

Usermanual

## **Amacs Manure drying**

Code No. 99-97-1922 GB

Edition: 11/2013 (Version: 2.0.6)





## Program version

The product described in this manual is computer-based, and most functions are realised by software. This manual corresponds to:

**Software Version: V2.0.6**

### Product- and Documentation changes:

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**IMPORTANT****Notes concerning the alarm system**

Where climatic control is used in livestock buildings, break-downs, malfunctions or faulty settings may cause substantial damage and financial losses. It is therefore **most important to install a separate, independent alarm system**, which monitors the house concurrently with climatic control. Please note that the product liability clause of **BIG DUTCHMAN**'s general terms and conditions of sale and delivery specifies that an alarm system **must be installed**.

We want to draw your attention to EU-directive No. 998 of 14/12-1993 concerning minimum requirements for domestic animals, which specifies that an alarm system must be installed in any house, which is mechanically ventilated. In addition to this, there must be a suitable emergency system.



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## 1 Manure Drying main screen

Initially, the development of ventilated manure belt batteries aimed at faster drying of manure belt in the house, the so-called production of dry manure. The dry matter contents increases from approx. 20% of fresh manure to approx. 45% after a storage period of one week and ventilation on the manure belt. The important and positive effects of the manure belt ventilation result from this, as e.g. environment protection, efficiency and improved house climate.



Depending on which equipment is installed, the screenshots in this manual may differ from those generated by your FarmController.

The areas that are visible depend on the configuration of the system. Menus that do not have any function are concealed to make the screen layout clearer.

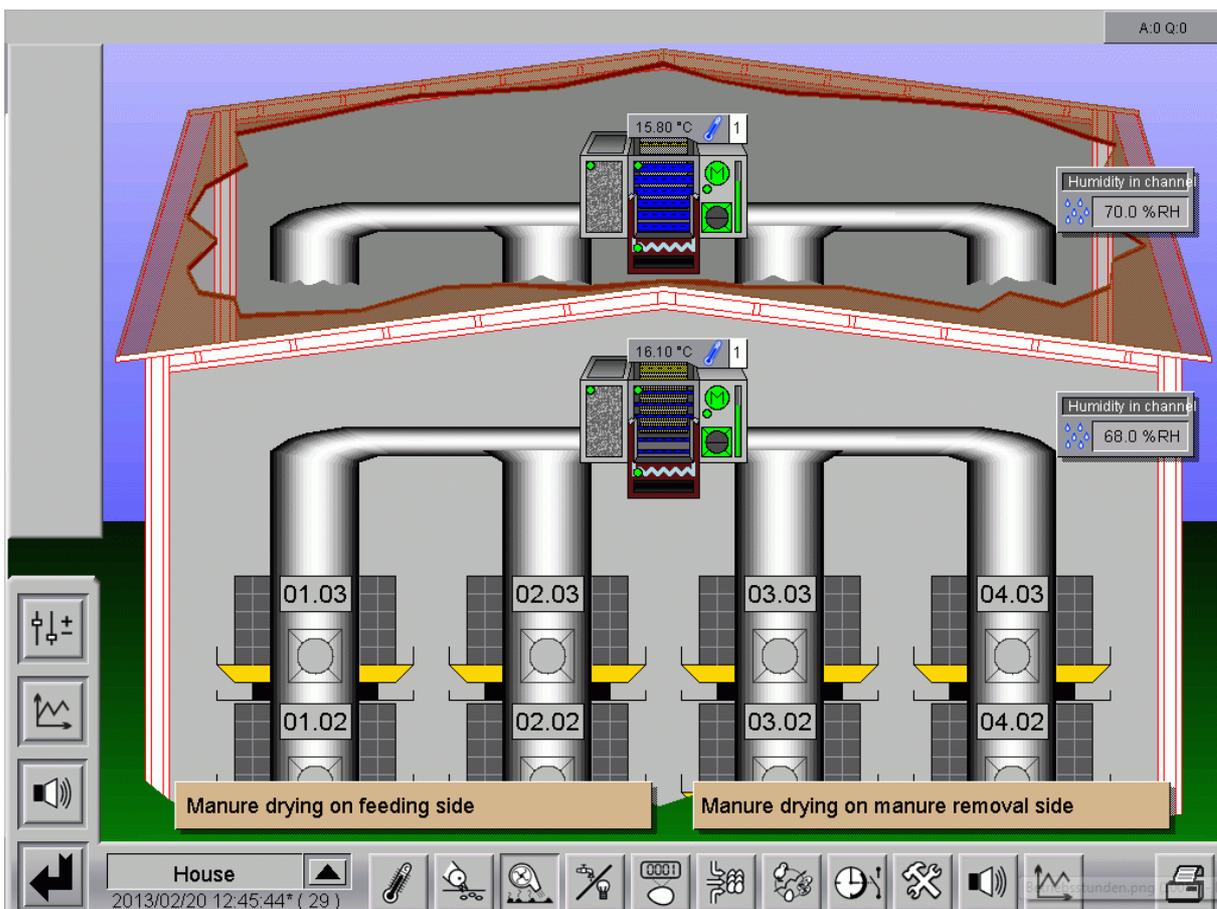


Figure 1-1: Main screen Manure drying



In order to access the overview screen for manure drying you must open the selection area. You can reach this via the hatched area at the bottom right of each house presentation. Confirm the manure drying symbol. The overview screen of the manure drying only opens if you hold the necessary rights.

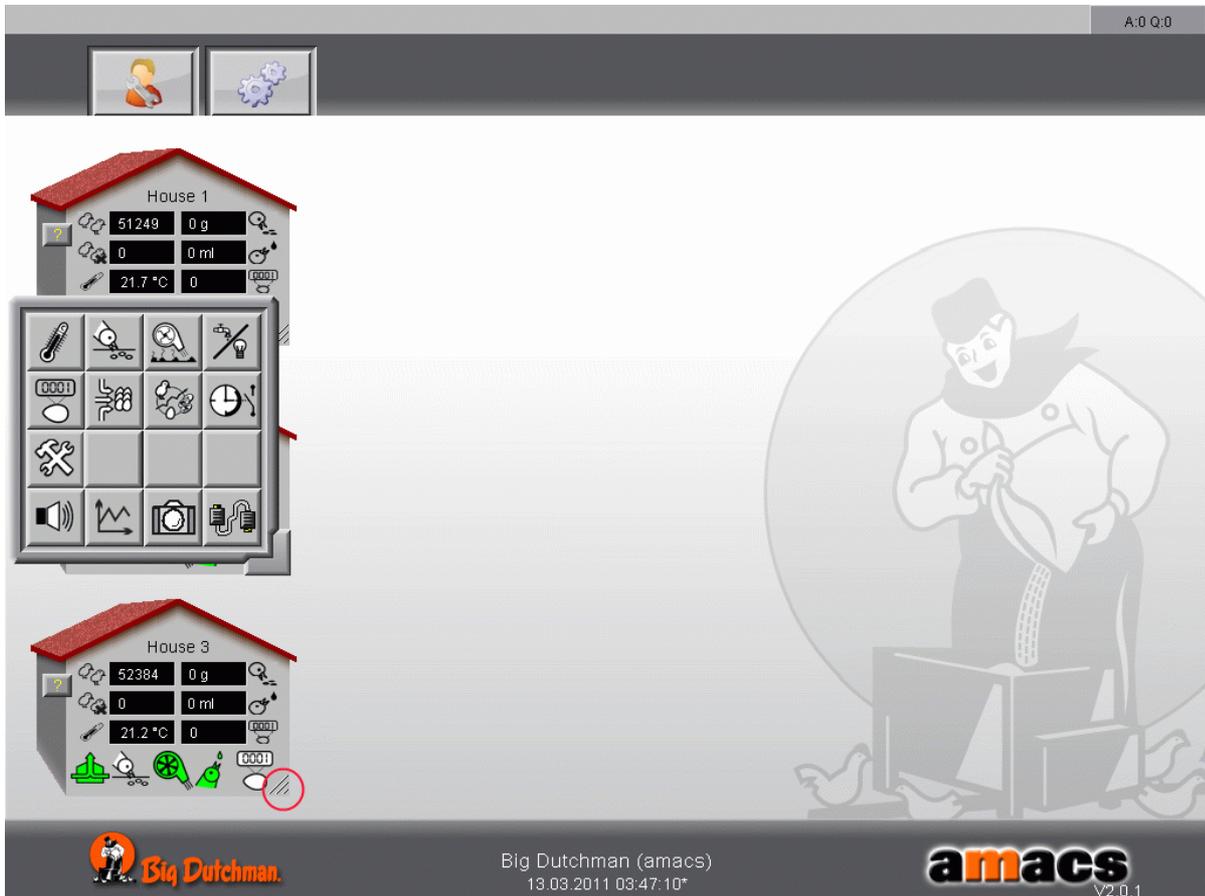


Figure 1-2: Zoom view manure drying

## 1.1 General view of objects

In the following chapter we have listed all existing objects and have explained them briefly. The other functions are explained in the respective chapters.

### 1.1.1 Sensors

The actually measured value is displayed in the main screen in the fields of the single sensors. This is directly transmitted from the house to the main screen without any delay.

If one of the sensor fields lights up red, the sensor doesn't work perfectly. An alarm is generated for the sensors after an adjustable time without modifying the unfiltered input value. These two alarms go to a common message.

#### Sensor defective / Cable break

In case of an alarm, the display of the sensors is as follows:

- If a cable is broken, the alarm is displayed red flashing.
- In case of a Min.- or Max.-alarm, the value is displayed red without flashing.

With a click on a sensor, the corresponding curve record is opened in a separate window. This curve supplies the respective historic data of the sensors which are displayed in a system of coordinates.

