# PL-9300

## POULTRY CLIMATE AND MANAGEMENT COMPUTER

# Table of contents

# Copyright/Disclaimer

# 1 General introduction

The manual is intended for the user of this device. It contains all the information necessary for operating and cleaning this product. Please read all information and instructions carefully before using the product.

Symbols mark warnings, important notes, tips, etc. in this manual.

Stienen has compiled this manual with all due care. If you find any errors, please let us know.

## 1.1 Symbols and definitions


Risk of injury by dangerous electric shock. Danger to people and animals.


Warning indicating danger to product, people and animals if procedures are not strictly complied with.


Warning indicating damage to products if procedures are not strictly complied with.


Pressure cleaning is not allowed.


Collect as separate flows


Important note


Additional information


Example of a concrete application of the functionality described.


Example calculation


Manual control


Tips and advice


Screenshot


Application note

## 1.2 Customer service

If you have any questions, please contact your installer. Be sure to have all the necessary data handy. You should also always write down the cause of a fault and the circumstances that occurred during the fault. This will enable you to avoid any ambiguities and it will enable your installer to deal with any faults quickly and effectively.

# 2 Safety instructions and warnings

Read the general safety instructions in this chapter carefully before using the device. A certified installer must install the device and resolve any faults, in accordance with the applicable guidelines. If this product is installed and used in any other way, the warranty will not apply.

## 2.1 Sound, independent alarm system

Although we have designed and built our control equipment with the greatest care possible, technical faults can never be ruled out. Insurance requirements in many countries are becoming increasingly stringent. This requires the alarm contacts of the various control computers to be connected a central alarm unit.


We recommend also installing a sound independent alarm system, for example a min/max thermostat.


We advise you to manually test the alarm at least once a week.

## 2.2 During use

The people who operate the device have read the manual carefully. They are aware of potential hazards that may arise from improper use and maintenance of the product.


The device must only be opened by authorised personnel.


Do not switch off the control computer while the house is empty, but switch it to *Off* mode. This will prevent condensation caused by the equipment cooling down.


Check the device for any damage at regular intervals. A damaged device is unsafe. Always report any damage to your installer.


Electronic equipment is splash-proof and must not be cleaned using a pressure cleaner.


If any emergency has occurred, write down: the circumstances under which the emergency occurred, installation settings, software date, software version number and possible causes.

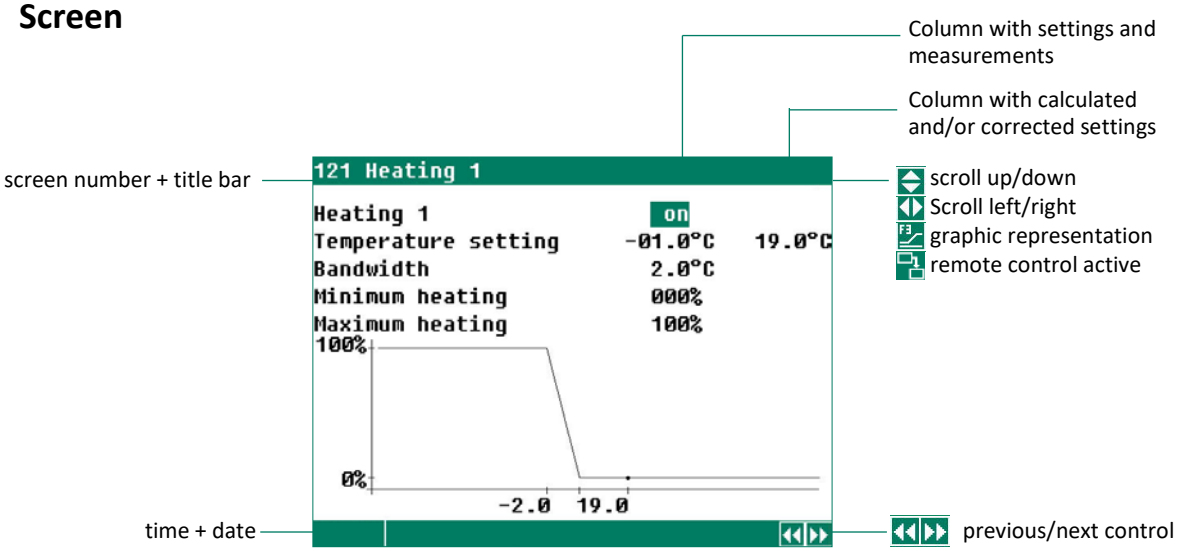
## 2.3 Disposal

The EU has set up systems for the separate collection of waste electrical and electronic equipment and batteries (Directive 20212/19/EU). If you do not dispose of the device properly, you risk a fine.


Electrical and electronic equipment must be collected separately at the end of its life.

# 3 Display and keyboard

## 3.1 Screen




! Due to the growth curve and/or compensations, the calculated setting may deviate from the value set by the user.

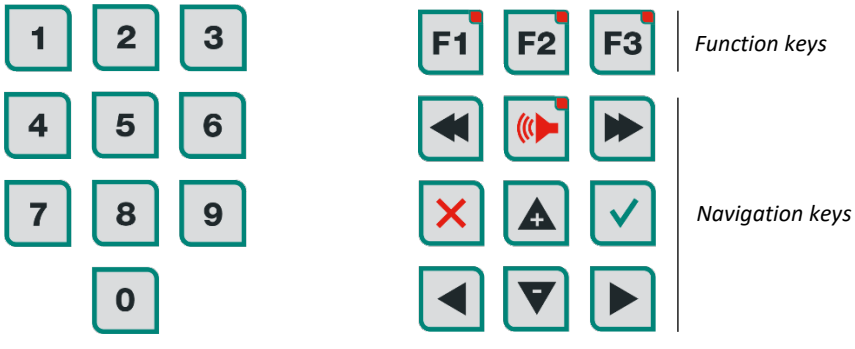
Indication that you can press ▲ ▼ to retrieve the remaining settings/measurements.

Indication that you can press ◀ ▶ to retrieve the remaining settings/measurements.

Indicates that settings can be displayed graphically by pressing the F3 function key. The dot (●) in the graph indicates the calculated value. Pressing F3 again turns off the graphical display.

Indication that you can press ◀◀ ▶▶ to select the previous/next screen.

## 3.2 Keyboard




⚠ Do not use sharp objects (pen or screwdriver) to operate the keys.

## 3.3 Function keys

F1 Press and hold F1 and use the keys ◀ / ▶ to select the previous/next language.

F2 Calling up poultry house status.

F3 The graph function is active when the LED in the function key lights up. You can switch off the graph function by pressing the function key again. The LED in the key is off then.

## 3.4 Numerical keys (0..9)

Use the numerical keys to enter a screen number, value or text. Select menu item 10 with 0 .

| Key | Character |
|---|---|
| 0 | _0 |
| 1 | .,1'-:+ |
| 2 | abcäáàâç2ABCÄÁÀÂÇ |
| 3 | defëéèê3DEFËÉÈÊ |
| 4 | ghiïíìî4GHIÏÍÌÎ |
| 5 | jkl5JKL |
| 6 | mnoöóòô6MNOÖÓÒÔ |
| 7 | pqrs7PQRS |
| 8 | tuvüúùû8TUVÜÚÙÛ |
| 9 | wxyz9WXYZ |

**Text input**

Use 2 .. 9 to change names (max. 15 characters including spaces). The character is shown in a little box. Press the numeric key repeatedly until the character to be selected is shown. To enter a punctuation mark, press 1 repeatedly. Press 0 to insert spaces.

2 Press 1x for a, 2x for b, etc.
Use and ◀ ▶ to move the text cursor.

For example, in menu choices the text automatically starts with a capital letter.

## 3.5 Navigation keys

✕ Abort menu option or change.
Press and hold this key to return to the main menu.

◀ ▶ In control mode, press and hold to move cursor left/right.
In edit mode, move cursor left/right.

▲ ▼ Move cursor up/down in control mode.
In change mode, decrease/increase the value.

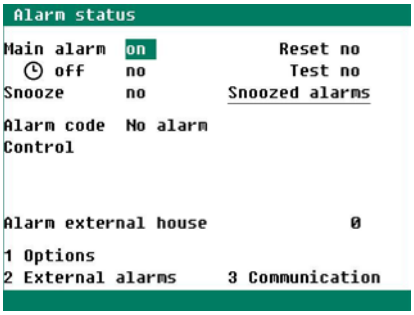
✓ Confirm the selected menu option, start edit mode and confirm the change.
In edit mode, the value to be changed appears in a green rectangle: 19.5°C.
While a change is being made, the character to be changed appears in a black frame: 19.5°C.

## 3.6 Adding and removing breakpoints or periods

1. Press (✓ *Enter key*) to enter the edit mode.
2. Press and hold F1 and press ▲ to add breakpoint/period (provided that the maximum value for periods/breakpoints has not been reached).
3. Press and hold F1 and press ▼ to remove a breakpoint/period (provided that there is at least one period/breakpoint).
4. The number of breakpoints/periods is adjusted automatically.

## 3.7 Alarm key

Shortcut for alarm screen. The LED in the alarm key lights up if one of the controls has an alarm situation.




Here you can turn the main alarm on and off. If the main alarm is off, the LED in the alarm button flashes evenly. No more alarms are issued. Installation errors cannot be disabled.

### Reset

Set *Reset* to *yes* to clear all alarms. After all alarms have been cleared, any active alarms will be turned on again.

### off = temporarily disable alarm

Option for temporarily disabling the alarm (siren). This does not apply to hardware alarms. The main alarm is disabled for 30 minutes; the LED flashes unevenly. After 30 minutes, the main alarm automatically reactivates. If the alarm cause has not been remedied, the alarm relay will de-energize again, causing an alarm.

You can clear the temporary alarm deactivation time by setting *off* to *no*.

| | |
|---|---|
| *Alarm code* | This code represents the alarm cause. |
| *Control* | The control to which the failure relates. |
| *'Terminal + control'* | Terminal number plus any second control to which the alarm relates. |
| *Alarm external house* | If a message received via loop communication shows that the alarm relay of a controller connected has failed, the relevant house number is shown here. |

### Alarm testing

| | |
|---|---|
| *Test = yes* | The alarm relay (siren) is tested for 60 seconds. |
| *Test = no* | The alarm test time is cleared. |

### Snooze function

The snooze function allows you to suppress the alarm notification up to a set time. If the snooze time is before the current time, the alarm notification is snoozed until the next day at most.

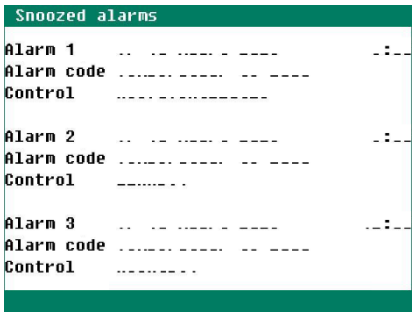
Alarms resulting from a setting error cannot be snoozed. Consider, for example, an incorrectly assigned input or output, or a setting error on the timers.

If the alarm disappears by itself, it is not removed from the snoozed alarm list. Thus, short-lived, repeating alarms can still be snoozed.

Possible options: *00:00, 12:00, 16:00, 20:00, Clear*

- A snoozed alarm remains in the list until the time setpoint is reached. At the time entered, the snoozed alarm will be removed from the list.
  The *Clear* option enables to clear the snoozed alarm list in its entirety. Any active alarms will then be re-generated.
- You can snooze up to 20 alarms simultaneously. Once the snoozed alarm list contains 20 alarms, you cannot add any more alarms to the list. You can still use the temporary alarm off function (*off*).
- A snoozed alarm does not appear in the alarm log.

Snoozed alarms

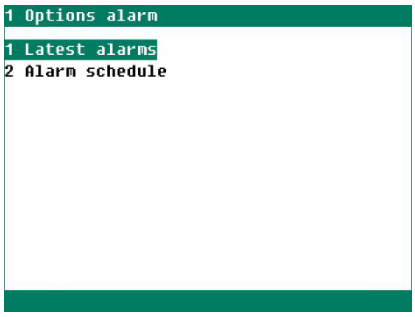



After resolving the fault, do not forget to turn the alarm back *on*. Preferably use the *off* function to clear the fault.

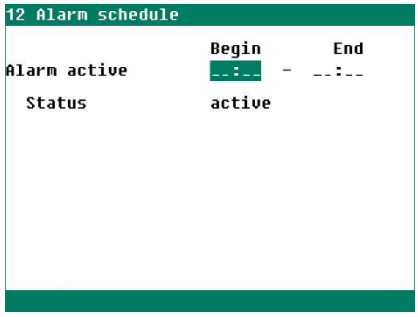
Always resolve installation errors such as *Output already assigned, Output type error, Input already assigned* etc., before commissioning.

By snoozing the alarm for a particular control, no new alarm is generated for this control until the set time.

## Options



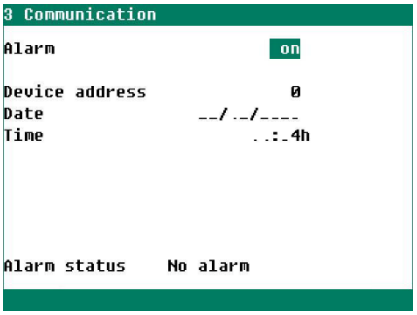

***1 Options alarm→ 1 Latest alarms***
See page 36.




***1 Options alarm→ 2 Alarm schedule***

| | |
|---|---|
| *Alarm active* | At *Start* and *End* you set the period, during which the on-time set alarms should be active.<br>Only when *Status* is set to *Active*, time-set alarms are transmitted to the computer. Alarms that occur during the Off *state are* no longer transmitted. |

## Communications




| | |
|---|---|
| *Alarm* | Here you can turn the communication alarm on and off. |
| *Device address* | The first address, from which the main station did not receive data. |
| *Date* | The date on which the communication alarm occurred. |
| *Time* | The time at which the communication alarm occurred. |
| *Alarm status* | *No alarm, Communication address x* or *Communication WEB-485* |

A communication alarm occurs when the master device has not received data from any device (PL-9xxx, PFA-9400, WEB-485 etc.) in the same RS485 data communication loop.

