PL-9400(i)

POULTRY CLIMATE AND MANAGEMENT COMPUTER

PL-9400

PL-9400i

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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 authorized 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.

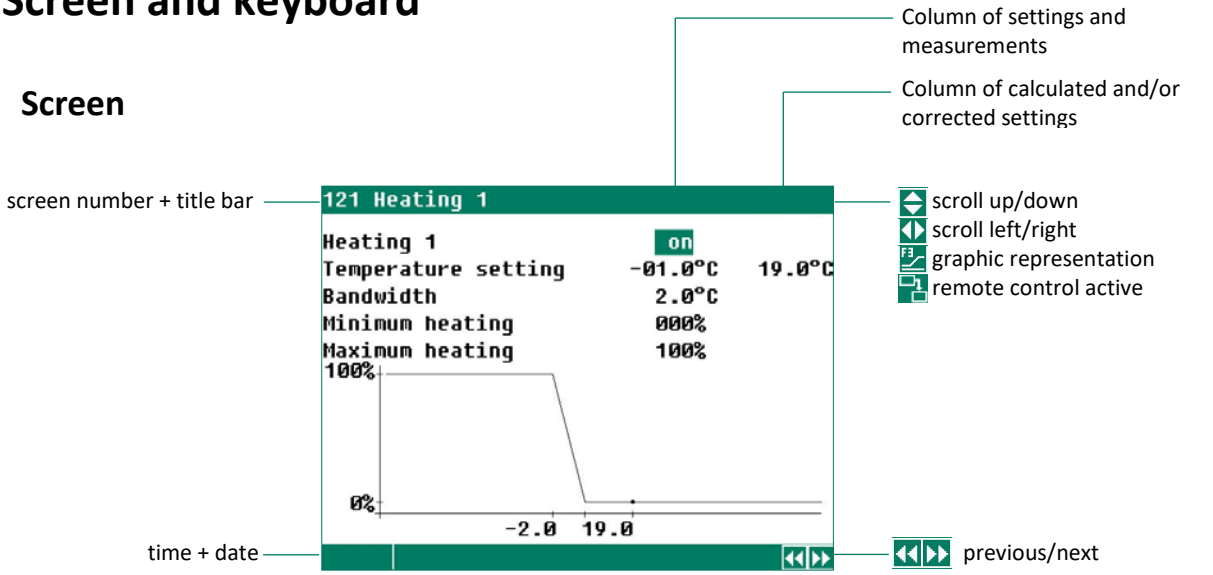
2.3 Disposal

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 Screen and keyboard

3.1 Screen



! As a result of the growth curve and/or offsets, the calculated setting may differ from the value set by the user.

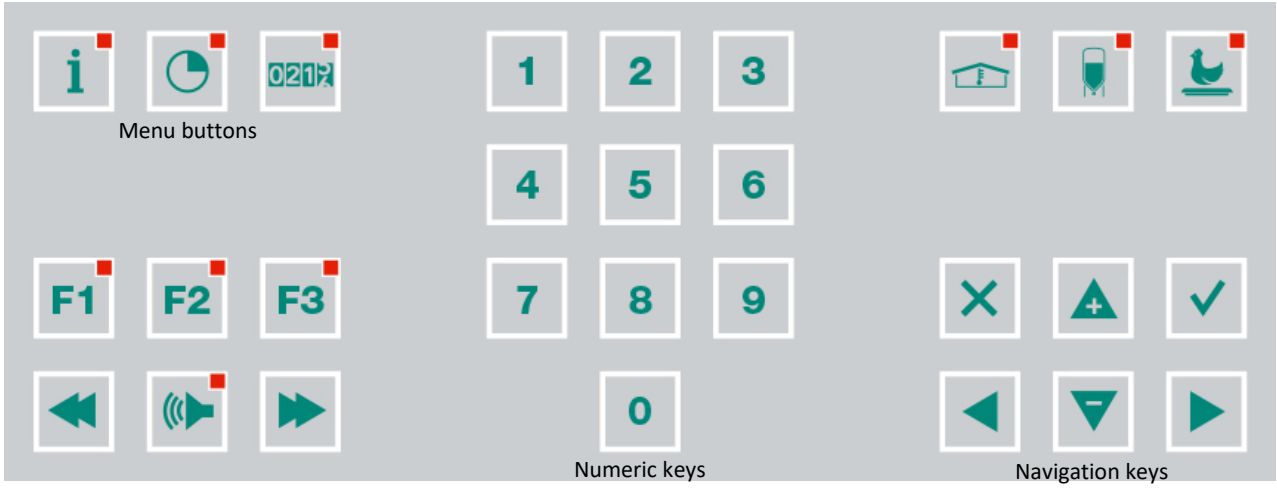
If some text lines extend beyond the screen, you will see in the title bar.
Press to retrieve the remaining settings and/or measurements.

If some text lines extend beyond the screen, you will see in the title bar.
Press to retrieve the remaining settings and/or measurements.

If is shown in the title bar and you press function key F3, the settings will be displayed graphically. The dot (●) in the graph indicates the calculated value. Pressing F3 again turns off the graphical display. The display lights up for a few minutes every time a key is pressed. This enables you to see the settings and measurements in a dark animal house.

Use these buttons to select the previous or the next control, if there are any controls of the same type, such as ventilation groups (left, right, recirculation, etc.).

3.2 Keyboard



Do not use sharp objects such as pen or screwdriver to operate the keys.

Menu keys

Information on animal welfare, number of animals, mortality, feed intake, etc.

Timers (standard timers, light controls etc.)

Counters (water, feed water/food ratio, etc.)

Poultry house climate

Feed weighing system. *ANote-FeedSysP-N-ENxxxxx.*

Animal weighing system. *ANote-AWeighing-N-ENxxxxx.*

Function keys

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

F2 Call 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.

Numeric keys (0..9)

Use the numeric 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

With 2 ... 9 you can change the name (max. 15 characters including spaces) of a recipe, timer, counter, external alarm, etc. The character appears in a block. Press the numeric key repeatedly until the character to be selected appears. To enter a punctuation mark, press 1 repeatedly. Use 0 to insert spaces.

2 : Press once for a, twice for b, etc.
Use ◀ ▶ to move the text cursor.

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

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 the cursor to the right or left.
Move cursor left or right in edit mode.

Move cursor up or down in control mode.
Increase or decrease value in edit mode.

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.

3.3 Adding and removing breakpoints or periods

1. Press the (Enter) key to enter the edit mode.
2. Press and hold F1 and press to add a 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.

3.4 Programming hot keys

The six function keys below can be assigned to a menu screen of the corresponding group.

1 2 3 4 5 6 (group number = first digit of menu option)

Assigning the overview screen to the hot key

You want to program the overview screen (611, menu group 6) under the info key ( ).

611 Overview house temperature

House temperature 20.1°C

Day	Min.°C	Time	Max.°C	Time
Today	19.2	6:26	20.1	15:09
Saturday	18.7	6:23	19.8	15:28
Friday	19.0	6:43	19.7	15:21
Thursday	19.2	6:39	20.1	15:17
Wednesday	18.8	6:32	20.0	15:01
Tuesday	18.6	6:24	20.2	15:06
Monday	18.9	6:19	19.7	15:11
Sunday	18.6	6:14	20.3	15:26

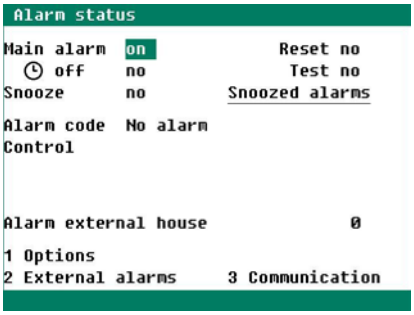
1. Go to the main menu.
2. Press successively 6 1 1 .
3. Press and hold F1 and then press . The function key bas now been programmed.
4. If you press , screen 611 will be displayed.
5. Press a numerical or navigation key to return to the main menu.

Deprogramming a hot key

Hold down F1 and press the hot key to be deprogrammed. You can clear the programmed key from the example by pressing the key combination + F1.

3.5 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	Code representing 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.

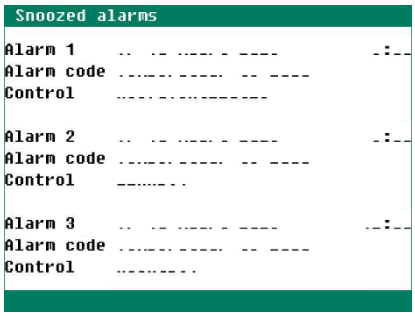
Alarms resulting from a setting error cannot be snoozed. Consider, for example, an incorrectly assigned input or output, or a setting error on the timers.

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

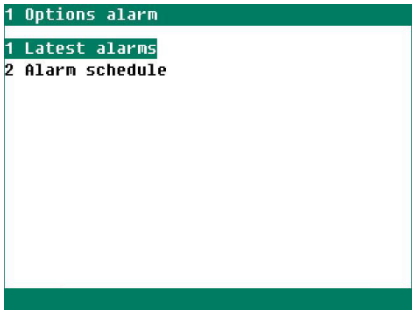


After resolving the fault, do not forget to turn the alarm back *on*. Preferably use the *off* function to clear the fault.

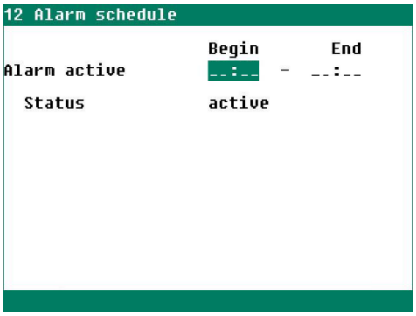
Always resolve installation errors such as *Output already assigned, Output type error, Input already assigned* etc., before commissioning.

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 48.

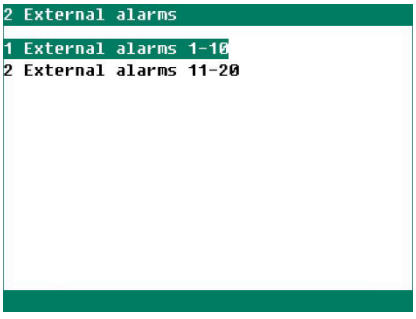


1 Options alarm→2 Alarm schedule

Alarm active — At *Start* and *End* you set the period, during which the on-time set alarms should be active.

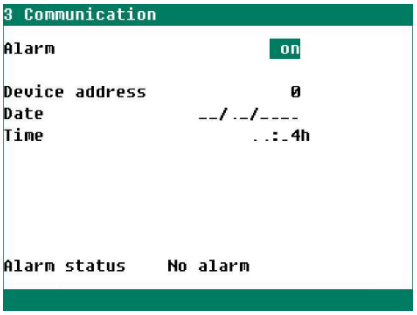
Only when *Status* is set to *Active*, time-set alarms are transmitted to the computer. Alarms that occur during the Off *state are* no longer transmitted.

External alarms



See page 49.

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 main station has not received data from any device (PL-9xxx, PFA-9400, PFV-9xxx, WEB-485 etc.) in the same RS485 data communication loop.
- Central controls are installed and the poultry computer has not received data from the relevant central control (for example, a central heating system).
- A PFB-35/70 feed weigher is installed and the poultry computer has not received data from the PFB-35/70.
- An PW-2 animal weigher is installed and the poultry computer has not received data from the PW-2.
- A PSW-1 silo weigher is installed and the poultry computer has not received data from the PSW-1-D. On the PSW-1-D silo weigher, check that dip switch SW1-6 is in the *OFF* position (slave mode).

