information, the curve settings form the basis of the controller's calculation of climate regulation. The controller can adjust automatically according to the animals' age.



Depending on the type and setup of the controller, the following batch curves may be available:

- Inside temperature
- Heater temperature
- Stand-alone heater temperature
- Humidity
- Maximum ventilation
- Ventilation level
- …

4.5.2.1 Setting curves

Menu button | **Strategy**

Set up for each curve:

- A day number for each of the required curve points.
- The desired value of the function for each curve point.

Press + to add the required number of curve points.

Typically, the last day number of the batch curve is set to match the expected production time.

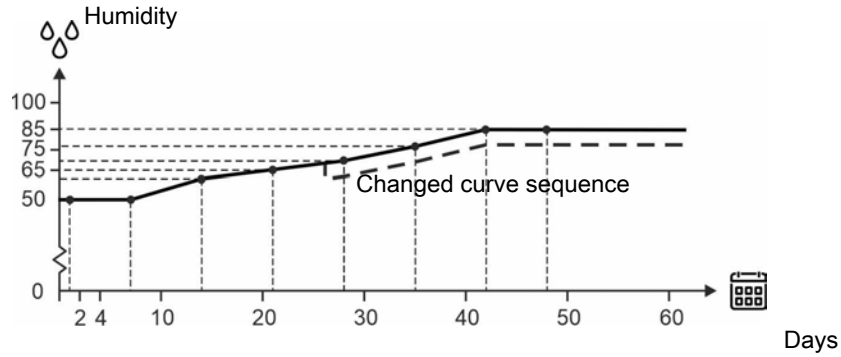


Figure 3: Curve for air humidity

It is generally the case for the curve functions that the controller automatically displaces the rest of a curve sequence in parallel when you change the associated setting during a batch.

4.5.3 Settings

The page provides access to general settings and alarm limits.

4.5.3.1 System

Menu button | **Settings | General | System**

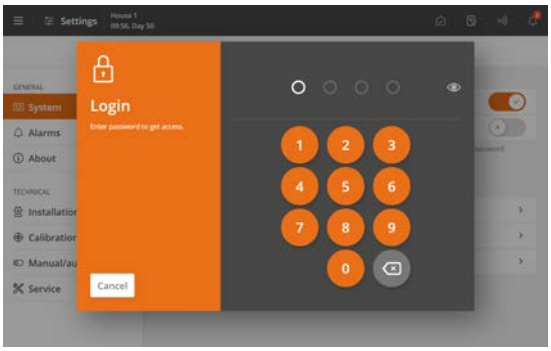
Adjust date and time	Setting current date and time. Correct clock setting is important for several control functions and alarm recording. Thus, all controller programs use date, time, and day number. The clock will not stop in the event of a power failure. **Summer and wintertime** There is no automatic adaptation in summer and winter, as some animal types are very sensitive to changes in their circadian rhythm. If you want the controller to follow the local time for summer and winter, you must manually change the time setting by +/- 1 hour.
Day number	Select whether the day number should show the time since start (house status is active) or the actual age of the animals. When the actual age of the animals is required, the day number must be adjusted until it matches the life expectancy. At midnight, day number 1 counts for every day that passes. Please note that if the day number is changed during a batch, it will shift/destroy the historical data of the batch (feed consumption, etc.). The function **Day number** can also be used to preheat the house by setting a number of minus days.
Week day	Viewing week day.
Start on day	Setting the day on which the batch shall start. Day number can be set as low as -3 so the controller can control the preheating of the house before the animals are stocked.
House name	Setting house name. Each livestock house must have a unique name when the controller is integrated with a LAN network. The house name is transferred through the network, and the livestock house should be identifiable based on the name. Set up a plan for naming all controllers connected to the network.
Password	Decide whether the controller must be protected against unauthorized operation using passwords. See section Password [▶ 26].

4.5.3.1.1 Password

This section is only relevant to houses where the Password function is activated.

The controller can be protected against unauthorized operation using passwords.

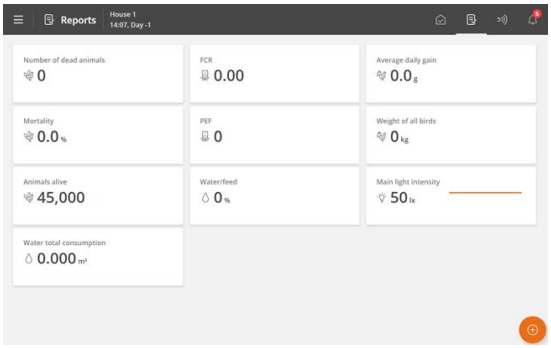
In order to have access to changing a setting, a password must be entered that corresponds to the user level which the relevant function is found at (**Daily**, **Advanced** and **Service**).



Menu button | **Settings** | **General** | **System** | **Password** to access the activation of the function.

Enter a service password.

After entering the password, the controller can be operated at the corresponding user level. After 10 minutes without operation, the user is automatically logged out.



Select a page after an operation. After 1 minute, the controller will request the password again.

Activate the function **Use password for technical menu only** to make the controller require the **Service** password only when the user wants to change settings in the menus **Installation**, **Calibration**, and **Service**.

Change password for each of the 3 user levels.

To gain access to changing a password a valid password must first be entered.

Menu button | **Settings** | **General** | **System** | **Password**.

User level	Gives access to	Factory-set code
Daily view (without login)	Entry of number of animals Fine-tuning of temperature, humidity, and air quality Manual climate control	
Daily	Daily: Changing set values	1111
Advanced	Daily + advanced: Changing curves and alarm settings Manual production control	2222
Service	Daily + advanced + service: Changing settings under Technical menu	3333

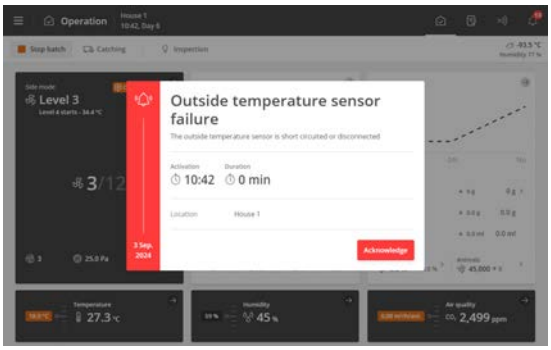
Access limitation to operate the controller

We recommend that you change the default passwords and subsequently change the password regularly.

4.5.3.2 Alarms

Alarms only work when the status is Active house.

The only exceptions are alarm tests and alarms for CAN communication and temperature surveillance at **Empty**.



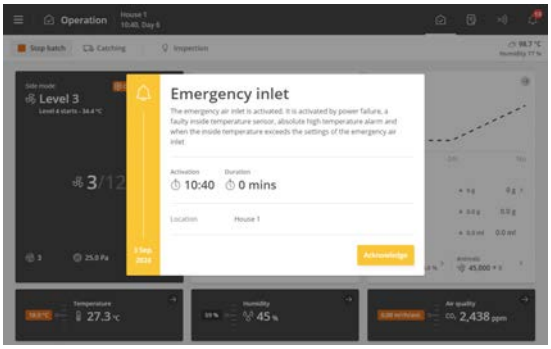
The controller will record the alarm type and time when an alarm occurs.

The information on the type of alarm will appear in a separate alarm window, together with a short description of the alarm situation.

Red: hard alarm

Yellow: soft alarm

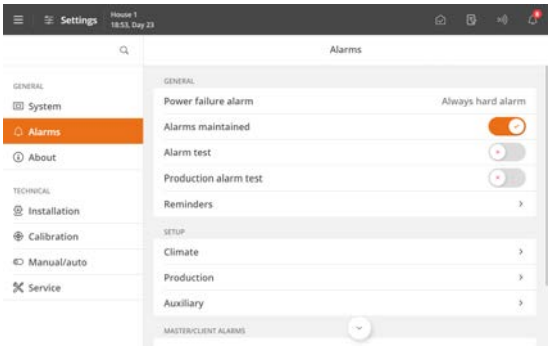
Gray: deactivated alarm (alarm state ceased)



You can choose whether the alarm should be hard or soft for selected climate and production alarms.

Hard alarm: Red alarm pop-ups on the controller and generation through the connected alarm units, e.g., a horn. Only hard alarms trigger the alarm relay.

Soft alarm: Yellow pop-up alert on the house controller. Soft alarms generate a pop-up in the display.

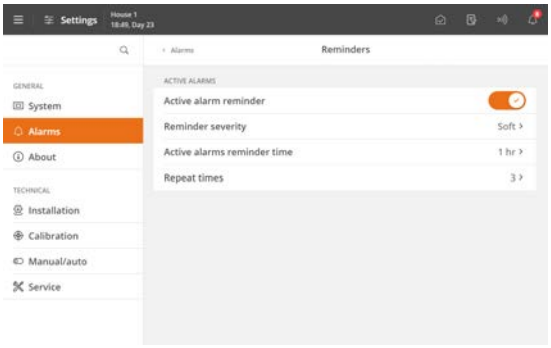


The controller will also trigger an alarm signal, which you can choose to maintain.