The time (date, hour, minute, second) is shown on the X-axis and the respective measuring unit (°C, PA, %RH, m/s, ppm) with which the sensor measures is shown on the Y-axis. The name of the sensor is indicated top left.

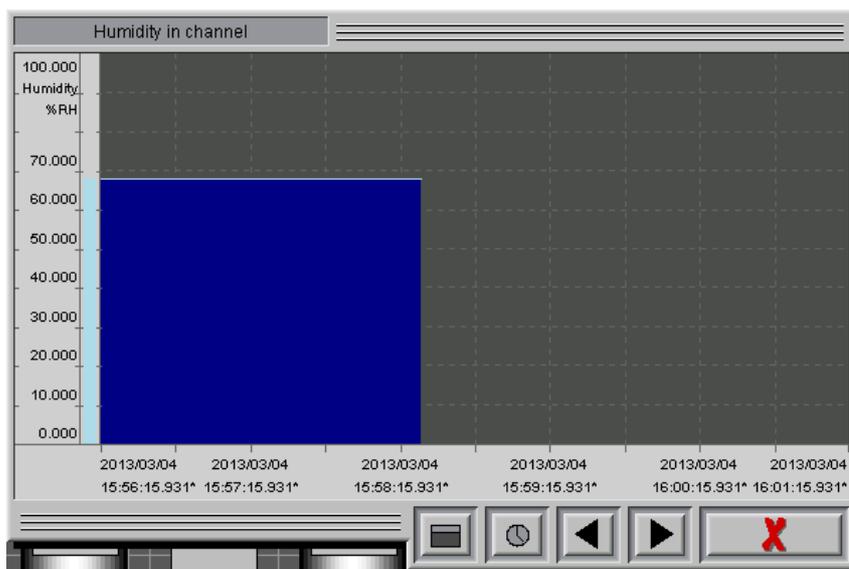


Figure 1-3: View: Curve record of a sensor

**Different views are possible in the window of the curve record:**



Showing a bar above the curve with further settings



adjust clock time



time domain forward and backward



close



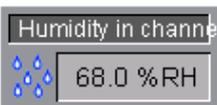
The handling of the curve records is described in the **Amacs - User Manual**.

- **Channel temperature**



The fresh air and house air flap is adjusted via the channel temperature in order to control the streaming in air temperature.

- **Channel humidity**



The centrifugal fan can be controlled via the channel humidity to save energy in case of dry manure.

### 1.1.2 Centrifugal fan

A centrifugal fan sucks in both fresh air and warm house air through one shutter flap each and then blows in the two mixed air streams into the air ducts. The fan can also be controlled continuously if a frequency converter is installed.

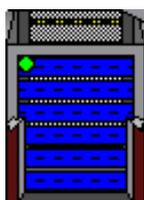


Centrifugal fan without frequency converter



Centrifugal fan with frequency converter

### 1.1.3 Shutter flaps

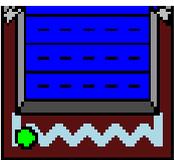


The intake air temperature is controlled via the fresh air and house air flap. If the temperature is too low, the flap for outside air is closed to a certain degree and the house air flap is opened by the same degree at the same time.

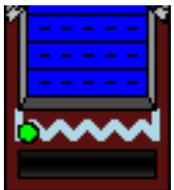
### 1.1.4 Heating system

The heat production of the animals is so high in a well insulated house that even in case of minus temperatures (except for very cold regions) a heating system is normally not necessary. For the manure belt ventilation, however, the fresh air must be heated up additionally if the outside temperatures are very low.

- In case of too low intake air temperatures there is a risk of undercooling since the air leaves the ducts directly underneath the birds.
- The manure on the belts can only be dried sufficiently by warm dry air.
- If the temperature of the fresh air lies below the dew point of the house air, condensation water accumulates in the air distribution system of the manure belt ventilation.



Digitally controlled heating system



Analogously controlled heating system

### 1.1.5 Filter cleaning



The filter cartridges are continually burdened with dust so that they must be cleaned in certain intervals. The time interval mainly depends on the dust concentration of the house air and may vary.

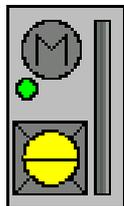
## 1.2 Drives

Each drive can be checked via the screen regarding its status and can be controlled manually. Below you will find an explanation for the meaning of the colours as well as the handling of the drive unit.

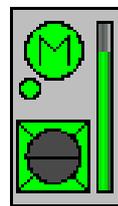
### 1.2.1 Status

The symbols at the drives show whether these are in automatic or manual mode (green or orange point at the drive unit) or if the drive is switched on or off.

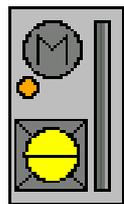
#### Colour definitions:



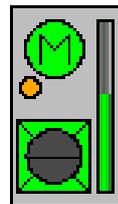
Automatic "OFF"  
air tube flap closed



Automatic "ON"  
air tube flap open



Manual "OFF"  
air tube flap closed



Manual "ON"  
air tube flap open



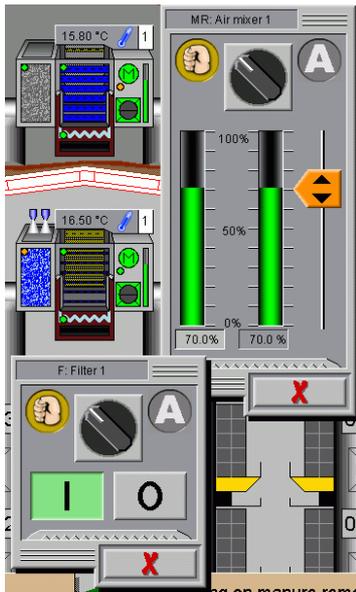
External release  
air tube flap closed



Error

### 1.2.2 Manual operation

Click on a drive to open a control panel. Depending on whether it deals with a digital or analogue element, a switch will appear or a slider control with which the drive can be switched from manual to automatic mode respectively can be switched on or off.



The drive can be switched from automatic to manual mode via the switch in the upper part of the menu.

In case of a digital drive, the drive can be switched on or off via the I/O keys.

If an analogue drive is installed, the desired position can be activated either via the orange slide or the value can be entered via the appearing input area below the desired position.



**Attention!**

Works on the drive or fans may be carried out when the protective switch is in OFF position. The drive units are activated without prior warning e.g. via the time switches. Local security advices and instructions are to be observed.

**1.2.3 Working hours**



In order to determine service intervals it is helpful if the running times of the motors can be read off. If you click on the highlighted area, the respective time meter of a component will be opened.

The performed hours "today" and "total" are indicated here. The values can be reset to 0 via the reset button.

### 1.3 Detail zoom

Even in big houses, the individual data of the rows / tiers can be viewed quite simply. Just click on a desired area. In those areas where a zoom view is possible, a cursor appears in the form of a magnifying glass. With only one click an enlarged view of the chosen area appears.

In order to leave the view, click on the zoomed picture on the push button which shows the zoom factor in the top left edge of the picture.

The area can also be changed during the zoom view. The picture can be shifted freely holding the mouse button pressed.

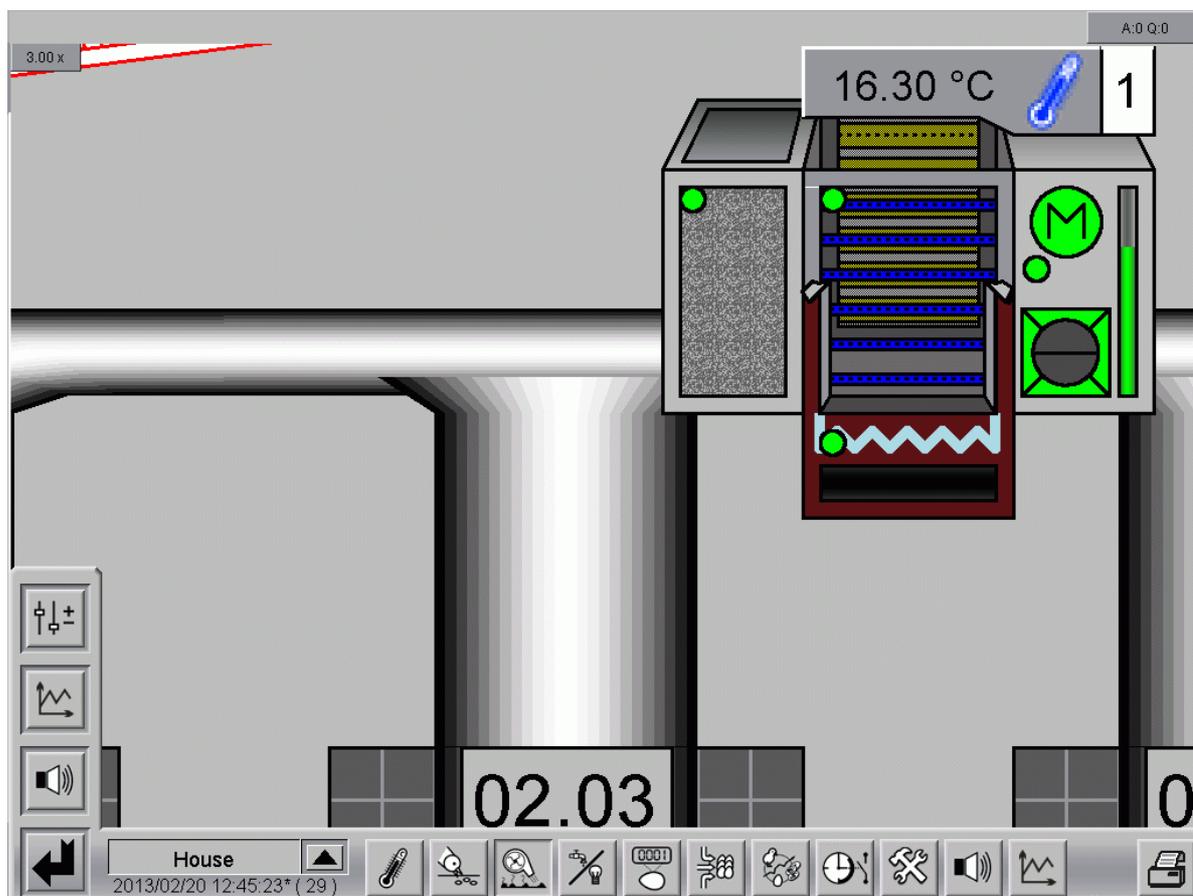


Figure 1-4: Zoomed view

## 1.4 Settings



In order to open the settings menu, click on the symbol for parameter settings. Here the runtimes can be preset and the control mode can be adapted.