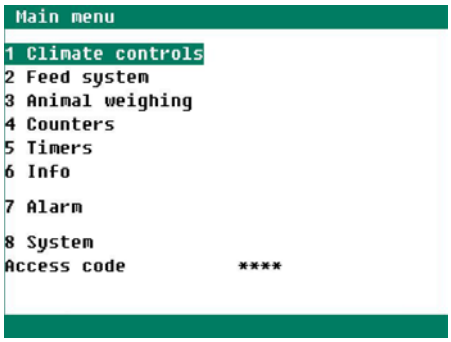
3.6 Terminal numbering of inputs and outputs

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

Character	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.

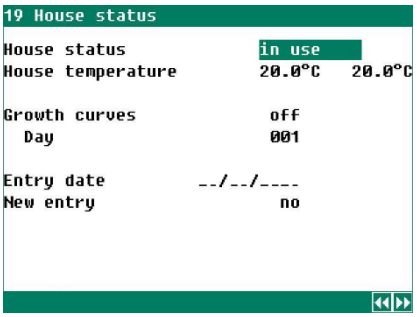
4.2 Access Code

You can set an access code (four digits) to prevent unauthorized personnel from changing settings. Your installer can set a maximum of 6 access codes for you.

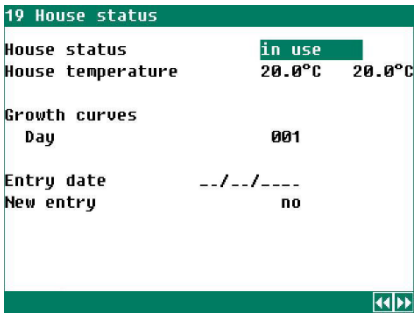
ⓘ You can program a separate access code for the status screen. If you only set an access code for the status screen, this will apply to all user screens.

5 Climate Controls

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; the day number is used by *FarmConnect*.

5.2 Relative or absolute temperature setpoint

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

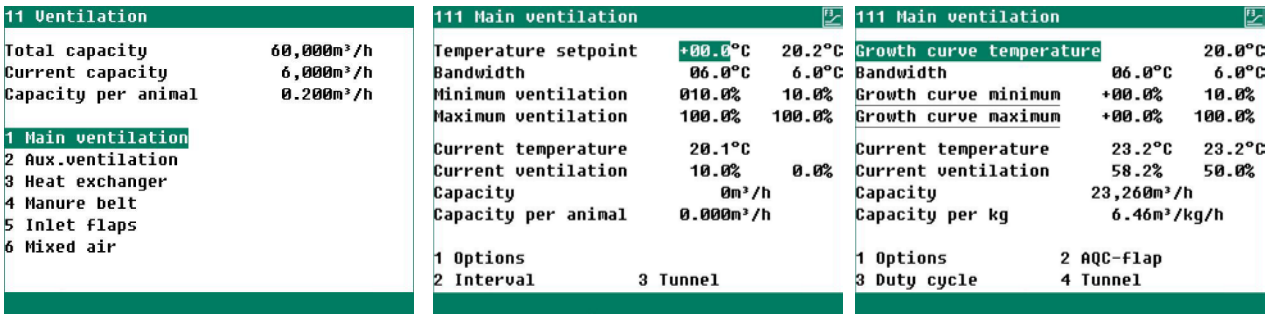
Set house temperature	20.0°C
Differential temperature	5.0°C

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
Add. ventilation group	Always relative to house temperature
Manure belt: intake fan	Value between -9.9°C and +9.9°C → setting is relative to house temperature Value equal to or higher than 10.0°C →absolute temperature setting
Manure belt: heater block	Always relative to house temperature
Ventilation groups	Always relative to house temperature
Heating 1..6	Value between -9.9°C and +9.9°C → setting is relative to house temperature Value equal to or higher than 10.0°C →absolute temperature setting
Central heating 1+2	Absolute temperature setting
Cooling 1..4	Value between -9.9°C and +9.9°C → setting is relative to house temperature 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 is set based on the occupancy rate, the minimum/maximum ventilation is adjusted to the number of animals housed. 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	Ventilation capacity of the main group: *total*, *per animal* or *per kg*.

Main ventilation using growth curves

The text Growth curve appears in front of the climate settings calculated from the curve. You can increase/decrease the calculated curve settings by changing the value in the first column (+0.0°C/+0.0%). With sick animals, you then do not need to adjust the curve settings each time.

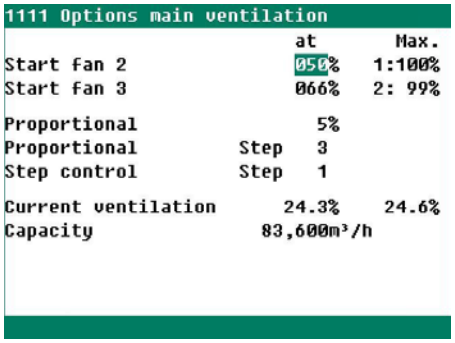
Growth curve temperature	Increasing or decreasing the calculated temperature for main ventilation.
Growth curve minimum	Increasing or decreasing the calculated minimum main ventilation.
Growth curve maximum	Increasing or decreasing the calculated maximum main ventilation.

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.

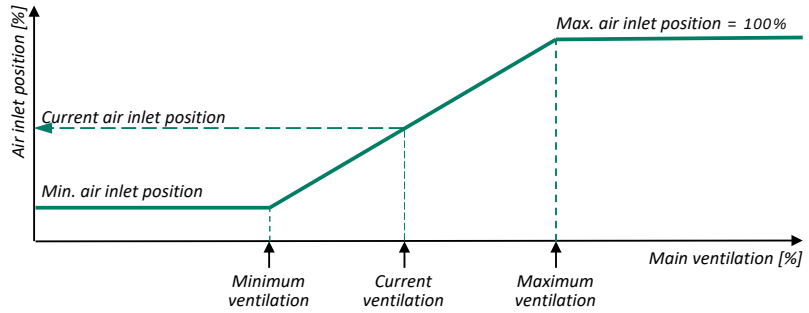


Proportional	*Step x*	Current step of the controlled ventilation group that is activated. 1. Fan 1 is on; 2. Fans 1 + 2 are on 3. Fans 1+2+3 are on
Step control	*Step x*	Current step of the step control.

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.

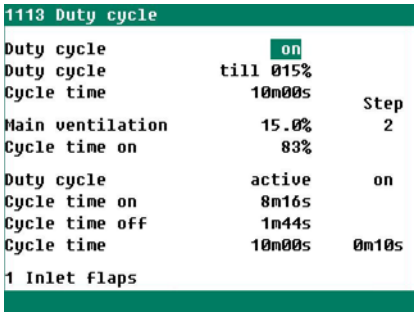
AQC valve

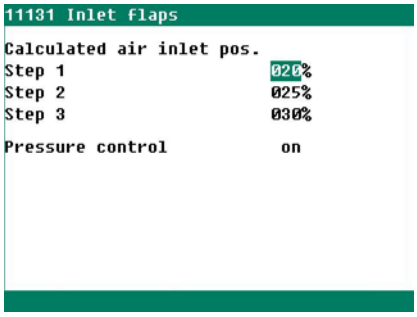
You can only set the control characteristics for an AQC valve without a measuring fan. If a measuring fan is present in the controlled ventilation group, menu item 2 *AQC valve* will not be displayed.



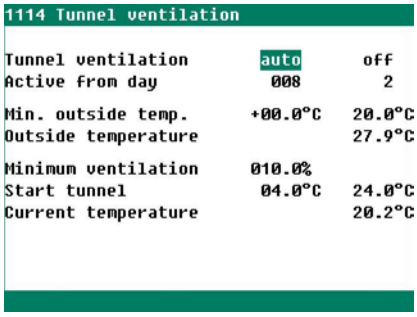
The AQC valve without measuring fan controls on the basis of the calculated main ventilation (main fan output).

Duty-cycle





Tunnel



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

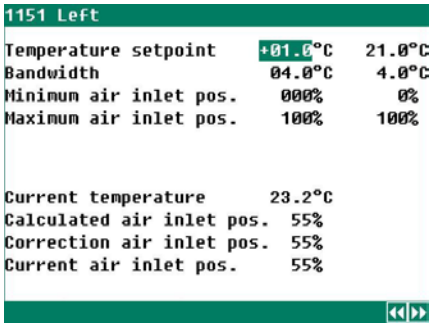
ANote-Tunnel-N-ENxxxxx → Tunnel ventilation

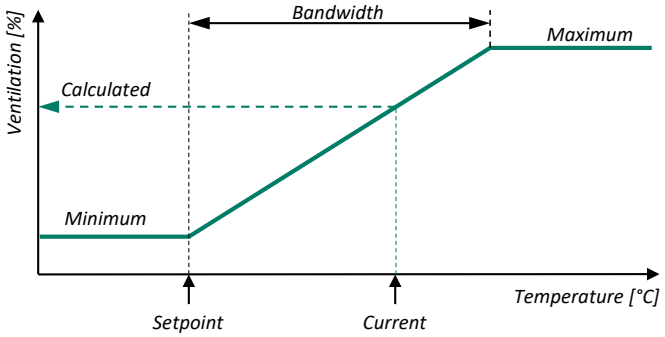
ANote-AuxVent-N-ENxxxxx → Auxiliary ventilation

ANote-HeatExcP-N-ENxxxxx → Heat exchanger

ANote-ManureB-N-ENxxxxx → Manure belt

5.4 Air inlet valves





The air inlet valve settings *Left, Right, Front, Middle, Rear, Recirculation, Top* and *Bottom* are identical in terms of settings and are all set accordingly.

An inlet valve has up to three separate controls (valves). The temperature setpoint, bandwidth, minimum and maximum ventilation apply to all three controls (1, 2 and 3).

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 inlets 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.

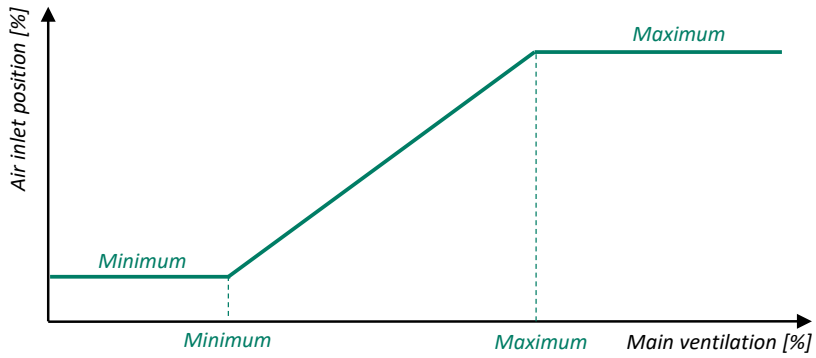
Pressure control features

- 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 position control based on ventilation



Minimum air inlet position The air inlet never closes beyond the set *Minimum air inlet position*. (%).

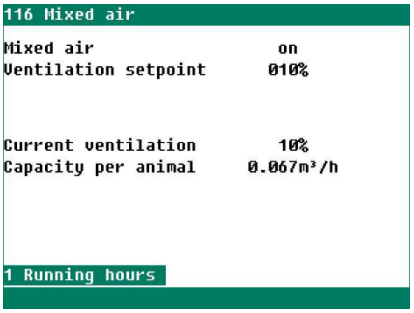
Maximum air inlet position The air inlet never opens beyond the set *Maximum air inlet position* (%).

Minimum ventilation (%) Below this minimum percentage, the air inlet is in its minimum open position. If the main ventilation rises above the set minimum (%), the air inlet will open further.

Maximum ventilation (%) Above this maximum percentage, the air inlet is in its maximum open position.

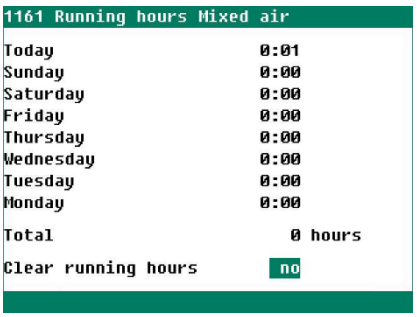
5.5 Mixed air

You can reduce ammonia emissions by blowing warm air from the ridge horizontally over the manure bedding through the ventilation ducts and fans. This will make the manure litter dry faster.