The alarm signal will thus continue to sound until you acknowledge the alarm. It also applies even if the situation that triggered the alarm has ceased.

Menu button | **Settings** | **Alarms**

Alarms maintained: Selecting whether the alarm signal should continue after the alarm condition has ceased.



Reminder

The controller can remind you of an ongoing alarm once you have acknowledged a hard alarm. It should ensure that the cause of the alarm is handled.

Reminder settings:

Active alarms reminder time: Setting how long after the alarm, the reminder is to appear.

Repeat times: Setting how many times the reminder is to appear.

See section Climate [▶ 50] for setting the alarm and alarm limits.

4.5.3.2.1 Stopping an alarm signal

The alarm window disappears, and the alarm signal stops when you acknowledge the alarm by pressing **Acknowledge**.

4.5.3.2.2 Power failure alarm

The controller will always generate an alarm and activate emergency opening in the event of power failure.

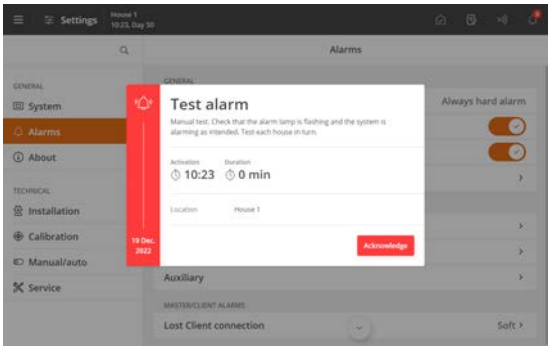
4.5.3.2.3 Power reduction when power supply is insufficient

If the power supply is insufficient for periods of time, the controller can turn off or limit the current consumption of the following functions: ventilation, main light, slave light, extra light, feeding system (pan feeding and layer feeding), and 24-hour clock.

The controller will also generate an alarm when the alarm condition has been present for 10 seconds.

4.5.3.2.4 Alarm test

Regular alarm tests help to ensure that the alarms actually work when needed. Therefore you should test the alarms every week.



Activate **Alarm test** to start testing.

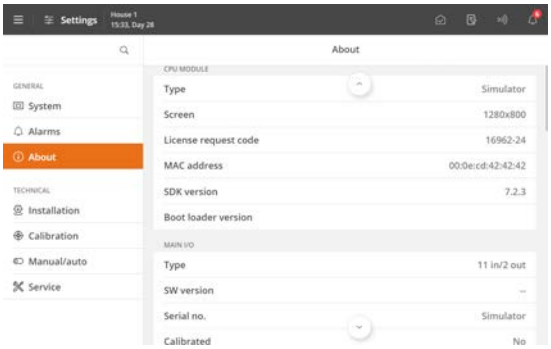
Check that the alarm lamp is flashing.

Check that the alarm system alarms as intended.

Press **Acknowledge** to finish testing.

4.5.3.3 About

The menu item contains information about types and versions of software and hardware.

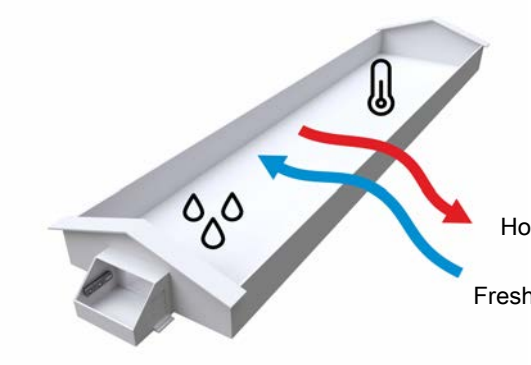


Furthermore, under **CPU module** you can see the license order code, which must be used when ordering additional software, e.g.,production add-ons.

5 Climate

5.1 Automatic climate control

The controller automatically regulates and monitors a large number of factors that are important for the climate in the house - e.g.,air change and temperature. It can regulate very precisely and maintain the required temperature and humidity level in the house.



With correct setup of the controller, the daily user of the house should only exceptionally need to make manual changes to the settings.

The controller will continuously adapt the climate to the animals' age and needs on the basis of the strategy laid out.

In addition, it can via its adaptive functions adapt the regulation to the very current conditions such as e.g., changing outside temperature.

.

Manual mode

Normally the controller must be set to automatic control. During start up, or in a service situation, it may however be convenient to control the individual functions manually.

After the manual operation, you must set the function back to automatic control, so that the controller continues to operate as before.

Operation | Climate equipment card **| See details**

Provide access to manual control of the climate equipment.

Menu button | **Settings | Technical | Manual/auto | Manuel Mode**

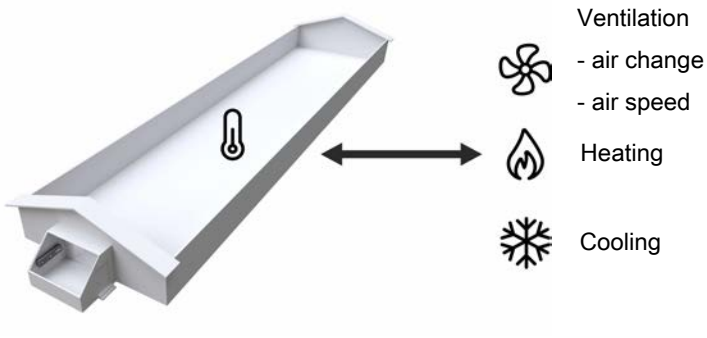
Lists all components currently set to manual mode.

The manual control can also be deactivated here.

5.2 Temperature

The controller adjusts the inside temperature according to the **Temperature setpoint**.

When the inside temperature is too high, the controller increases the ventilation level to supply more fresh air and cool the air if needed. When the inside temperature is too low, the controller reduces the ventilation level to keep the heat in the house. The heating level is increased if needed.

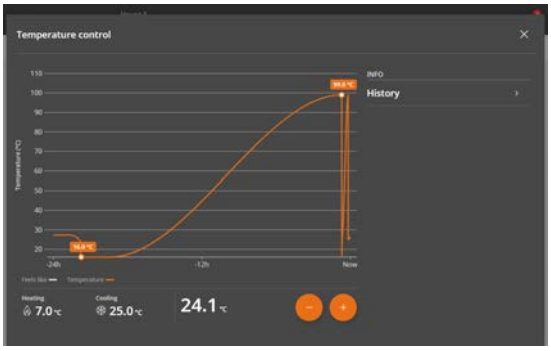


Operation. The most important temperature values can be viewed and adjusted via the card **Temperature**.

The front of the card shows the current inside temperature and the temperature setpoint.

The following sections describe the functions and setting options available for temperature.

5.2.1 Temperature control



Operation | **Temperature** card

Side mode

The temperature card provides easy access to adjust the inside temperature during a batch.

When a higher or lower inside temperature is requested, adjust the setting up or down by 0.5°C. Wait approximately 2 hours and assess the status.

When the temperature setpoint is changed, the start temperature for the individual levels in the matrix is automatically updated.

The Temperature card also provides access to the following:

- Graphic history curve.

When determining the desired temperature strategy, the following parameters are taken into account:

Menu button | **Strategy** | **Temperature**

Inside temperature	Setting of batch curves for **Inside temperature** .

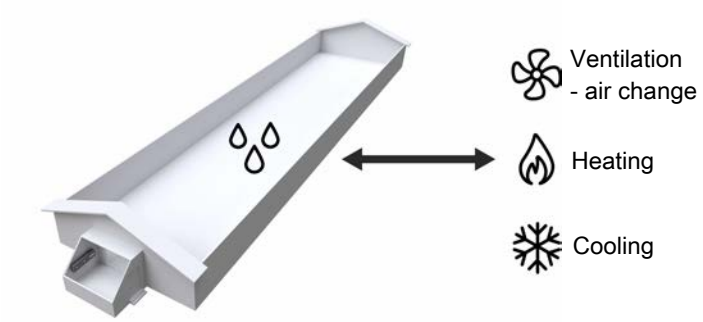
5.3 Humidity

The air humidity in the house is important for the indoor climate and the animals' well-being. Concerning air humidity, the regulation must ensure a suitable level - neither too high nor too low.

When the animals are young, it is especially important to avoid a very high humidity level (> 80%) to reduce the pathogens in their immediate environment. A very low humidity level (<40%) can dry out the house, and the animals.

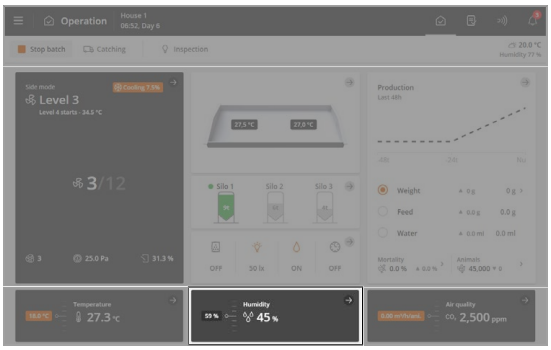
Concerning animal welfare, it is generally more important to keep the correct inside temperature than to keep the humidity within a precise level. Therefore, the controller regulates humidity only when the temperature control allows it.

Note that a high inside temperature and high air humidity (>85%) can be life-threatening to the animals.