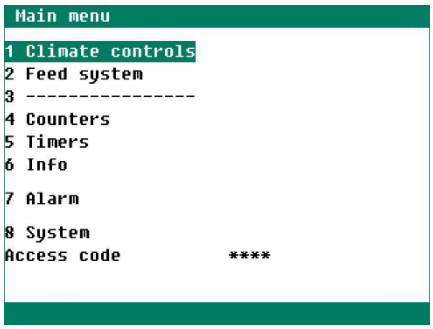
## 3.8 Terminal numbering for inputs / outputs

The terminal number of an input/output consists of a 2-digit module address (between 00 and 31), the input/output type (letter) and a 2-digit serial number (between 01 and 99, 00 = output not used).

| Letter | I/O type | Description |
|---|---|---|
| A | 0-10V output | Analog output with a range of 0-10V or 10-0V. |
| B | Relay output | Relay contact output (no alarm relays, digital outputs, etc.) |
| C | Digital output | Optocoupler output (max. 35Vdc 30mA). |
| D | Open/close output | Open/close control with position feedback. This includes heaters and valves with feedback potentiometers. |
| F | Controlled triac output | Controlled triac output with a range of 30-230Vac. |
| G | Analogue output | Analogue output with fixed range of 2-10V with position feedback reporting. This includes valves with feedback potentiometers. |
| K | Temperature sensor | All types of temperature sensors with a 10K NTC resistor (N10B, BV10B etc.) |
| L | 0-10V input | Analogue input with a measuring range of 0-10V. For connection of e.g. measuring sensors (RH, pressure, $CO_2$, $NH_3$, etc.) |
| M | Digital input | These include measuring fans, counter contacts etc. |
| N | Meteo station | Module to which a wind speed meter, wind direction meter and rain sensor can be connected to. |
| R | Pressure sensor | n. a. |

# 4 Main menu

## 4.1 Overview screen




When using an access code, we recommend that you write it down and keep it somewhere safe. You will not be able to change any settings if you do not have the access code.

If one access code is active, you can only change the setting after entering the correct access code.

The access code will remain active until the overview screen is selected. If you want to change a setting, you will then have to enter it again.

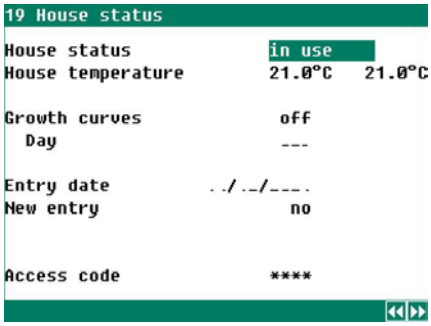
## 4.2 Access code

You can set an access code (four digits) to prevent unauthorized personnel from changing settings. Your installer can set a maximum of six access codes for you.

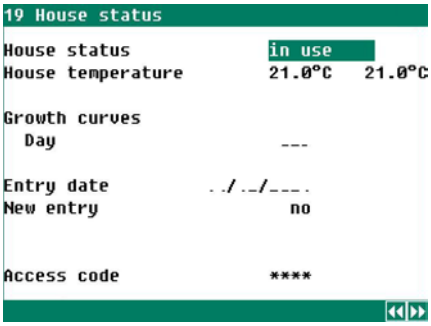
You can program a separate access code for the status screen. If you only set an access code for the status screen, this will apply to all user screens.

# 5 Climate control

## 5.1 House status




*Growth curves = on*




*Growth curves = off*

*House status* — *in use* = The poultry computer controls are based on the settings.
*not in use* = All control, alarm and temperature monitoring functions are switched off; air inlets are closed and timers are switched off.

*House temperature* The temperature based on which the ventilation groups and heaters are controlled. The second value indicates the corrected house temperature based on any active corrections.

*Growth curves* If your installer has set you not to use *Growth Curves*, the text *Growth Curves, Day* will still appear on the screen (animal weight growth curve is active).

## 5.2 Relative or absolute temperature setting

*Relative* The temperature control follows the set house temperature. Control is based on the set house temperature and the differential temperature.

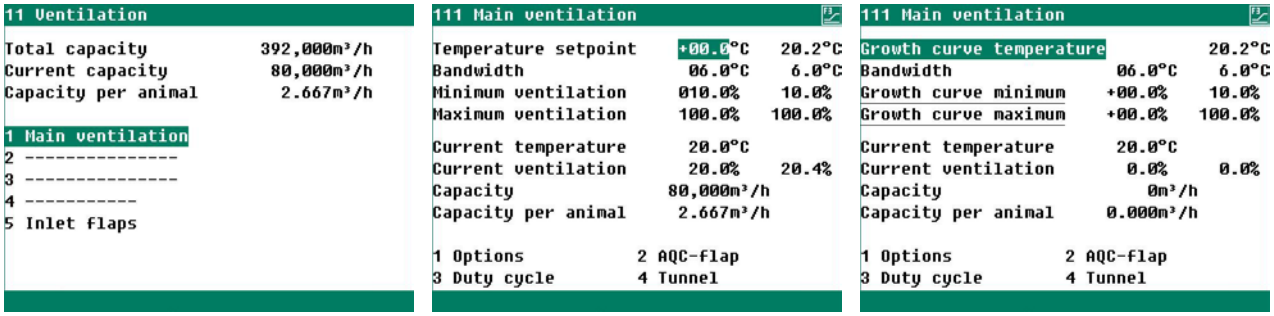
| | |
|---|---|
| Set house temperature | 20.0°C |
| Differential temperature | 5,0°C |

The temperature is controlled at: 20.0°C+5.0°C = 25.0°C
If you change the house temperature setting to 18.0°C, the computer will continue controlling at: 18.0°C+5.0°C = 23.0°C.

*Absolute* The temperature control works with absolute temperature settings. If the temperature is set to 5.0°C, the output will be controlled at 5.0°C. The temperature control works independently of the set house temperature.

| Control | Type of setting (absolute or relative) |
|---|---|
| *Main ventilation group* | Always relative to house temperature |
| *Additional ventilation group* | Always relative to house temperature |
| *Air inlet groups* | Always relative to house temperature |
| *Heating 1..2* | Value between -9.9°C and +9.9°C → setting is relative to house temperature<br>Value equal to or higher than 10.0°C → absolute temperature setting |
| *Cooling 1..2* | Value between -9.9°C and +9.9°C → setting is relative to house temperature<br>Value equal to or higher than 10.0°C → absolute temperature setting |
| *Temperature 1+2* | Inform your installer whether temperature control 1/2 is a relative or absolute temperature setting. |

## 5.3 Main ventilation




Main ventilation with growth curves

*Ventilation capacity* — The calculated total ventilation capacity, the actual ventilation capacity and the ventilation capacity per animal in $m^3$/h.
*Total ventilation capacity house = auxiliary ventilation + manure belt ventilation (exhaust ventilation) + total ventilation capacity of the main ventilation group* (capacity of 1st, 2nd and 3rd fan and step control).

*Main ventilation* — The group which controls the *main ventilation* in the house. Compensations can cause the calculated value to differ from the value setting.

*Temperature setting* — The temperature on which the main ventilation group controls; this setting is relative to the house temperature. The calculated temperature on the basis of which the ventilation group controls is shown behind the temperature setting.

*Bandwidth* — The 'sensitivity' of the fan to temperature changes. The smaller the bandwidth, the greater the fan's response to a temperature change. Large ventilation fluctuations are not good for the internal house climate.

*ANote-CompensP-N-ENxxxxxx → Automatic bandwidth increase*

*Min/max ventilation* — If compensation depending on the fill ratio has been installed, the minimum ventilation and/or maximum ventilation will be adjusted to the number of animals in the house. In addition, the minimum and maximum ventilation can be affected by the RH, $CO_2$, $NH_3$, meteo, night settings and outside temperature.

*Current temperature* — Readout of the current, average house temperature.

*Current ventilation* — If the main ventilation is controlled using a measuring fan, the measured ventilation is displayed behind the calculated ventilation. If no measurement fan has been installed or if it is defective, the calculated ventilation will be equal to the measured ventilation. The current ventilation is calculated using the bandwidth and the minimum and maximum ventilation settings.

*Capacity* — The ventilation capacity of the main group: *Total*, *per animal* or *per kg*.

### Main ventilation with growth curve

Climate settings, which are calculated in accordance with a curve, Climate settings, which are calculated in accordance with a curve, are preceded by the text *Growth curve*.
The behaviour of the animals shows the quality of the climate. To avoid having to continuously adjust the curve settings to the animal's behaviour, you can increase or decrease the calculated curve settings of the first column (+0.0°C/-0.0%).

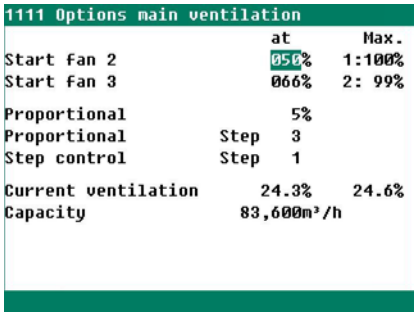
*Growth curve temperature* — To increase or decrease the calculated house temperature.
*Growth curve minimum* — To increase or decrease the calculated minimum ventilation.
*Growth curve maximum* — To increase or decrease the calculated maximum ventilation.

### Displaying curve, changing settings or switching off curve

Place the cursor on *Growth curve temperature, Growth curve minimum* or *Growth curve maximum* and press ✓. Use ✗ to return to the previous screen. If you have switched off the curve, the text *growth curve* will be replaced by the standard text and you can no longer access the relevant curve settings from this window

### Options

If the main ventilation system consists of more than one fan, then at *Start fan 2* and/or *Start fan 3* you enter the percentage at which the fans should switch on. The activation percentage is relative to the total ventilation capacity of the controlled ventilation group.



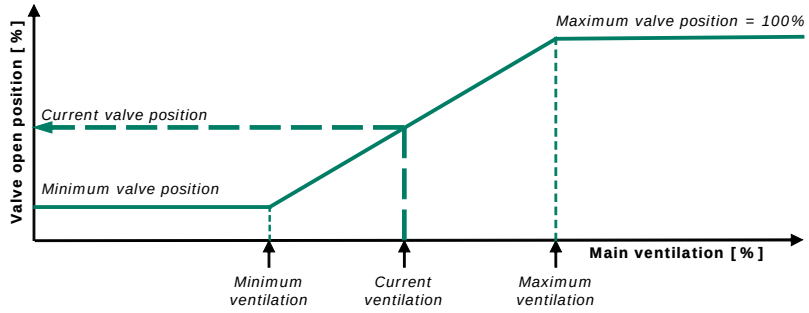

*Proportional Step* — Current step of the controlled ventilation group that is activated.
1. Fan 1 is on;
2. Fans 1 + 2 are on
3. Fans 1+2+3 are on

*Step control Step* — Current step of the step control.

If the capacity of the controlled ventilation group in relation to the total capacity is less than the percentage entered at *Minimum ventilation*, the controlled group is fully on.

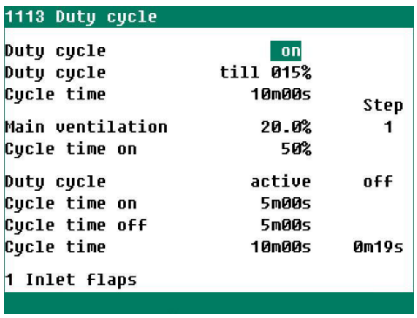
### AQC valve

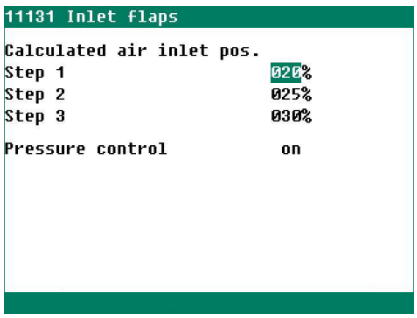
You can only set the control characteristics for an AQC valve without a measuring fan. If a measuring fan is present in the controlled ventilation group, menu item 2 *AQC valve* will not be displayed.



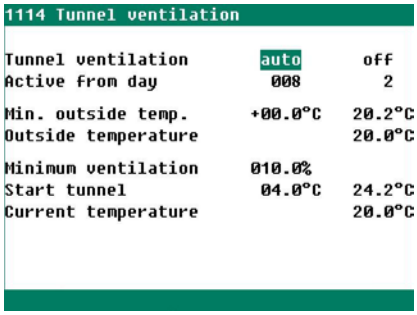

The AQC valve without measuring fan controls on the basis of the calculated main ventilation (main fan output).

### Duty cycle



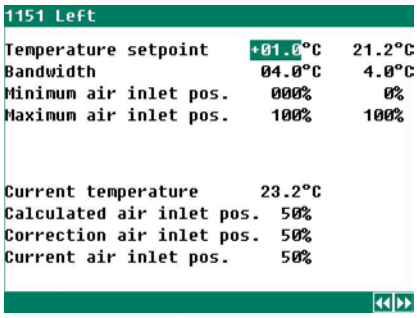



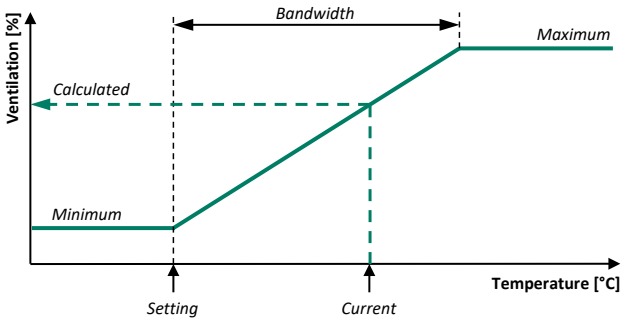
### Tunnel




*ANote-IntVent-N-ENxxxxxx → Interval ventilation* and *Duty-cycle*
*ANote-Tunnel-N-ENxxxxx → Tunnel ventilation*

## 5.4 Air inlets




The air inlets *left, right and tunnel* ventilation groups are identical in terms of settings and are all set accordingly.