In this screen you can enable and disable the mixed air control. You can manually enter the ventilation rate of the mixed air fan.

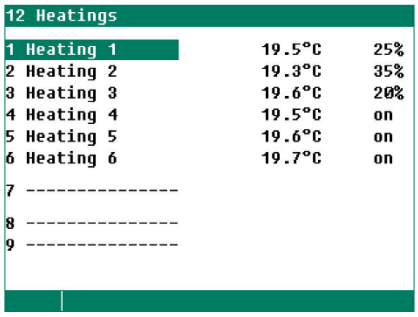
Operating hours

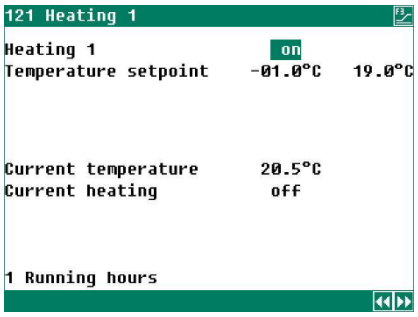


Running hours Reading out operating hours of mixed air control:
- today's operating hours
- operating hours of the past seven days
- total number of operating hours

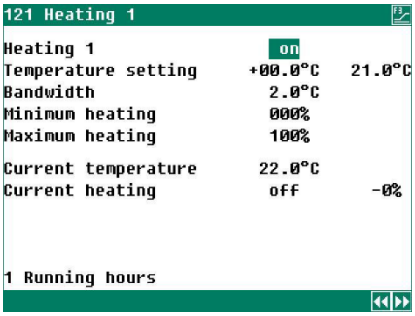
Clear running hours *yes* = delete operating hours.

5.6 Heating

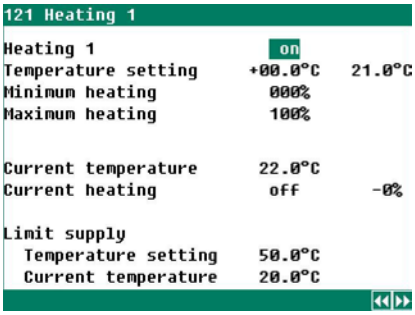




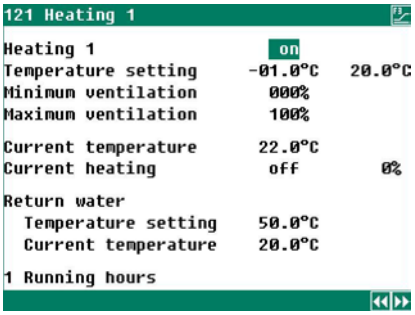
On/Off heating



Controlled heating



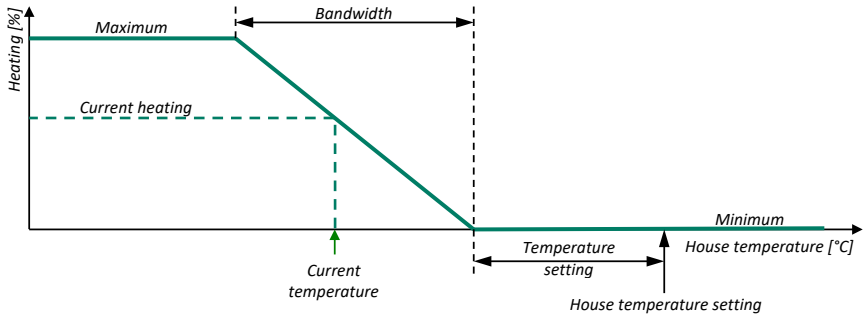
Floor heating



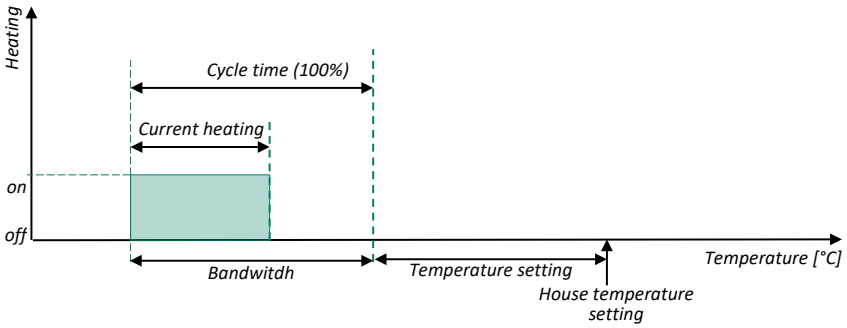
Return water control

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.

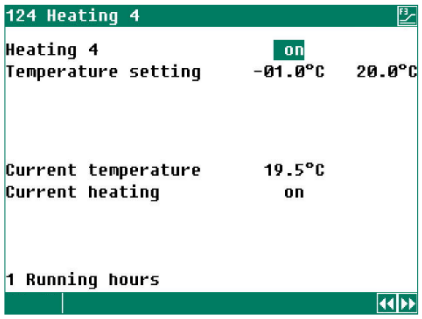
Current temperature — The currently measured supply water temperature.

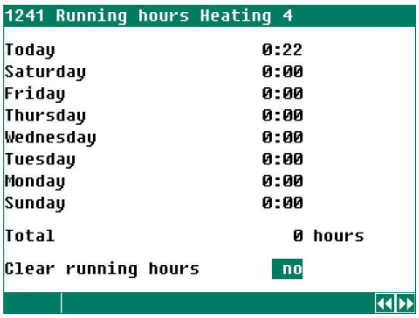
Return water

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

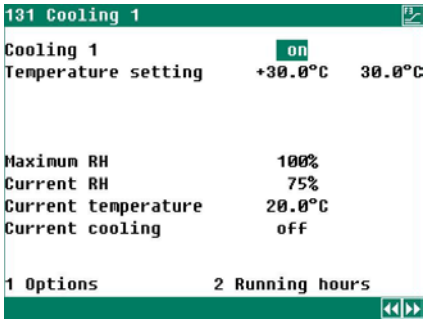


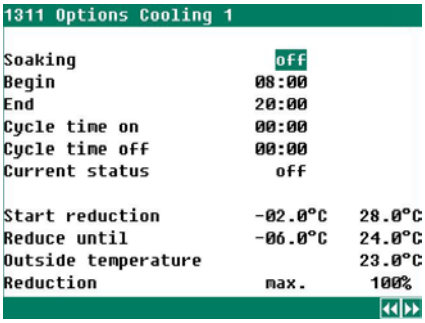


Running hours — Readout of the operating hours of an on/off heating:
- today's operating hours
- operating hours of the past seven days
- total number of operating hours

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

5.7 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.

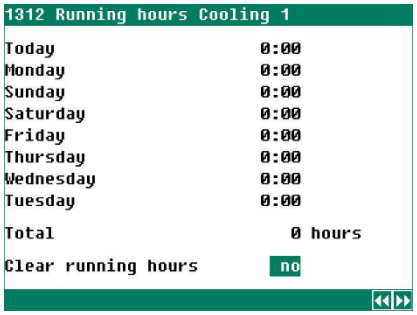
Start reduction — Enter the temperature at which the reduction should start.

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

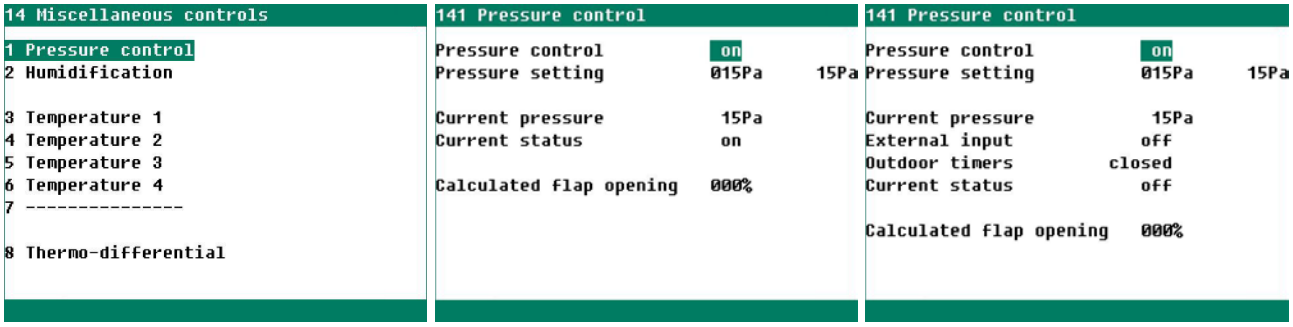


Running hours — Reading out the operating hours of an on/off (non-modulating) cooling system:

- 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.

5.8 Pressure control



Air inlet control is based on a preset negative pressure to guarantee an optimum flow pattern of the incoming air.

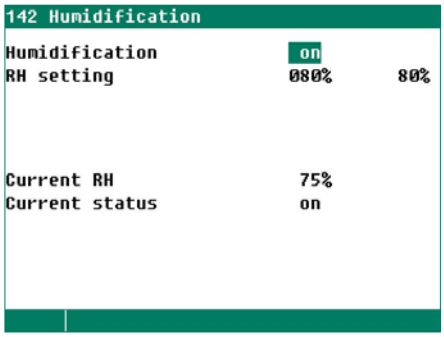
The pressure control is disabled if:
- A pop-hole timer is installed;
- The *Compensation pressure control* is activated at the pop-hole timer;
- The current status of the pop-hole timer is *on*.

The *calculated flap opening* is determined on the basis of the set and measured pressure. The pressure-controlled air inlets are controlled every 2 minutes. Change the *Calculated flap opening* to speed up or slow down the settling time for the air inlets.

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 pop-hole doors are open. The air inlet control being based on pressure will now be based on temperature.

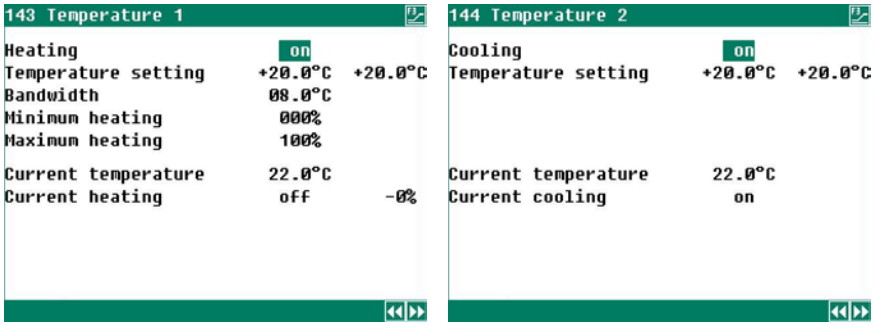
5.9 Humidification control



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	Switching the humidification control on and off.
RH setting	The percentage setpoint of the relative humidity below which the humidification control has to be active.

5.10 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

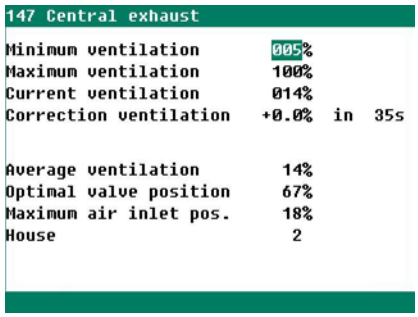
If you have set the temperature control as heating, the temperature control is set in the same way as a heating, see page 16. The minimum and maximum heating can be set separately.

Temperature control as cooling

If temperature control has been set as cooling, the temperature control is set identically to the cooling on page 18.

