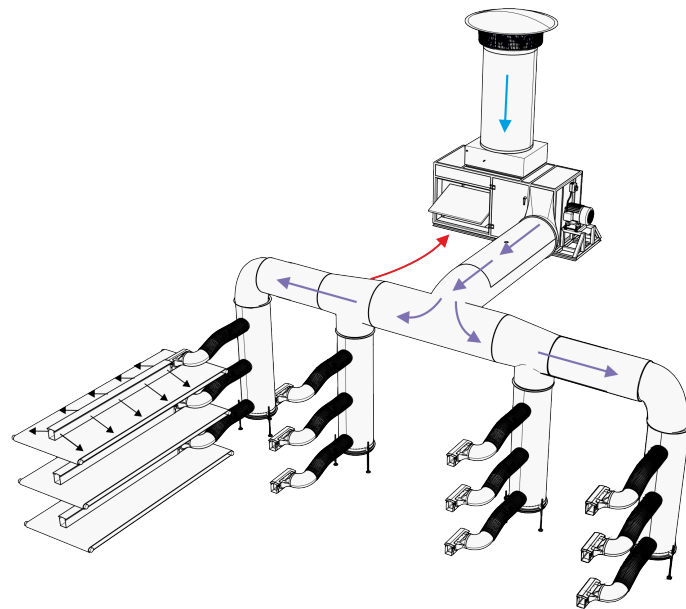


# Manure Drying Viper Touch



**Big Dutchman.**



## 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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## **1 Guidelines**

This manual describes the specific feature software functionality. For a general description of the controller's operation and other functions, see the controller user and technical manual.

## 2 Product description

Manure drying is a software function used for drying of animal manure in poultry houses with cages and manure belts. It is used with a manure drying system and can regulate two of these independently of each other.

A manure drying system typically functions by mixing fresh outside air and house air and directing it over the manure belt. The air mix is determined by a temperature setpoint for the air led into the manure channel. The air flows will make the manure dry faster. This reduces the release of ammoniac in the house and makes manure easier to handle and store. The function can also handle the cleaning of filters, if the manure drying unit has been equipped with such filters.

Manure drying is delivered in two different ways:

- As stand-alone house controller only for regulation of manure drying.
- As software feature containing a specific functionality for after-installation on existing house controllers with production functionality.

Manure drying is used together with a DOL 10 temperature sensor for registration of the temperature in the air led into the manure channel. Vibration sensors are an accessory which can be placed on the fan engines to monitor if they run in a stable manner.

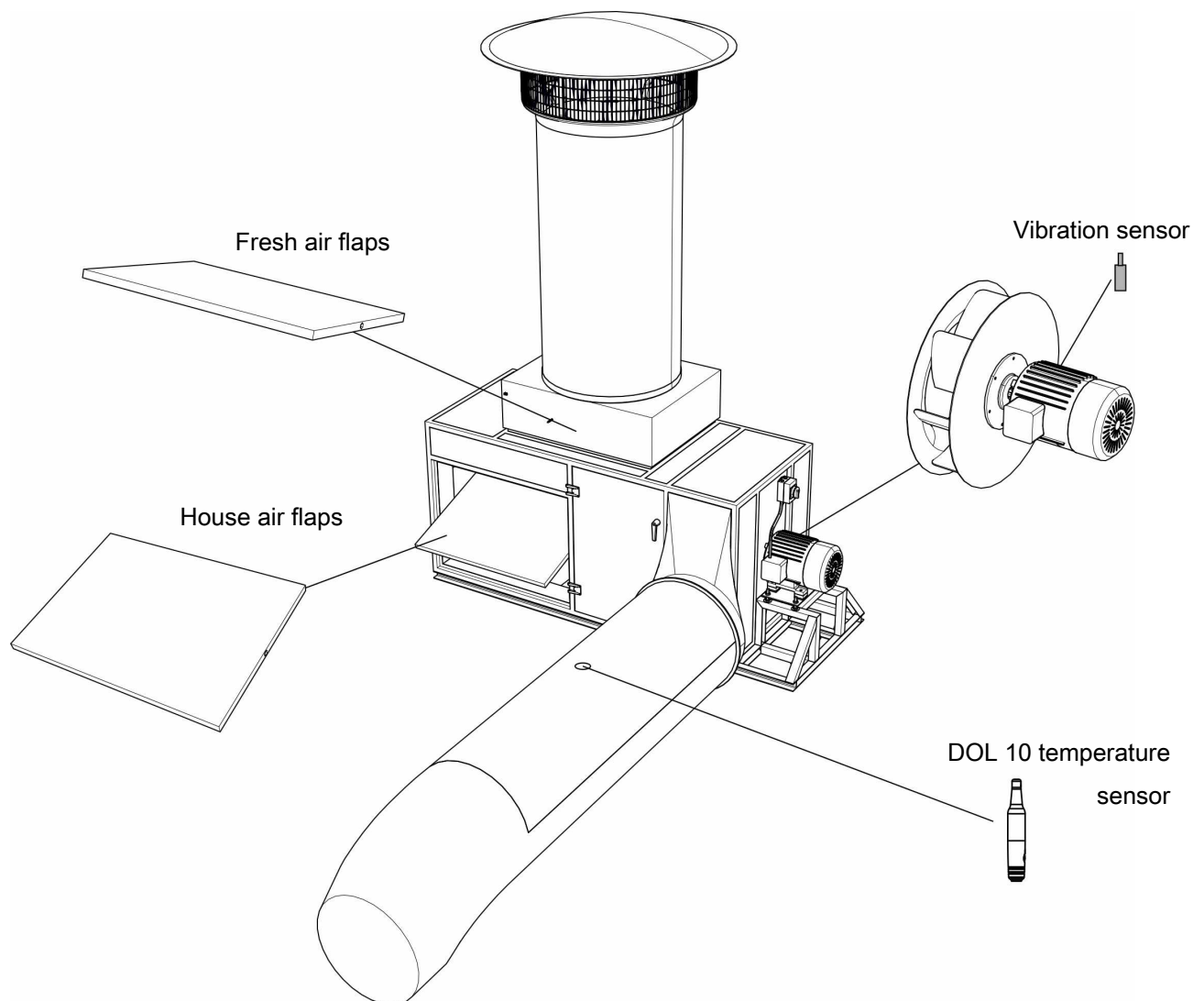


Figure 1: Air mixer for manure drying

## 3 Product overview

### Controller



#### 136640 Viper Touch 710 7" Manure drying

Stand-alone house controller for the regulation of up to two manure drying systems.