An air inlet consists of up to two separate controls (air inlet valves). The temperature setting, bandwidth and minimum and maximum ventilation apply to both controls (1 and 2).

*Temperature setting* — The calculated temperature based on which the air inlet positions are controlled. This setpoint is relative to the house temperature.

*Bandwidth* — The bandwidth determines the 'sensitivity' of the control. A short bandwidth will cause the control to react to a change in temperature very quickly. Result: too many fluctuations of the air inlet positions. This is not good for the climate in the house. That is why we advise a bandwidth of 4 to 7°C, depending on the outside temperature.

*ANote-CompensP-N-ENxxxxxx → Automatic bandwidth increase*

*Min/max air inlet pos.* — Setting the minimum and maximum air inlet positions.

*Current temperature* — The current, average temperature based on which the air inlet positions are controlled.

*Calculated air inlet pos.*

*Control based on temperature*
The actual air inlet position is calculated from the measured temperature, bandwidth, minimum and maximum air inlet positions.

*Control based on ventilation*
The actual air inlet position is calculated from the main ventilation and the minimum and maximum air inlet positions entered.

*Control based on differential pressure*
When the ventilation group control is based on the setpoint entered and pressure control is enabled, the control tries to keep the differential pressure in the house as constant as possible.

*ANote-CompensP-N-ENxxxxxx → Pressure* control.

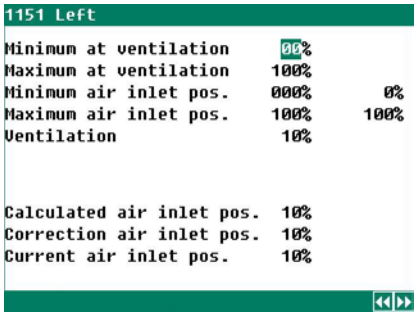
**Pressure control features**

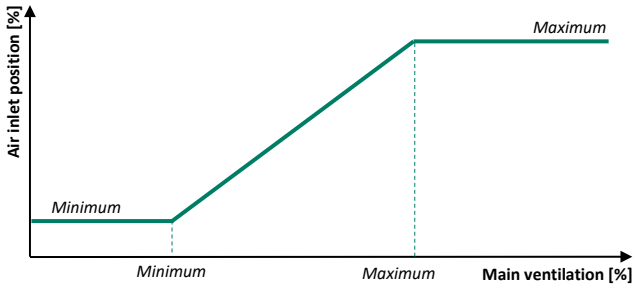
- The pressure setpoint is automatically adjusted to the outside temperature.
- Any temperature differences in the house are taken into account when determining the air inlet positions.
- The pressure control will be instantaneously switched-off if a ventilation alarm occurs at the main ventilation control.
- In the event of a pressure alarm, the pressure control is switched off with a delay (delay time, see screen 1861).

*Correction air inlet pos.* When the output characteristic is active, the calculated air inlet position is corrected according to the valve characteristic (installer setting).

*Current air inlet position* The current position of the air inlet valve.

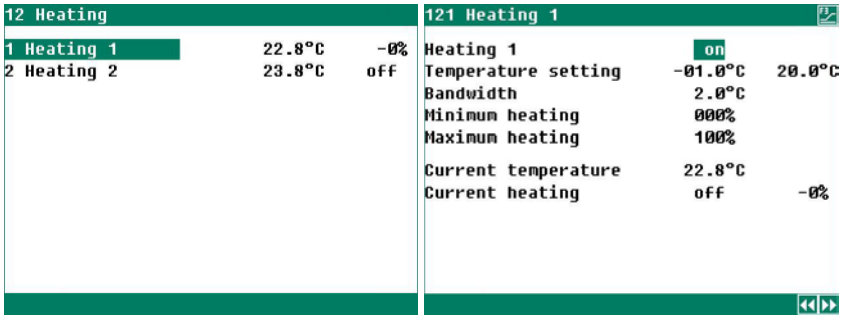
## Air inlet control based on ventilation



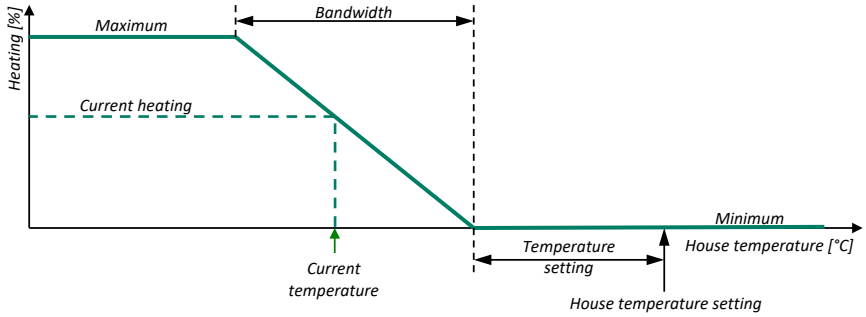

*Min. air inlet position* The air inlet valve never closes beyond the set *Minimum air inlet position* (%).
*Max. air inlet position* The air inlet valve never opens beyond the set *Maximum air inlet position* (%).
*Min. ventilation (%).* Below this minimum percentage, the air inlet valve is in its minimum open position. If the main ventilation rises above the set minimum (%), the valve will open further.
*Max. ventilation (%)* Above this maximum percentage, the air inlet valve is in its maximum open position.

## 5.5 Heating

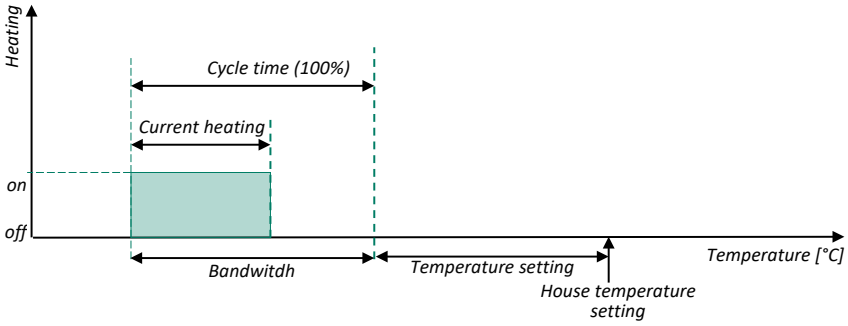



### Proportionally controlled heating

Proportional control




Time-proportional control




| | |
|---|---|
| *Heating* | Switching the heating on or off. |
| *Temperature setting* | Relative setting (value lower than 10.0°C) to the house temperature or absolute house temperature setting (10.0°C or higher). |
| *Growth curve* | If the cursor is on *Growth curve temperature* and you press the confirmation key the curve of the heating will be displayed. You may change the curve settings or switch off the curve. Press the cancel key to return to the previous screen. If you have switched off the curve, the text *growth curve* will be replaced by the standard text. You can then no longer access the curve settings from this screen. |
| *Bandwidth* | The bandwidth determines the 'sensitivity' of the heating to temperature changes. Within the bandwidth, the heating is controlled from minimum to maximum. If the bandwidth is too small, the heating will react very quickly to temperature changes. The switched heater has a fixed switching hysteresis set by the installer. |
| *Min/Max heating* | Limits for the minimum or maximum heating capacity of a controlled heating. |
| *Current temperature* | Displays the average temperature of the assigned temperature sensors. You can assign a maximum of 4 temperature sensors to a heating control. |

*Current heating* — The current heating status and the current, calculated valve position resp. heating capacity. If the actual, calculated position is 0% (or the heating is switched off), the stop voltage will be sent out instead of the minimum voltage setting (provided that *house status* = *in use*). If *minimum heating* is activated, the *minimum voltage* is outputted when the current temperature exceeds the temperature setting. The current position or the current heating capacity is only displayed with controlled heating.

*Limit supply*

*Temperature setting* — The supply water temperature of the floor heating is limited to the water temperature setpoint entered here.

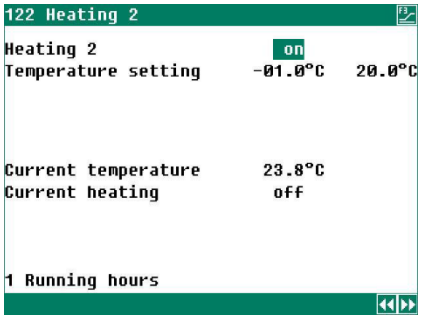
*Current temperature* — The currently measured supply water temperature.

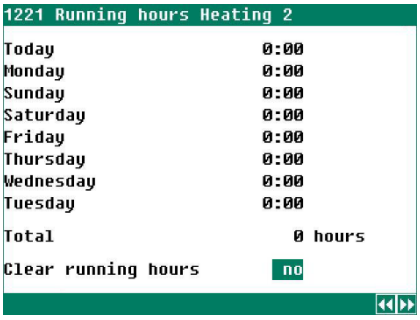
*Return water*

*Temperature setting* — The heating return water temperature is limited to the water temperature setpoint entered here.

*Current temperature* — The currently measured return water temperature

### On/Off-controlled heating

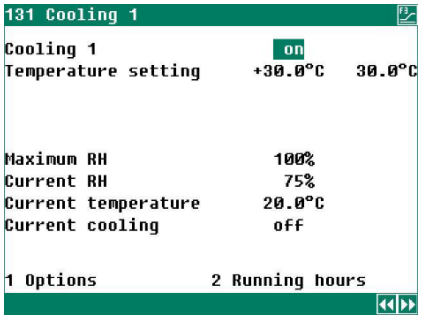


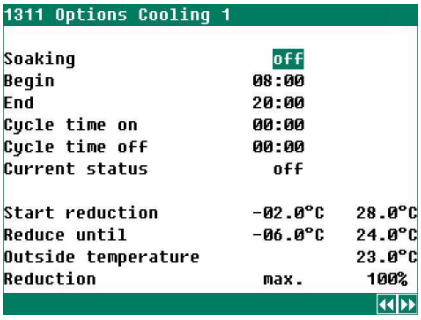




*Running hours* — Readout of the operating hours of an on/off heating:
- today's operating hours
- operating hours of the past seven days
- total number of operating hours

*Clear running hours* — *yes* = delete operating hours.

## 5.6 Cooling




### Options

*Maximum RH* — Cooling increases the humidity in the house. Above this setting, the cooling system will switch off to prevent the relative humidity from rising too high.

*Soaking* The soaking option is only available with cooling 1. If the house is not in use, you can use the *soaking* function. As soon as the house status changes, *Soaking* will be switched *off* to prevent the soaking from starting immediately after having switched the house to *not in use*.

If you have an on/off, you can call-up the operating hours.

You can limit the current cooling level and prevent too much cold air from entering into the house when the outside temperature is low and the current house temperature is higher than the house temperature setting.

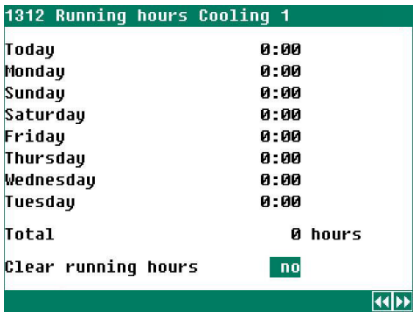
*Start reduction* Enter the temperature at which the reduction should start.

*Reduce until* Enter the temperature until which the reduction should take place.

*Outside temperature* Readout of the current outside temperature.

*Reduction max.* Setting of the maximum (relative) reduction.

### Running hours

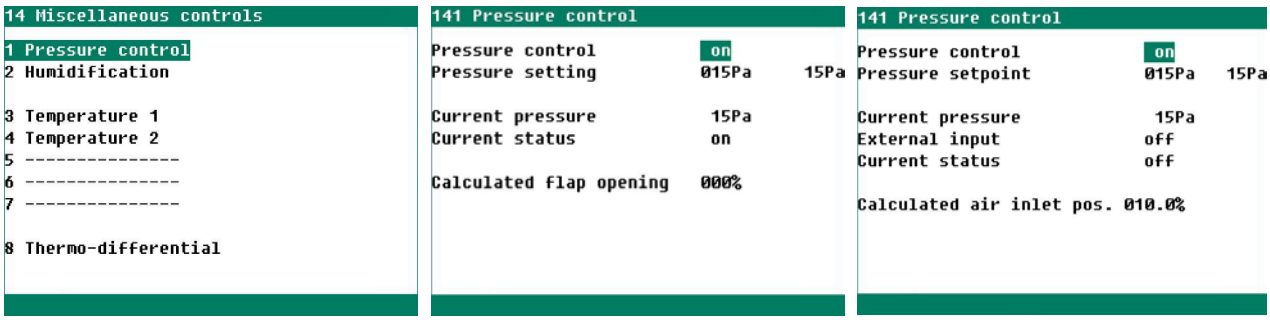



*Running hours* Reading out the operating hours of an on/off (non-modulating) cooling system:

- Today's operating hours
- operating hours for the last seven days
- the total number of operating hours

*Clear running hours* Set to *yes* to erase the operating hours.

## 5.7 Pressure control



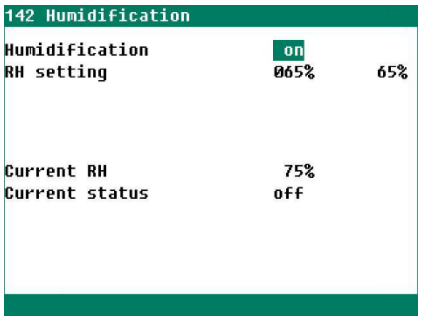

The air inlet control is based on a preset negative pressure. Only then an optimal flow pattern of the incoming air is guaranteed.

The required air inlet position is calculated based on the set and measured pressure. The pressure-controlled air inlets are adjusted every 2 minutes. Change the calculated air inlet opening to control the air inlets to the desired position faster.