Humidity is supplied to the housing air partly from the animals, feed, drinking water, and animal waste and partly from the cooling and humidification functions.

Basically, the humidity in the house can be regulated by increasing or decreasing the ventilation level or increasing or decreasing the heat supply. The controller has several humidity control principles, which you can choose from, depending on what suits the house in question. See section Humidity control mode [▶ 34].



Operation. The most important humidity values can be viewed and adjusted via the card **Humidity**.

The front of the card shows the current inside humidity and the desired air humidity.

The humidity card provides access to easy adjustment of the inside humidity during a batch.

The humidity card provides furthermore access to following humidity related views:

- Graphic history curve. See section History curves.

The following sections describe the functions and setting options available for humidity.

Operation | **Humidity** card

Humidity setpoint	Setting the upper air humidity limit. If you need to adjust the humidity, changing it 3% and waiting 3-4 days is recommended. Then assess whether a further adjustment is necessary.

Operation | **Humidity** card | **Control settings**

Humidity control enabled	Connection and disconnection of humidity control. When the humidity control is disconnected, the controller regulates the ventilation exclusively in relation to the inside temperature. Switching off the humidity control during certain outdoor climate conditions may be relevant. It applies to areas with high outside humidity and temperature for a long time. Here, however, the humidity control will have no effect.

Humidity to stop side cooling	The air humidity percentage that makes the controller stop the cooling function. Furthermore, a humidity limit can be set for the tunnel cooling. Cooling is gradually removed 10% before the humidity limit.
Humidity control mode	Selecting type of humidity control. See also the section Humidity control mode [▷ 34].
Maximum humidity ventilation	At temperature reduction. Setting of the degree of ventilation where the humidity ventilation stops. At Humidity heat. Setting of the degree of ventilation where the heat is reduced. If you, e.g., in periods of high outside humidity and temperature, want to limit the humidity ventilation, this setting can be reduced.
Humidification setpoint	Setting of lower air humidity limit. It can be set to a maximum of 5% below Humidity. Also see the section Humidification [▷ 34]
Humidification last day	Setting of the day number when the controller deactivates humidification.
Switch humidity control on batch day	Changing the humidity control mode during the batch can be advantageous as the animals' needs change with age. Changing the humidity control mode automatically on a specific batch day is possible. Select the humidity control mode to start with and the mode to switch to and select the day for the switch to take place.
Switch humidity control setup	Selection of the humidity control principle the batch should switch to and selection of the day number where the change takes place.

Menu button | **Strategy** | **Climate**

Humidity	Determination of strategy via batch curves for **Humidity** and **Maximum humidity ventilation**. The curve values must be set to suit the production method, type of animal, and the area's climate - especially outside humidity. See also the section Strategy [▷ 24].

5.3.1 Humidification

Humidification increases the air humidity of the house by supplying atomized water to the air. It is important to maintain a certain air humidity, among other things to prevent dehydration of the animals' mucous membranes.

The controller increases humidification as long as the air humidity is below the humidification setpoint.

During batch production, the controller can automatically regulate the humidification in relation to the age of the animals by adjusting the batch curve. See also the section Strategy [▶ 24].

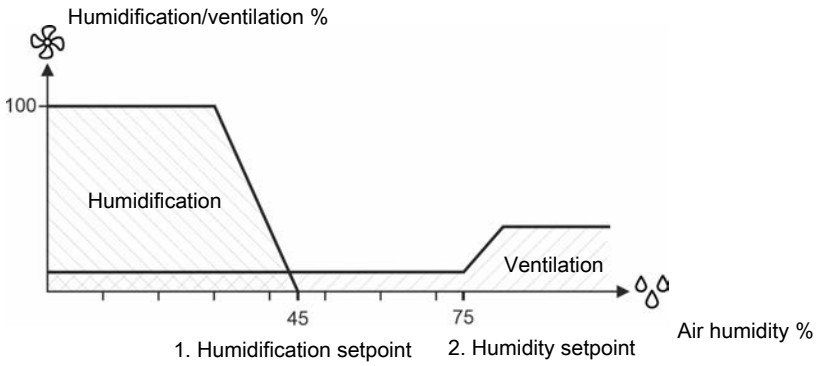


Figure 4: 1. Decreasing air humidity. The air humidity is below Humidification setpoint. The controller starts the humidification. 2. Increasing air humidity The air humidity is above humidity setpoint. The controller increases the ventilation.

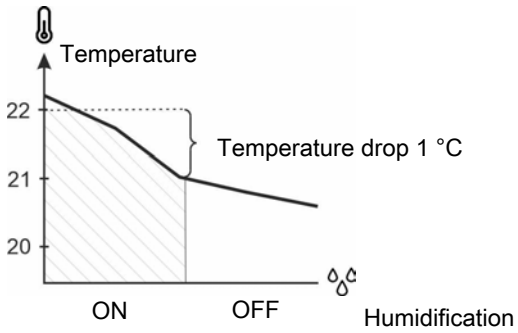


Figure 5: Decreasing temperature: Humidification will be disconnected if the inside temperature is 1° C below Temperature setpoint. Humidification could otherwise make the inside temperature drop further.

5.3.2 Humidity control mode

The air humidity can be regulated based on the correlation between the air temperature and its ability to contain moisture. The warmer the air is, the more water vapor it can contain.

It is generally estimated that for every 1 °C temperature change, the humidity will change 5%.

- As the temperature rises, the relative humidity decreases.
- As the temperature falls, the relative humidity increases.

If the temperature falls so much that the relative air humidity reaches 100%, the water vapor will start to condense (dew point).

These general principles can be exploited by choosing the humidity control mode that best suits the requirements of the animals and the individual house (geographical location).

The controller has 2 primary humidity control modes, each of which takes its own area into account.

Temperature reduction	Humidity heating
Animals	Air quality (CO2)

5.3.2.1 Temperature reduction

The house controller can control the house humidity according to the humidity control principle with temperature reduction when the animals can tolerate a temperature drop at high air humidity. This function limits the use of heating in the house but cannot keep the air humidity at the humidity setpoint.

Consequences	Method of operation
Less heat consumption Possible to regulate humidity without heat Does not maintain the set humidity The animals must be able to tolerate the temperature drop at high humidity.	The inside temperature that is controlled as it is reduced so that ventilation can be increased.

Temperature reduction with heat supply

When the house controller is set to control humidity according to the temperature reduction principle, the controller will adjust a too high humidity level by reducing the inside temperature by a few degrees (reduction).

At a lower temperature setting, the house controller will thus increase ventilation and consequently the change of air. When this has made the inside temperature drop, ventilation will decrease to minimum ventilation in order to limit the heat loss from the ventilation.

If this is insufficient to maintain the reduced House heater setpoint, the controller will gradually supply more heat.

Temperature reduction without heat supply

The humidity control process is the same as for heat supply until the point at which ventilation is reduced to minimum ventilation. Without heat supply, the inside temperature could continue to drop below the **Heater setpoint**.

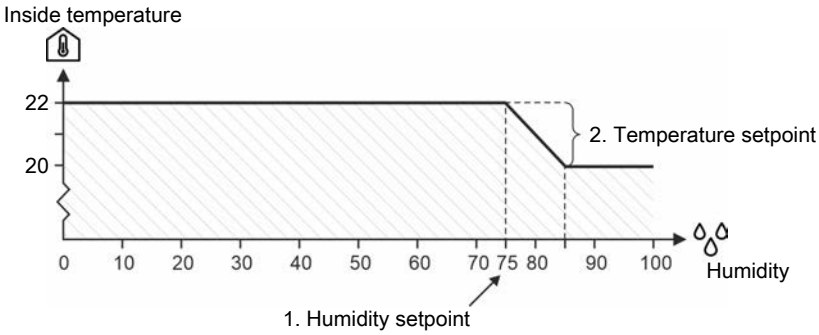


Figure 6: Humidity control with temperature reduction

The house controller will lower the set temperature by 1° C each time the air humidity exceeds the humidity setpoint by 5 %.

5.3.2.2 Humidity heat

When the controller has been set to control humidity according to the humidity heat principle, it will reduce a too high humidity level by gradually increasing the heat supply. The increased heat supply will make the inside temperature rise. In order to maintain the temperature, the ventilation system will gradually increase ventilation.

Humid heat makes it possible to keep the house air humidity at the set humidity.

Consequences	Method of operation
Highest heat consumption	Increases heat supply.
Maintains the set humidity	Humidity and heat are removed through ventilation when the temperature gets too high.

Heating costs

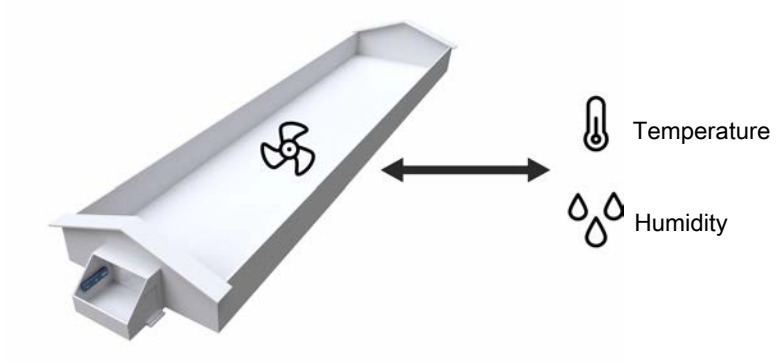
Check the heat consumption at regular intervals when using the principle of humidity heating to regulate the house humidity. Settings for heating and humidity control should be checked to avoid excessive heating costs.