Used with a DOL 10 temperature sensor per system.

### Feature Software



#### 136658 Viper Touch feature Manure Drying

Manure drying for after-installation on house controller with installed Layer or Breeder programme. When loading the feature software, the new functions are added to the menus of the controller.

Feature software can be installed on controllers, version 6.1 software or later. If the controller software version is older than version 6.1, it requires update to the latest version prior to installation of the software feature.

In combination with climate functionality it is possible to include the manure dryer's fresh air inlet in the calculation of the normal ventilation system's air output.

## 3.1 Accessories



#### 140246 DOL 10 temperature sensor

Used as temperature sensor in manure drying systems.

Order a sensor for each air mixer.

Cable length 1.5 m



#### 140278 Vibration sensor

Used during manure drying for surveillance of the fans' operation.

Order a sensor for each motor in the air mixer. Maximum two per air mixer

Cable length 2 m

## 4 User's manual

### 4.1 Air mixers

#### Program overview | Manure drying | Program

<b>Program</b>	Settings for up to four daily programs with start and stop times, temperature setpoint, fan speed control, and minimum fresh air.
<b>Temperature setpoint</b>	<p>Setting of the temperature that the air needs to have after air mixing. The temperature is achieved by a mixture of house air and fresh air from outside.</p> <p>The correct temperature is important for avoiding dew in the channel.</p> <p>In case of problems with dew, the temperature can be raised by 1 °C. The problem with dew is evaluated again the following day before the settings are changed again.</p>
<b>Fan speed</b>	Adjusting the speed of the fans.
<b>Minimum fresh air</b>	<p>The settings of the minimum opening which the flaps on the fresh air inlet should have.</p> <p>The setting can impact on whether dew is formed in the manure dryer. If this happens, the setting can be reduced.</p>

#### Program overview | Manure drying

<b>Manure drying status</b>	<p>Display of the current status for manure drying, options are:</p> <p><b>Idle</b> - Manure drying is active but not running.</p> <p><b>Running</b> - Manure drying is active and running.</p> <p><b>Manual running</b> - Manure drying is started manually.</p> <p><b>Stopped</b> - Control mode is set to <b>OFF</b>.</p> <p><b>Stopped by alarm</b> - An active alarm has stopped the manure drying. When the alarm ceases, drying will resume automatically.</p> <p><b>Paused by input</b> - An external signal has set manure drying on pause. When the signal disappears, drying will resume automatically.</p> <p><b>Manual cleaning</b> - Cleaning has started manually.</p> <p><b>Cleaning by time</b> - Cleaning is ongoing according to settings in the program.</p> <p><b>Cleaning due to alarm</b> - Cleaning is ongoing because of an alarm from the vibration sensors.</p> <p><b>Stopped by alarm. User must resume</b> - Manure drying stops after alarm because of too great vibrations and needs to be restarted by the user.</p> <p><b>Empty house</b> - Manure drying is stopped, when the house state is <b>Empty house</b>. (Only for feature software).</p> <p>The underlying menu also shows state for flap positions, fan speed and vibration sensors.</p>
<b>Resume after alarm?</b>	<p>This menu is also shown, when the manure drying is stopped because of too great vibrations on the fans. Also, see Alarm settings [▶ 11].</p> <p>Clean before manure drying is restarted.</p> <p>Select <b>Yes</b> to restart manure drying.</p>



---

**Manure drying settings**


---

<b>Next start time</b>	View of when manure drying will run again according to the program. If a start time has not been set, <b>00:00 hh:mm</b> is shown.
<b>Operation mode</b>	Choice of how manure drying should run: <ul style="list-style-type: none"> <li>- <b>OFF</b>. It cannot start.</li> <li>- <b>Program</b>. It starts and stops automatically at pre-determined hours up to four times daily.</li> <li>- <b>Manuel</b>. It starts and runs the whole time.</li> </ul> If manure drying is installed with the function External pause input, this external signal will stop the manure drying no matter the control mode. The state will appear as <b>Paused by input</b> .
<b>Temperature</b>	Showing the temperature of the air led into the manure channel.

---

**Air mixer settings**


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<b>Manual</b>	See a description of parameters under program above.
<b>Max. fan speed</b>	Settings of a maximum speed which the fans are allowed to run at. This setting can e.g. be used if some of the air ducts are closed.

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**Program overview | Manure drying**


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<b>Copy settings from mixer 1 to mixer 2</b>	In houses with two manure drying systems where the same setup of the two systems is desired, the settings and alarm settings from air mixer 1 are copied to air mixer 2.  Installation parameters and calibration values will not be copied.
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## 4.2 Cleaning

Cleaning is an optional function used with manure-drying units with a cleaning function. The process of cleaning usually involves using compressed air to blow through the fans and filters.

Cleaning can be activated automatically according to a program or manually, when it is desired.

Cleaning can also start after an alarm because of too high vibrations at the fan motors. Also, see Alarm settings [▶ 11].

### Program overview | Cleaning

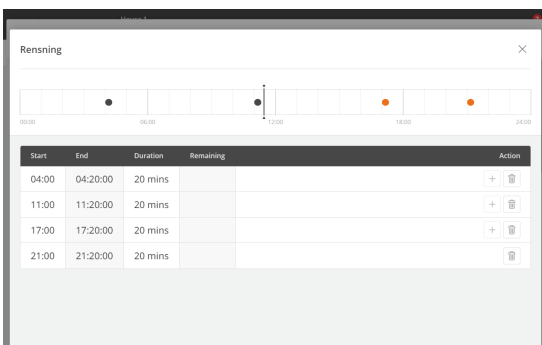
**Cleaning program** The cleaning program can run up to four times a day.  
Setting a start time and duration for each cleaning.