Depending on how many air mixers are installed, the menus for each air mixer are shown separately in the picture. The channel temperatures as well as the control parameters can be set individually for the existing air mixers. For the settings it is distinguished between the air mixers on the feeding side (in front) and those on the manure removal side (behind) in order to have a better overview.

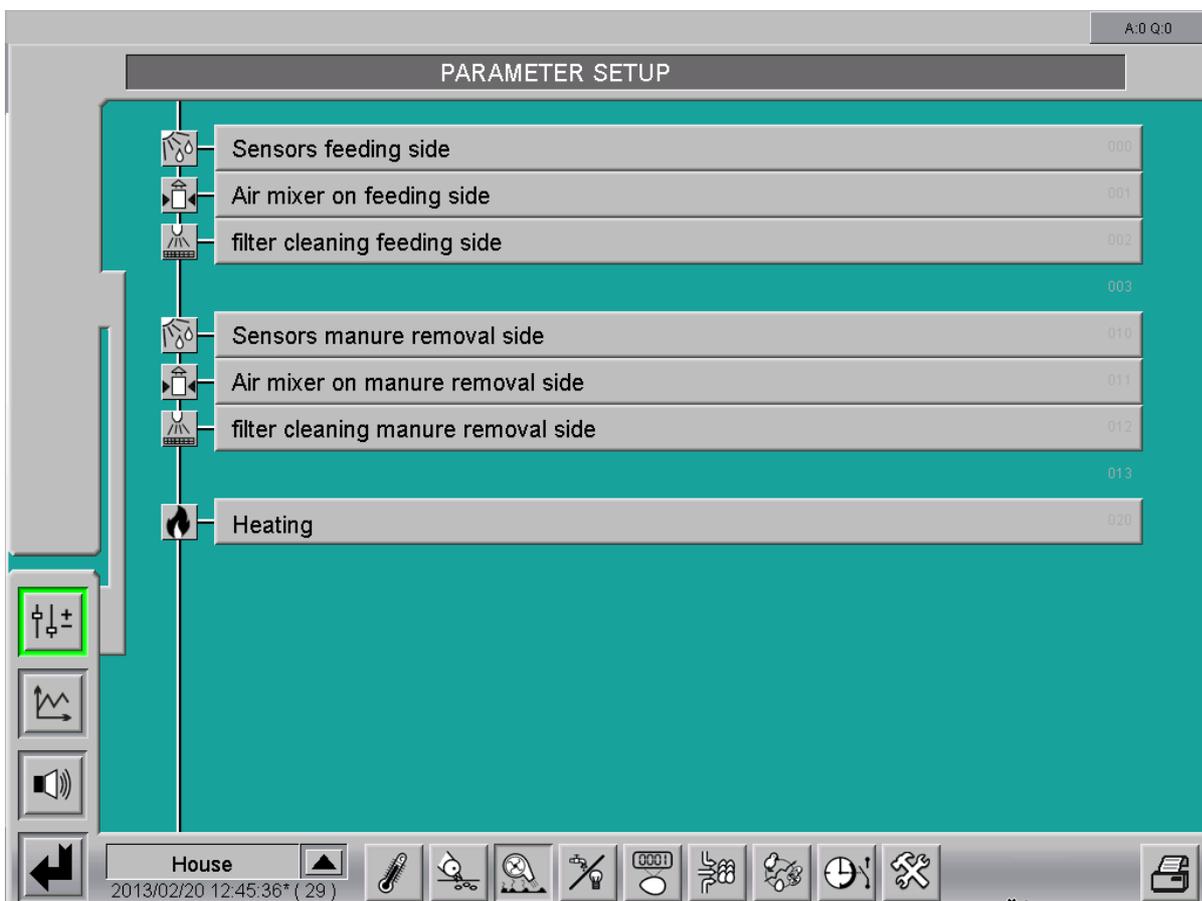


Figure 1-5: Setting



All shown settings only serve as examples. The appropriate settings are made during the initial operation and may then be optimized during operation.

## 2 Sensors

A click on the button **sensors** opens a menu where specifications can be made concerning the used climate sensors.



Figure 2-1: Sensors



**Attention!**

The values for the measuring range of the sensors which are preset once must not be changed arbitrarily since otherwise wrong measured values may result. At the initial operation it is determined which sensor is used with which measuring range.

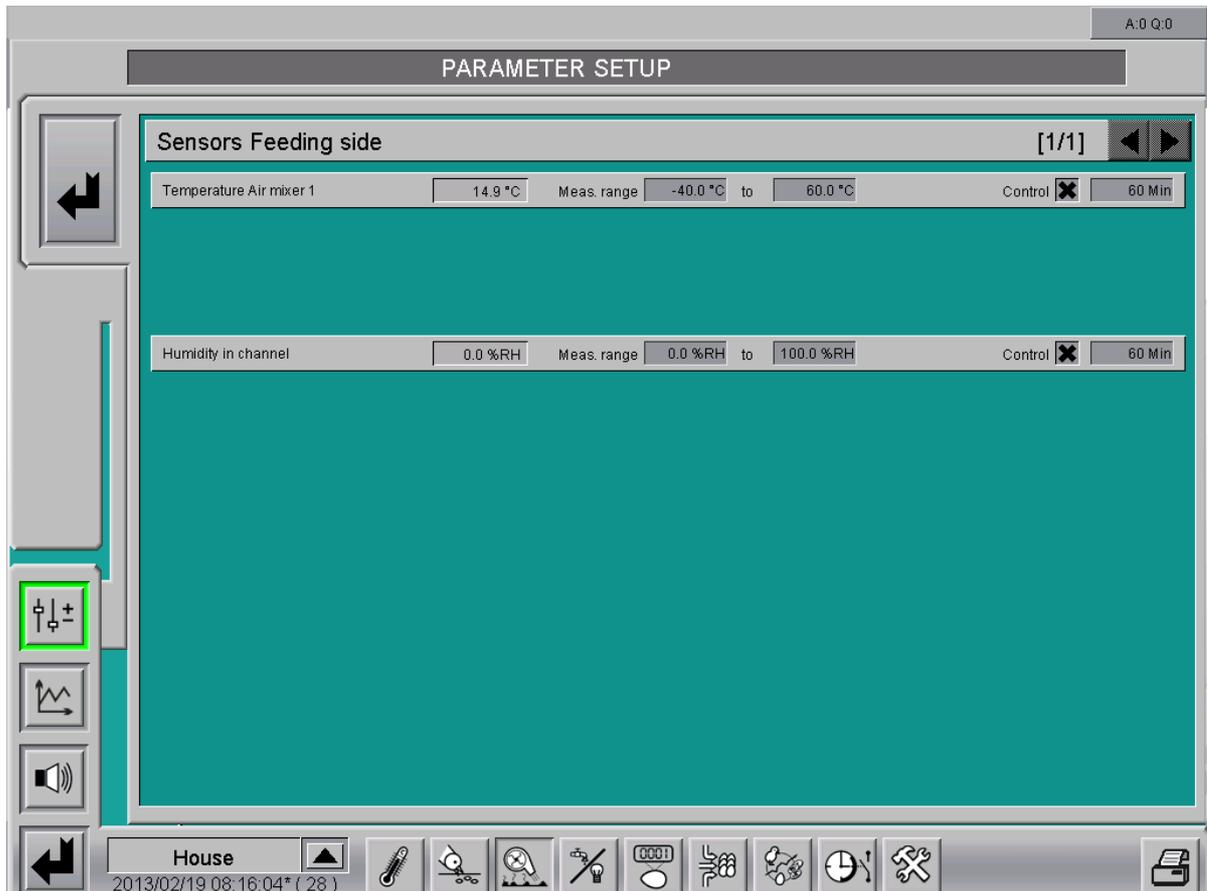


Figure 2-2: Sensors feeding side

## 2.1 Alarm characteristics

An alarm is generated if the control time is exceeded without modification of the unfiltered input value. If the end of the measuring range is reached, an alarm is generated immediately. Both alarms show the following messages:

### **Sensor defective (cable break)**

The message can be delayed in the alarm settings (initial value: 0). The delay should be set to 0 so that one can respond immediately to a cable break which occurs when the end of the measuring range is reached.

In case of an alarm, the display of the sensors is as follows:

- If a cable is broken, the alarm is displayed red flashing.
- In case of a Min.- or Max.-alarm, the value is displayed red without flashing.

## 2.2 Temperature air mixer

The fresh air and house air flap are controlled via the air duct temperature in order to control the streaming in air temperature.

- **Temperature air mixer**

In the first column, the current measured value can be read for up to 4 temperature sensors. The display provides a quick overview of the current temperatures. Entries cannot be made here.