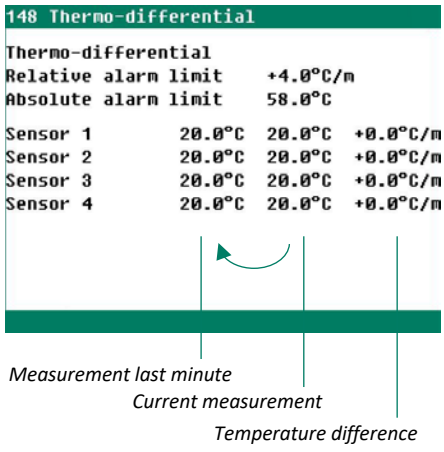
Temperature setting See *Relative or absolute temperature* , page 10.

5.11 Central exhaust



ANote-CentVent-N-ENxxxxx

5.12 Thermo-differential



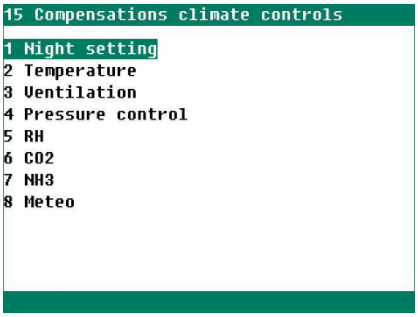
The thermo-differential function is activated by your installer (max. 8 sensors). The current measurement of each sensor is compared with the measurement of one minute ago. If the measurement is within the limits, the previous measurement is made equal to the current measurement and a new measurement is started.

An alarm is given if:

- The temperature increase in that minute is greater or equal than the relative limits.
- The temperature measured by the sensor exceeds the absolute limit.

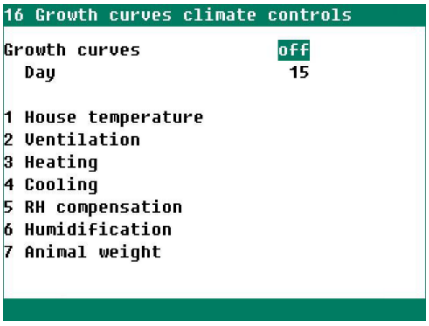
The thermo-differential alarm occurs only in case of a *positive difference.*

5.13 Compensations (offsets)



ANote-CompensP-N-ENxxxxx

5.14 Growth curves



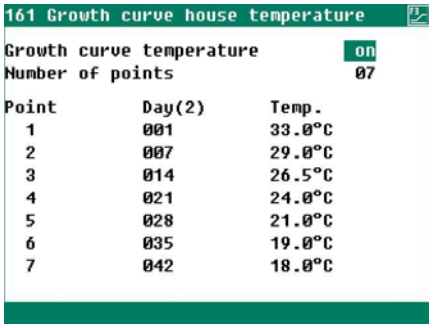
Several growth curves are available for gradual automatic adjustment of the climate in the house. A growth curve can consist of a maximum of 7 breakpoints.

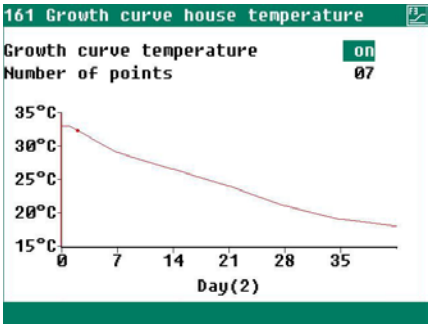
The current setting is determined on the basis of the growth curve, depending on the current day number. The uses this calculated setting to control the climate in the house.

Growth curves (installer setting) must be set to *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 10.
- Day numbers in the growth curve should be consecutive.
- The setting of the first breakpoint determines the day numbers.
- 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 <u>every hour</u> to achieve a more gradual development of the setting.
- Function key F3 can be used to switch between diagrammatic and graphic presentation of data.





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.

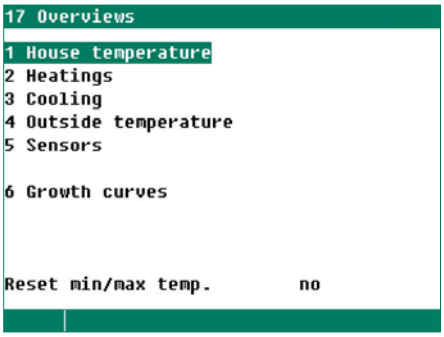
Ventilation The temperature setting of the ventilation groups is relative to the house temperature.

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 growth curve

The *animal weight growth curve* appears, if the *Capacity per kg* is displayed. You cannot turn the growth curve *on* and *off*.

5.15 Overviews



An overview of the selected temperature control.

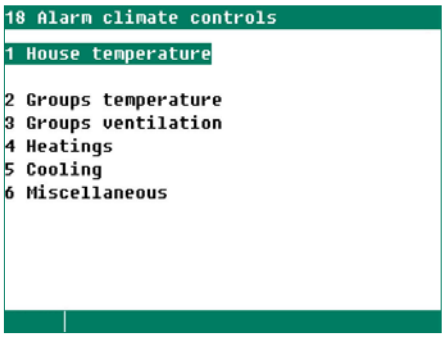
Animal weights equal to or greater than 10,000 grams are displayed in kilograms: 10,000 grams = 10.0 kg.

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*.

You can delete the min/max readings in temperature overviews via:
Overview house temperature (screen 17) → *Reset min/max temp*. *Today* will then read the current temperature.

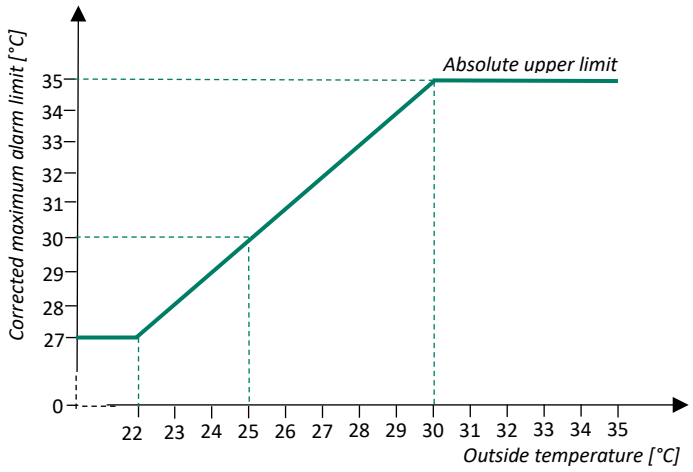
5.16 Alarm



House temperature limits

These temperature limits apply to all ventilation groups.

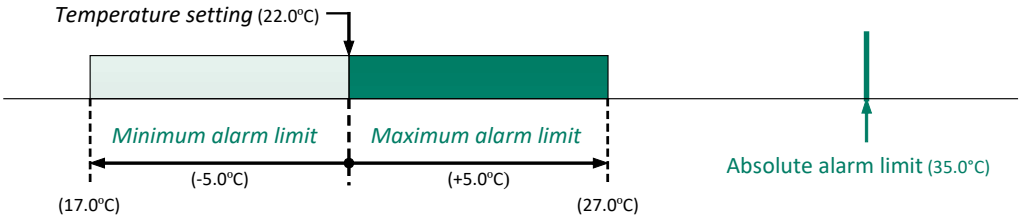
Outside temperature compensation for alarms



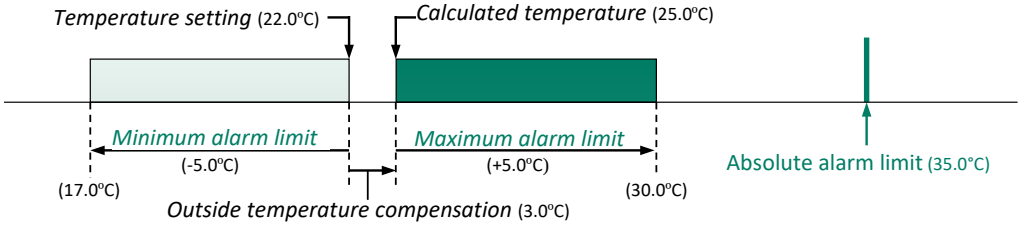
If the outside temperature is higher than the temperature setpoint, the maximum alarm limit shifts. The corrected alarm limit can never exceed the absolute temperature limit setpoint. This prevents the alarm from being triggered unnecessarily in case of high outside temperatures.
If the actual temperature rises above the absolute value, an alarm is still triggered. You should 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
Measured 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**

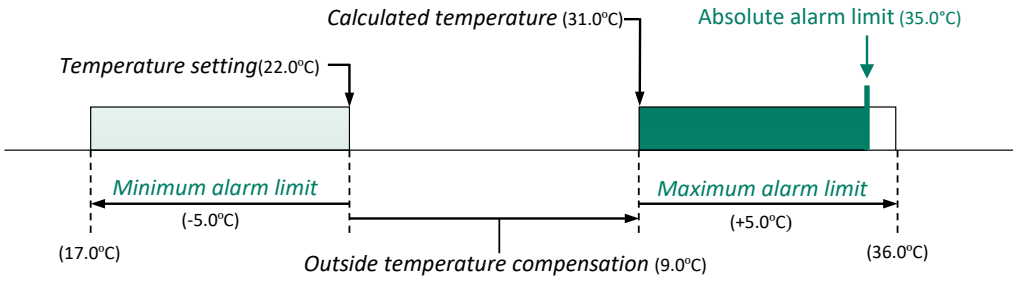
1. Outside temperature is lower than the house temperature setting → The calculated alarm limit will be increased to the maximum alarm limit setting in keeping with the house temperature.



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 or PL-9200-POT module.

Heating / Cooling / Miscellaneous

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

5.17 Alarm other controls

```
186 Alarm miscellaneous controls

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

6 Temperature control
7 Central exhaust        on

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

Pressure control

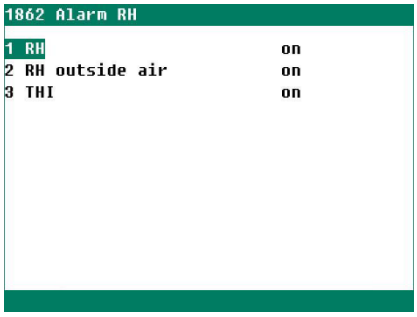
```
1861 Alarm pressure control

1 Pressure control       on
2 Pressure 1             on
3 Pressure 2             on
```

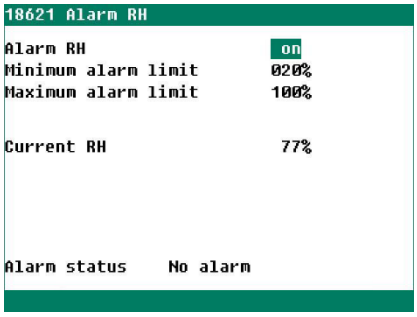
```
18611 Alarm pressure control

Pressure alarm            on
Minimum alarm limit      -10Pa      6Pa
Maximum alarm limit      +10Pa     26Pa
Absolute alarm limit      050Pa
Delay time              10m00s    10m00s

Current pressure           15Pa


Alarm status     No alarm
```

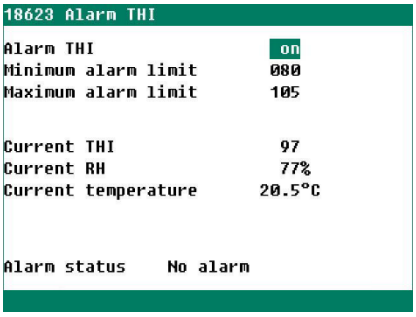
```
18612 Alarm Pressure 1

Pressure alarm            on
Minimum alarm limit     0000Pa
Maximum alarm limit     0050Pa
Delay time             10m00s