### Program overview | Manure drying settings | Cleaning settings

**Alarm cleaning duration** Setting the duration of cleaning after a vibration alarm.

**Manual cleaning duration** Setting a manual cleaning duration.

**Start manual cleaning** Activation of manual cleaning. The cleaning will run during the set time period.



### Cleaning program

The duration also includes a short period before the actual cleaning where the manure dryer's fans stop (02:00 mm:ss) and a short period afterward where the dust can settle (00:30 mm:ss).

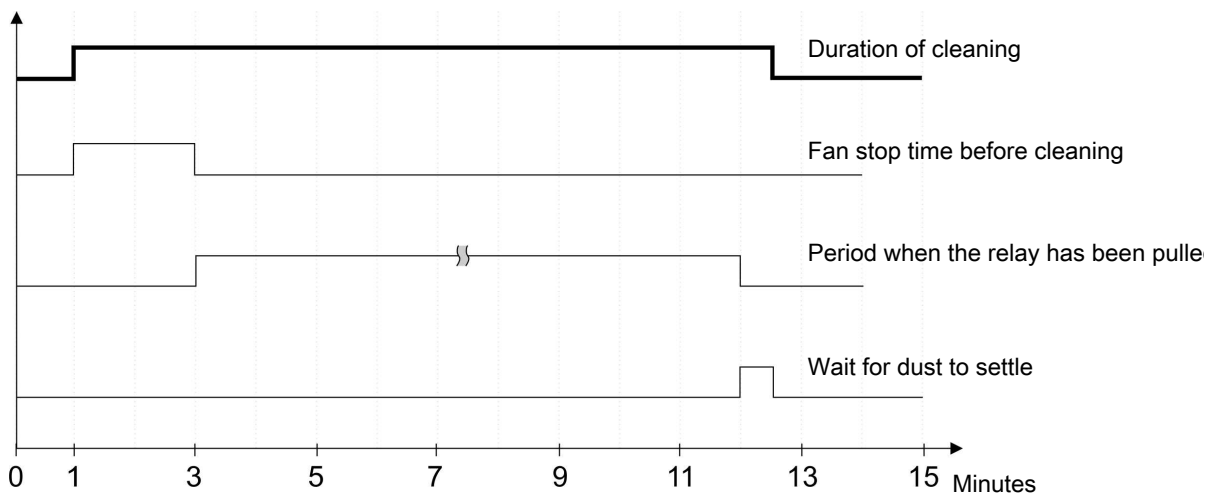


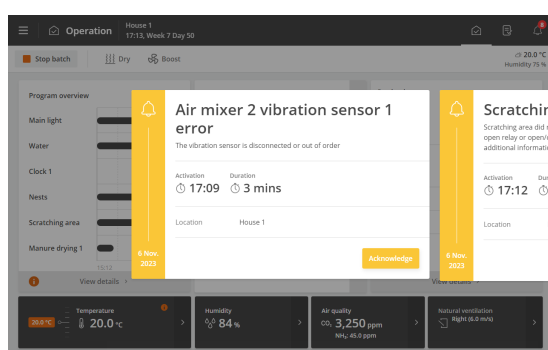
Figure 2: Progress during cleaning

Cleaning should not be set below 02:30 mm:ss (default setting for fan stop time + 00:30 mm:ss).

## 4.3 Alarm settings

### Alarms | Manure drying

Temperature alarms	Air mixer 1 low temperature alarm	Disabled <b>Soft</b> Hard
	Air mixer 1 low temperature limit	15 °C
Flap alarms	Air mixer 1 error fresh air flap	Disabled <b>Soft</b> Hard
	Air mixer 1 error house air flap	Disabled <b>Soft</b> Hard
Sensor errors	Air mixer 1 error temperature sensor	Disabled <b>Soft</b> Hard
	Air mixer 1 error vibration sensor	Disabled <b>Soft</b> Hard
Air mixer fan vibration high	Vibration limit	4.0 mm/s
	Alarm delay	03:00 mm:ss
	Air mixer 1 fan 1 vibration high alarm	Disabled <b>Soft</b> Hard
Air mixer fan vibration too high	Vibration limit	6.0 mm/s
	Alarm delay	10:00 mm:ss
	Air mixer 1 fan 1 vibration too high alarm	Disabled <b>Soft</b> Hard



All alarms for manure drying are factory set as soft alarms. Hence, there is a yellow warning pop-up on the controller, but you are not alerted by, for instance, an alarm signal.

#### Temperature alarm

Alarm for low temperature. If the temperature is below the set low temperature limit for more than two minutes, the alarm will go off.

At a too low temperature inside the manure dryer, dew is formed. In order to remedy this the setting of **Minimum fresh air** can be reduced. See Air mixers [▶ 8]

The alarm will not stop the manure drying.

Flap alarm	<p>The flap alarms are technical alarms. Only for flap installed with feedback.</p> <p>The controller triggers an alarm if the actual flap opening deviates from the setting that the controller has calculated as correct.</p> <p>The alarm will not stop the manure drying.</p>
Sensor alarm	<p>The sensor alarms are technical alarms. The controller triggers an alarm if the sensor is short-circuited or disconnected and stops the manure drying.</p> <p>When the error situation has been resolved, the manure drying will restart with the status it had before the alarm.</p>
Vibration alarm	<p>The vibration alarms are technical alarms. The controller triggers an alarm if the vibration sensors on the fans register any vibrations. The alarms will only change state when the fans run.</p> <p>There are two vibration limits. One indicates that the fan is dirty and is a reminder to the user of cleaning it. The other alarm indicates that the fan is so dirty that it should not run any more. This alarm stops the manure drying.</p>

Please also see description of manure drying state Air mixers [► 8].

## ***5 Maintenance guide***

There is no maintenance of software.

The functions from a feature software are not overwritten by a subsequent software update, but are updated together with the latest update.

It is not possible to uninstall feature software once it is installed.

## 6 Installation guide



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.

### 6.1 Feature software

The Feature Software is provided on a USB stick.



#### Important information

Feature software can only be installed on house controllers with software version 6.1 or later.

The controller restarts after loading the feature software so it is not advisable to carry out the upload when there are animals in the livestock house.