- **Measuring range**

In the second column, the measuring ranges of the sensors are to be entered. Big Dutchman uses a PT1000 or DOL12 sensor as standard probes. These probes have a measuring range of -40°C up to +60°C.

- **Control**

A control of the input value can be activated at each probe and a monitoring time can be set during which the value must change. In case of an error, an alarm for cable break will be released which involves the signal change control and also controls whether the input signal has reached the end of the measuring range (short circuit or open).

## 2.3 Channel humidity

The centrifugal fan can be controlled via the channel humidity to save energy with dry manure.

### 2.3.1 Settings

- **Channel humidity**

The air humidity can be read in the first column. It is not possible to make entries.

- **Measuring range**

The measuring range of the sensor is entered in the second column. Big Dutchman uses a sensor with a measuring range of 0%RH up to 100%RH as standard sensor.

- **Control**

A control of the input value can be activated at each probe and a monitoring time can be set during which the value must change. In case of an error, an alarm for cable break will be released which involves the signal change control and also controls whether the input signal has reached the end of the measuring range (short circuit or open).

### 2.3.2 Alarm characteristics

In case of a sensor defect (cable break) the controlled manure drying is deactivated.

### 3 Air mixer

A click on the button **air mixer** opens a menu where times can be set when the air mixer shall work as well as the corresponding control parameters.

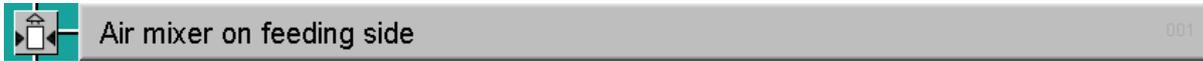


Figure 3-1: Air mixer

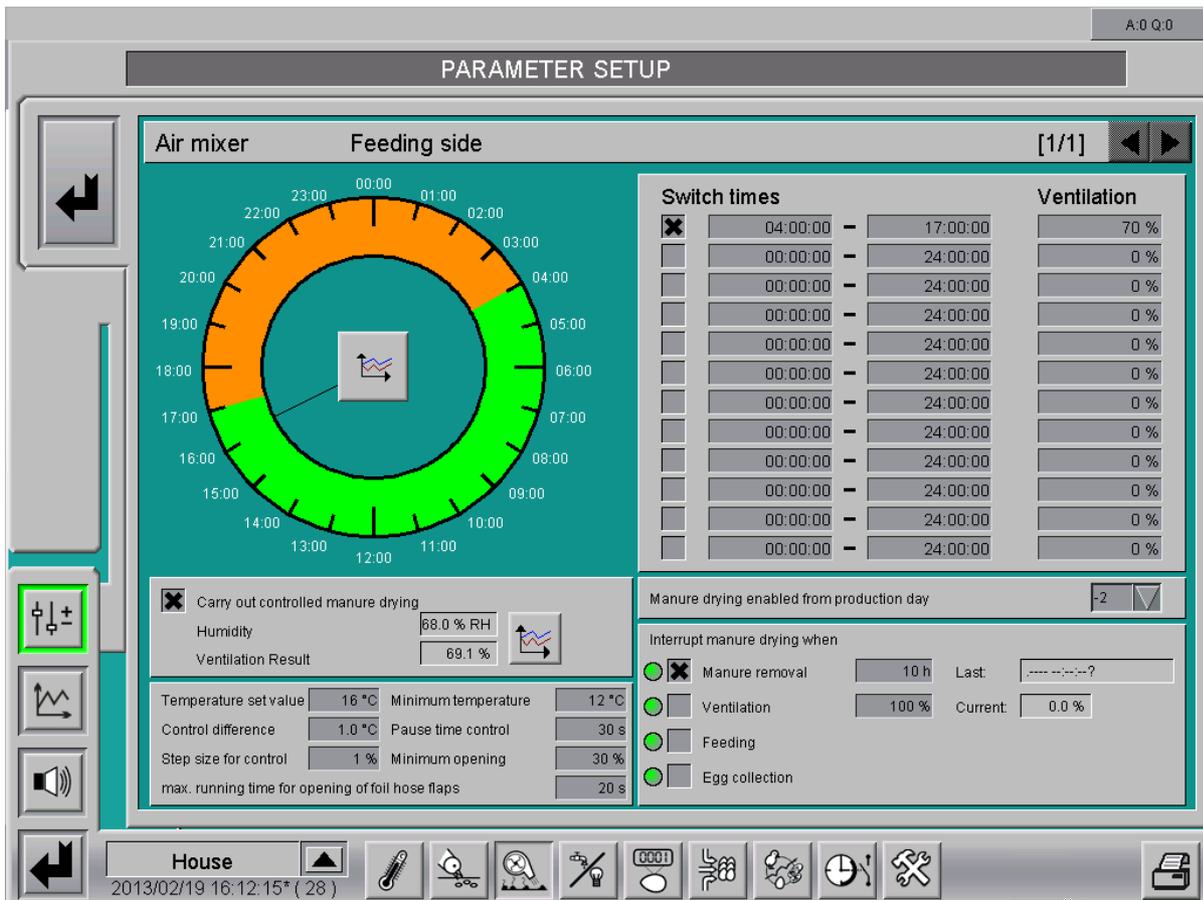


Figure 3-2: Setting air mixer

### 3.1 Switching times

In the lower screen you can enter the times when the air mixer shall switch on or off and with which intensity the fan shall be activated. The graphic display on the clock provides a clear view of the running times set for the whole day.

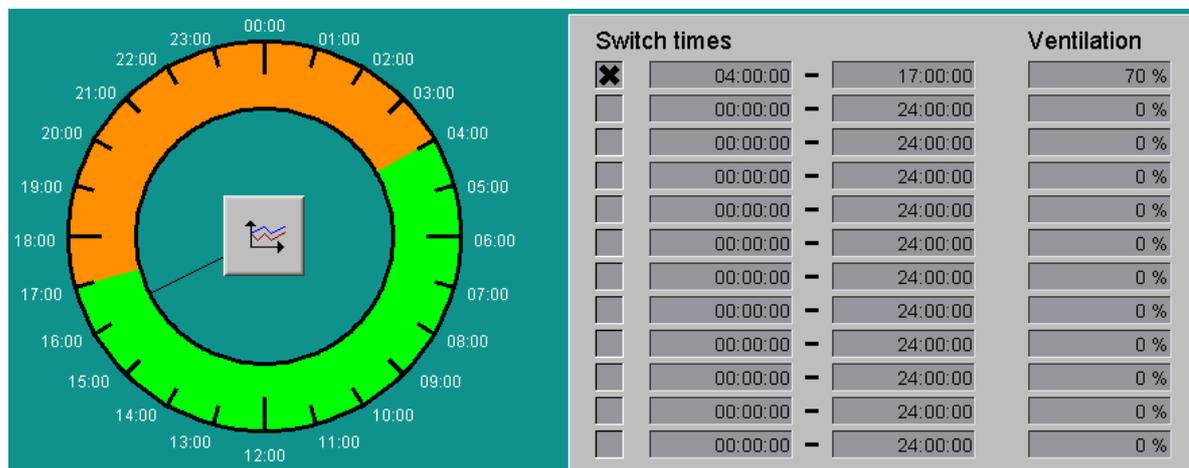


Figure 3-3: Switching times

- **Graphic display**

The graphic display indicates when the air mixer is switched on (**green**) or off (**orange**) via the switching times. The **black pointer** shows the current time of the system. In addition, one click on the **curve symbol** opens the curve overview of the previous switching times of the air mixer.

- **Setting the switching times**

Twelve switching times maximal can be activated via the check boxes in front of the start time. The **start-** and **stop time** during which the air mixer shall run can be entered in a separate field in the format **hh:mm:ss**.

- **Controlled air mixer**

For the widest variety of reasons, the air mixer's motor is controlled by frequency regulators in many enterprises.

This makes it possible to start the motor slowly and thus reduce wear to material. Lowering the volume of the motors at night for noise-prevention reasons is also conceivable.

The air output of the ventilators as a whole must occasionally be limited, as a **trumpet effect** can be caused, which means that an undesirable loud noise is produced at the outlet holes in the air channel.

### 3.2 Manure drying active from production day

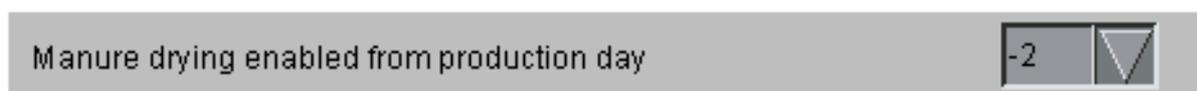


Figure 3-4: Manure drying active from production day

In the setting Manure drying active from production day, settings can be made for the manure drying, depending on the production day. Manure drying will start from a previously stipulated production day.

### 3.3 Control parameters channel temperatures

Temperature set value	16 °C	Minimum temperature	12 °C
Control difference	1.0 °C	Pause time control	30 s
Step size for control	1 %	Minimum opening	30 %
max. running time for opening of foil hose flaps			20 s

Figure 3-5: Control parameters channel temperatures

- **Temperature set value**

The **target temperature (channel temperature)**, that you wish to reach by mixing the outdoor air with the house air is entered here. Of course, the air can only be dried as well as possible by dry, hot air.

Make sure that the system's channel temperature is set accordingly.

Temperatures that are too cold may result in the dew point being reached in the house and condensation water forming in the air ducts and on the air intake pipes. There is also the risk of undercooling, as the air emerges directly underneath the birds.