Current pressure           15Pa


Alarm status     No alarm
```

The *Pressure Control 2* settings are identical to the *Pressure Control 1* settings.

RH

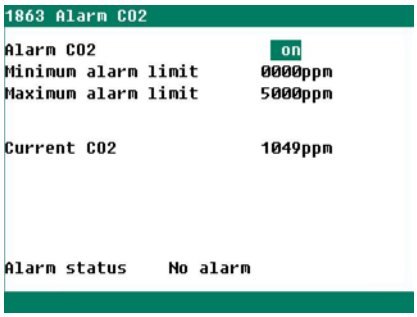




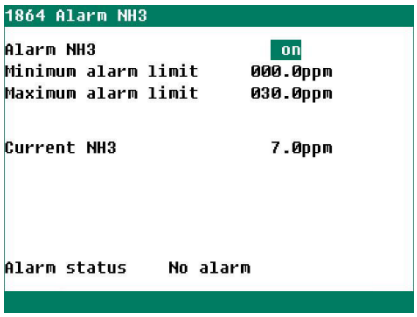


The relative humidity (RH) of the outside air has no alarm limits.

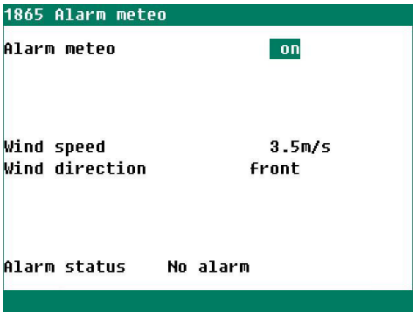
CO_2



NH_3

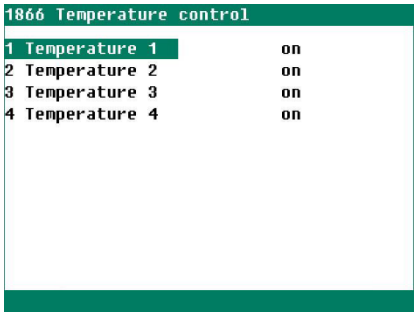


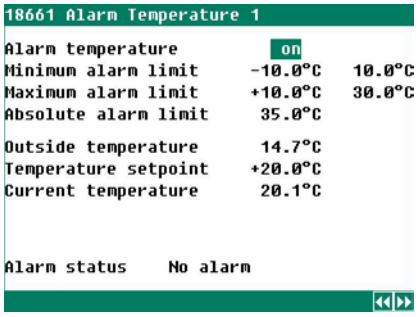
Meteo

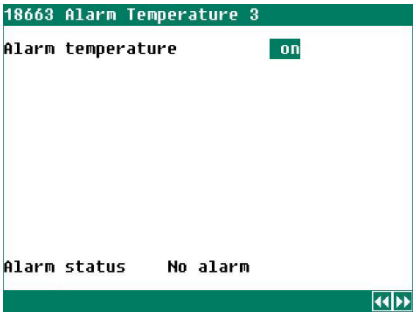


This menu item does not appear when meteorological data is received over the communication loop.

Temperature control

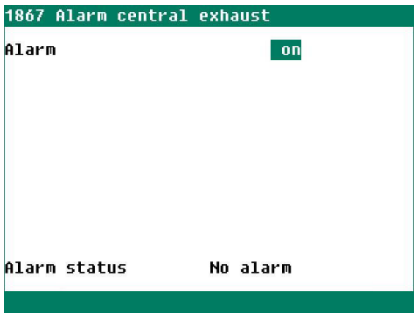




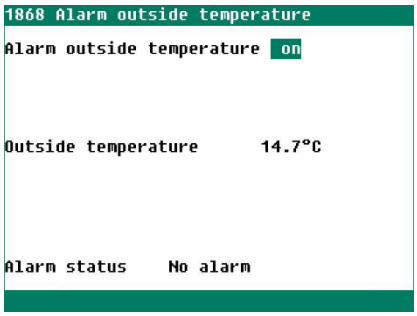


Heating and cooling are configured identically.
A Delta-T control does not have separate alarm limits.

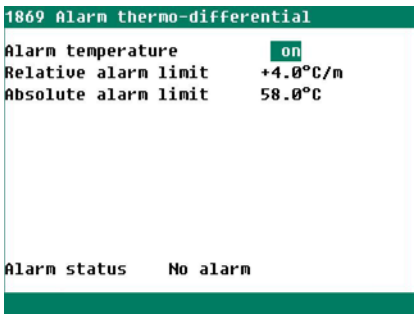
Central exhaust



Outside temperature



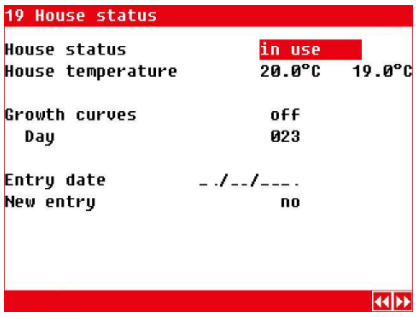
5.18 Thermo-differential alarm



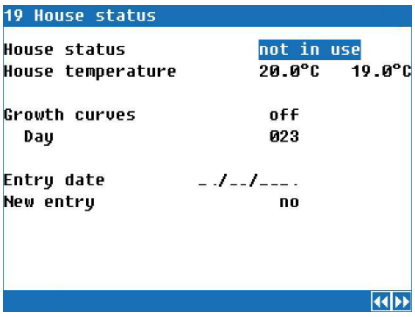
You can turn off the thermos-differential alarm by setting *Alarm temperature* to *off*. The current temperature reading is then cleared and the alarm is automatically turned back on. See also temperature monitoring page 20.

6 House status

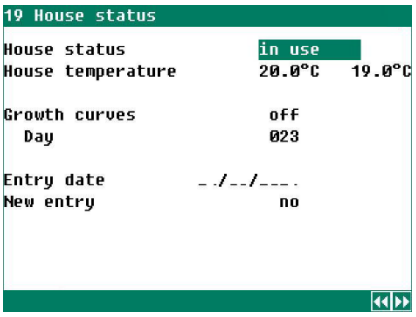
6.1 Putting the house in and out of operation



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 set-up in the house.

New entry When setting up the animals, this *New entry* setting has to be set to *Yes.* After that:

- the setup date is then given the date of 'today';
- mortality tables are cleared;
- the corrections entered at *growth curve min/max main ventilation* and *auxiliary ventilation* are cleared;
- the house temperature, min/max main ventilation and auxiliary ventilation are recalculated from the growth curve;
- the occupancy rate is recalculated (if it depends on the setup data);
- the feed dosing will be started (if a feeding cycle is active).

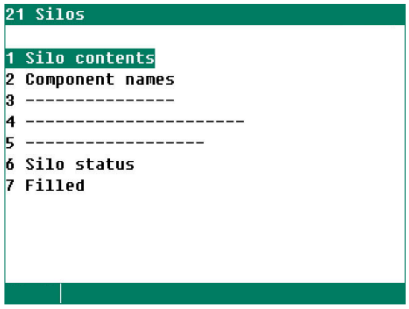
! The day number is not automatically updated.

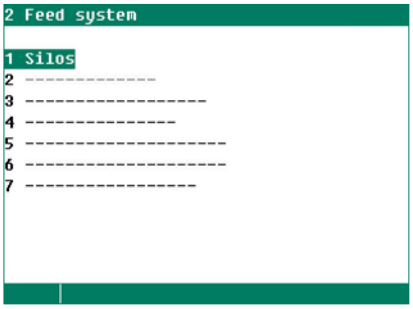
You can have a separate access code set up for the status screen (F2).

7 Feeding system

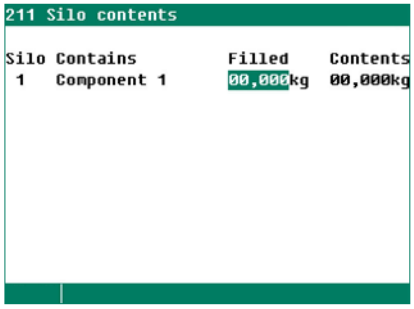
7.1 Feeding system with feed counter(s)

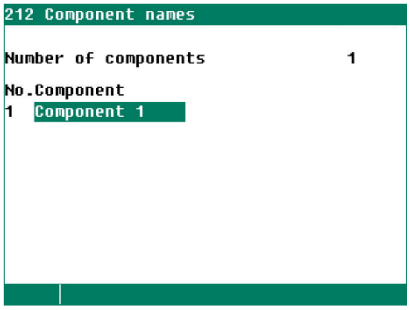
! If no feed weigher has been installed but one or more feed counters have been installed, all these feed counters relate to one and the same silo, i.e. silo 1.

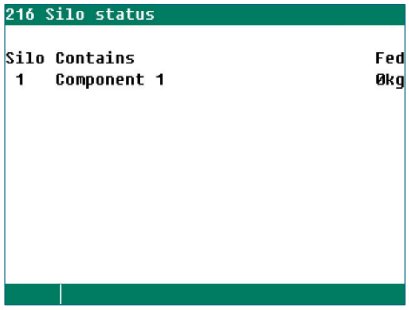




Silos



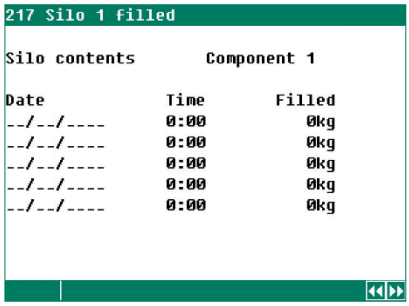




Silo	*Contains*	The name of the component in the corresponding silo.
	Filled	Setting the bulked amount of feed.
	Content	Readout of current silo contents: stock or shortage.

After filling up the silo's (feed bulking), the control computer adds the bulked amount of feed to the current *Content* and then resets *Filled* to 00,000kg.

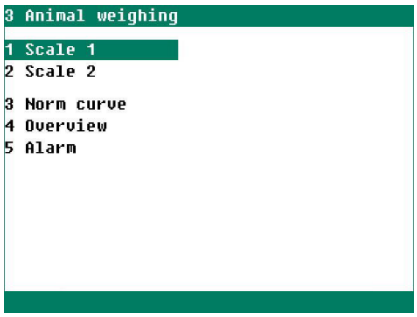
Filled up (bulked)



An overview per silo of the last five dates with the times at which the silo was filled up. You should always enter this data immediately after filling up the silo.

ANote-FeedSysP-N-ENxxxxx → Feeding systems

8 Animal Weighing

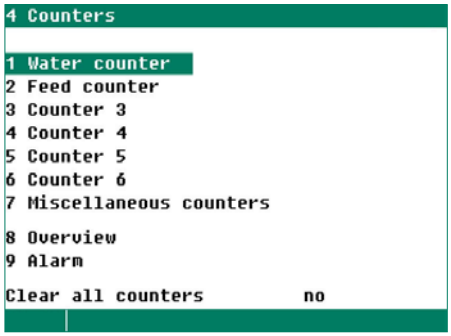


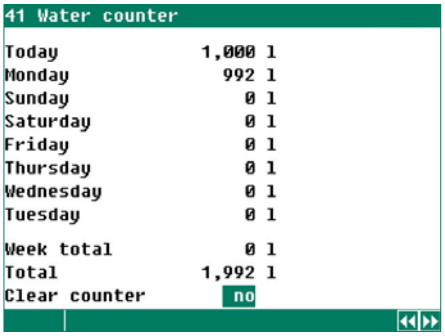
ANote-AWeighing-N-ENxxxxx → Animal weighing

9 Counters

9.1 Clearing counter(s)

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



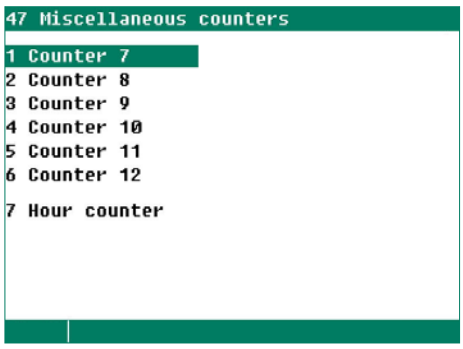


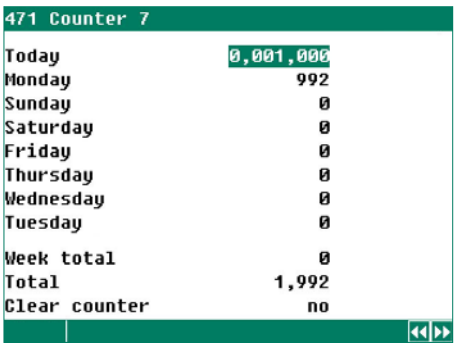
Clear all counters *yes* = clear all counters.

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 selected counters or of all counters are deleted.

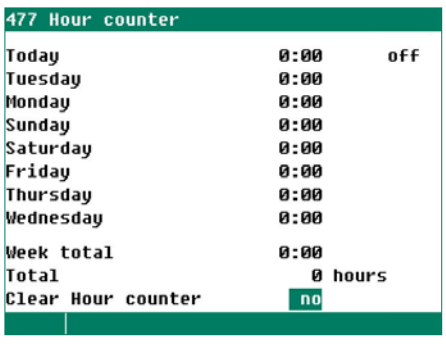
9.2 Counter readings of miscellaneous counters





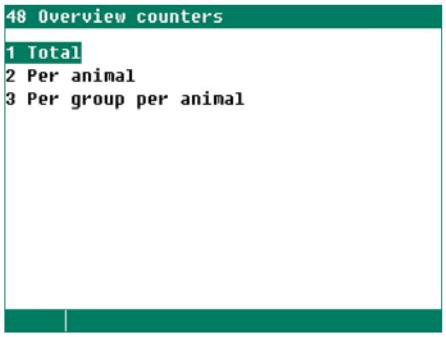
Today Here you can change the counter value of 'today'.

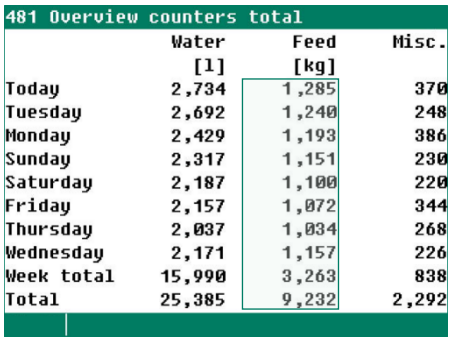
Hour counter