If it is necessary to load the software while animals are in the house, it should be carried out in the presence of a veterinary expert.

#### Working procedure when installing Feature Software

1. Create a backup copy of the controller settings.
2. Load feature software and wait for the house controller to restart.
3. Activate the function.
4. Set up the function in the house controller.
5. Make the settings.

#### 6.1.1 Backup of settings

Save the controller settings and pages before loading the software.

 Menu button |  Settings |  Service | SD card | Save

Confirm and wait until the controller indicates that the settings are saved.

## 6.2 Loading software

1. Loosen the screws (A) that hold the front panel in place.
2. Lift out the front panel. Make sure not to pull the flat cable so that the plug (B) is damaged.

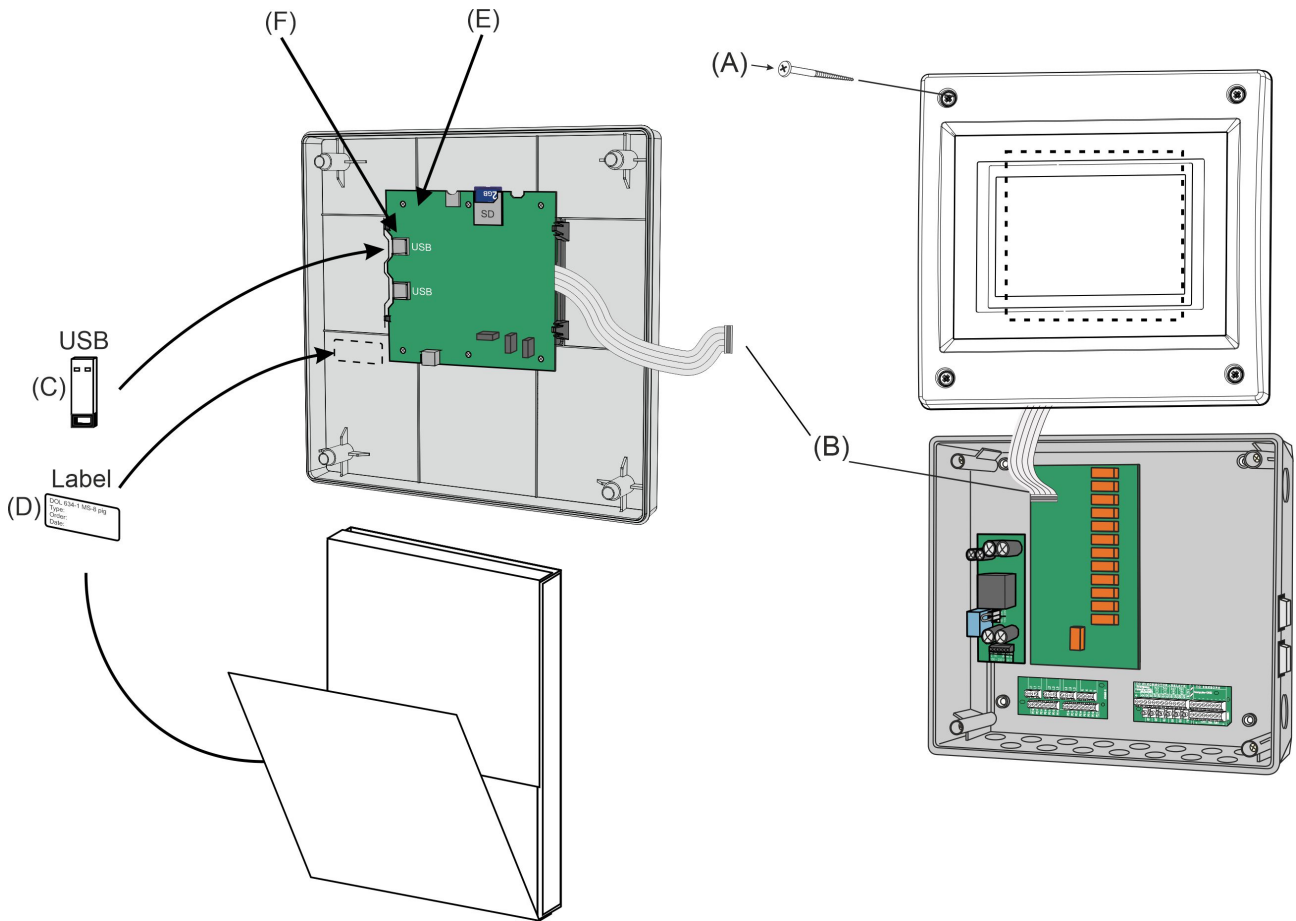
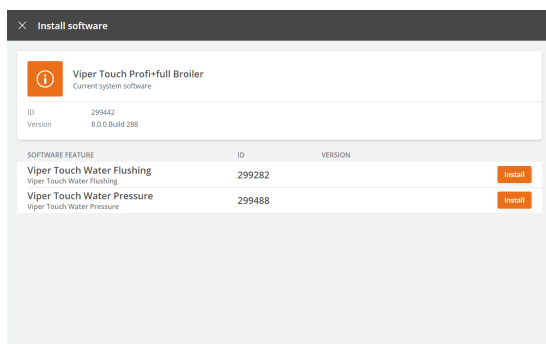


Figure 3: Loading software

3. Unpack the USB stick (C) and label (D) from the box.
4. Place the small accompanying label at the side of the CPU module (E).
5. Insert the USB stick containing the software in the USB port (F) on the CPU module.

☰ Menu button | ⚙ Settings | ✂ Service | Install software



Select the required software.

Installation begins.

Settings are automatically saved before the installation starts and are loaded after the restart.

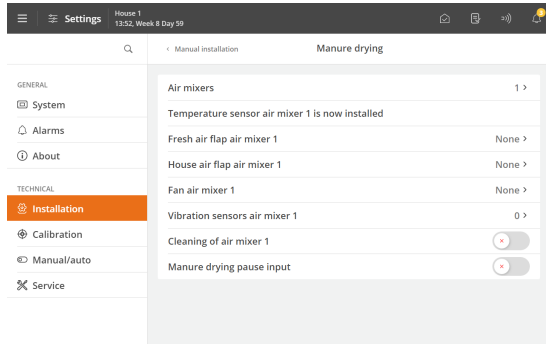
The controller restarts during installation.