At high outside temperature and high outside air humidity

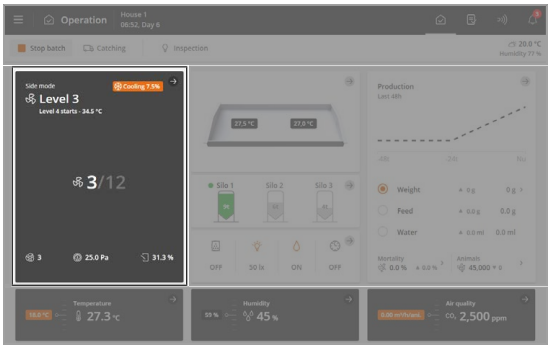
Heat management according to humidity will not provide better litter or air quality. Increased ventilation will basically draw as much humidity into the house as is ventilated out.

5.4 Ventilation

The house ventilation consists of air inlets and air outlets. Apart from supplying fresh air to the house, ventilation is to remove humidity and excess heat, if any.



The controller corrects the ventilation based on the matrix and will thus increase or limit ventilation according to whether the inside temperature is too high or too low.



Operation. The most important ventilation values can be viewed and adjusted via the card **Climate equipment**.

The front of the card shows how the ventilation system is running right now. It applies to the active equipment and the active functions.

The following sections describe the settings options for the page **Strategy**, where the batch curves are set. Also, see Matrix menu for levels [▷ 15].

Menu button | **Strategy** | **Ventilation** | **Minimum ventilation**

Minimum ventilation	Setting of the desired ventilation in m^3/h/animal.
Stepless	Display of how much the stepless fan is active. This is automatically calculated based on the desired minimum ventilation.
Inlet	Setting the required opening degree for air inlet.

Menu button | **Strategy** | **Ventilation** | **Control settings**

Minimum time at level	Setting the minimum time the controller must remain on a level before it can switch to another level. Increasing this setting makes the ventilation more stable.
Level hysteresis	Setting the minimum temperature difference before the controller can switch from one ventilation level to another.
Fans cycle time	Setting of cycle time for fans in the air out.
Stir fan 1 cycle time	Setting the cycle time for stir fan.

Menu button | **Strategy | Ventilation | Ventilation level**	
Min level	Setting a batch curve for the lowest permissible ventilation level supplies the house with minimum airflow that ensures acceptable air quality.
Max. level	Setting a batch curve for the highest allowed ventilation level.

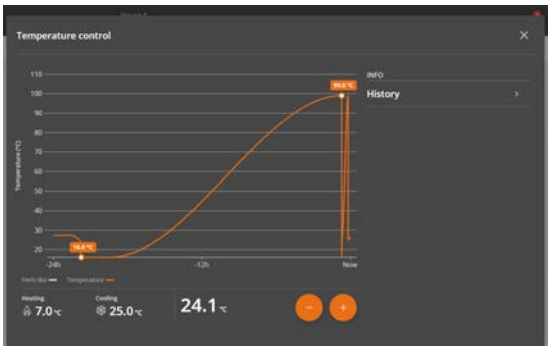
5.4.1 Air quality

The **Air quality** function provides just the amount of air to the house, which ensures acceptable air quality. The function is particularly relevant in periods with cold weather when it is not necessary to ventilate to keep down the inside temperature.

Operation | Air quality card

The air quality card provides access to easy adjustment of the air quality during a batch.

The front of the card shows the current CO_2 level (ppm) and the fixed level of 3000 ppm.



If the air quality is poor or if the temperature is too low

Adjust the setting up or down and wait and reevaluate the status the next morning.

The controller can regulate according to minimum ventilation (m^3/h/animal) or a limit value for CO_2 (requires a CO_2 sensor).

Menu button | **Strategy | Climate | CO_2 Air quality**	
Air quality control	The controller can adjust according to minimum ventilation (m^3/h/animal).

Menu button | **Strategy | Climate | Ventilation**	
Minimum ventilation	Setting a lower limit for how little is ventilated in relation to the animals' air requirement (m^3/h/animal). The animals' fresh air requirement varies according to breed and weight. Enter the requirement as m^3/h/animal. The correct number can be found in the technical literature or by asking an advisor. Minimum ventilation must only be adjusted in relation to the desired air quality - not to regulate the inside temperature.

From the factory, the limit for CO_2 is set based on the goal that the CO_2 level in the house must not exceed 3,000-3,500 ppm (in EU max. 3,000 ppm).

It is important that the batch curve is adapted according to the type of animal, local authority requirements, outside climate conditions, and type of heat supply.

When setting batch curves:

- Note that the number of animals must be correct.
- Note that in the case of heat supply with direct combustion, where combustion gas is led out into the house itself (e.g.,gas and oil burners without a chimney), a higher minimum ventilation will be required.
- Note that a high minimum ventilation results in increased heat consumption.

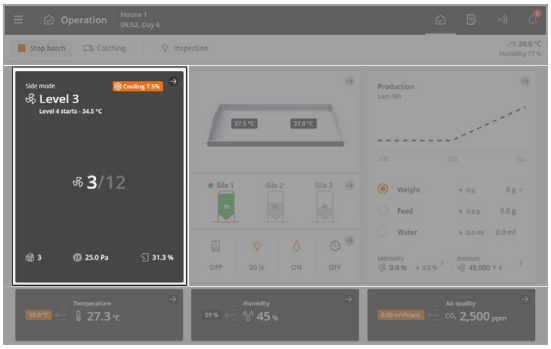
Lack of ventilation in the case of CO2 alarm

In the case of CO_2 sensor errors or high CO_2 alarm, the controller deactivates the CO_2 function and enables Minimum ventilation. It is to prevent a faulty CO_2 sensor from causing a too-low or too-high ventilation level.

It is therefore essential that Minimum ventilation and Number of animals are correctly set, even when using CO_2 minimum ventilation.

5.4.2 Pressure

The controller regulates the air inlets based on the measured pressure so the required pressure is maintained in the house.



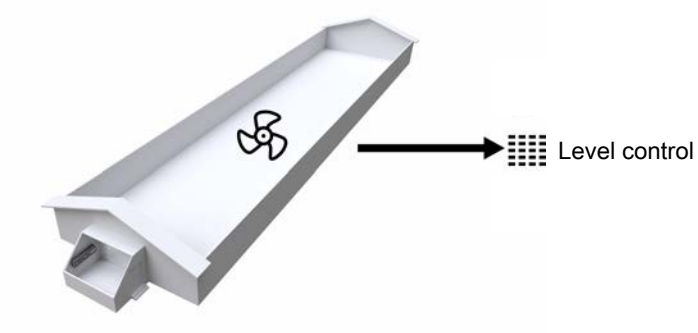
Operation. The current pressure level can be seen on the **Climate equipment** card.

Operation | **Air conditioner** card | **pressure**

Pressure	Graphic display of the historical values in different time intervals from 24 hours to 2 months.
Pressure	Current pressure.
Pressure inlet requirement	Percentage indication of how much the flaps must be open to maintain the Pressure setpoint.
Active	Connection and disconnection of pressure control.

5.4.3 Stir fan

A stir fan is typically used to improve air circulation inside the house and thus provide a more uniform temperature in the house. Depending on the type, location and connection method, however, it can be used for many different purposes.



Operation | Climate equipment card | **Stir fans | Stir fan 1**

Fan requirement	ON/OFF fan: ON or OFF. Variable fan (0-10 V): fan speed in %.
Control settings	Menu for setting of the individual fan. The content of the menu depends on the stir fan type. See the section below.

5.4.3.1 Regulation via level control

When the stir fan is regulated as a level control, it operates according to the settings for each level in the matrix. See the section Stir fan matrix [▶ 17]

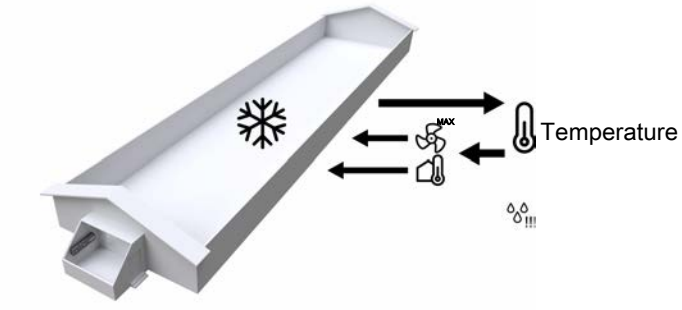
Operation | Climate equipment card | **Stir fans | Stir fan**

Manual fan control	Manual activation or deactivation of the stir fan. - for example, to briefly create increased air movement. Setting the speed that the stir fan must run at when in manual override. Remember to deactivate manual mode again.

5.5 Cooling

Cooling is used in houses where ventilation alone cannot reduce the inside temperature sufficiently.