### External input

Items such as the status of the pop-holes that provide access to an open-air run can be connected to the external input. The openings of these pop-holes enable a lot of cold air to enter the house which causes a significant drop in the house temperature, specifically at the bottom of the house. If the pressure control was not switched off, the air speed and the temperature difference in the house would increase enormously. As this may easily cause a draught which would affect the animals the pressure control is switched off as soon as the hatches are open. The inlet flaps, which were being controlled on the basis of pressure, are now temperature-controlled.

## 5.8 Humidification control

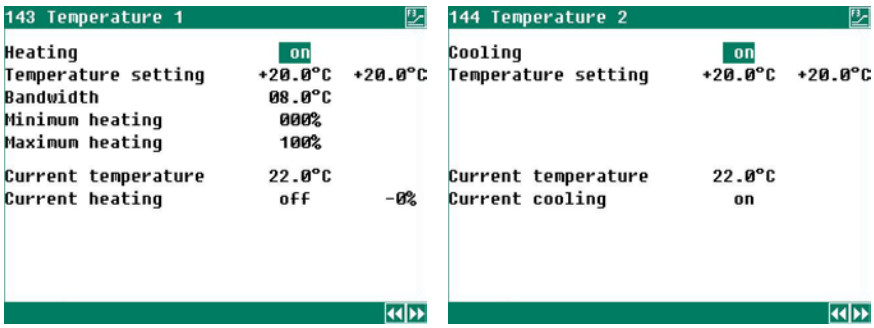



If *Cooling 1* and *Humidification* are connected to the same output, the output will be energized as soon as one of both controls is active.

*Humidification* Switch the humidification control on and off.

*RH setting* Relative humidity percentage setting below which the humidification control has to be active.

## 5.9 Temperature control




You can set the temperature control as heating or cooling. Depending on the type of output, it is either regulated or switched heating/cooling.

### Temperature control as heating

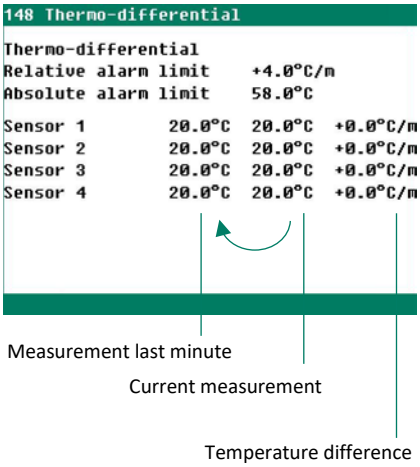
If you have set the temperature control as heating, the temperature control is set in the same way as a heating, see page 14. The minimum and maximum heating can be set separately.

### Temperature control as cooling

If temperature control has been set as cooling, the temperature control is set identically to the cooling on page 15.

*Temperature setting* See *Relative or absolute temperature setting* , page 9.

## 5.10 Thermo-differential



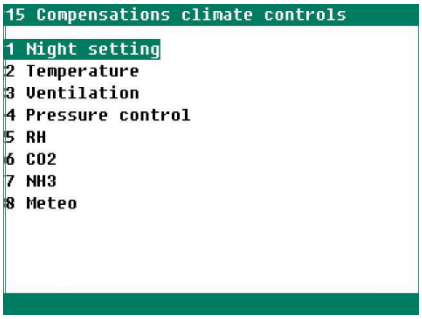

The thermo-differential function is activated by your installer (max. 4 sensors). The current measurement of each sensor is compared with the measurement of one minute ago. If the measurement is within the limits, the previous measurement is made equal to the current measurement and a new measurement is started.

An alarm is given if:

- The temperature increase in that minute is greater or equal than the relative limits.
- The temperature of the sensor increase above the absolute limit.

The thermo-differential alarm occurs only in case of a *positive difference.*

## 5.11 Compensations



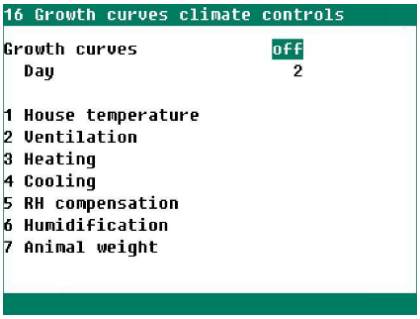

Compensations increase/decrease the setting depending on:

- with or without night settings
- the current outside temperature
- the current RH
- the current $CO_2$ level
- the current $NH_3$ level
- wind speed and wind direction

For RH, $CO_2$ and $NH_3$ correction, the largest value of both corrections is decisive for the eventual adjustment of the ventilation/air inlet position.

*ANote-CompensP-N-ENxxxxx*

## 5.12 Growth curves



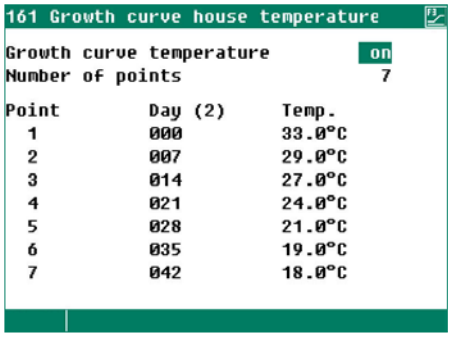

Several growth curves are available for gradual automatic adjustment of the climate in the house. A growth curve can consist of a maximum of 7 breakpoints.

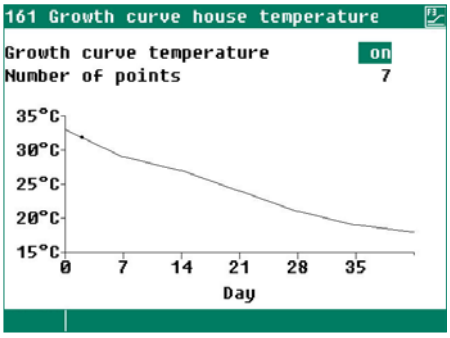
The current setting is determined on the basis of the growth curve, depending on the current day number. The  uses this calculated setting to control the climate in the house.

The *Growth curves* setting must be *on*.

*Growth curves on/off* You can use this setting to switch <u>all</u> curves on or off simultaneously.

- Relative or absolute temperature setting, see page 9.
- The day numbers in the curve have to be consecutive numbers.
- If the day number of the first breakpoint is greater than 1, the setting for the first breakpoint will be maintained until the preset day number.
- If the temperature compensation is active, the calculated house temperature will immediately be adjusted to the curve setting.
- The settings obtained from a growth curve are recalculated every hour to achieve a more gradual development of the setting.
- Function key F3 = to graphical presentation of the curve and to return to the numerical screen.



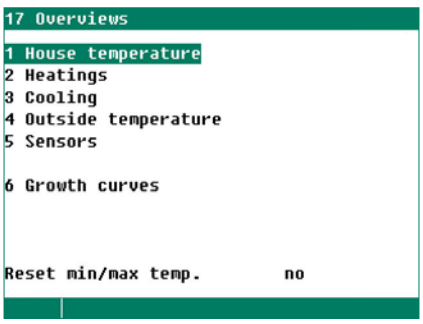




| | |
|---|---|
| *Day (2)* | The current day number is shown in brackets. |
| *House temperature* | When the growth curves of the stall temperature are changed, all controls change relative to this temperature. |
| *Ventilation* | The temperature setting of the ventilation groups is relative to the house temperature. |
| *Heating/Cooling …* | Temperature setting below 10.0° → Temperature is relative to house temperature. Temperature setting higher than or equal to 10.0°C →Temperature is an absolute value. |
| *RH Compensation* | Setting growth curve RH compensation. |
| *Humidification* | Setting growth curve humidity control. |
| *Animal weight* | Setting growth curve animal weight. |

### Animal weight growth curve

The animal weight growth curve appears, when the *Capacity per kg* is displayed. It cannot be switched on or off.

## 5.13 Overviews



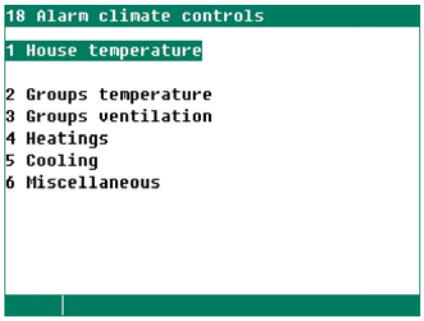

An overview of the selected temperature control.
Animal weights equal to or greater than 10,000 grams are displayed in kilograms: 10,000 grams = 10.0 kg.

Use the double-arrow buttons to select the next/previous control.

You can clear the operating hours of all heaters via:
*Heater overview* (screen 172) →*Clear running hours*.

The min/max readings in temperature overviews can be deleted via:
*Overview temperature* (screen 171) →*Reset min/max temp*. *Today* will then be filled with the current value.

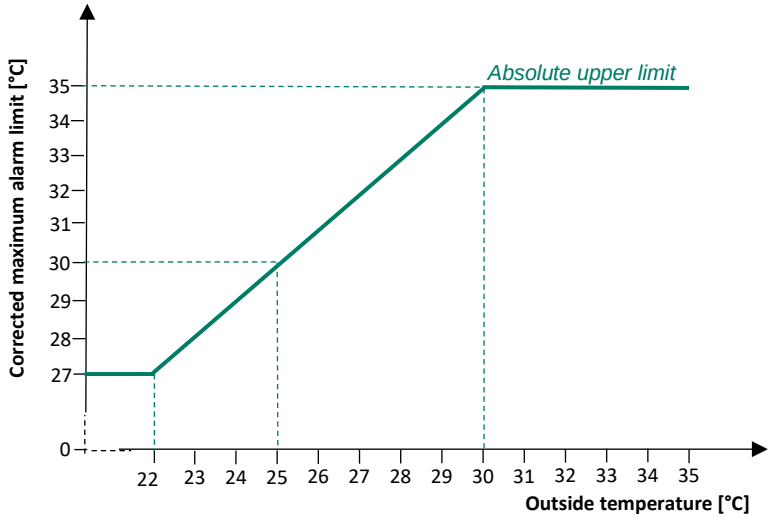
## 5.14 Alarm




### House temperature limits

These temperature limits apply to all ventilation groups.

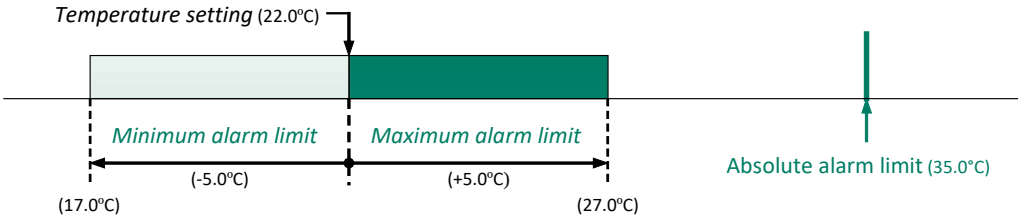
### Outside temperature compensation for alarms



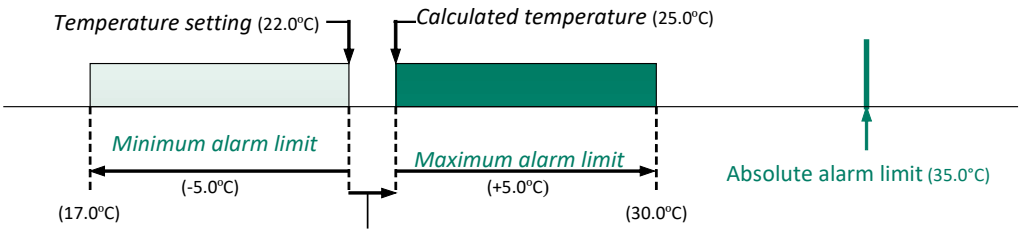

If the outside temperature rises to above the temperature setpoint, the maximum temperature alarm limit will be corrected upwards until the absolute alarm limit is reached. This compensation prevents the alarm from being activated unnecessarily when outside temperatures are high.
An alarm is generated if the current temperature rises to above the absolute value. You must then take measures to lower the temperature in the house.

| Example | $T_{OUTSIDE} < T_{HOUSE}$ | $T_{OUTSIDE} \geq T_{HOUSE}$ | $(T_{OUTSIDE} + T_{ALARM}) > T_{ABS}$ |
|---|---|---|---|
| *Absolute temperature limit setting* | 35,0°C | 35,0°C | **35,0°C** |
| *Temperature setting* | **22,0°C** | 22,0°C | 22,0°C |
| *Maximum alarm limit setting* | **5,0°C** | **5,0°C** | 5,0°C |
| *Current outside temperature* | 18,0°C | **25,0°C** | 31,0°C |
| *Calculated maximum alarm limit* | 22,0+5,0 = **27,0°C** | 25,0+5,0=30**,0°C** | **35,0°C** |
| | **1** | **2** | **3** |

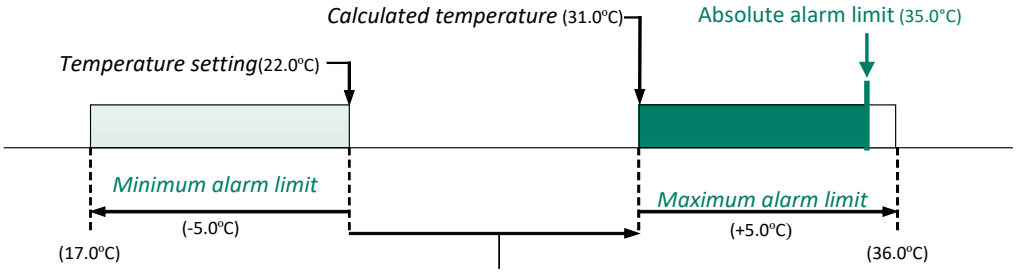
1. Outside temperature is lower than the house temperature setting → The calculated alarm limit will be increased to the maximum alarm limit setting in keeping with the house temperature.



2. Outside temperature is higher than the house temperature setting → The calculated alarm limit will be made equal to the outside temperature and the calculated alarm limit is shifted.




3. Maximum alarm limit exceeds the absolute alarm limit → The maximum alarm limit will be made equal to the absolute alarm limit.




### Temperature groups

Switch the alarm on/off. The alarm limits shown are the calculated alarm limits and depend on such factors as the preset house temperature limits and the preset temperature of the control itself.