It is VERY important not to disconnect the power supply during installation.

Do not remove the USB memory stick until the installation is fully completed. In other words, when the graphical user interface is accessible and usable.

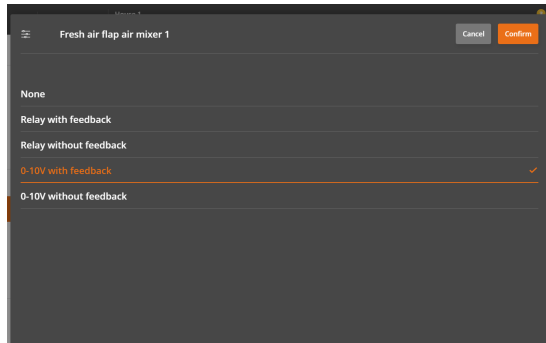
## 6.3 Setup of manure drying in house controller



Select the number of air mixers.

**Installation | Manual installation | Manure drying | Air mixers**

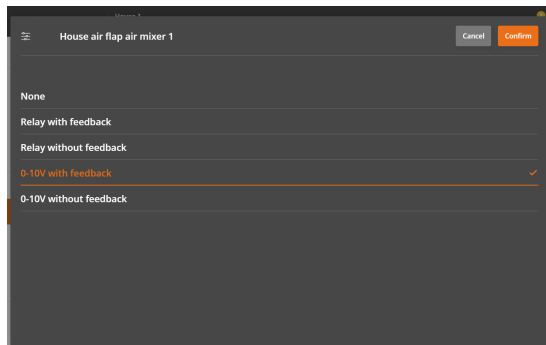
A maximum of two air mixers can be selected.



Select type of fresh air flaps.

**Installation | Manual installation | Manure drying | Fresh air flap air mixer 1**

If the same signal is used for both fresh air flaps and house air flaps, only fresh air flaps should be selected. House air flaps are not used in that case.



Select type of house air flaps.

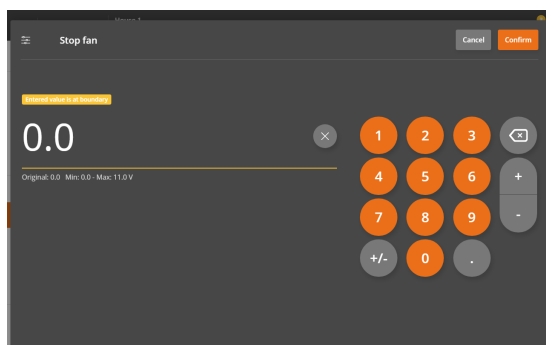
**Installation | Manual installation | Manure drying | House air flap air mixer 1**



Select type of fan.

**Installation | Manual installation | Manure drying | Fan air mixer 1**

With a stop relay, the fan runs when the relay is ON.

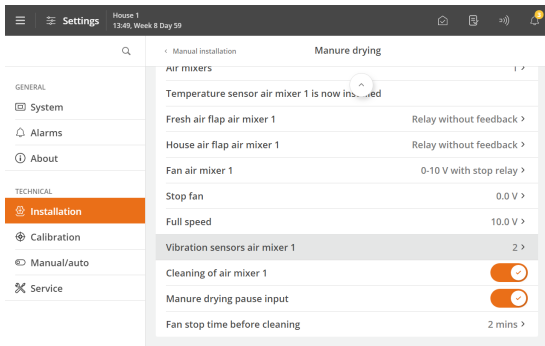


When the fan is controlled by a 0-10 V speed control, voltages must be set corresponding to the fan stopped and the fan running at full speed. This settings will depend on the type of fan speed controller used.

The factory setting is:

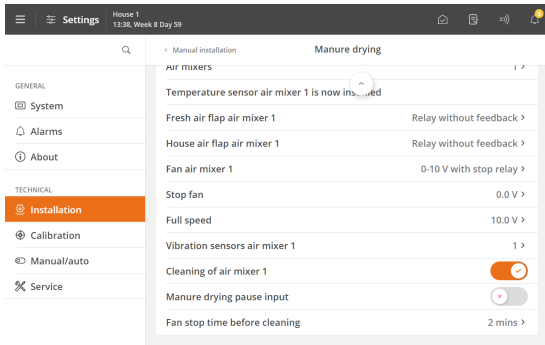
- 0.0 V for stop fan
- 10.0 V for full speed





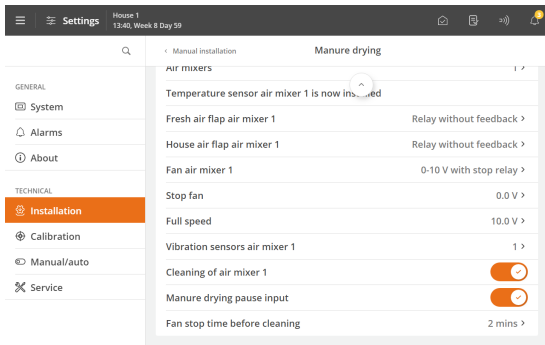
If vibration sensor is required. Select number of vibration sensors.

**Installation | Manual installation | Manure drying | Vibration sensor air mixer 1**



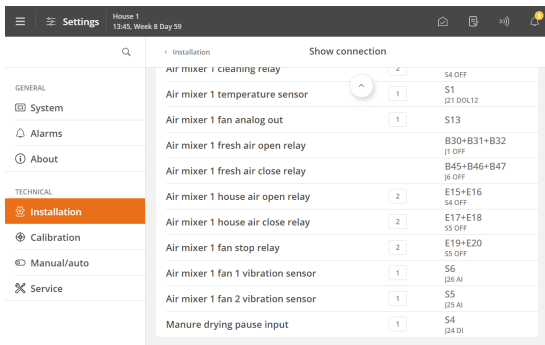
If cleaning is required.

**Installation | Manual installation | Manure drying | Cleaning of air mixer 1**



If a pause input is required.

**Installation | Manual installation | Manure drying | Manure drying pause input**



The installation menu will indicate specifically which terminal a component needs to be connected to.