Cooling has the advantage over ventilation that it can bring the inside temperature down below the outside temperature. On the other hand, cooling will also increase the air humidity in the house.



The combination of a high inside temperature and high air humidity can be life-threatening to the animals. As cooling makes the house humidity increase, the controller automatically disconnects cooling when the house humidity exceeds **Humidity to stop side cooling** (normally 75-85%, factory setting: 85%).

Operation. The most important cooling values can be viewed and adjusted via the **Climate equipment** card.

When cooling is active, this is shown in the upper right corner of the card.

The following sections describe the functions and setting options available for Side cooling.

Operation | Climate equipment card **| Cooling**

Cooling	Graphic display of the historical values in different time intervals from 24 hours to 2 months.
Cooling sensor	The average temperature from several sensors controlling the cooling.
requirement	Reading of current cooling requirement.
Requirement incl. humidification	Only when humidification is connected to the relay for side cooling system. This is particularly useful in hot and dry areas where side cooling will run alternately to the humidification, respectively to cool and increase humidity. Display of how big a percentage of the side cooling system's capacity that is currently active.
Start cooling offset	The number of degrees by which the temperature is to exceed Temp. setpoint incl. additions before cooling starts. The controller gradually increases cooling.
Absolute start temperature	Display of the measured inside temperature at which side cooling starts.

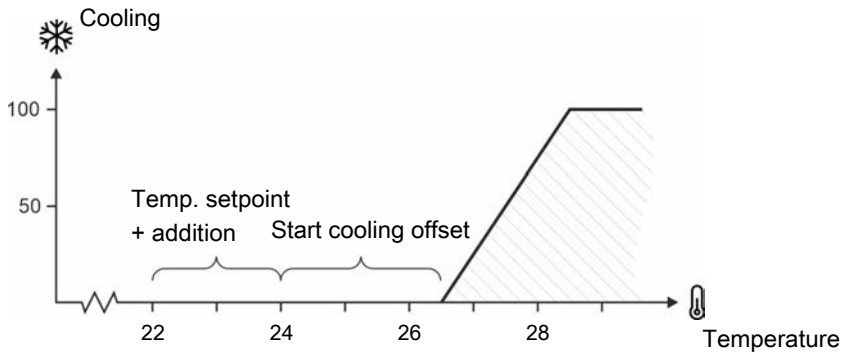


Figure 7: Cooling

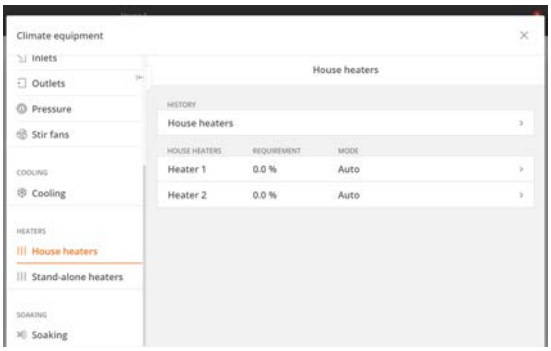
A prerequisite for cooling to be able to start is that ventilation is set to **Maximum ventilation** *or that the outside temperature is above* **Temperature setpoint**.

5.6 Heating

5.6.1 House heaters

Room heaters are used to heat the entire house and cold areas in the house.

During setup, select which sensors are to control the heating demand for each heating unit.



The room heating demand is set for each level in the matrix.

Operation | Climate equipment card **| House heaters**

History	Graphic display of the historical values in different time intervals from 24 hours to 2 months.
Manual control	Manual activation or deactivation of the room heating. Remember to deactivate manual mode again.

Menu button | **Strategy | Heating**

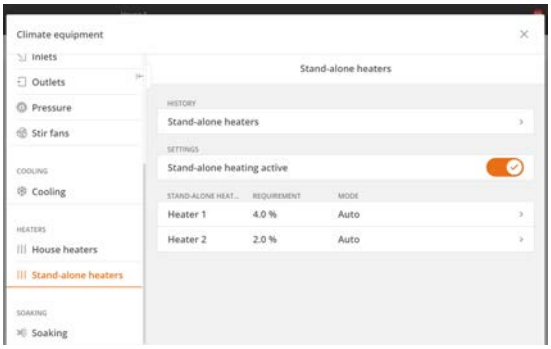
Cycle time	Setting the intervals in which the heating system is active. ON + OFF-time of the heating relay.

Inappropriate regulation

If you turn off the heat supply manually without disconnecting heating on the controller, the regulation of the ventilation will be inappropriate as the controller will try to regulate based the assumption that heating is still available.

5.6.2 Stand-alone heater

Stand-alone heaters are used,e.g., in cold areas of the house to equalize temperature differences.



Operation | Climate equipment card | Stand-alone heaters

History	Graphic display of the historical values in different time intervals from 24 hours to 2 months.

Operation | Climate equipment card | **Stand-alone heaters**.

Stand-alone heater active	Connecting or disconnecting all stand-alone heaters.

Operation | Climate equipment card | **Stand-alone heaters** and the desired stand-alone heater in the table.

Stand-alone heater 1 active	Connecting or disconnecting the individual stand-alone heater.

Operation | Temperature card | **Stand-alone heaters**.

Stand-alone heater setpoint	Setting of the temperature which is the lowest temperature allowed in the local zone. When the temperature is lower than this setting, the heater supplies heat.

Menu button | **Strategy | Temperature**

Stand-alone heater	Determination of strategy via batch curves for stand-alone heaters.

Inappropriate regulation

If you turn off the heat supply manually without disconnecting heating on the controller, the regulation of the ventilation will be inappropriate as the controller will try to regulate based the assumption that heating is still available.

5.7 Catching

Catching is designed to alter the air change in the house in connection with all or some of the animals leaving the house. The ventilation status will change to **Catching** and adapt its settings. When status changes back, the ventilation returns to half the ventilation requirement that was just before the function started.

The function also modifies the feeding program, light control and alarms.

Catching should be carefully planned and the settings adjusted to what is desired. The catching itself should be closely monitored to avoid damage to the animals.

Operation | Catching | Control

Plan catching	Setting the date and time when the function should start (with display operation). Calculate how long catching and transport take compared to when the animals must be delivered. The plan can be removed if there are changes to when catching is to take place.
Catching start period	Setting the time period when the user can activate the function. (only push button and key).
Catching time-out	Setting how long catching should be active. After the set time has elapsed, a transition time of 30 minutes starts before ventilating as normal.
Catching start	Only visible when the function is active. Displaying the time when catching was activated.
Catching stop	Only visible when the function is active. Displaying the time when catching is to stop (based on **Auto stop catching after**). If catching lasts longer than expected, the stop time can be changed.
Feed mixture uses	Display of the last selected feed type.
Feed mix stop	Display of the time when feed mixture stops.
Stop feed system	Selecting whether the feed system should stop when catching is activated.
Stop feed weigher before feed system is stopped	Setting the time period. The time period should correspond to the time it takes for the animals to eat the feed which is distributed in the system.

Stop cross auger with feed weigher	With time-controlled feed weigher with cross auger but without silo auger and feed demand sensor. Selecting whether the cross auger should stop when the catching stops the feed weigher.
Stop feed mixing before feed weigher is stopped	Setting the time period. The time period should correspond to the time that the animals should only have one type of feed.
Type of feed when feed mixing is stopped	Selection of the last type of feed to be used before the feeding system is stopped.

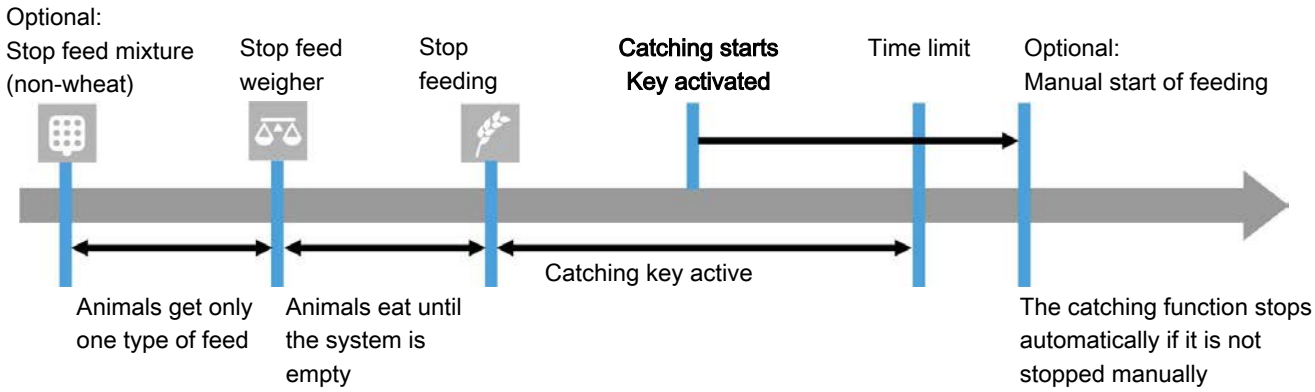


Figure 8: The sequence when stopping the feed system during catching

Climate

During catching, the ventilation must both protect the animals against heat stress and cooling. The inside temperature should be kept between 16-18 °C (where possible). House heaters should be switched off.