### Ventilation groups

If the measuring fan is switched off it no longer influences the control and alarm functions of the main ventilation group. You can only switch the ventilation alarm on/off for air inlet valves connected to a DMS.

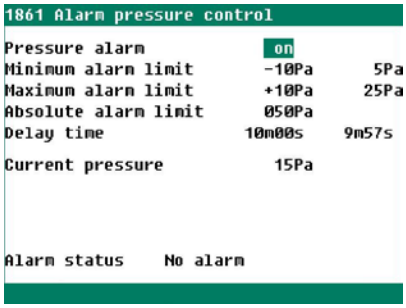
### Heating / cooling / miscellaneous

The alarm limits can be set separately for every individual control.

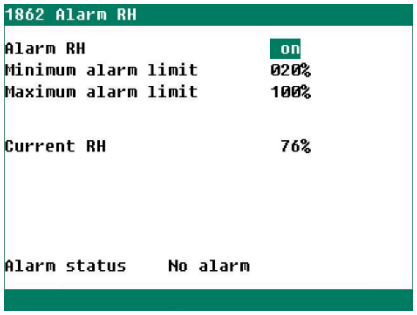
## 5.15 Alarm other controls

```
186 Alarm miscellaneous controls

1 Pressure control          on
2 RH                        on
3 CO2                       on
4 NH3                       on
5 Meteo                     on

6 Temperature control
7 ---------------

8 Outside temperature       on
9 Thermo-differential       on
```

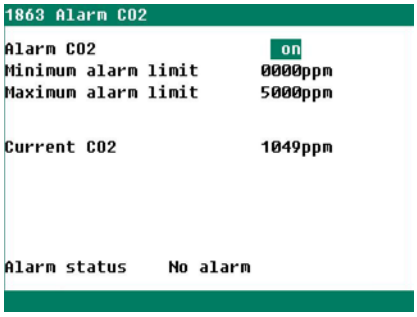
## Pressure control



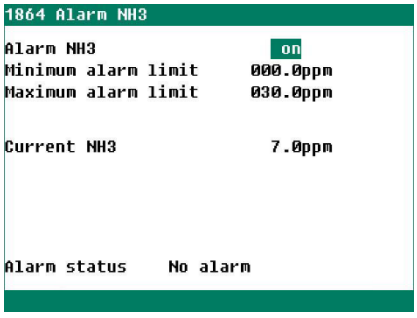

## RH



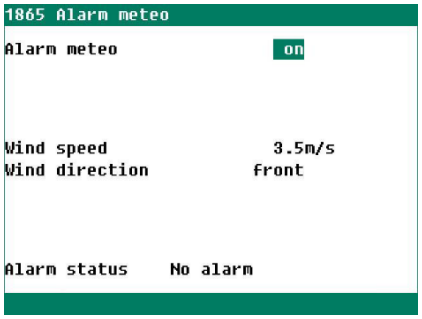

## $CO_2$




## $NH_3$

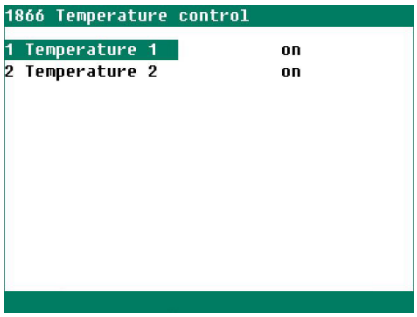


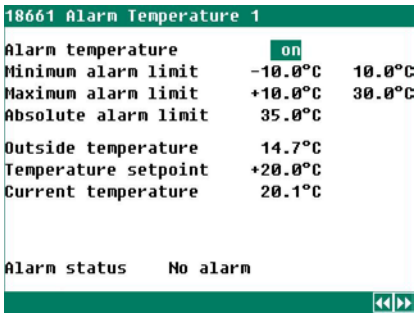
### Meteo




This menu item does not appear when meteorological data is received over the communication loop.

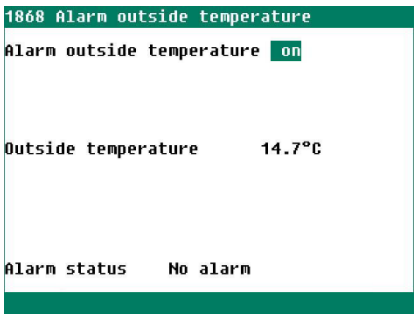
### Temperature control



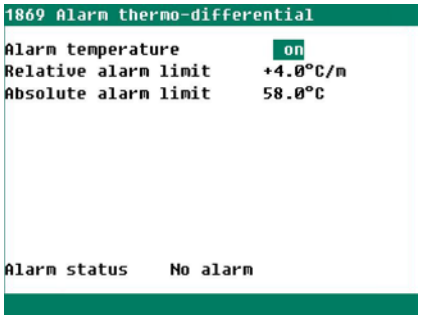




Heating and cooling are configured identically.

### Outside temperature



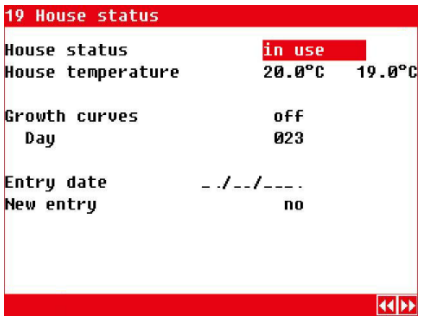

## 5.16 Thermo-differential alarm



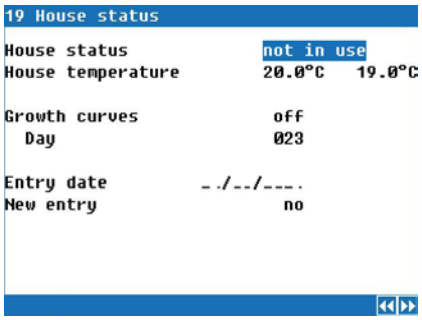

You can deactivate the thermo-differential alarm by setting *Alarm Temperature* to *off*. The current temperature reading will then be deleted and the alarm will automatically be reactivated. See also temperature monitoring page 18.

# 6 House status

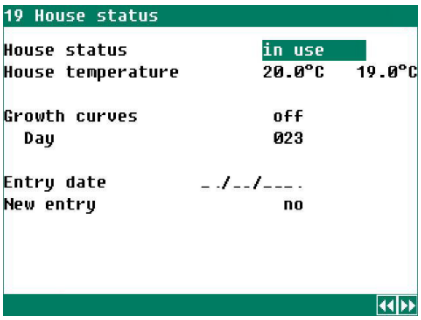
## 6.1 Putting the house in and out of operation




*Alarm*




*Out of operation*




*In operation*

F2 = displaying house status

The colour of the title bar, status bar and cursor change depending on the stall status and alarm status:
RED = alarm (alarm relay active or main alarm disabled)
BLUE = House status is not in use (no alarm)
GREEN = House status is in use (no alarm)

*House status: in use* The poultry computer controls as set.
*House status: not in use* All controls, alarms and temperature monitoring functions are switched off. Air inlets are closed and timers are switched off.

*Growth curves* Switching the growth curves on and off.
*Day* Here you can change the day number of the curves.

*Entry date* The date on which the animals were brought into the house.
*New entry* After the animals have been set-up, set this setting to *Yes.* The *Entry date* is then set to 'today' and the mortality table is erased. *Set-up* (screen 644) shows the number of animal's set-up in the house.

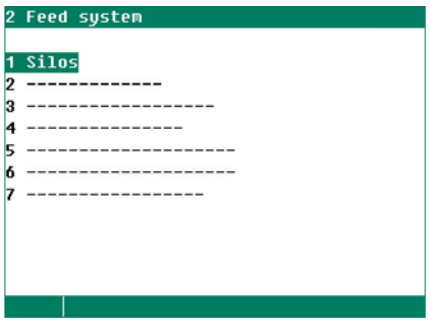
! The day number is not adjusted automatically.

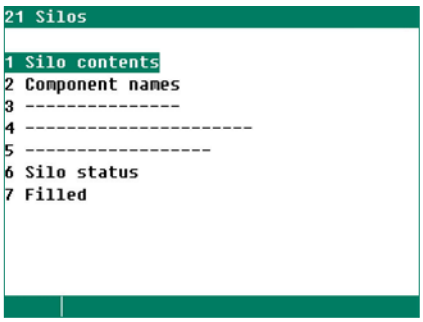
You can have a separate access code programmed for the status screen.

# 7 Feeding system (feed counter installed)

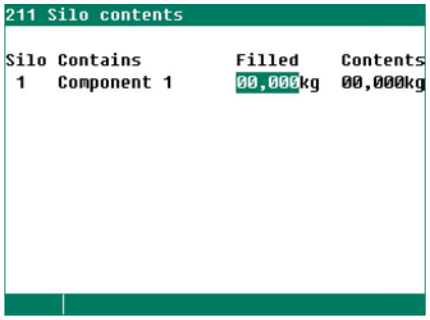
If multiple feed counters are installed, all feed counters relate to silo 1.

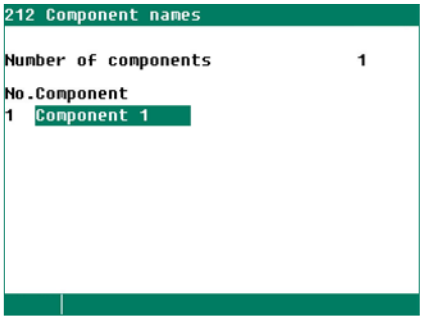
## 7.1 Silos




### Silo content

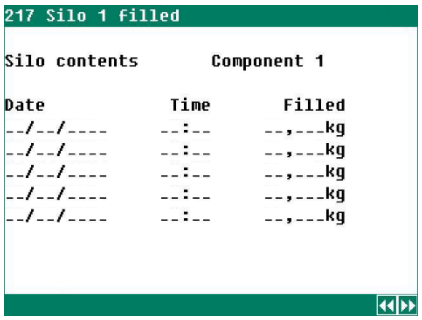



| | | |
|---|---|---|
| *Silo* | *Contains* | The name of the component in the silo selected. |
| | *Filled* | Setting of the amount filled. |
| | *Contents* | Readout of the current silo contents: stock or shortage. |

After filling up the silo, the filled amount is added to *contents* and *Filled* is automatically set to 0.00.000kg.

### Filled up



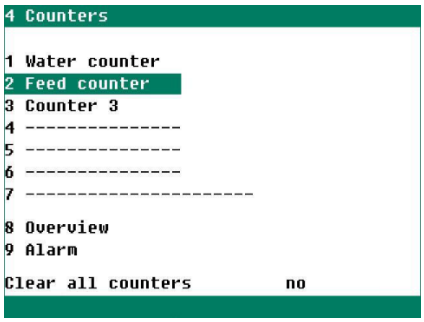

An overview per silo of the last five dates with times when the silo was filled up with feed. It is important that you enter these details immediately after filling.

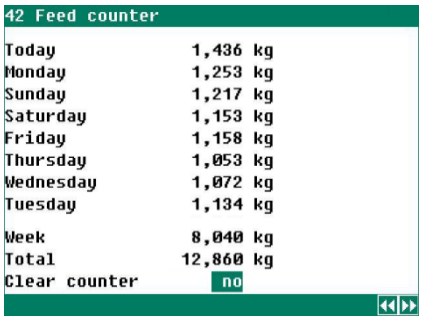
Application note Feed systems: *ANOTE-FeedSysP-N-ENxxxxx*

# 8 Counters

## 8.1 Clearing counter(s)

You can request an overview of the counter readings.
For the water and feed counters you can set a dosage alarm.



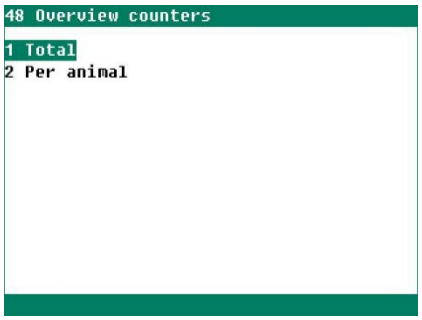



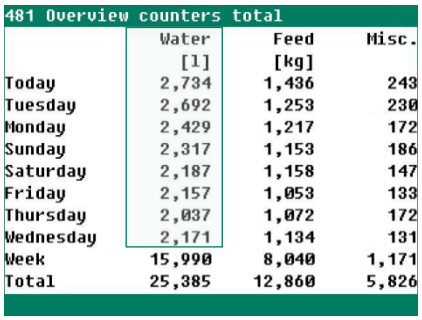

*Clear all counters* *yes* = clearing the position values of all counters.

*Clear counter* *yes* = only clear the counter readings of the counter selected.

When the counter is cleared, the data for today is also deleted. In addition, the overviews of the amounts fed and the feeding times of the counters concerned are deleted.

## 8.2 Counters overview




If several water, feed and/or other counters have been installed, the counter readings of all identical counters (water, feed and/or other) are added together and shown in the corresponding column. For example, if two water counters have been installed, today's totals for water counter 1 and water counter 2 will be displayed after *Today* in the *Water* column, etc..