**The channel temperatures are usually entered as follows:**

Type of birds	Channel temperature in °C	Channel temperature in °F
Parents	16°-18°	61°-64°
Laying	16°-18°	61°-64°
Breeding	Adapt to house temperature	Adapt to house temperature

Table 3-1: Channel temperatures for air mixer

- **Minimum temperature**

If the temperature is below the minimum temperature, the air mixer will close the outside air valve entirely and continue the manure drying process with house air only. This value must not be too low, otherwise the dew point is reached in some cases.

This value is usually set **at approx. 4°C below** the desired channel temperature.

To clarify the connection between low temperatures and humidity in the formation of condensation water, here is a table which shows when the dew point is reached and why the minimal temperature ought not to be set too low.

		R.F. in %										
		50	55	60	65	70	75	80	85	90	95	100
S t a l l t e m p.  i n  °C	15	4,6	5,9	7,2	8,4	9,5	10,5	11,5	12,5	13,3	14,2	15,0
	16	5,5	6,9	8,1	9,3	10,5	11,5	12,5	13,4	14,3	15,2	16,0
	17	6,4	7,8	9,1	10,3	11,4	12,5	13,5	14,4	15,3	16,2	17,0
	18	7,3	8,7	10,0	11,2	12,4	13,4	14,5	15,4	16,3	17,2	18,0
	19	8,2	9,6	11,0	12,2	13,3	14,4	15,4	16,4	17,3	18,2	19,0
	20	9,1	10,6	11,9	13,2	14,3	15,4	16,4	17,4	18,3	19,2	20,0
	21	10,1	11,5	12,9	14,1	15,3	16,4	17,4	18,4	19,3	20,2	21,0
	22	11,0	12,5	13,8	15,1	16,2	17,3	18,4	19,4	20,3	21,2	22,0
	23	11,9	13,4	14,8	16,0	17,2	18,3	19,4	20,3	21,3	22,2	23,0
	24	12,9	14,4	15,7	17,0	18,2	19,3	20,3	21,3	22,3	23,2	24,0
	25	13,8	15,3	16,7	18,0	19,2	20,3	21,3	22,3	23,3	24,2	25,0
	26	14,8	16,3	17,7	18,9	20,1	21,3	22,3	23,3	24,3	25,1	26,0
	27	15,7	17,2	18,6	19,9	21,1	22,2	23,3	24,3	25,2	26,1	27,0
	28	16,7	18,2	19,6	20,9	22,1	23,2	24,3	25,3	26,2	27,1	28,0
	29	17,6	19,1	20,6	21,9	23,1	24,2	25,3	26,3	27,2	28,1	29,0
	30	18,6	20,1	21,5	22,8	24,1	25,2	26,3	27,3	28,2	29,1	30,0

Figure 3-6: Dew points of various house temperatures depending on relative humidity

If e.g. the house temperature is 23°C and the relative humidity 70%, then the dew point is at 17.2°C.

If the intake air system is below 17.2°C, condensation water forms on the distributor system and on the air channels. The lower the outside temperature and the higher the intake air target value, the lower the proportion of fresh air will be.

#### Sample calculation:

The air mixer feeds in 0.7m<sup>3</sup> air per bird per hour, the outside temperature is 0°C, the highest temperature is 22°C and the air should be introduced at 16°C.

The proportion of fresh air can be calculated from these temperatures:

proportion of fresh air = (house - target) ÷ (house - outside) x 100%

proportion of fresh air = (22°C - 16°C) ÷ (22°C - 0°C) x 100 % = 27 %

Since the air volume is too low for the birds' oxygen supply, the air volume actually required must be provided by the house ventilation system.

At the same time, adequate air extraction is necessary to prevent the relative humidity from rising above 70% and thus causing a sharp increase in the house air's dew point.

- **Control differential**

The control differential determines how much upward and downward tolerance of the target value is permitted. If, for example, the target value is undershot by 1°C, the computer alters the valve position in order to increase the temperature in the channel again.

- **Pause-time control**

There is always a pause between each control cycle, the duration of which may be set in seconds here. A practicable entry value is approx. 30 seconds. Gentle but dynamic control is thus achieved.

- **Incremental control**

To prevent control from occurring too quickly, the desired alteration of the valve position may be completed in small steps. That prevents the valve from always being adjusted at wider intervals, so that the channel temperature is never reached, as the control fluctuates too much.

The values that ought to be used here are between 2% and 5%.

- **Minimum opening**

Even if the channel temperature is below the set value, a certain part of fresh outside air is still mixed with house air, as described under menu item **minimum temperature**.

This minimum opening is maintained as long as the minimum channel temperature is not below the set value.

As rule of thumb, the opening in layer or parent houses is approx. 15%, in case of rearing houses the initial value is 0% and is then slowly increased to 15%.

### 3.4 Foil hoses

Air mixers can be equipped with foil hoses in order to preheat the air taken in from outside.

Because the air firstly passes through the film, it warms up and, in its preheated state, can be mixed with the house air.

To prevent the film tubes from bursting in the event of the air mixer starting when not controlled, there is a servo motor which slowly opens a valve in the channel after the air mixer has started, in order to blow the tube up.

Temperature set value	16 °C	Minimum temperature	12 °C
Control difference	1.0 °C	Pause time control	30 s
Step size for control	1 %	Minimum opening	30 %
max. running time for opening of foil hose flaps			20 s

Figure 3-7: Air mixer with foil hoses

Under **max. run time for opening the foil hose flaps** the time is set which is needed until the flap is completely open. The end position of the flap is controlled by the computer via a digital input.

If the valve does not reach this position, an alarm is triggered.

### 3.5 Controlled manure drying

In order to react actively to the humidity of the manure, the **humidity can be measured** and the air capacity of the air mixer can be derived.

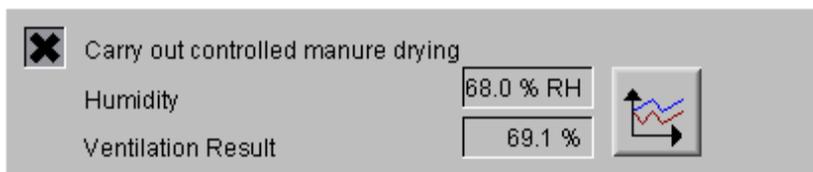


Figure 3-8: Controlled manure drying

- **Carry out controlled manure drying**

Activate the check box in order to determine whether the regulation of the air capacity shall be active by permanent measuring of the humidity in the manure.

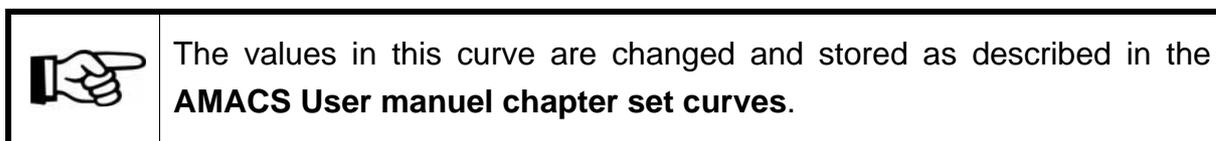
- **Humidity**

The currently measured humidity is shown here.

- **Curve**

The ratio of the fan to the humidity can be entered here. Thus the ventilation can be reduced or increased, depending on the humidity.

To change the value, the ratio curve is to be opened. This can be opened with a click on the button with the curve symbol. Now a new screen window is displayed.



- **Resulting ventilation**

Here the current capacity of the air mixer is shown which is based on the measured values and the settings in the curve.

### 3.6 Interruption of manure drying

The manure drying can be interrupted to avoid energy peaks, if

- the manure removal,
- ventilation,
- feeding
- and/or the egg collection are activated.

For this, the check boxes in front of the parameters can be activated at option.

The sensors in front of the check boxes appear in green if the manure drying is active or in red if it was interrupted by activating a check box.

Figure 3-9: Interrupt manure drying

- **Manure removal**

If an interruption of the manure drying is requested after the manure removal, a pause time can be entered here in hours during which the manure drying shall be deactivated after the last manure removal has been switched off.

This is reasonable since there is hardly manure on the manure belt after the manure removal.

- **Ventilation**

If a certain ventilation value is sufficient for the drying of the manure on the manure belts, the check box can be activated and a value can be entered in percent at which the manure drying can be switched off.

- **Feeding**

If the check box for the feeding is activated, the manure drying is interrupted at the start of the feeding.

- **Egg collection**

If the check box for egg collection is activated, the manure drying is interrupted at the start of the egg collection.

If one of the conditions is fulfilled for interrupting the manure drying, a message appears in the main screen of the manure drying. On the screen below you can see the message for interruption of feeding.