The input's status is displayed in addition to today's operating hours.
Total shows the total number of operating hours since the last time the hour counter was cleared.

9.3 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
Thursday	1,245	1,447	2,692
Monday	1,311	1,118	2,429
Sunday	1,047	1,270	2,317
Saturday	1,098	1,089	2,187
Friday	1,002	1,155	2,157
Thursday	1,049	988	2,037
Wednesday	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, see page 40). This means that the weekly total is not the sum of the readings shown on the screen

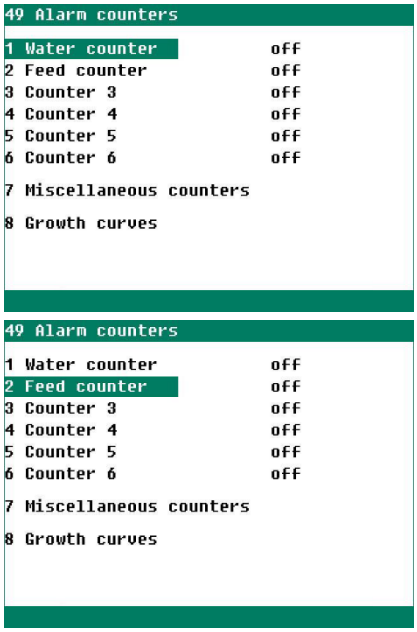
Per animal

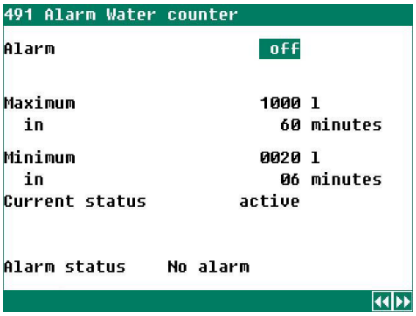
The counter readings shown are per animal. This screen also shows the *water/feed ratio*.

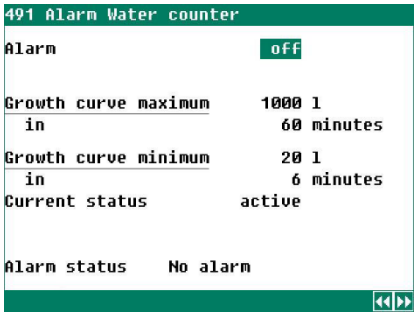
Per animal group

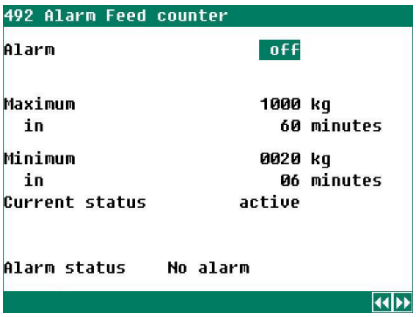
The counter readings shown per animal group.

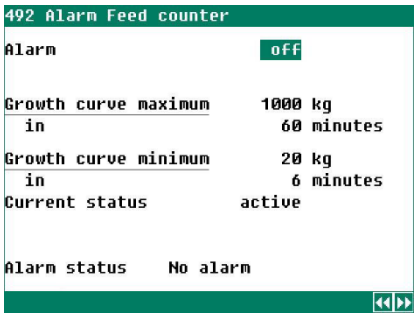
9.4 Alarm counters











Without growth curve *With growth curve*

Without growth curve Here you enter the maximum amount of water and feed to flow through the pipes during the set period. If this amount is exceeded, an alarm is triggered.

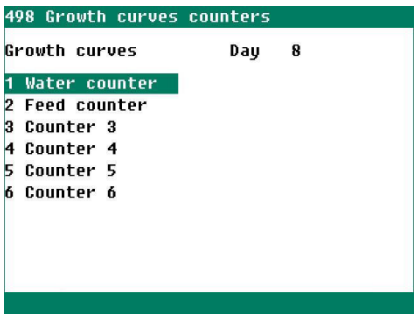
With growth curve The current value is calculated from the curve. If the counter value exceeds the maximum amount during the time entered or remains below the set minimum, an alarm is triggered. Your installer must have activated the minimum supply alarm.

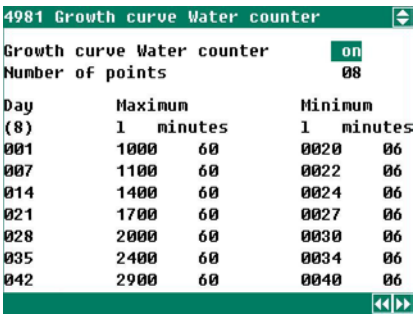
Actual status When the input is active, the *Minimum supply alarm* is also active. Connecting this input to the light timer, for example, prevents the minimum supply alarm from being activated at night.

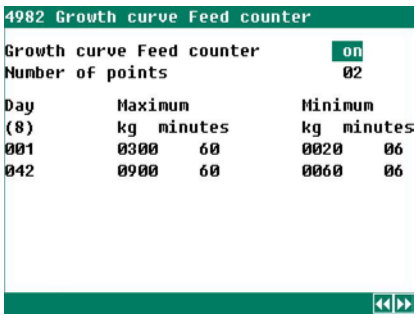
In this way, any pipe breaks or leaks can be detected early. If the counter is connected to a dosing timer, the output of the dosing timer is also switched off.

Alarm
- *on* Alarms are transmitted to the poultry computer.
- *off* The alarms are not transmitted to the poultry computer.
- *time* If the *Alarm Schedule* is active, alarms are transmitted to the poultry computer. If the Alarm *Schedule is* not active, then any alarms are not transmitted to the poultry computer.

Growth curve counter alarm limits





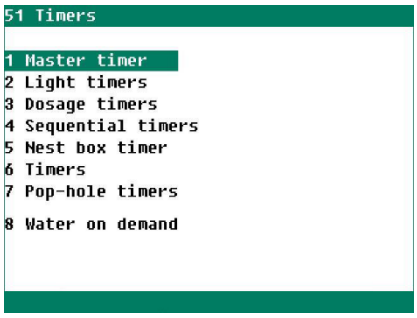


With minimum supply alarm *Without minimum supply alarm*

You can record the maximum and minimum counter readings with the corresponding period times in a growth curve, see screens 491 through 496.

10 Timers

You can set up to 24 time periods per timer. All times must be consecutive and the time difference between two times is at least 1 minute. If you are using growth curves (*growth curve schedule*), you can automatically activate a different schedule depending on the animals' age.
For example, when feeding and watering times vary within a short time frame (several days/weeks), you can use different time schedules. By programming these time schedules in advance, you can quickly change schedules.



Number of periods = 0: timer off. Application: switching of the timer using a time schedule.
Number of periods = 1: start and end = 00:00, timer is switched on for 24 hours.

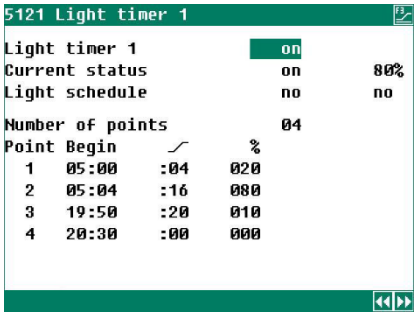
Master timer

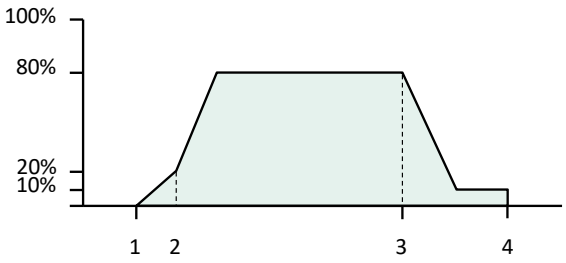
ANote-Timers-N-ENxxxxx

Light timers

It is possible to use a light control so that the switching on/off of lighting is gradual. With a light control, ideal day and night conditions can be created (dawn switching).

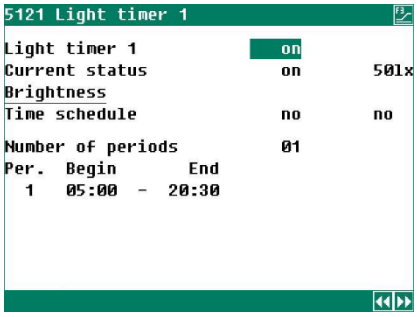
Standard lighting scheme

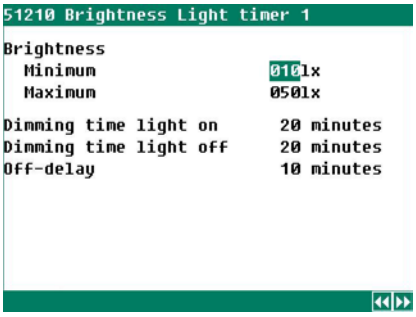


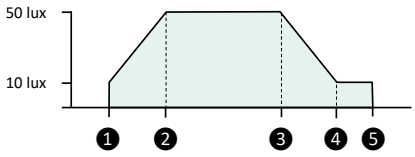


At *05:00* the lights turn on and their intensity is controlled to 20% in 4 minutes (⟋ :04).
At *05:04* the intensity is driven to 80% in a time of 16 minutes (⟋ :16).
At *19:50* the lighting is regulated back (dimmed) to 10% in 20 minutes (⟋ :20); At 20:10 the 20-minute after burn time starts.