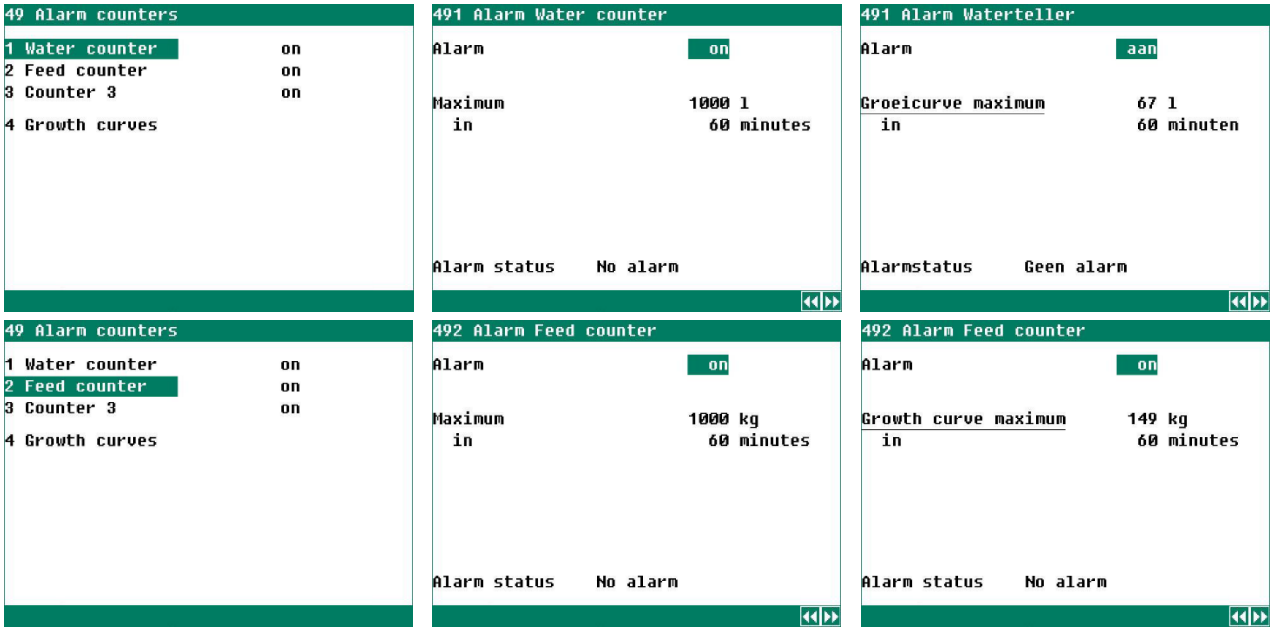
| Day | Water counter 1 | Water counter 2 | Water [l] |
|---|---|---|---|
| today | 1.323 | 1.411 | 2.734 |
| Saturday | 1.245 | 1.447 | 2.692 |
| Friday | 1.311 | 1.118 | 2.429 |
| Thursday | 1.047 | 1.270 | 2.317 |
| Wednesday | 1.098 | 1.089 | 2.187 |
| Tuesday | 1.002 | 1.155 | 2.157 |
| Monday | 1.049 | 988 | 2.037 |
| Sunday | 1.053 | 1.118 | 2.171 |

*Week total* The weekly total is the sum of the counter readings of the past week for every type of counter (from the first day of the week to 7 days later). This means that the weekly total is not the sum of the readings shown on the screen.

### Per animal

The counter readings shown are per animal. This screen also shows the *water/feed ratio*.

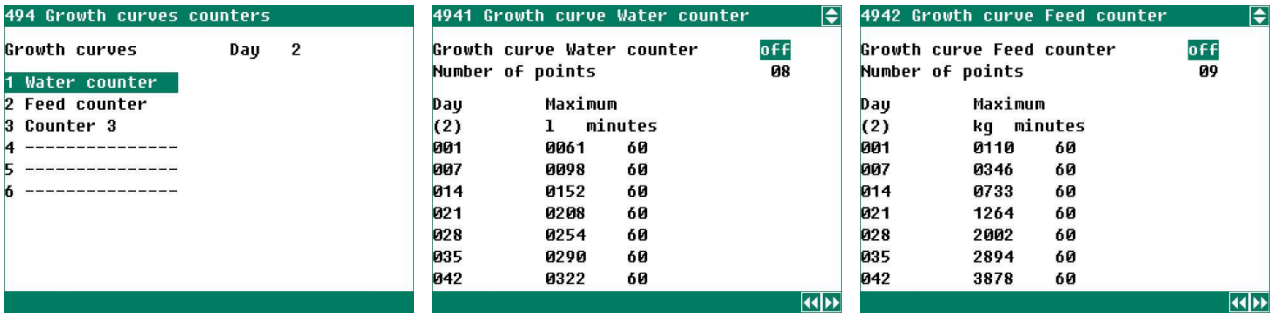
## 8.3 Alarm




In this screen, you set the maximum amount of water/feed/other allowed to flow through the pipe/tube during the set period. If this amount is exceeded, an alarm is triggered. This allows early detection of possible pipe breaks or leaks.

If the counter is linked to a dosing timer, the output of the dosing timer is also switched off.

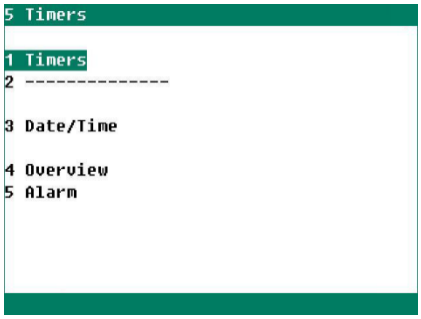
### Growth curve counter alarm limits

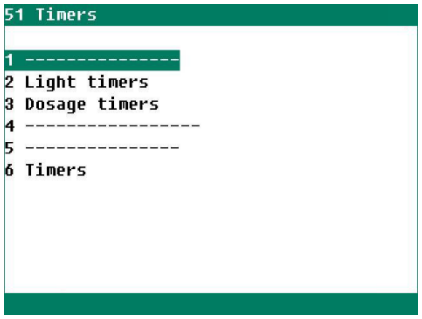



You can record the maximum counter readings with the corresponding period times in a growth curve, see screens 491 through 493.

# 9 Timers

A maximum of 24 periods can be set on a timer. All times have to be consecutive times. The difference between two times must be at least 1 minute.

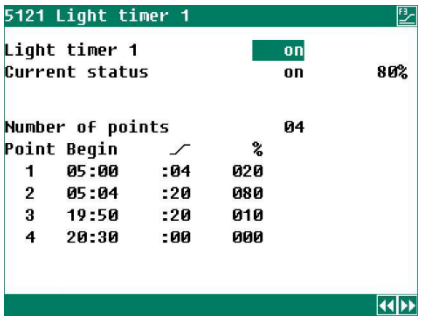


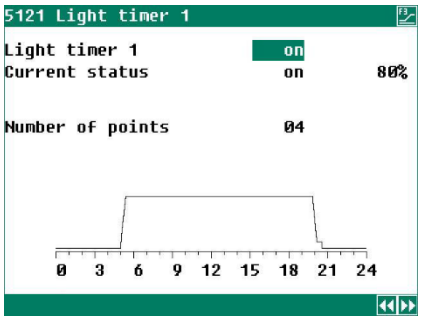




## 9.1 Light timers

Light timers enable a light regulation to be used, so that the lights are gradually switched on/off. A light regulation enables you to create ideal day and night conditions (dawn program).

### Light control




*Time 05:00* The lights are switched on and their intensity is driven to 20% in a time of 4 minutes.
*Time 05:04* The intensity is driven to 80% in a time of 20 minutes.
*Time 19:50* The lights are dimmed to 10% in a time of 20 minute. 20:10 The light delay then starts.
*Time 20:30* The lights switch off

## 9.2 Dosing timers

The timer output of a dosing timer is linked to a counter input to enable the water and/or feed intake to be monitored. If significant variations occur, the control can generate a *Dosing alarm* and stop the dosing of water or feed. If the installer has set the *Dosage curve* setting to *no,* the dosage timer will act as a 'normal' timer.

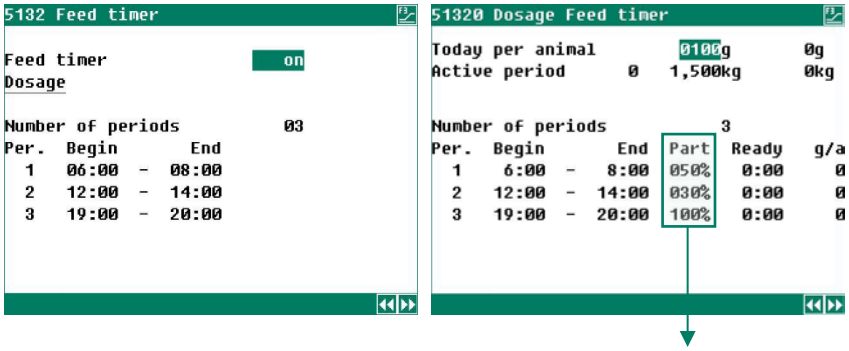
*Water timer* The water clock can be used to switch elements such as the water valves on or off. In addition, there is the possibility of feeding back information on the actually administered water amount to a counter input of the poultry computer (see *Water dosage*).

*Water dosage* For water dosing, the water amount actually dosed is compared to the amount setting. Dosing stops when the pre-set amount is reached, even if the stop time has not been reached yet. A water dosing alarm is generated if the stop time is reached and the amount has not been reached yet.

*Feed timer* The feed clock can be used to switch elements such as the discharge augers on or off. In addition, there is the possibility of feeding back information on the actually administered amount of feed to a counter input of the poultry computer (see *Feed dosage*).

*Feed dosage* For feed dosing, the amount actually fed is compared to the amount setting. Feeding stops when the pre-set amount is reached, even if the stop time has not been reached yet. A feed dosing alarm is generated if the stop time is reached and the amount has not been reached yet.

## Dosage schedule




If *Auto. partition period* has been *switched off* by your installer, you can manually divide the total daily amount of the feed etc. over the pre-set number of periods.

Water and feed dosing make use of the number of animals present in the house. The number of animals is determined at the start of the first actual dosing period, in order to calculate the total amount to be dosed. If the number of animals changes in the meantime (due to animals dying, being removed or added) this no longer affects the calculation.

*Today per animal* If the dosage curve is active, the current amount per animal is calculated from the dosage curve, using the day number. If the curve is not active, you can set the current amount of feed per animal at *Today per animal*. The last column shows the amount already dosed per animal today.

*Active period* This line shows the active dosing period, followed by the total amount to be dosed and the amount already dosed in the active period.

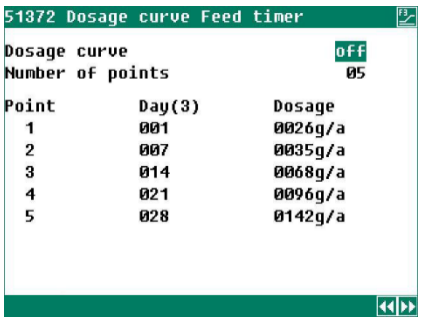
## Partition period

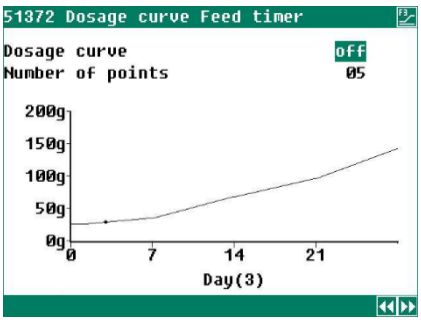
- The quantity to be dosed is (re)calculated between two periods.
- With *Auto. partition period* - The total daily volume is divided over the number of set periods.
- Without *Auto. partition period* - the percentages set in column *Part* are dosed. If the total dosage is smaller than the minimum dosage, a *Dosage alarm* is triggered.
- The dosed amount per period is listed under the last column (*ml/d* or *g/d*). If the amount to be dosed is reached within the period, the time when the cycle has ended is shown under *Ready* .
- If something has gone wrong in previous cycles, this will be corrected in the last cycle. If possible, this will be corrected until the total amount has been dosed.

## Dosage curves

If no growth curves have been installed for the climate control, you can set the day number of the dosing curve here.

If the installer has activated the dosing curves, you can use *programmable curves* to have the amount of water and/or feed per animal increase automatically as the animals grow older. The total amount is calculated again every day using the curve settings, the current day number and the current number of animals in the house.

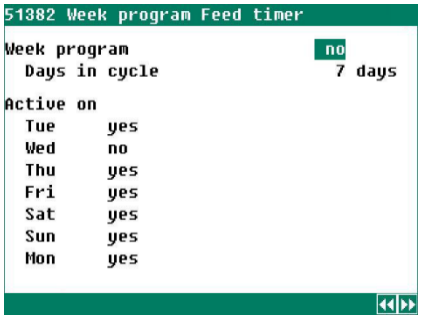


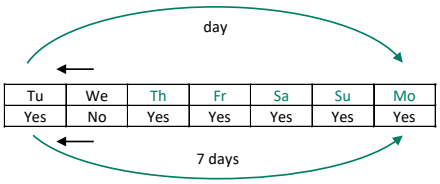




In the dosage curve the amount per animal per day can be set.

A curve can consist of a maximum of 15 breakpoints, the day number must be between 1 and 999. The current day number is increased automatically at midnight.

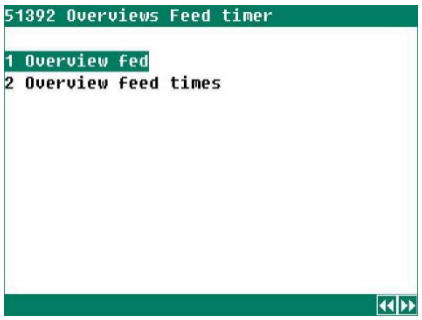
## Week program

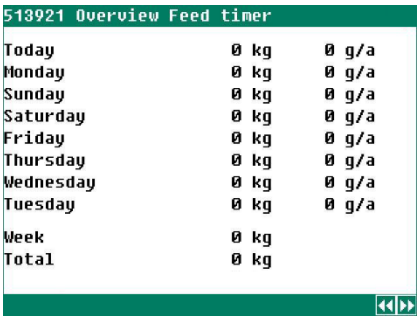


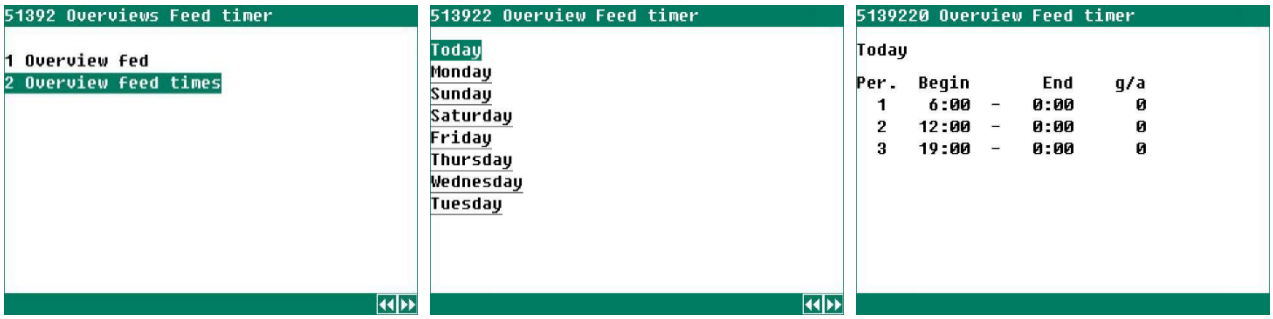




Based on the *Week program* the feed chain is, for example, active for 6 days and inactive for 1 day. This means that one day is not fed.