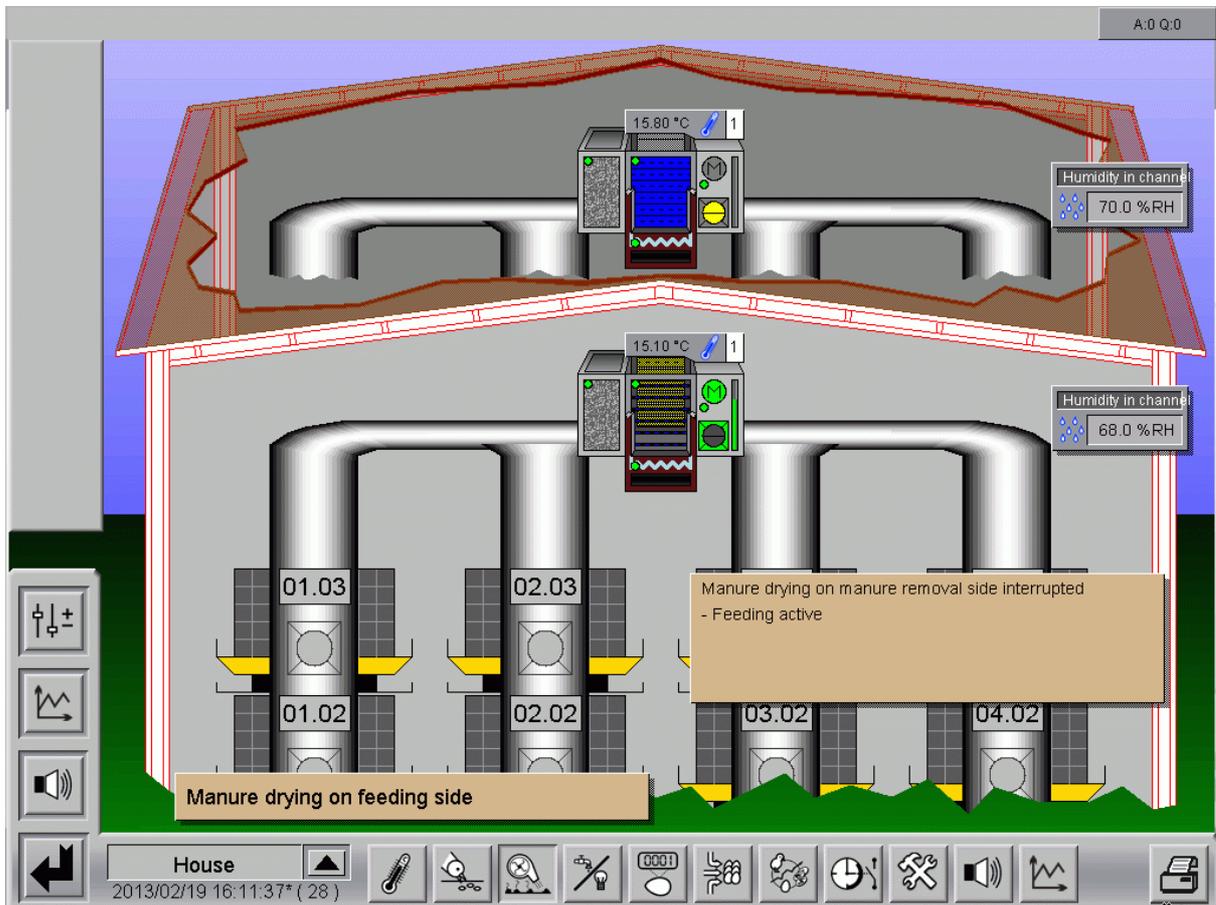


Figure 3-10: Message manure drying interrupted

## 4 Filter cleaning

A click on the button **filter cleaning** opens an additional menu where the automatic filter cleaning can be set.



Figure 4-1: Manure drying with automatic filter cleaning

Many air mixers are fitted with dust filters which are cleaned automatically. A short compressed air pulse is sent into the filter cartridge to loosen the dust adhering from the outside.

It is then gathered in a pan under the filters and the pan is cleaned manually from time to time.

Since there are several such filter cartridges, filter after filter must be "flushed" with the aid of several solenoid valves, in order to obtain enough pressure and air volume.

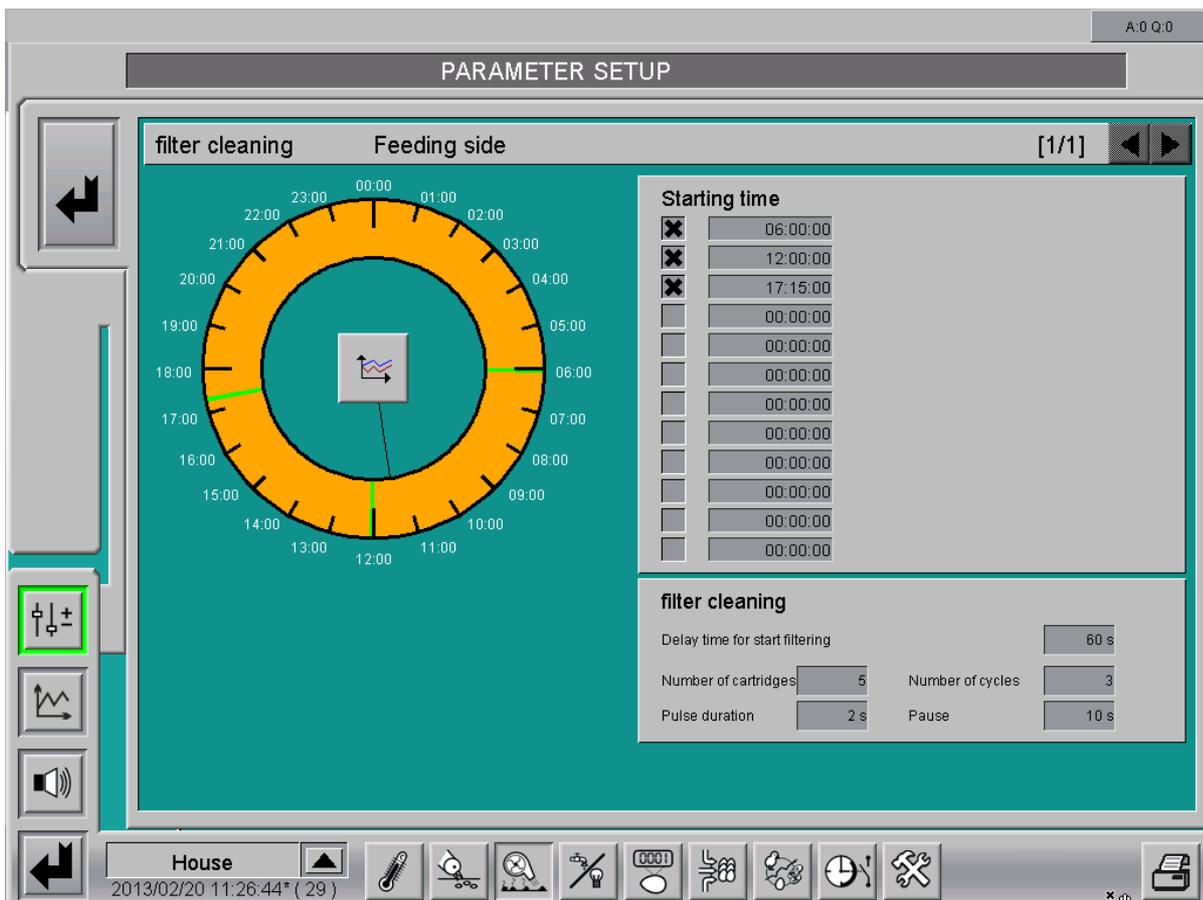


Figure 4-2: Set filter cleaning

## 4.1 Start time

In the screen below you can enter the start times at which the filter cleaning shall be activated. The graphic display on the clock provides a clear overview of the set start times.

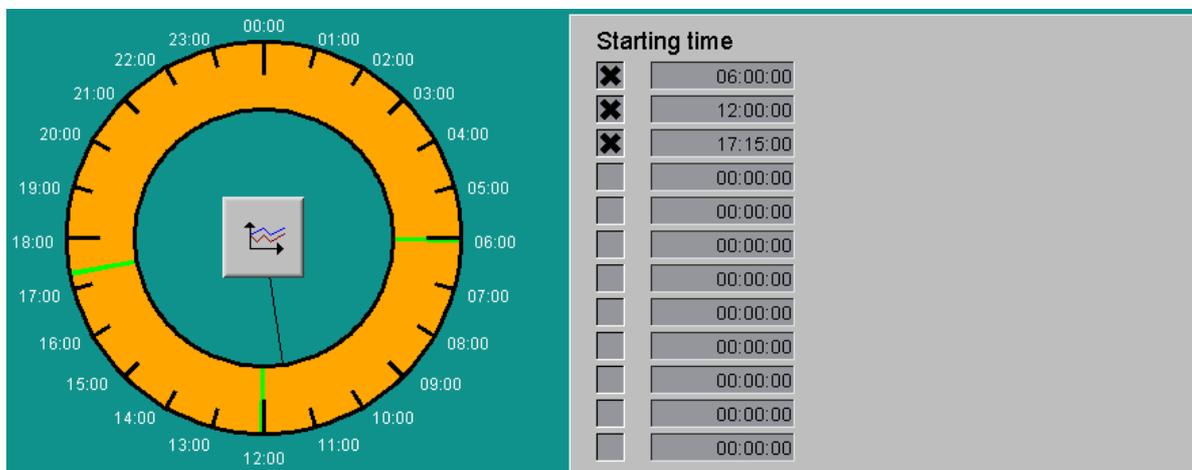


Figure 4-3: Start times

- **Graphic display**

The graphic display shows the times when the filter cleaning can be activated (**green**) or deactivated (**orange**) via the start times. The **black pointer** shows the current time of the system. Moreover, the curve view of the previous start times of the filter cleaning can be opened by clicking on the **curve symbol**.

- **Set start times**

It is possible to perform a cleaning process at 12 different times per day. These can be activated via the check box in front of the start time. The filter is normally cleaned two or three times a day, at two cycles per filter element. **Start times** at which the filter cleaning shall be activated are entered in a field with the format **hh:mm:ss**.

## 4.2 Control parameters

filter cleaning			
Delay time for start filtering			60 s
Number of cartridges	5	Number of cycles	3
Pulse duration	2 s	Pause	10 s

Figure 4-4: Control parameters filter cleaning

- **Delay time for start of filter cleaning**

It is possible to enter a time before cleaning starts, to enable the air mixer to shut down completely.

60 sec. must normally be entered as a value, unless there is a frequency converter which has a braking period of longer than 60 sec.

- **Number of cartridges**

The number of cartridges equals the number of solenoid valves to be controlled.