For correct connection, see the menu **Installation | Show connection**

### 6.3.1 Adjustment

#### Manure drying system with cleaning

##### Fan stop time before cleaning

**02:00 MM:SS**

To avoid dispersing dust in the system during cleaning the fans are stopped before the cleaning begins. Set a time for how long before cleaning the fans should stop.

See also section Cleaning [▶ 10].

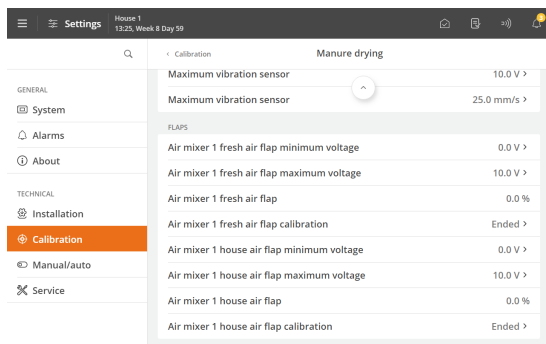
## 7 Calibration

### 7.1 Calibration of fresh air and house air flaps

Calibration depends on the installed flap type.

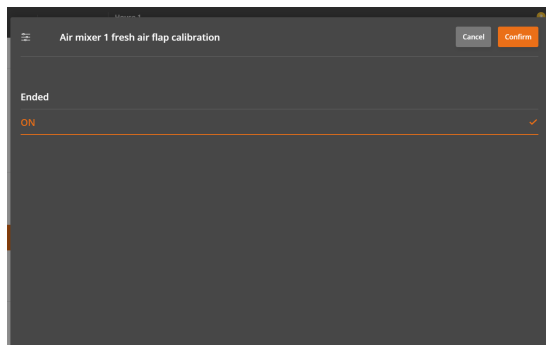
- Relay with feedback: Flaps with feedback must be calibrated by a technician.
- 0-10V with feedback: Flaps with feedback must be calibrated by a technician.
- 0-10V without feedback: Min. / Max. voltage is registered manually.

When using a 0-10 V controlled flap it is possible to adjust the output voltage through minimum voltage and maximum voltage.



Select calibration.

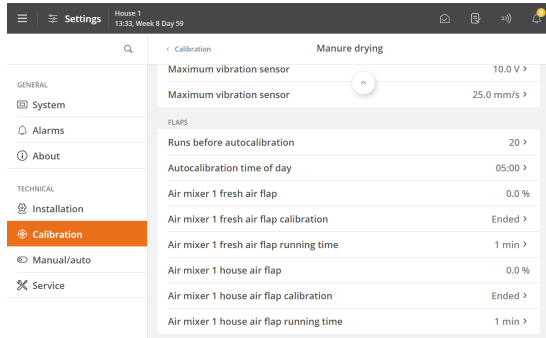
  **Calibration | Manure drying | Flap | Air mixer 1 fresh air/house air flap position**



Select **ON** to start calibration.

Check that flaps open and close correctly.

Wait until the calibration is finished and the display shows **Calibration ended** again.



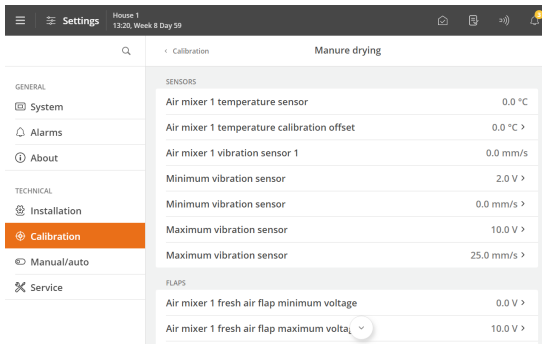
#### Relay without feedback

Flaps without feedback calibrate automatically when the technician has set:

  **Calibration | Manure drying | Flap**

- **Runs before autocalibration**
- **Autocalibration time of day**
- **Air mixer 1 fresh air/house air flap running time**

## 7.2 Calibration of Sensors



GENERAL	
System	
Alarms	
About	
TECHNICAL	
Installation	
<b>Calibration</b>	
Manual/auto	
Service	
SENSORS	
Air mixer 1 temperature sensor	0.0 °C
Air mixer 1 temperature calibration offset	0.0 °C >
Air mixer 1 vibration sensor 1	0.0 mm/s
Minimum vibration sensor	2.0 V >
Minimum vibration sensor	0.0 mm/s >
Maximum vibration sensor	10.0 V >
Maximum vibration sensor	25.0 mm/s >
FLAPS	
Air mixer 1 fresh air flap minimum voltage	0.0 V >
Air mixer 1 fresh air flap maximum voltage	10.0 V >

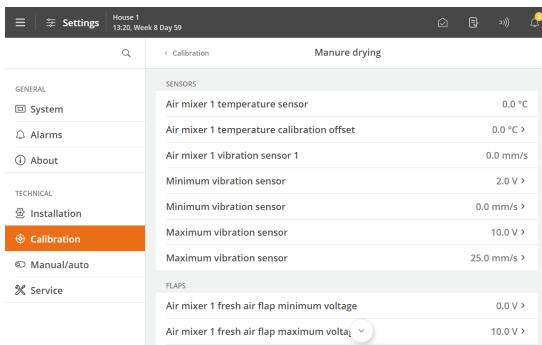
### Temperature

Select calibration.

#### Calibration | Manure drying | Air mixer 1 temperature calibration offset

Temperature sensors can be calibrated with an offset.

If you measure the current value to another level than the displayed value during manual measurements, the display value can be adjusted with an offset so that it corresponds to the manual measurements.



GENERAL	
System	
Alarms	
About	
TECHNICAL	
Installation	
<b>Calibration</b>	
Manual/auto	
Service	
SENSORS	
Air mixer 1 temperature sensor	0.0 °C
Air mixer 1 temperature calibration offset	0.0 °C >
Air mixer 1 vibration sensor 1	0.0 mm/s
Minimum vibration sensor	2.0 V >
Minimum vibration sensor	0.0 mm/s >
Maximum vibration sensor	10.0 V >
Maximum vibration sensor	25.0 mm/s >
FLAPS	
Air mixer 1 fresh air flap minimum voltage	0.0 V >
Air mixer 1 fresh air flap maximum voltage	10.0 V >

### Vibration

From the factory the default calibration values for sensors typically used in a Big Dutchman system are set.