At *20:30* the lights turn off.

Light timer based on brightness

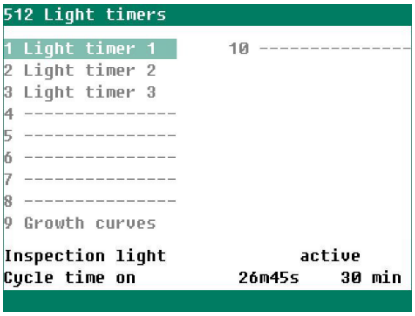






At *05:00*, the lighting switches on at minimum intensity (❶).
The intensity is controlled from minimum to maximum in *20 minutes* (❷).
At *20:30*, the switch-off process starts (❸).
The intensity is regulated from maximum to minimum in *20 minutes*; at 20:50, the after burn time of 10 minutes starts (❹).
At *21:00*, the lighting switches off again (❺).

Inspection light



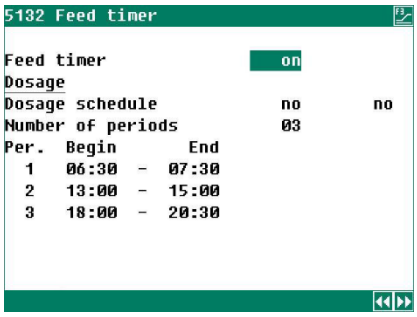
You can manually switch the light, using a pushbutton, in order to inspect the houses.

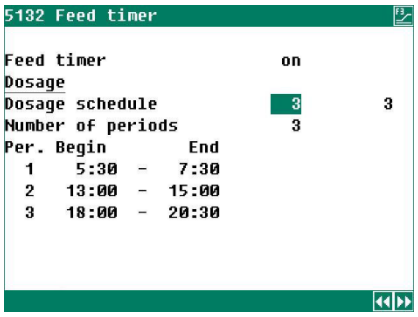
At *Cycle time on* you enter the maximum time the light should remain on after pressing the *inspection light* button. Pressing this button again within this period switches the inspection light off again.

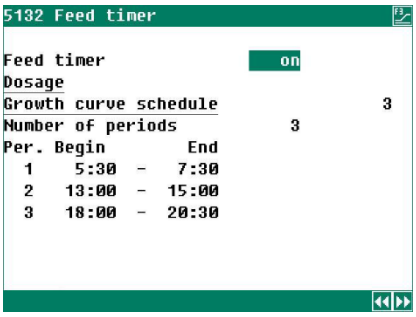
10.1 Dosing timers

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.

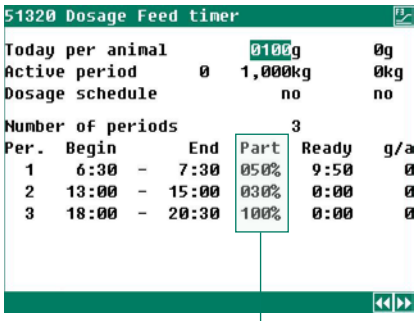


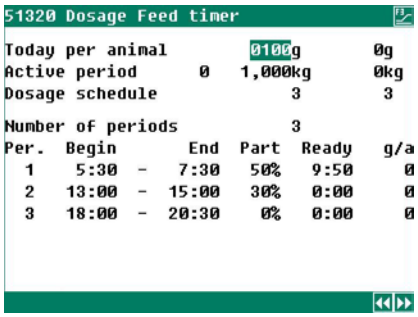


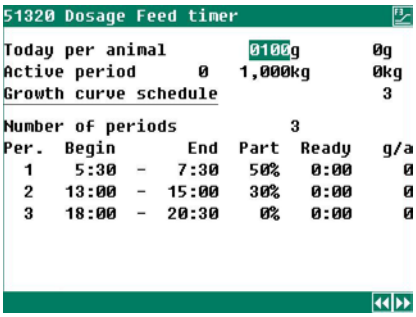


Fixed dosing schedule

Variable schedule (from curve)







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.

Dosing schedule / Growth curve schedule — This line states the current time schedule (see *Timers* on page 33).

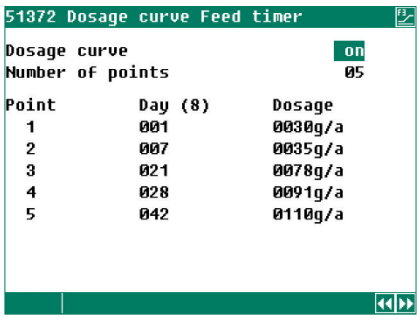
Distribution of feeding cycles over a number of periods

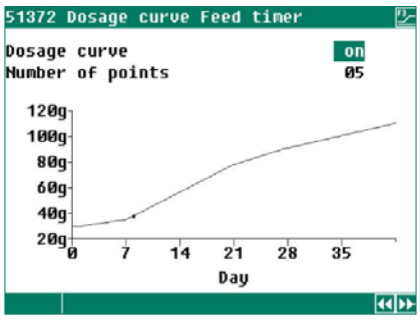
- The quantity to be dosed is (re)calculated between two periods.
- With *Auto. partition period* - The total daily amount is divided over the preset number of periods.
- Without *Auto. partition period* - The percentages entered in column *Part* are dosed. If the total dosage is less than the minimum dosage, *Dosage Alarm* is given.
- 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 at which 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.

10.2 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.

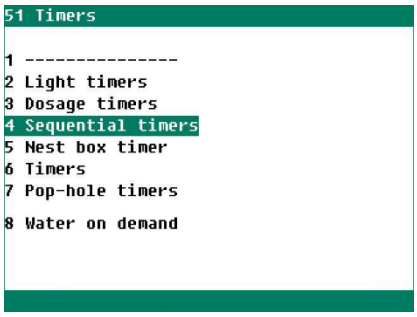


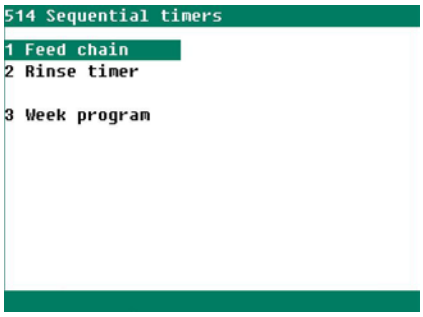


In the dosage curve the amount per animal per day can be set.

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.

10.3 Sequential timers

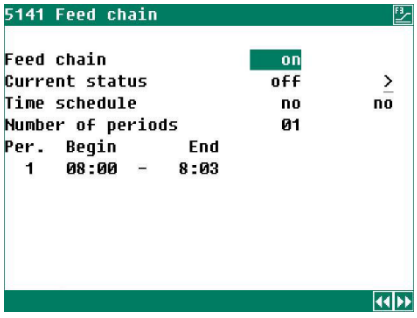


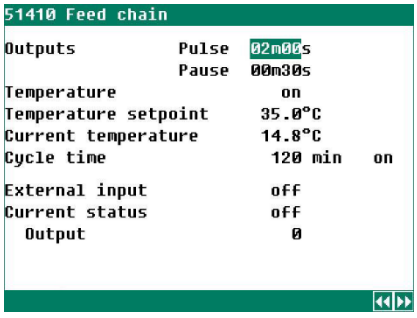


Sequential timers activate the different outputs that have been assigned to the timer in turn, after each other. An output is not activated until the preceding output is no longer active. The different actions carried out after each other are also called 'phases' or 'steps'.

Sequential timers are used for actions such as driving feed chains or rinsing water pipes. You set the starting time for the sequential timer. The end time is determined by the total pulse-pause time and the number of outputs.

Feed Chain





Feed chain

off The feed chain control is disabled.
on The feed chain control is enabled. You can use the local on/off times (*Time Schedule = no*) or preset time schedules (*Time Schedule = 1..9*).

slave On/off times of the timer are based on the switch times of the *Master timer*.

Current status The current status of the feed chain timer.

Time schedule

no The local on/off times are used.
1..9 The on/off times are taken from the preset time schedule.

Number of periods

Feed chain	Timetables	Number of periods
on	*no*	Adjustable between 0..24
on	*1..9*	Settings are taken from the set time schedule.
slave	*master clock*	Settings are taken over from the master clock. Locally, the times can still be influenced by entering a difference time from the master clock at *Start*.

Output

Pulse Time that an output is enabled.
Break Waiting time until the next output is enabled.

Temperature Turn on/off rinsing based on temperature.

Temperature setting When water temperature exceeds the set value, flushing starts.