If there is already an electronic system provided in the air mixer, which controls all the cleaning system valves one after another, only a "1" has to be entered as a number.

- **Number of cycles**

It is possible to run through this cleaning process several times.

If, for example, three cycles are entered, all the cartridges are each cleaned three times with a burst of air.

- **Pulse pause**

Since cleaning is done according to the principle "air pulse", only a very short burst of approx. 2 seconds per filter cartridge is required to loosen the dust adhering from outside.

If an electronic system is integrated which controls all cleaning system valves in the air mixer, the cleaning process duration may be entered here, 30 seconds for example.

- **Pulse pause**

Since the compressor needs time to build up the pressure again between the cycles, a time may be entered in seconds, which is used as a pause between the cycles.

The necessary length of the pause depends on the output of the compressor installed and must be determined by a test.

## 5 Heating system

A click on the button **heating** will open an additional menu where the digital or analogue-controlled heating system can be set optionally.



Figure 5-1: Manure drying with heating system

If fresh air is to continue to be brought into the house during colder outside temperatures, this air must be preheated from a certain temperature.

This occurs with the aid of large heating coils - adapted to the desired heat and air output, which are often heated by hot water.

This guarantees good, even heat distribution, particularly in breeding coops.

## 5.1 Analogue-controlled heating system

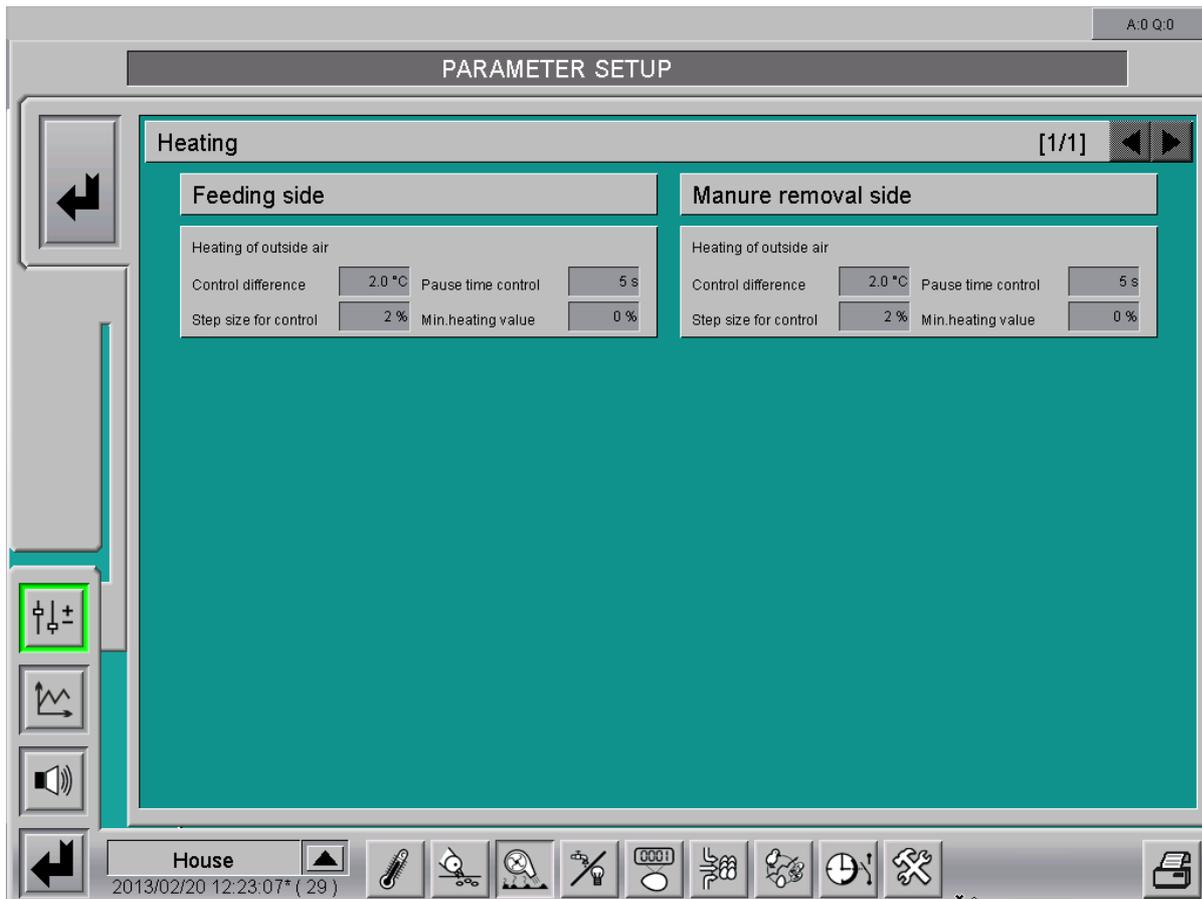
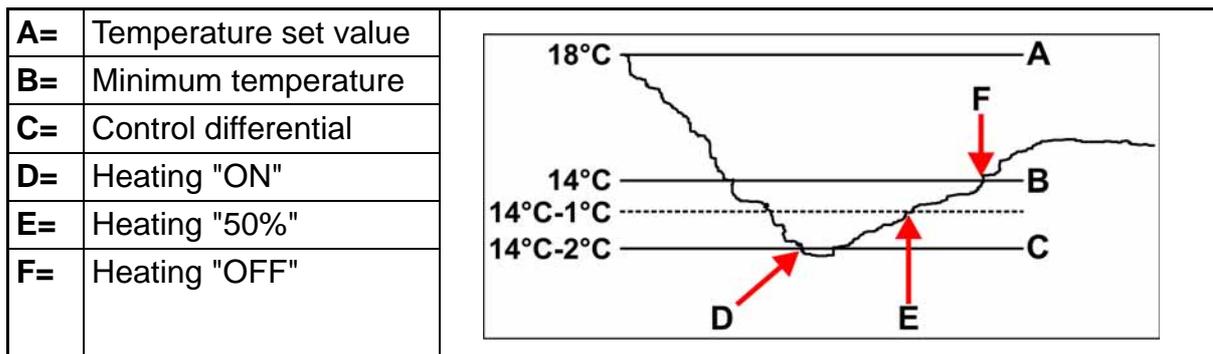


Figure 5-2: Analogue-controlled air mixer heater

- **Control differential**

If an analogue-controlled heating system was installed, it is possible to determine via this parameter at which °C below the minimum temperature the heating system is switched on. After that, this control differential is used to control the capacity of the heating - as in case of a band width control.

The following diagram (see following page) shows the type of control; here 14°C were programmed as minimum temperature and 2°C as control differential.



- **Pause-time control**

There is always a pause between each control cycle, the duration of which may be set in seconds here. A practicable entry value is approx. 30 seconds.

Gentle but dynamic control is thus achieved.

- **Incremental control**

To prevent control from occurring too quickly, the desired alteration of the valve position at the analogue-controlled warm water heating system may be completed in small steps.

That prevents the valve from always being adjusted at wider intervals, so that the channel temperature is never reached, as the control fluctuates too much. The values that ought to be used here are between 2% and 5%.

- **Minimum heating**

If a permanent heating requirement is desired, to prevent the heating system from freezing up or for other reasons, a minimal heating requirement may be entered here.

## 5.2 Digital heating

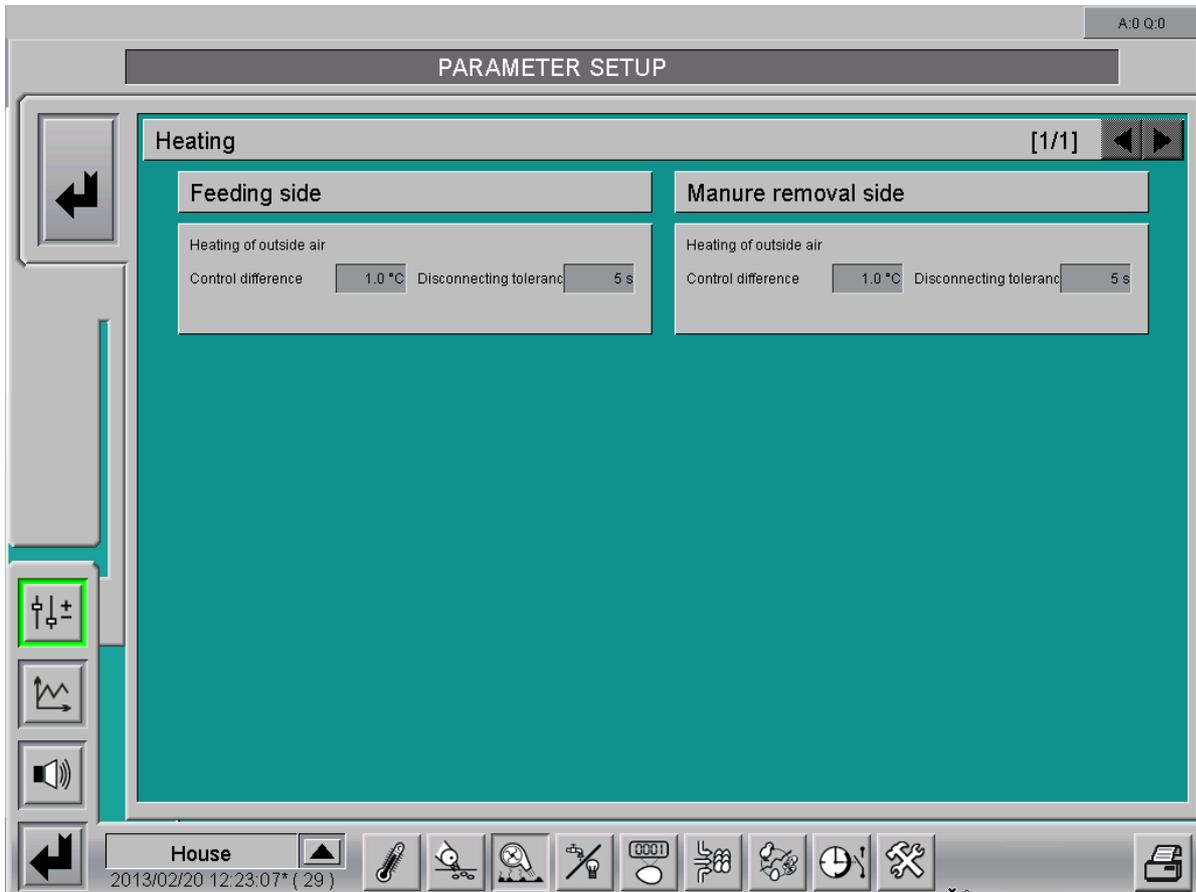


Figure 5-3: Digital controlled air mixer heating

- **Control differential**

If the **minimum temperature** is below the set value, and the value set here is subtracted, the heating system will switch on.