These only needs to be changed, if another type of sensor is used. Check values in the sensor's data sheet.

Select calibration.

#### Calibration | Manure drying

The vibration sensor can be calibrated at:  
**Minimum vibration sensor V and mm/s**  
**Maximum vibration sensor V and mm/s**

## 8 Testing

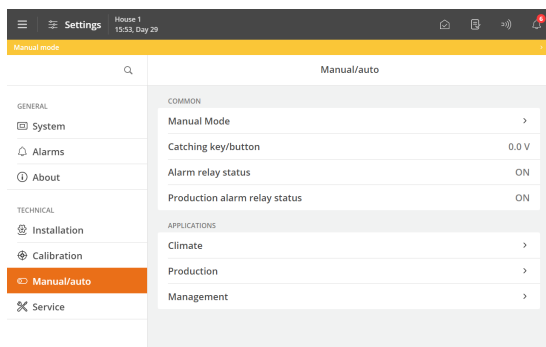
After installation of the manure drying system it is necessary to carry out a thorough testing to ensure that the system works as planned.



### 8.1 Testing of components: Manual control

In the menu **Manual/auto** the controller displays the components selected in the menu **Installation**.

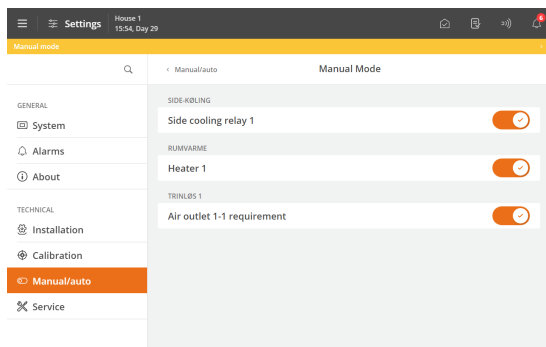
**Automatic control:** Normally the controller must be set to automatic control.

**Manual control:** During start up, or in a service situation, it may be convenient to control the individual functions manually.



The components currently set for manual mode are listed in the menu   **Manual/auto | Manual mode overview**.

The manual control can also be deactivated here.



Select the function to be tested and test the components one at a time.

A colored bar at the top of the page indicates that a component is set to manual mode.



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

I/O will remain at the setting that it was at the moment the component was set to manual. It means that operation continues when it is returned to automatic control.

## 8.1.1 Testing of sensors

Check each sensor separately.

 | [Program overview](#) | [Manure drying](#) | [Manure drying settings](#)

### Temperature

- Check that the shown temperature corresponds to what can be measured in the air mixer.
- Check that the temperature increases in the display when it is warmed up by hand.

 | [Program overview](#) | [Manure drying](#) | [Manure drying status](#)

### Vibration

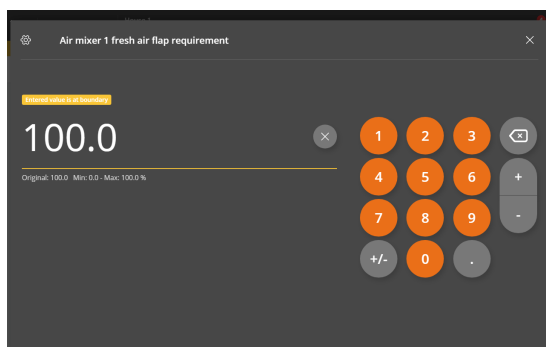
- Check that the readout for the vibration sensor changes, when it is shaken.

## 8.1.2 Testing flaps

 | [Program overview](#) | [manure drying](#) | [Manual/auto settings](#) | [Air mixer fresh air flap requirement](#) or [Air mixer house air flap requirement](#)

The testing will show if the flaps can open and close completely.

Check each flap separately.



Activate **Manual mode**.

Set 100%.

Check that the flap opens completely.

Set 0 %.

Check that the flap closes completely.

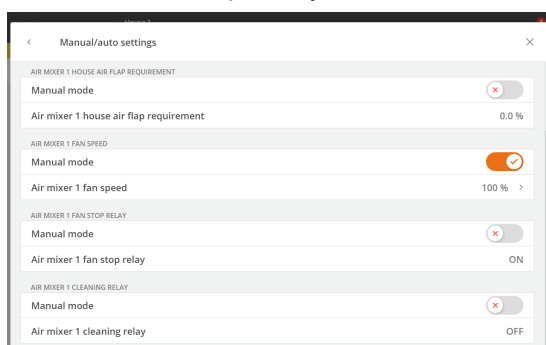
Set the flap to the required setting.

## 8.1.3 Testing fans

 | [Program overview](#) | [Manure drying](#) | [Manual/auto settings](#) | [Air mixer 1 fan speed](#)

The testing will show if the fans are correctly set, i.e. can run at maximum and maximum speed and whether they are correctly placed/connected.

Check each fan separately.



Activate **Manual mode**.

Set the **Air mixer 1 fresh air flap requirement** at 100 %.

Check that the fan is placed in the correct manure dryer.

Check that the fan exhaust air from the house/from outside (possibly through a smoke test).

Check that the fan is running at maximum speed.

Set the **Air mixer 1 fresh air flap requirement** at 1 %.

Check that the fan is running down to minimum speed.

Set the **Air mixer 1 fresh air flap requirement** at 0 %.

Check that the fan stops completely.

### Fan with stop relay

Activate **Manual mode**.

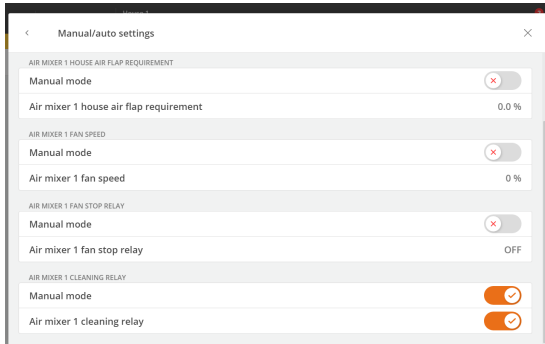
Select **ON** and check that the fan is running when necessary and that it stops at 0 %.