Air inlet	Setting how much the air inlets must be open in percent during catching.
Roof inlet	Setting roof inlet, flap, fan and stir fan in percent during catching.
Stepless	Setting how much the air inlets must be open in percent during catching.
MultiStep	Selecting which MultiStep should be active during **Catching**. For example, you can control the desired direction of the airflow, by only activating the MultiStep at one end of the house.

Light control

The light level should be reduced as much as possible to limit the animals' activity. However, be careful to take into account the safety of staff and animals and the completion of the job.

Light control can be made for all types of light (main light, slave light and extra light).

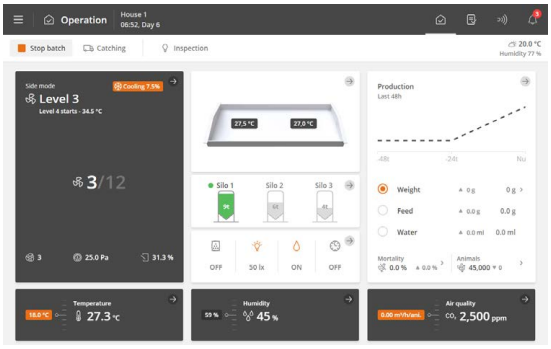
Light active	Select if activating catching should change the light control.
Light intensity	Setting the desired light intensity at catching. It is an advantage if the animals calm down after the light is dimmed.

5.8 House mode Active house - Empty house

The controller has 2 different modes of operation, one for when there are animals in the house and one for when the house is empty.

With animals in the house – active house. Control takes place according to the automatic settings and strategies and all alarms are active.

Without animals in the house – empty house. Control takes place according to the in-between batches setting **Empty**. Only active alarms are alarms for CAN communication and temperature surveillance for **Empty.**

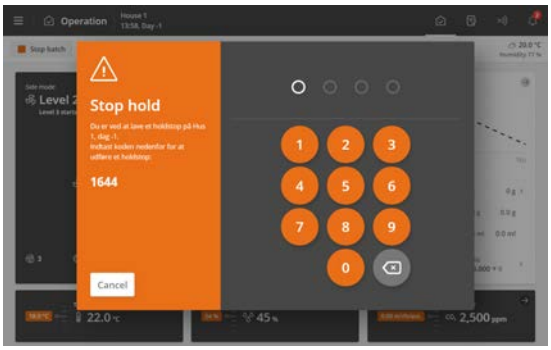


Press **Operation**.

Press **Stop batch** to change house status to **Empty**.

or

Press **Start batch** to change to house status active.



The change between active and empty house is done manually by the user. It is critical for the animals that the change does not happen by mistake. The function is therefore protected with a code entry.

Enter the displayed code to change the house status.

The change takes place immediately when the fourth digit is entered.

.

Active house

It may be an advantage to change the status to active house 1-3 days before stocking the animals. This way the controller has time to adapt the climate to the needs of the animals and to feed in the house.

When the house status changes to active, the day number changes to **Start at day**, and the controller controls according to the automatic settings.

(Be aware that it can cause problems with the history of production data if you change the **Day number** after the house status is set to active. This setting should only be used for service).

Empty house

The house status should not be changed to **Empty** until the house has been depopulated.

Then the controller disconnects the adjustment and controls according to the settings for **Empty**. It protects the animals in case a house is set to **Empty** by mistake.

If the house is to be completely closed, the settings of the function **Empty** must be reset. See the section Empty house [▷ 46].

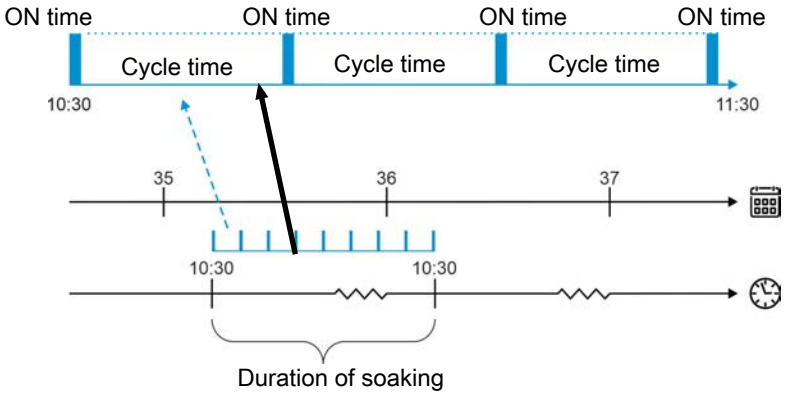
When the house status changes to **Empty**, the controller resets all settings that deviate from the strategy and settings made during the previous batch.

5.9 Pause functions

5.9.1 Soaking

Soaking will soak the house with water, loosening dust and dirt. It will not only reduce the amount of dust during the subsequent cleaning process, which also becomes easier.

In soaking mode, the ventilation must stop to maintain the humidity in the house. The soaking system adds humidity for a number of minutes (**ON time**) for each interval (**Cycle time**) in the total time, during which the soaking should last.



Menu button | **Pause functions** | **soaking**

Duration of soaking	Setting the number of hours during which the function is active and supplies humidity in intervals.
Cycle time	Setting the intervals in which the soaking system is active.
ON time	Setting the active period for soaking.

Inlets	
Side inlet	Setting the flap opening for side air inlet (side).

Outlets	
Level	Setting the air outlet level.
Air outlet 1 flap	Setting the flap opening for air outlet. When the house is in **Empty** mode, the function is typically used to open the stepless flap.
Air outlet fan speed	Setting of speed control for air outlet. When the house is in **Empty** mode, the function is typically used to turn off the stepless fan.

5.9.2 Washing

During washing the house manually, ventilation must run again to start changing the air in the house.

Menu button | **Pause functions** | **Functions** | **Washing**

Duration of washing	Setting the number of hours during which the function is active.

Inlets	
Inlets	Setting the flap opening for air inlet.

Outlets	
Level	Setting the air outlet level.
Air outlet 1 flap	Setting of flap opening for air outlet When the house is in **Empty** mode, the function is typically used to open the stepless flap.

Air outlet fan speed	Setting of speed control for air outlet. When the house is in **Empty** mode, the function is typically used to turn off the stepless fan.

5.9.3 Drying

Menu button | **Pause functions** | **Functions** | **Drying**

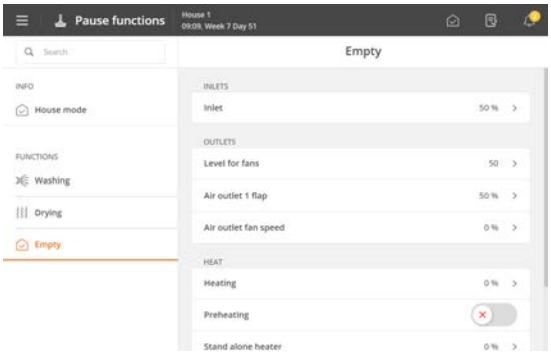
Duration of Drying	Setting the number of hours during which the function is active.

Inlets	
Inlets	Setting the flap opening for air inlet.

Outlets	
Level	Setting the air outlet level.
Air outlet 1 flap	Setting of flap opening for air outlet When the house is in **Empty** mode, the function is typically used to open the stepless flap.
Air outlet fan speed	Setting of speed control for air outlet. When the house is in **Empty** mode, the function is typically used to turn off the stepless fan.

Heating	
Heating	Setting of heat supply.

5.9.4 Empty house



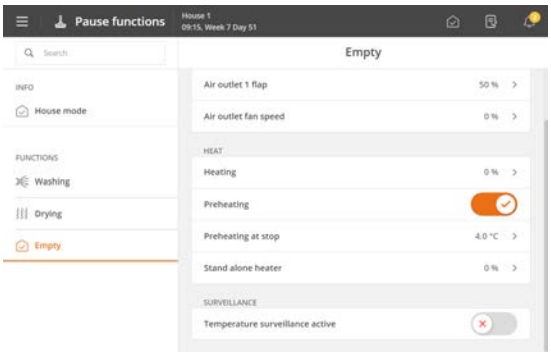
Empty house

The function **Empty** will maintain the air change in the house by allowing ventilation to run at a fixed percentage (50 %) of system capacity. This is to protect the animals in case a house is set to **Empty** by mistake.

When batch status is **Empty**, the controller disables all automatic regulations and operates according to the settings for **Empty**.

All alarm functions - with the exception of temperature monitoring when the house is empty - are switched off. See also the section Temperature surveillance [▶ 47].

5.9.4.1 Preheating



Preheating ensures that the inside temperature does not drop below the set temperature when house status is **Empty** for a longer period of time.

The function can therefore also be used for frost protection of the house.

Heating can be supplied as room heating or floor heating.

At batch production the **Preheating at stop** function maintains an inside temperature of 4°C, for example, between two batches. Note that ventilation must be shut off and the heating system must be connected.