- **Disconnection offset**

A delay period must be entered here so that, in the case of temperature variations surrounding the value entered for the **minimum temperature**, the heating system does not switch on and **immediately** switch off.

## 6 Alarm description



In the alarm settings you can choose which alarms you require and when they should appear. In addition you can state whether the alarm is to be issued by the alarm device or sent to the users by e-mail.

**Attention!**

All alarms are activated as standard!

Before deactivating an alarm you should check whether it is really not required. Alarms help to prematurely recognise problems that may potentially endanger the animals' health. Alarms should not be viewed as disturbing but as a chance to be able to keep the productivity of the house at a consistently high level.

How to operate the **alarm settings** can be found in the **Amacs Operation** manual.

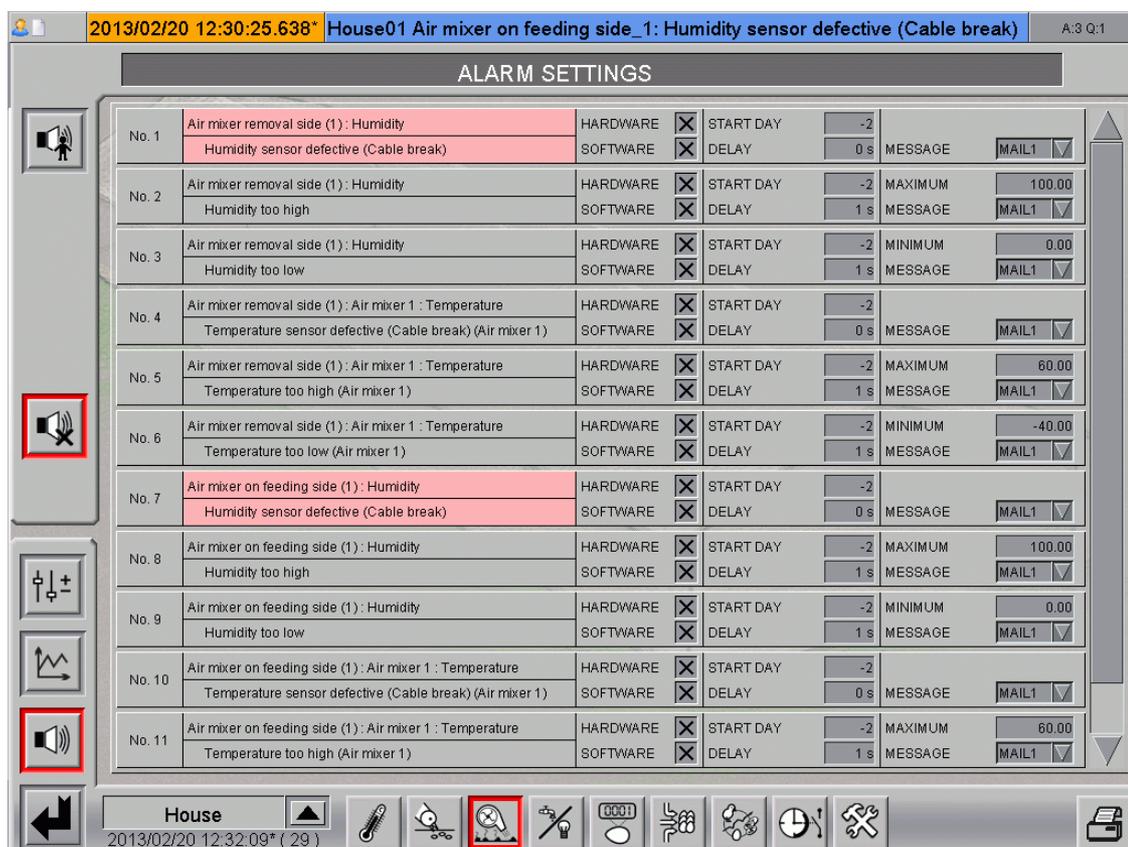


Figure 6-1: Alarm setting

This section describes the various alarms shown in the message line and their cause. You will find information regarding how to operate the message line in the manual Amacs Operation.

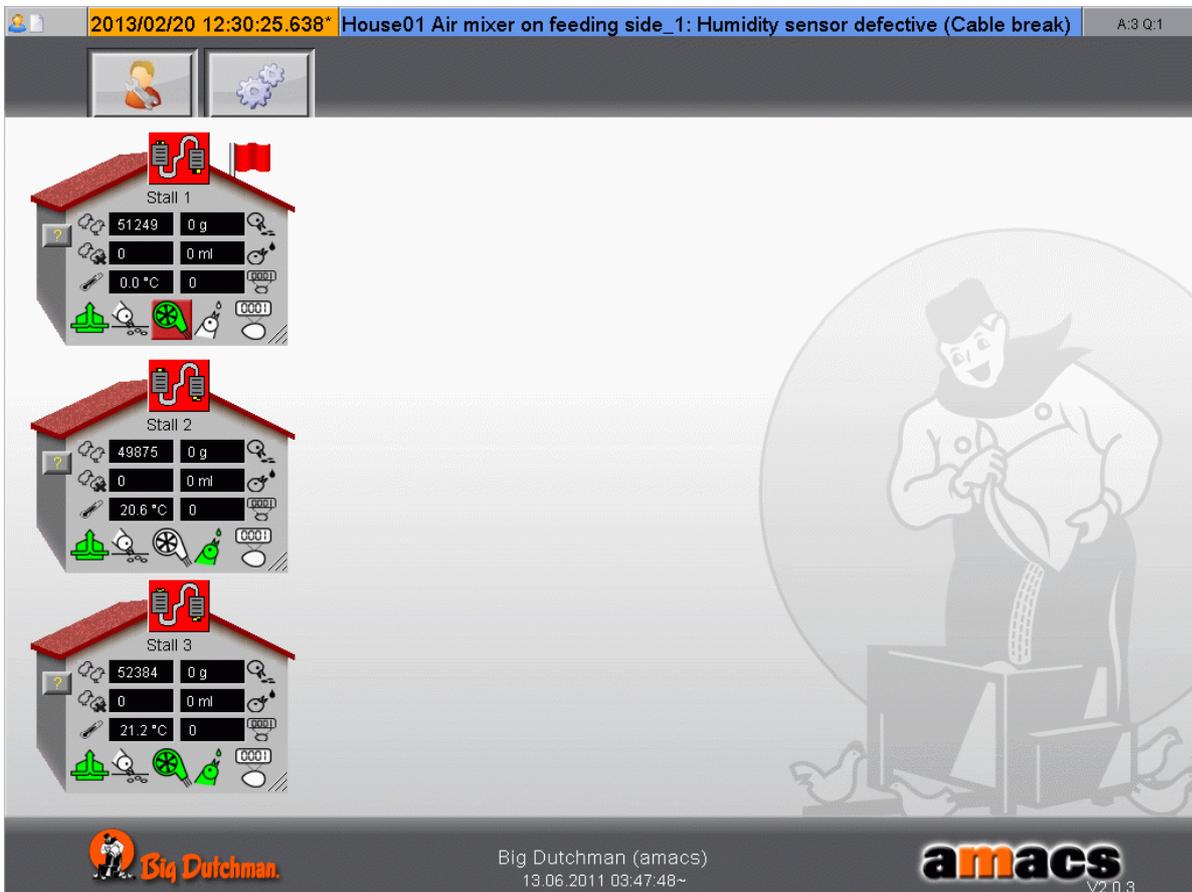


Figure 6-2: Alarm line

<b>Temperature sensor defective (cable break)(Air mixer [X])</b>
The temperature sensor triggers an alarm after an adjustable control time without any changes and when the end of the measuring range is reached.
<b>Temperature too high (Air mixer [X])</b>
The measured channel temperature of the air mixer [X] is above the set maximum limit.
<b>Temperature too low (air mixer [X])</b>
The measured channel temperature of the air mixer [X] is below the set maximum limit.

Table 6-1: Alarm sensors - channel temperature

<b>Humidity sensor defective (cable break)</b>
The humidity sensor triggers an alarm after an adjustable control time without any changes and when the end of the measuring range is reached.
<b>Humidity too high</b>
The measured channel temperature is above the set maximum limit.
<b>Humidity too low</b>
The measured channel temperature is below the set maximum limit.

Table 6-2: Alarm sensors - humidity

<b>Exceeding the time for opening the foil hose flap (air mixer [X])</b>
The flap for slowly blowing up the foil hose is not open at the air mixer [X].

Table 6-3: Alarm air tube flap