## Overviews



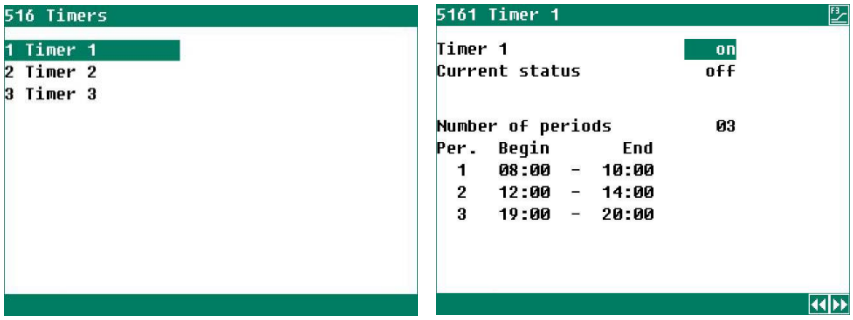






Overview of the quantity fed, showing not only the total quantity, but also the quantity per animal, provided that animal data is available. If there is a dosage clock, you can call up the quantity fed per animal for each feeding period. You can clear the overviews by clearing the counter readings, see page 26.

The poultry climate and management computer can store data from the past 7 days.

## 9.3 Timers




These are on/off timers.

Number of breakpoints = 0 → timer off
Number of breakpoints = 1 and *Begin* and *End* = 00:00 → timer switched on for 24 hours

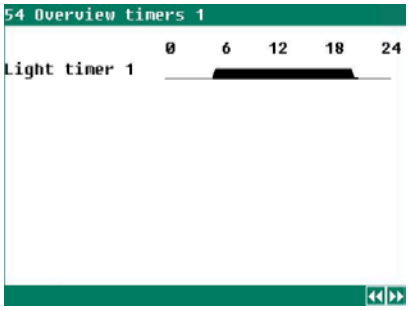
## 9.4 Date and time

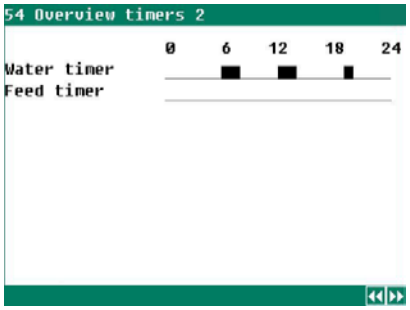
You can set the *First day of the week*. This setting is used to determine the weekly totals. For example, if you set the *First day of the week* to *Sun* (*Sunday*), the weekly totals will be calculated on Sunday. A week total is the sum of Sunday, Saturday ... and Monday.

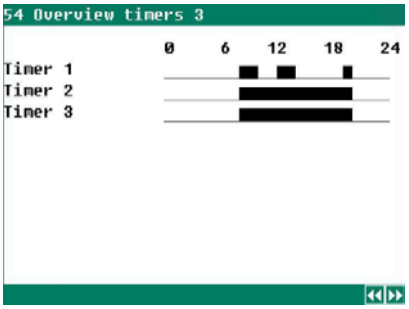
If the poultry computer is linked to a feed computer, you cannot change the settings *First day of the week* and *Begin new day* on the poultry computer. These settings are taken from the feed computer.

**!** Be careful when changing the *Begin new day* setting. If this time is within a dosing period, the error message *Beginning day in period* is generated.

## 9.5 Overview



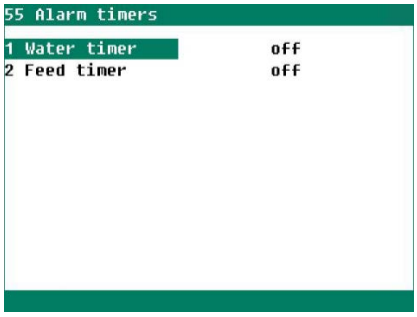



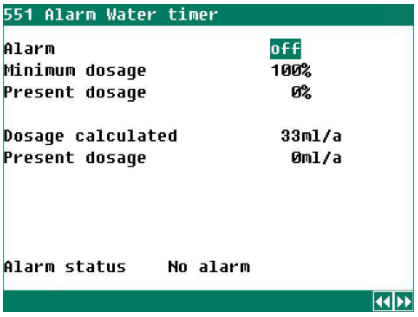



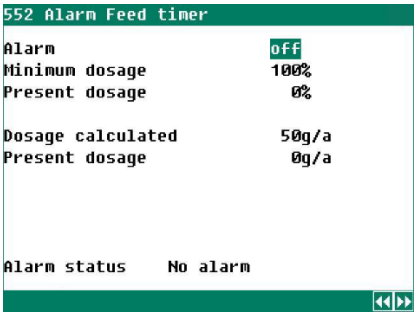

A graphical overview of the timers appears on the screen. The on/off times are only displayed for activated timers.

## 9.6 Alarm

### Timers

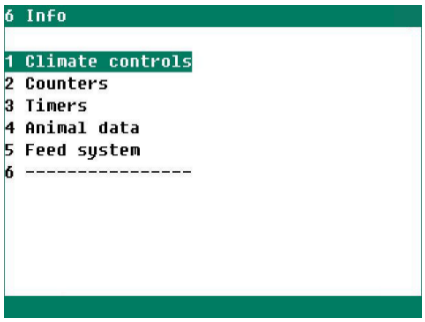


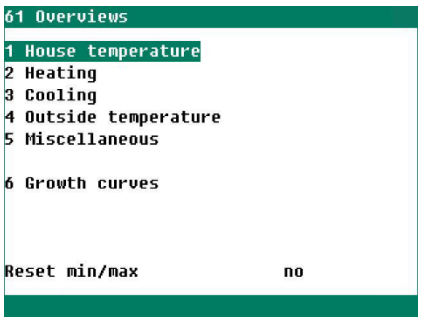




With a water/feed timer, you can set the minimum amount to be dosed. This is a percentage of the total amount to be dosed. If this percentage is not reached, a dose alarm is generated.

# 10 Info

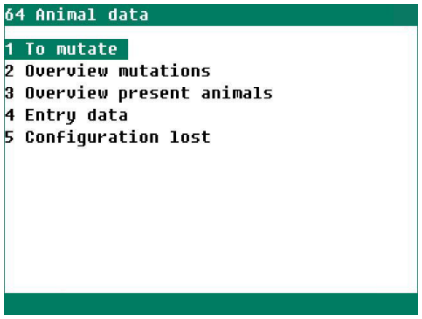


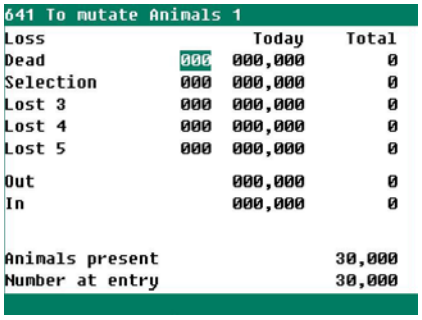

The setting *Reset min/max temp.* clears all min/max measurements in all temperature overviews. The current value then appears at *Today*.

The screens for *Temperature, Counters, On/off timers, Animal Data* and *Feeding System* are identical to those of the menu selections: 17 *Temperature overviews*, 48 *Overview counters*, 54 *Overview timers*, see pages 19, 26 and 32.

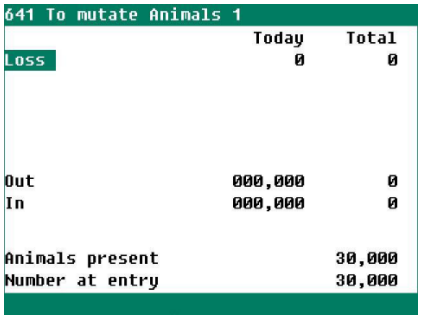
## 10.1 Animal data



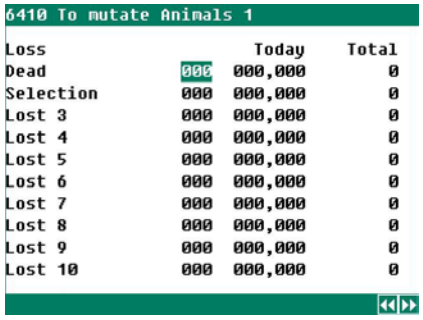

### Mutations




*Number of dropout categories ≤ 5*




*Number of dropout categories > 5*

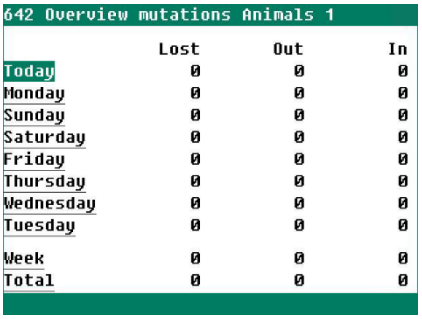



If there are several animal groups, the data below can be entered per animal group.
Use the buttons ◀◀ ▶▶ to select the previous/next animal group.

| | |
|---|---|
| *Loss* | You can set up to five loss categories. |
| *Dead* | Enter the number of animals which have lost at this moment (per group of animals). *Dead: Today* (today's mortality) is increased automatically by the value entered, after which the entry is erased. |
| *Dead: Today* | Today's total mortality. If you have entered an incorrect value you can correct this by changing the value below *Today*. |
| *Dead: Total* | The total mortality calculated using the mortality of the previous days and today's mortality. |

| | |
|---|---|
| *Lost 3,4,5* | See description under *Dead*. |
| *In/Out: Today* | Entry of the number of animals added/removed today. |
| *In/Out: Total* | The total number of animals added/removed. |
| *Animals present* | Sum of: *Number at entry – Lost: Total – Out: Total + In: Total*. |
| *Number at entry* | The number of animals set-up in the house. |

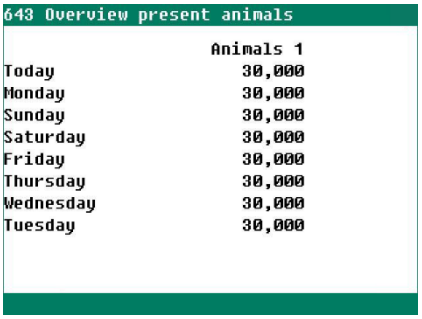
## Overview of mutations


642 Overview mutations Animals 1

| | Lost | Out | In |
|---|---|---|---|
| Today | 0 | 0 | 0 |
| Monday | 0 | 0 | 0 |
| Sunday | 0 | 0 | 0 |
| Saturday | 0 | 0 | 0 |
| Friday | 0 | 0 | 0 |
| Thursday | 0 | 0 | 0 |
| Wednesday | 0 | 0 | 0 |
| Tuesday | 0 | 0 | 0 |
| Week | 0 | 0 | 0 |
| Total | 0 | 0 | 0 |

The mortality (animals lost), the number of animals delivered (*Out*) and the number of animals entered (*In*) per day are displayed.

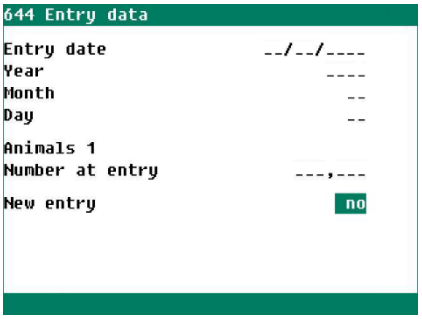
## Overview of animals present


643 Overview present animals

| | Animals 1 |
|---|---|
| Today | 30,000 |
| Monday | 30,000 |
| Sunday | 30,000 |
| Saturday | 30,000 |
| Friday | 30,000 |
| Thursday | 30,000 |
| Wednesday | 30,000 |
| Tuesday | 30,000 |

The current number of animals in the house per day per animal group.

## Set-up data

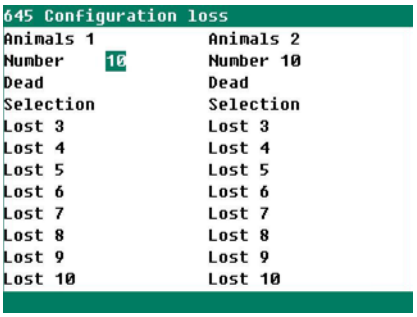

644 Entry data

| | |
|---|---|
| Entry date | --/--/---- |
| Year | ---- |
| Month | -- |
| Day | -- |
| Animals 1 | |
| Number at entry | ---,--- |
| New entry | no |

This data is entered at the beginning of each new round. The PL-9300 poultry computer uses this data to calculate the current number of birds, feed dosage etc.

| | |
|---|---|
| *Entry date* | The poultry computer uses the set-up date to calculate the animal age. Beside that the *Entry date* is used to fill in the mutation table. The  can store the data of the past seven days. |
| *Year, month, day* | Here you can enter/modify the set-up date. |
| *Number at entry* | The number of animals (per animal group) set-up in the house. |
| *New entry* | If you set this to *yes*, the:<br>▪ mortality table is erased;<br>▪ set-up date is filled in;<br>▪ fill ratio is recalculated (if it depends on the entry data);<br>▪ feed dosage is started (if a feeding cycle is active). |

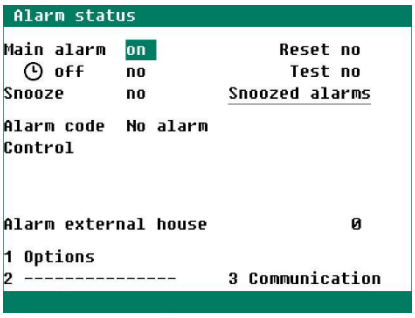
## Configuration of the mortality categories




In this screen you set the number of 'mortality' categories (maximum 10) per animal group. These mortality categories appear in the mutation screen. For each category you enter the number of animals lost.