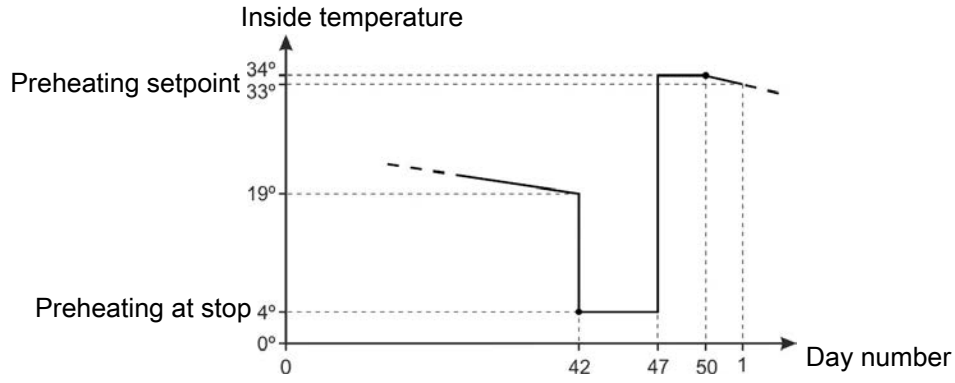
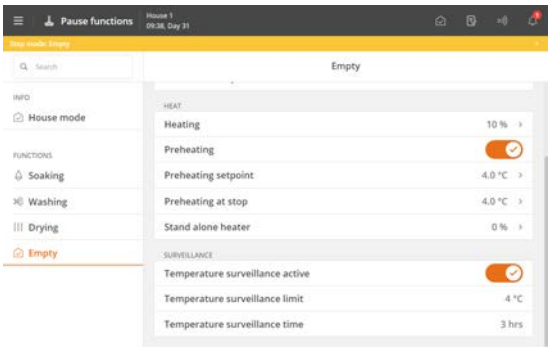


Figure 9: Example of setting of preheating.

Menu button | **Between batches | Functions |** **Empty**

Preheating	Connection and disconnection of the function.
Preheating setpoint	Setting of desired inside temperature at start.
Preheating at stop	Setting of desired minimum inside temperature between 2 batches.
Stand-alone heater	Setting the percentage at which the stand-alone heater should run. The stand-alone heater stops when the indoor temperature exceeds the set temperature.

5.9.4.2 Temperature surveillance



The controller can be secured against incorrect setting to the house status **Empty**.

The controller monitors the temperature in the house for 3 hours after changing the batch status to **Empty**. If the temperature increases in this period by more than 4 °C (indicate there are animals in the house), the controller triggers an alarm and activates the ventilation.

This temperature surveillance is interrupted if an in-between function is activated.

Menu button | **Between batches | Functions |** **Empty**

Temperature surveillance active	Connection and disconnection of the function.
Temperature surveillance limit	Display of the number of degrees the temperature must rise after batch stop.

Temperature surveillance time	Display of the time period when the temperature is monitored after batch stop.

6 Management

6.1 Equipment status

When monitoring equipment such as e.g. a current sensor for the individual components of the system, a complete overview can be seen in the menu **Operation | Climate equipment** card **| Equipment status**.

See also the section Equipment status.

6.2 Power reduction

The function is designed to limit the current consumption of the connected components during periods when the power supply is under load.

The controller is notified that the power supply is insufficient. It can then turn off or limit the current consumption to the following functions:

- Ventilation
- Main light, slave light and extra light
- Feeding system (pan feeding and layer feeding)
- 24-hour clock

Menu button | Strategy | Power reduction | Climate

Power reduction enabled	Selecting whether power reduction should be applied to ventilation. This will enable a reduction in the ventilation level.
Ventilation setpoint	Setting the degree of ventilation to be ventilated when power reduction is active.

Menu button | Strategy | Power reduction | Production | Main light

Main light power reduction enabled	Selecting whether power reduction should be applied to main light. It will allow a reduction of the light intensity.
Main light intensity reduced by	Setting the required light intensity when power reduction is active.

Corresponding settings for slave light and extra light.

Menu button | Strategy | Power reduction | Production | Feed system

Enable power reduction	Selecting whether power reduction should be applied to the feeding system (pan feeding and layer feeding only). It will pause feeding. However, during pan feeding, the cross auger and the silo auger will continue to fill the feed dispenser until the feed requirement is met.

Menu button | Strategy | Power reduction | production | 24-hour clock

Clock 1 power reduction enabled	Selecting whether power reduction should be applied on the 24-hour clock. This will pause the equipment that the 24-hour clock controls.

7 Alarm settings

The controller has a number of alarms, which it will activate if a technical error occurs or alarm limits are exceeded. A few of the alarms are always connected, e.g. power failure. The other alarms can be activated / deactivated, and for some of them, you can even set the alarm limits.

The user is always responsible for ensuring that all alarm settings are correct.

See also the section Alarms [▷ 28].

7.1 Climate

7.1.1 Temperature alarms

Menu button | **Settings | General | Alarma | Climate | Temperature**

Error inside temperature sensor	The controller triggers an alarm if the sensor is short-circuited or disconnected. Without this sensor, the controller cannot control the inside temperature, and apart from the alarm, the error will also trigger an emergency control of the ventilation system, which will open 50 %. The alarm is always a hard alarm.
Error outside temperature sensor	The controller triggers an alarm if the outside temperature sensor is short-circuited or disconnected.
Error outside temperature sensor low (-35°C)	Selection of whether the controller should monitor whether there is an error in the outside temperature sensor. The function is intended for use in areas where the outside temperature usually does not fall below -30 °C.
Misplaced outside sensor	The alarm indicates whether the sensor is exposed to solar heating and therefore displays an incorrect outside temperature. The controller triggers an alarm when the inside temperature measured by the controller is the number of degrees below the outside temperature that the function is set to (for example 5°C).
High temperature limit	The temperature alarm for high temperature is only activated when the batch state is **Active house**. The alarm is set as an excess temperature to **Temperature setpoint**.
Low temperature limit	Alarm for excessively low temperature in relation to the **Temperature setpoint**.
Summer Alarm at 20 °C and 30 °C Outside	The function has a varying alarm limit that monitors changes in the high outside temperature. When the temperature rises, the alarm limit will also rise. It will thus postpone the time when the high temperature alarm is triggered. The controller only triggers the alarm if the inside temperature also exceeds the high temperature alarm.

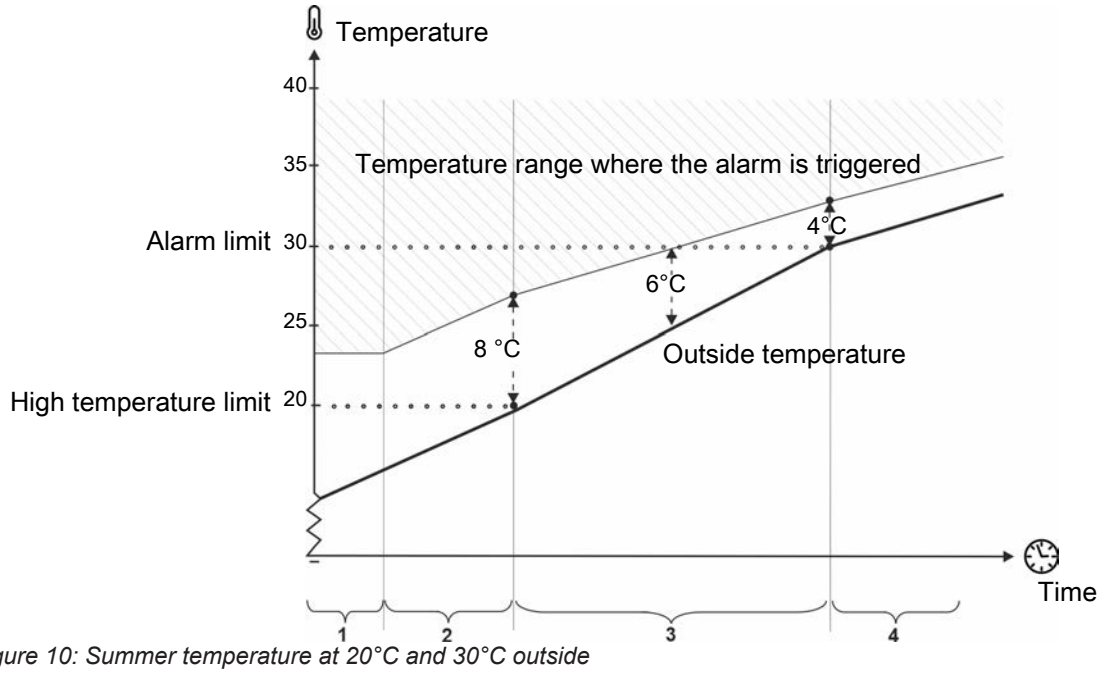


Figure 10: Summer temperature at 20°C and 30°C outside

1. *The alarm limit does not fall below the High temperature limit.*
2. *Below 20°C outside, the alarm limit is 8°C, staggered in relation to the outside temperature.*
3. *Between 20°C and 30°C, there is a gradual transition from 8°C to 4°C. At an outside temperature of, e.g., 25°C, the inside temperature must be 6°C higher (above 30°C) for the alarm to be triggered.*
4. *Above 30°C outside, the alarm limit is 4°C, staggered in relation to the outside temperature.*

Absolute high temperature	The alarm for absolute high temperature is triggered by an actual temperature, such as 32°C. The controller triggers the absolute high temperature alarm when just one inside temperature sensor measures a temperature that exceeds this setpoint. The absolute high temperature alarm is set as a temperature curve.