## 8.1.4 Testing cleaning



**Program overview | Manure drying | Manual/auto settings | Air mixer cleaning relay**

Test that the function can start and stop.



Activate **Manual mode**.

Activate **Air mixer cleaning relay**.

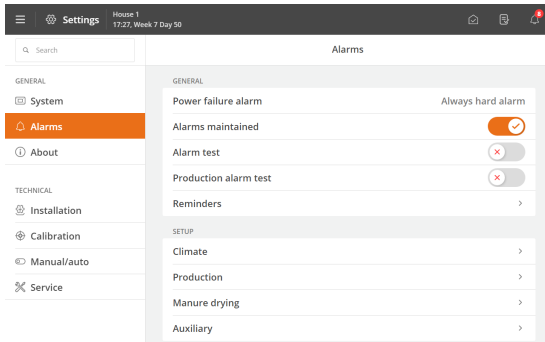
Check that cleaning is running.

Deactivate **Air mixer cleaning relay**.

Check that cleaning is not running.

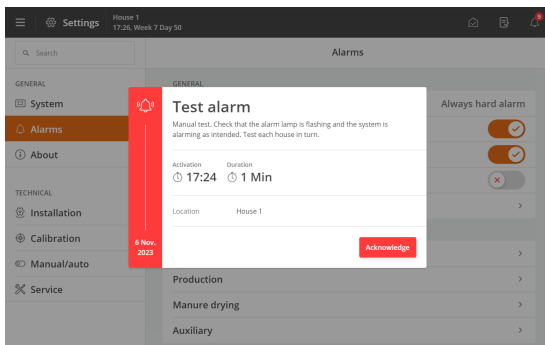
## 8.2 Testing Alarm

Select alarm test. | **Alarm settings | Alarm test**



Activate **Alarm test** to start testing.

Check that the alarm system alarms as intended.

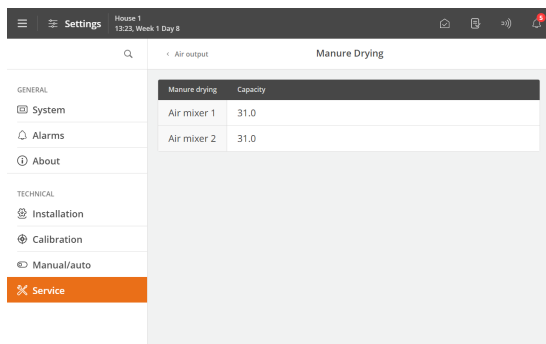


Deactivate **Alarm test** to end the test.

Test the alarm every week.

## 9 Settings

### Service | Climate | Air output | Manure drying



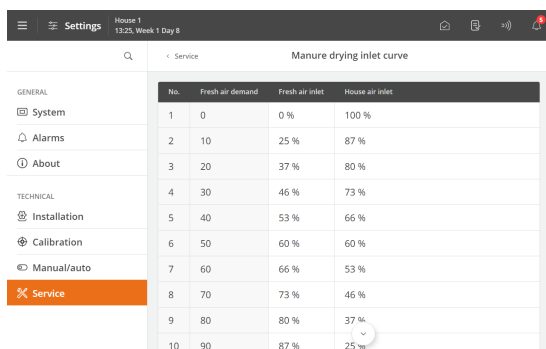
**Only for feature software in combination with a climate controller**

It is possible to set the air mixer's capacity in m<sup>3</sup>/h.

This needs to be done when you want the house controller to regulate on the basis of the total air flow for manure drying and the normal air inlet.

The house controller will then reduce the airflow of the normal air inlet with this value.

### Service | Manure drying inlet curve



The house controller will adjust the flaps for both fresh air and house air flaps in order to keep the set temperature in the manure dryer.

These values only need to be changed if they don't correspond to the values in the manure dryer's data sheet.

## 10 Troubleshooting guide

Error	Solution
No connection to manure drying unit.	Check connections and setup. See the section Installation guide [▶ 14].
Dew in manure drying unit.	Raise the temperature setpoint for manure drying. See the menu <b>Manure drying</b> and the section Air mixers [▶ 8].
Manure drying unit doesn't run when I expect it to.	Check for the following: Is the unit's state OFF? See section Air mixers [▶ 8]. Are there any active alarms? See section Alarm settings [▶ 11]. Check if time settings in the program are as expected. See the menu <b>Manure drying   Air mixer 1   Air mixer 1 settings   Program</b> .
Manure drying unit runs all of the time.	Check if it is set to run manually See the menu <b>Manure drying   Air mixer 1   Air mixer 1 operation mode</b> and the section Air mixers [▶ 8].
Temperature alarms continue to appear.	Reduce the setting of <b>Minimum fresh air</b> , so that the flap will close more. See the menu <b>Manure drying   Air mixer 1   Air mixer 1 settings   Manual   Minimum fresh air</b> and the section Air mixers [▶ 8].
The pressure is too high in the manure drying unit.	Reduce the setting for <b>Max. fan speed</b> See the menu <b>Manure drying   Air mixer 1   Air mixer 1 settings   Max. fan speed</b> and the section Air mixers [▶ 8]. Or reduce the <b>Fan speed</b> . See the menu <b>Manure drying   Air mixer 1   Air mixer 1 settings   Manual   Fan speed</b> and the section Air mixers [▶ 8].



## 11 Technical data USB

Network		
USB		1 x USB 2.0 A type: 2GB (formatting requirement: FAT16) 2-32GB (formatting requirement: FAT32)
Variant		
House controllers		Viper Touch
Animals		Breeders and Layers
Software version		6.1 or later
Environment		
Operating temperature	°C (°F)	-40 to +40 (-40 to +104)
Storage temperature	°C (°F)	-40 to +70 (-40 to +148) – and protected against direct sunlight.
Shipment		
Dimensions crated H x W x D	mm	340 x 265 x 30
Shipping weight	g	210





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