# 11 Alarm

## 11.1 Alarm status

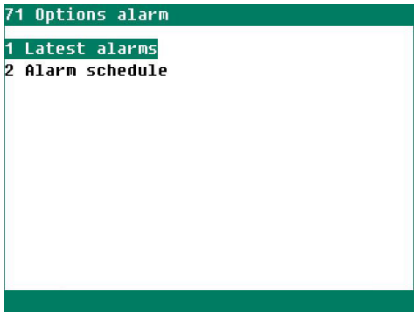


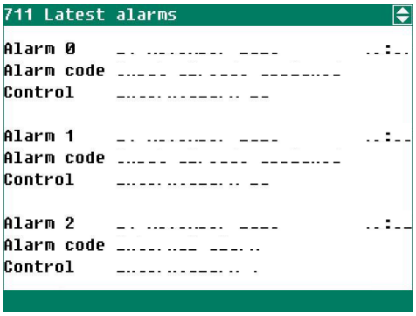

*Main alarm* Here you can switch the main alarm off. The alarm cause and control (and possibly the terminal number or address) appear on the screen.

Do not forget to turn the alarm back *on* after it has been turned off for troubleshooting. Preferably use the *off* option (the temporary-alarm-off function) to solve a malfunction.

Installation errors such as *Output already assigned, Wrong output type, Input already assigned* must be eliminated before putting the system into operation.

## 11.2 Latest alarms

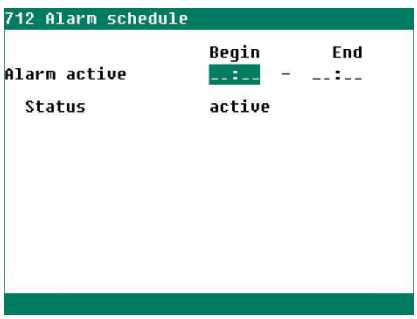



*Alarm 0* The cause of the *last alarm* with the time until when the alarm is/was active.

*Alarm code* The poultry computer stores the last five causes that caused the alarm relay to de-energize. Next to the alarm cause are displayed the corresponding date and time. Press ▼ to display previous alarm data.

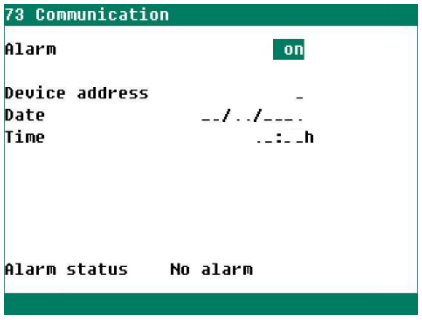
## 11.3 Alarm schedule




*Alarm active* With *Begin* and *End* you enter the period, during which the time-dependant alarms should be active.

*Status* Only when the *Status* is active, time-dependant alarms will be transmitted to the poultry computer. Alarms that occur during the off-status will no longer be transmitted.

## 11.4 Communication




Here you can activate and deactivate the communication alarm. This screen will only appear for a main station. *Device address* shows the address from which the main station did not receive data.
When communication alarms occur, the current *Date* and *Time* appear.

Do not forget to turn the alarm back *on* after it has been turned off for troubleshooting. Preferably use the *off* option (the temporary-alarm-off function) to solve a malfunction.

Installation errors such as *Output already assigned, Wrong output type, Input already assigned* must be eliminated before putting the system into operation.

## 11.5 Alarm codes

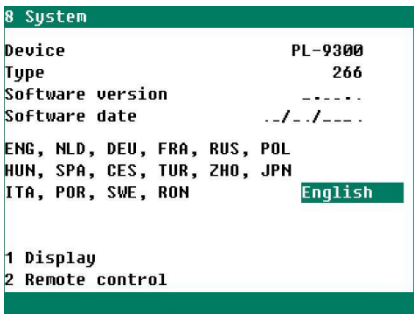
| Alarm code | Description |
|---|---|
| *Alarm unknown (xxx)* | This alarm code cannot be translated into text. Please note the number displayed and contact your supplier. |
| *$CO_2$ too high* | Measured $CO_2$ exceeds the calculated maximum alarm limit |
| *$CO_2$ too low* | The measured $CO_2$ is lower than the calculated minimum alarm limit |
| *$CO_2$ sensor faulty* | Measurement of $CO_2$ sensor is outside the set limits. |
| *Communication* | The master device has not received data from the displayed device address. |
| *Configuration changed* | The module configuration (inputs/outputs etc.) has been changed. Read in the module number again. |
| *Counter already assigned* | The counter has been assigned to two or more controls. |
| *Dosage too low* | The dosed water/feed volume is lower than the set minimum dosing amount, see page 32. |
| *Input already assigned* | The input has been assigned to two or more controls. |
| *Invalid input* | The input number does not exist on the module. |
| *Invalid output* | This output number does not exist on this module. |
| *Invalid period (x)* | The times set for a timer must be ascending and the difference between Start and End and between two periods must be at least 1 minute.<br>In a lighting control system, the starting time + running time must not be after the next starting time. However, the time may fall at the same time as the next starting time. X = period number |
| *Minimum supply alarm* | The counter remains, within the set time frame, below the specified minimum. |
| *Maximum supply alarm* | The counter exceeds the specified maximum within the set time frame. |
| *Module not installed* | The module number set for the terminal does not exist. |
| *Module does not respond* | Module address not found. Check the settings on the module. |
| *Module reset alarm* | Module keeps resetting due to a fault. Check the module. |
| *No communication address* | Device address poultry computer missing. |
| *No input assigned* | No input terminal number has been entered. |
| *No pressure control* | The control installed requires a pressure control but no pressure control has been installed. |
| *No USB stick available* | USB logging is on, but the USB stick on the RTCPU board is missing. |
| *No output assigned* | No output terminal number has been entered. |
| *No outside sensor* | You have installed a controller that requires an outside sensor. However, the outside temperature sensor has not been installed. |
| *NH3 too high* | Measured NH3 exceeds the calculated maximum alarm limit |
| *NH3 too low* | The measured NH3 is lower than the calculated minimum alarm limit |
| *NH3 sensor faulty* | Measurement of NH3 sensor is outside the set limits. |
| *Output already assigned* | Output is already used for another control. |
| *Outside sensor faulty* | Outside temperature sensor measurement is < -50.0°C or > +50.0°C |
| *Overlapping periods1* | Several dosage timers are active at the same time. |

| Alarm code | Description |
|---|---|
| *Potentiometer faulty* | The value measured by the potentiometer is outside the limits (EGM 100P, winch motors etc.). |
| *Pressure too high* | The measured pressure is higher than the calculated maximum alarm limit. |
| *Pressure too low* | The measured pressure is lower than the calculated minimum alarm limit. |
| *Pressure sensor faulty* | Pressure sensor measurement is outside set limits. |
| *RH too high* | The measured RH is higher than the calculated maximum alarm limit. |
| *RH too low* | The measured RH is lower than the calculated minimum alarm limit. |
| *RH sensor faulty* | The RH sensor value measured is outside the preset limits. |
| *Sensor faulty* | The values measured by the sensor (temperature, RH, CO2, pressure, etc.) are outside preset limits. Both limit switches of the laying nest and/or pop-hole timer are enabled. |
| *Start day in period* | *Start new day* falls within a period. This is not permitted. The *Start New Day* time must be before the first period. |
| *Temperature too high* | The measured temperature is higher than the calculated maximum alarm limit. |
| *Temperature too low* | The measured temperature is lower than the calculated minimum alarm limit. |
| *Temperature sensor faulty* | The value measured by the temperature sensor is lower than -50.0°C or higher than +100.0°C |
| *Thermo-differential Sensor x* | The temperature difference between the last two readings from the sensor exceeds the maximum permissible difference or the sensor temperature is above the absolute limit, see pages 18 and 23. |
| *Unknown terminal type* | The selected terminal type does not exist. |
| *Ventilation too high*[2] | The ventilation measured is higher than the calculated maximum alarm limit. |
| *Ventilation too low*[2] | The ventilation measured is lower than the calculated minimum alarm limit. |
| *Wrong input type* | The set input type does not comply with the input type based on which the controller is controlling. |
| *Wrong output type* | The set output type does not comply with the output type which activates the control. |
| *Wrong RTCPU version(x)* | Insufficient memory present on the current RTCPU_DEKx board to perform a software update. Replace the RTCPU_DEKx board with an RTCPU_DEK3 board or a more recent version. |

1 If all feed dosage timers function on the basis of release contacts, the periods may overlap.
2 When controlling a valve, always check first that the valve is not in manual mode.

# 12 System

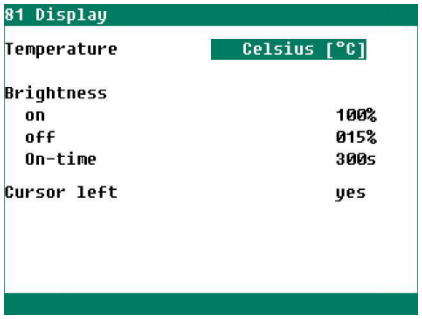
## 12.1 General




| | |
|---|---|
| *Device* | Name of the device. In this example, PL-9300. |
| *Type* | Type number of the device. The PL-9300 has type number 266. |
| *Software version* | Version number of the software in the PL-9300. |
| *Software date* | The date of the software used in this computer. |
| *ENG, NLD, DEU, ....* | Setting of the language in which the screen texts appear: NLD=Dutch, ENG=English, DEU-Deutsch, etc. |

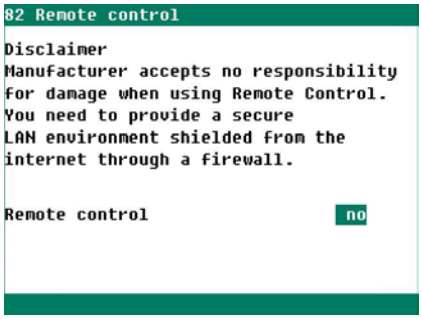
Shortcuts for changing language: Press and F1 hold and use to select ◀ ▶ the previous/next language.

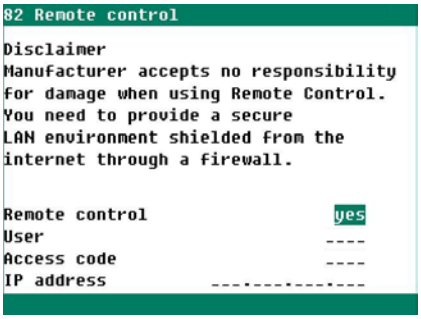
## 12.2 Display




| | | |
|---|---|---|
| *Temperature* | *Fahrenheit (°F)* | Temperatures are displayed in degrees Fahrenheit. |
| | *Celsius (°C)* | Temperatures are displayed in degrees Celsius. |
| *Brightness* | *on* | Setting the brightness for the display in the operation mode. |
| | *off* | Setting the brightness for the display in sleep mode. |
| | *On-time* | Number of seconds that the backlight stays on after the last time a key was pressed. 0 seconds = backlight stays on forever. |
| *Cursor left* | *yes* | Place the cursor to the far left when changing. |
| | *no* | Move cursor to the far right when changing. |

## 12.3 Remote control




*ANote-Remote-N-ENxxxxx*

# 13 Maintenance and check-up

Good climate control is indispensable for good farm business. Prevention of diseases starts with optimizing the climate in the poultry house. A responsible and regular inspection and cleaning of fans, valves, measuring fans, ventilation chimneys, sensors and is therefore necessary of fans, valves, measuring fans, ventilation chimneys, sensors and climate controllers is therefore necessary.

| What | When | Action |
|---|---|---|
| *Alarm system* | Monthly | Check the alarm system for proper functioning. |
| *Air leaks* | Regular | Air leaks can lead to draughts and - in summer - they can result in unwanted heating due to hot air being drawn in from between the roof and the insulating materials for example. This will require the fans to work extra hard to enable the preset house temperature to be reached, causing the energy costs to increase unnecessarily. |
| *Measuring fans and settings* | Regular | Air leaks can lead to draughts and - in summer - they can result in unwanted heating due to hot air being drawn in from between the roof and the insulating materials for example. This will require the fans to work extra hard to enable the preset house temperature to be reached, causing the energy costs to increase unnecessarily. |
| *Negative pressure in the house* | Regular | Clogged filters or air inlet valves which are still in the 'winter mode' may cause an unnoticed increase in the counter-pressure in the ventilation system in combination with a rising temperature. This will result in the fans having to run much faster than is usually required. When opening or closing doors of the poultry house, be alert to any resistance, which you may feel. If you can feel the negative pressure, we advise you to check the operation of the filters and valves. |
| *Temperature sensors* | Monthly | Clean the temperature sensors with a damp cloth. |
| *Ventilation chimneys* | Annual | Cleaning at least once a year |
| *Cleaning ventilation system* | When cleaning the house | Keep (measuring) fans, valves and ventilation chimneys clean in order to keep energy consumption low. Dust and dirt can affect the operation of the equipment. Clean the fans with a soft hand brush. Use a damp cloth to clean the poultry computer, measuring fan and valves. The ventilation duct may be cleaned with a high-pressure hose.<br><br>⚠ Do not use the high-pressure jet to clean the climate controller, measuring fan, valves and other electrical equipment. When cleaning the ventilation chimney, do not point the jet at these sensitive parts. |
| *Fans* | Weekly | Switch on the fans at least one time every week, even in winter, to prevent it from getting stuck. |