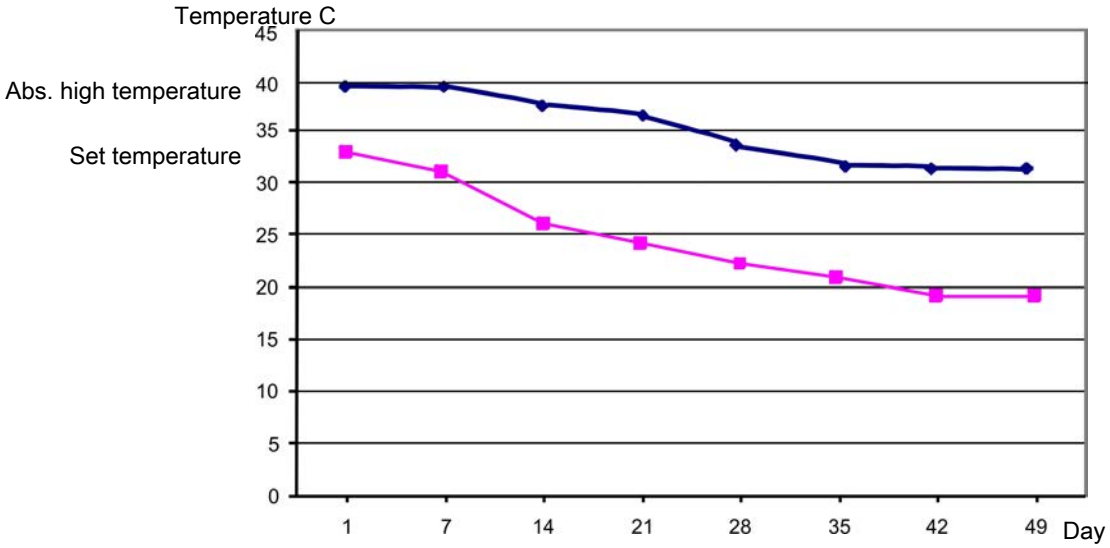


Figure 11: Example of Absolute high temperature alarm.

Alarm for Absolute high temperature is released when the inside temperature exceeds the set value. The value can be set as a curve over a time span of eight day numbers.

House heater alarm **House heater limit** **Stand-alone heat alarm** **Stand-alone heat limit**	All active heating temperatures are compared to the active grow zone temperature. An alarm is generated if the difference exceeds the set limit. In tunnel mode the alarms are based on the tunnel temperature.

7.1.2 Humidity alarm

Menu button | **Settings** | **Alarms** | **Climate** | **Humidity**

Outside humidity sensor failure	Select the alarm type **Hard**, **Soft** or **Disabled**.
Error humidity sensor	Select the alarm type **Hard**, **Soft** or **Disabled**.
Absolute high humidity	Select the alarm type **Hard**, **Soft** or **Disabled**.
Absolute high humidity limit	The controller triggers the alarm for absolute high humidity when the humidity exceeds the setpoint. This may be due for example to lack of ventilation or a technical sensor error.

7.1.3 Inlet and outlet alarm

Menu button | **Settings** | **Alarms** | **Climate** | **Inlet and outlet alarm**

Inlet and outlet alarm	The inlet and outlet alarms are technical alarms. The climate controller triggers an alarm if the opening of the air inlet or outlet deviates from the setting calculated by the controller.

7.1.4 Pressure sensor

Menu button | **Settings** | **General** | **Alarms** | **Climate**

Pressure sensor	With the function Sensor alarm delay you can postpone the alarm signal so that the alarm is not triggered by transient changes of the pressure level in the house, e.g.,when a door is opened. The controller triggers an alarm when the pressure in the house drops below or exceeds the settings of **Pressure high limit**/**Pressure low limit**.

7.1.5 CO2 alarm

Menu button | **Settings** | **Alarms** | **Climate**

CO2 alarm	The house controller triggers an alarm if the values for the sensor fall below or exceed the setpoints.

7.2 Auxiliary

7.2.1 Auxiliary sensor alarm

Menu button | **Settings** | **Alarms** | **Auxiliary**

Auxiliary sensors	The controller triggers an alarm if the values for the sensor fall below or exceed the setpoints.

7.2.2 Auxiliary alarms

It is possible to create a number of auxiliary alarms. For example, the controller may give an alarm from a connected motor controller, a water pump or other equipment.

The alarms can be sorted within each column by pressing the heading.

Menu button | **Settings | Alarms | Auxiliary | Auxiliary alarm settings**

Press **Add** to add a new alarm.

Press **Name** to name the alarm.

Press **Category** to add the alarm to a category.

Select the alarm type **Hard**, **Soft** or **Disabled**.

Set a delay, if required. In this way, the alarm signal can be delayed so that the alarm is not triggered when the alarm limit is briefly exceeded.

Set the activation to take place in the event of high or low input.

Select if the alarm should be active always or from a specific day number.

To delete an auxiliary alarm, press the icon .

After creating the alarm, see the menu | **Installation | Show connection** for information about where to connect the extra equipment.

7.3 Master/Client alarms

If the controller is set up to share equipment with other controllers, it gives an alarm if the connection between the controllers is lost. A 'Client' controller will continue to regulate according to the latest received value from the 'Master' controller equipment until the network connection is restored.

Menu button | **Settings | Alarms**

Connection to Client lost	Select the alarm type **Hard**, **Soft** or **Disabled**.
Connection to Master lost	

7.4 Equipment status

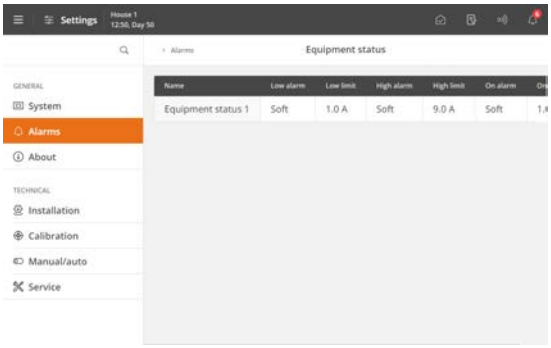
By connecting monitoring equipment such as a current sensor to the system's individual components (stepless fans), it is possible to get an alarm that can indicate possible error types.

There are 3 alarm types:

Low alarm	Possible equipment failure. The equipment may be disconnected by mistake. Alarm due to missing current consumption. For example, if the emergency switch on the fan is turned off, stepless fans may be activated, and the power consumption may be too low.
High alarm	The equipment shows signs of wear. Alarm due to excessive current consumption.
ON alarm	The equipment is active, but should not be in relation to the controller's regulation. Alarming due to current consumption, which should not be there. For example, stepless fans may be activated, and the current power consumption may be too high if there is an emerging defect in the fan.

Alarms are only triggered when a limit has been exceeded for 5 minutes.

The alarms are set up to match the connected monitoring equipment. This is done in the menu **Alarms | Equipment status**



Select the alarm type **Hard**, **Soft** or **Disabled**.

First read the current consumption during normal operation to get an indication of the voltage ranges.

Then set voltage ranges for **Low limit**, **High limit** and **Alarm if ON**.

8 Maintenance instructions

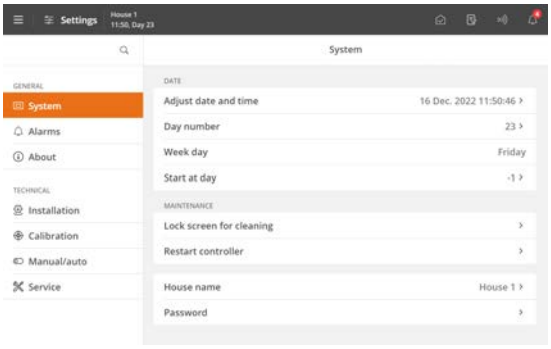
The controller requires no maintenance to function correctly.

You should test the alarm system every week.

Use only original spare parts.

Note that the service life of the controller will be extended if it stays connected all the time, as this will keep it dry and free from condensation.

Lock screen for cleaning



When the controller is to be cleaned, it is possible to lock the screen to avoid inadvertent operation during cleaning.

Press Menu button | **Settings | General | System | Maintenance | Lock screen for cleaning** to lock the screen.

Press and hold for 5 seconds to unlock the screen.

The controller automatically cancels the lock after 15 minutes.

8.1 Cleaning

Clean the product with a cloth that has been wrung out almost dry in water and avoid using:

- high-pressure cleaner
- solvents
- corrosive/caustic agents

8.2 Recycling/Disposal

The label indicates that the product must not be disposed of as general refuse disposal and must be treated as electronic waste.

The label indicates that the product is suitable for recycling.

It must be possible for customers to deliver the products to local collection sites/recycling stations in accordance with local instructions. The recycling station will then arrange for further transport to a certified plant for reuse, recovery and recycling.

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