Current temperature The currently measured water temperature.

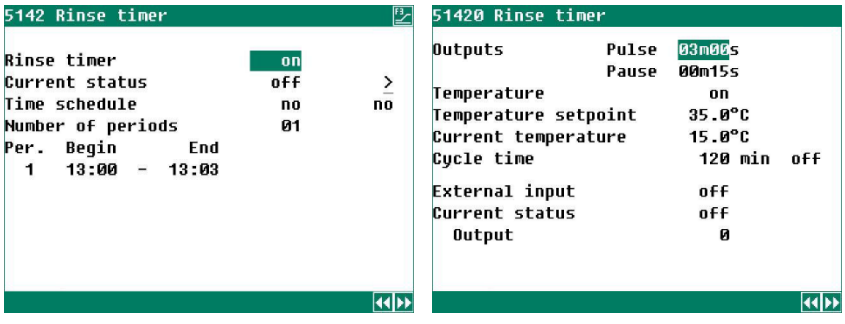
Cycle time After you have started rinsing, you cannot restart rinsing until the cycle time has elapsed. *Cycle time* shows the status: off → cycle time not active; on → cycle time active.

Current status Current status of the feed chain timer

Output The output (1..6) which is currently being activated (0 = no output).

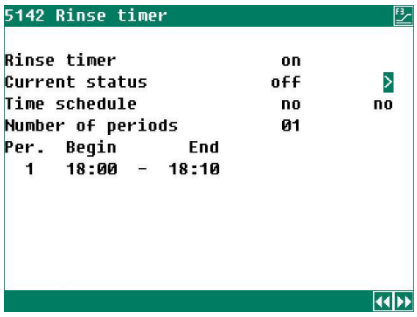
External input The feed chain can also be stopped temporarily via an external contact. When the input is active, the process is 'frozen'; once the input is no longer active, the process will continue again.

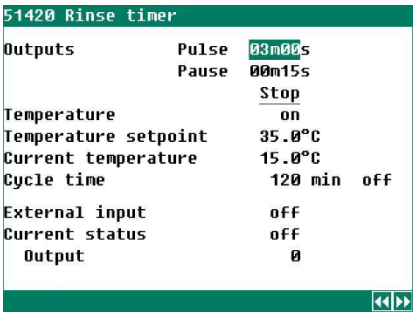
Rinse timer

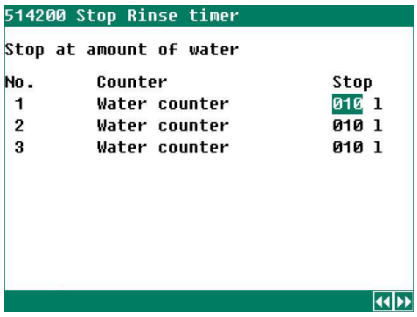


Without *Stop at amount of water*

The rinse timer (without *Stop at amount of water*) is set according to the feed chain.





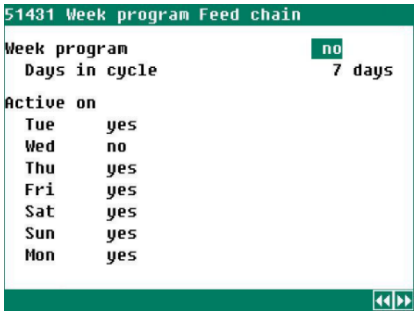


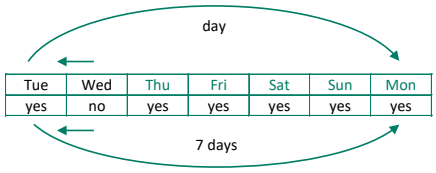
With *Stop at amount of water*

If the amount of water is reached within the pulse time, the next output is selected after the pause time has elapsed. This is repeated until all outputs have been used.

ANote-Timers-N-ENxxxxx

Weekly Program





For example, based on the *Week Program,* the feeding chain is active for 6 days and inactive for 1 day. In this case, then one day in the week is not fed.

The weekly program of the spool clock is set in the same way as the feed chain.

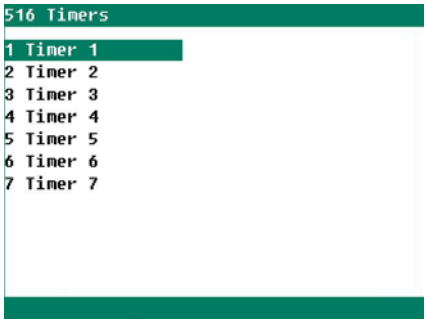
10.4 Laying nest timer

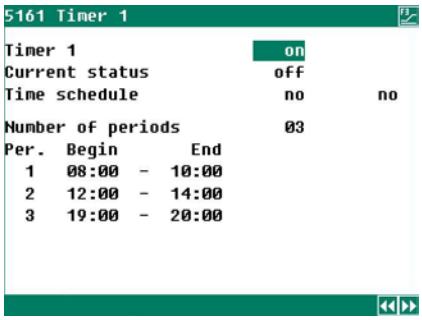
The PL-9400 has an on/off timer for opening and closing the laying nests. The opening and closing can even be done in intervals, according to the pulse-pause principle. Your installer sets the pulse-pause times so that the laying nests open and close at the required rate.

The laying nest timer is set in the same way as the standard timer, see *Timers*.

10.5 Timers

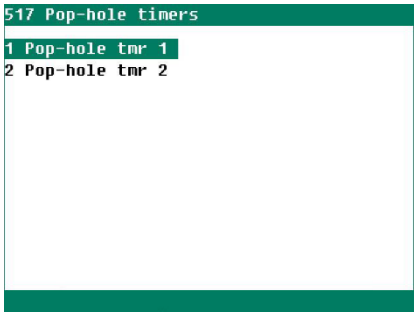
These timers are on/off time switches. The standard timers are controlled based on preset time schedules or a growth curve of preset time schedules.

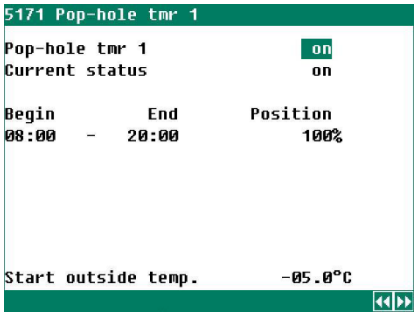




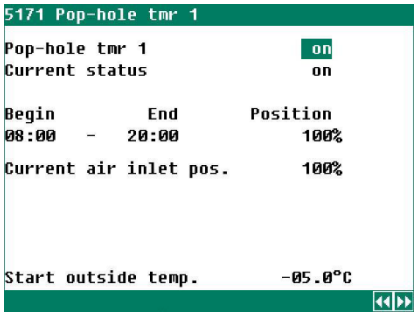
Standard timer

10.6 Pop-hole timers





On/off



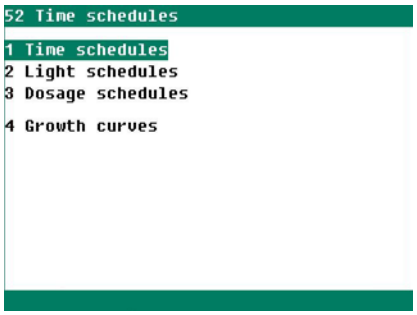
Controlled

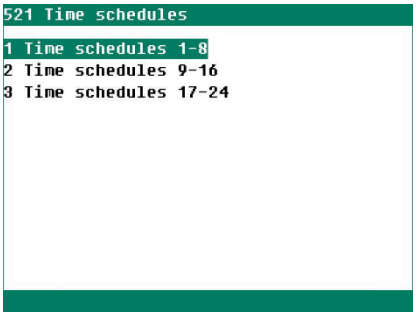
Outdoor timer 1	Enabling and disabling the pop-hole timer.
Current status	Current status of the pop-hole timer.
Begin - End	Period that the pop-hole timer is active.
Current pop-hole pos.	The pop-hole door position during the active period.
Start outside temp.	Below the outside temperature setpoint, the pop-hole timer does not activate.
Compensation Pressure control	See *Pressure control,* page 19.
Outdoor timer 2	This timer is set in the same way as *Outdoor timer 1*.

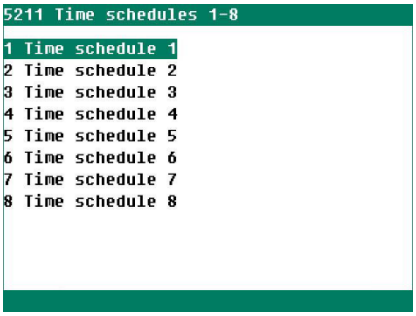
10.7 Setting growth curves and time, light and dosage schedules

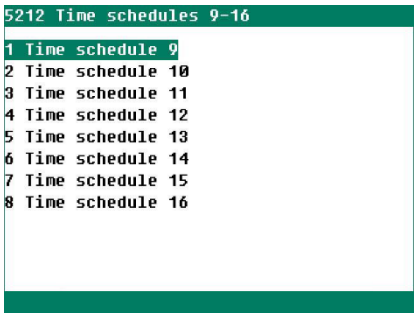
Time schedules

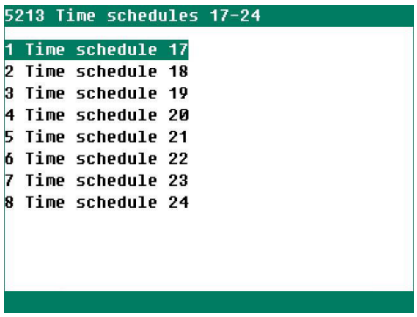
You can set a maximum of 24 different time schedules.

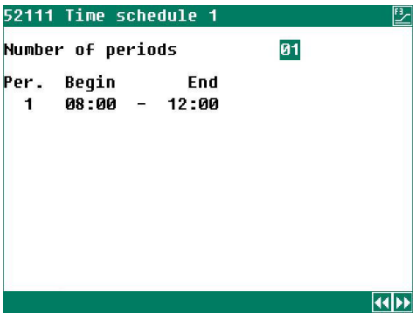








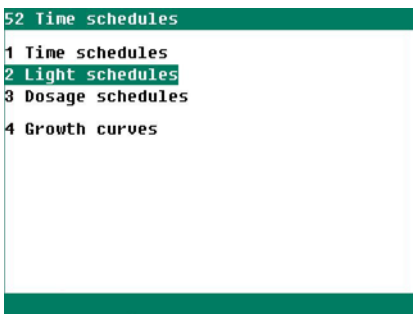


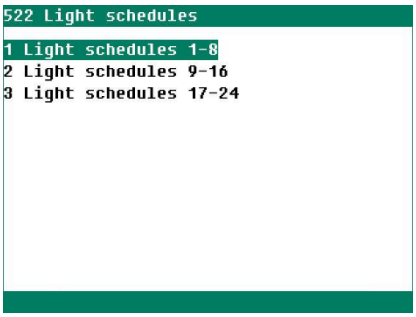


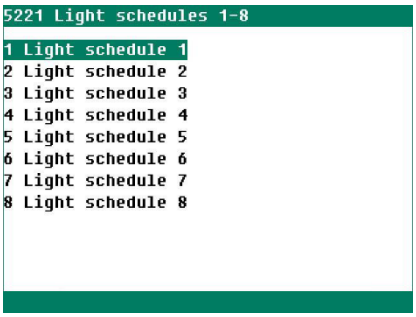
Each schedule consists of up to 24 periods.

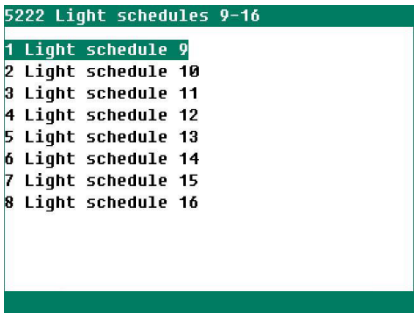
Lighting schedules

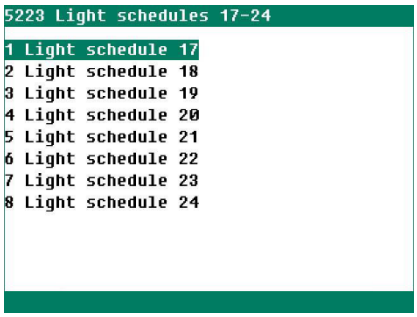
You can set a maximum of 24 different lighting schedules.

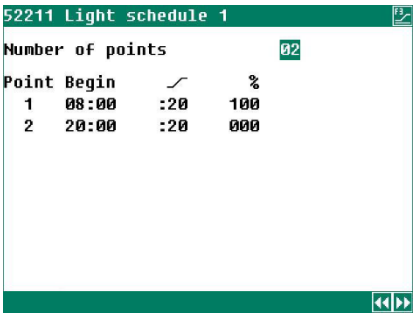








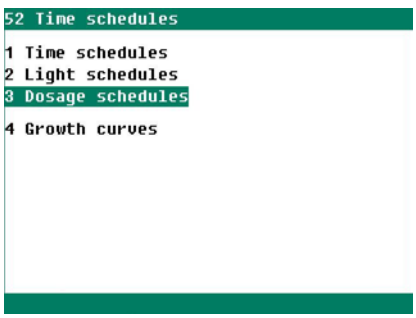


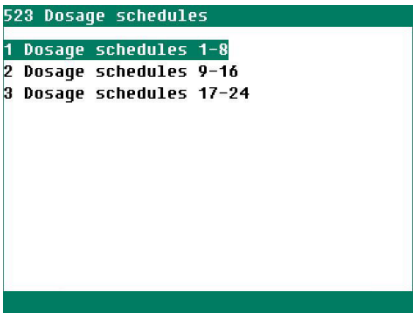


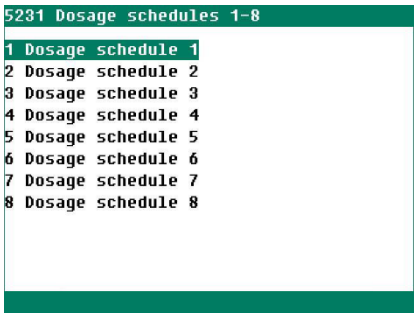
Each light schedule consists of up to 48 periods.

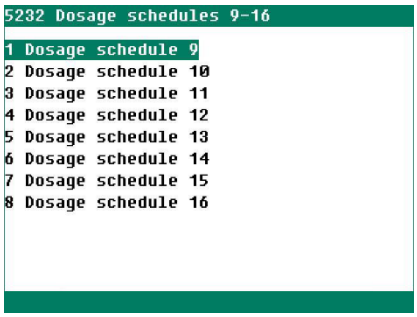
Dosing schedules

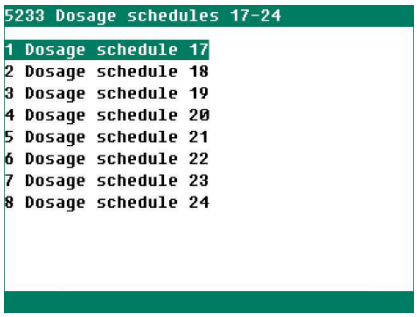
You can set a maximum of 24 different dosing schedules.

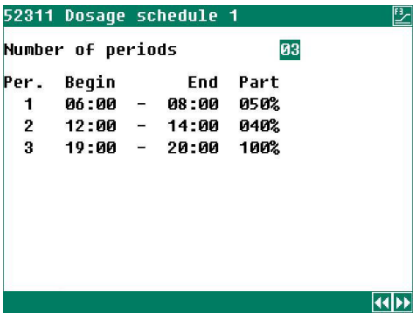








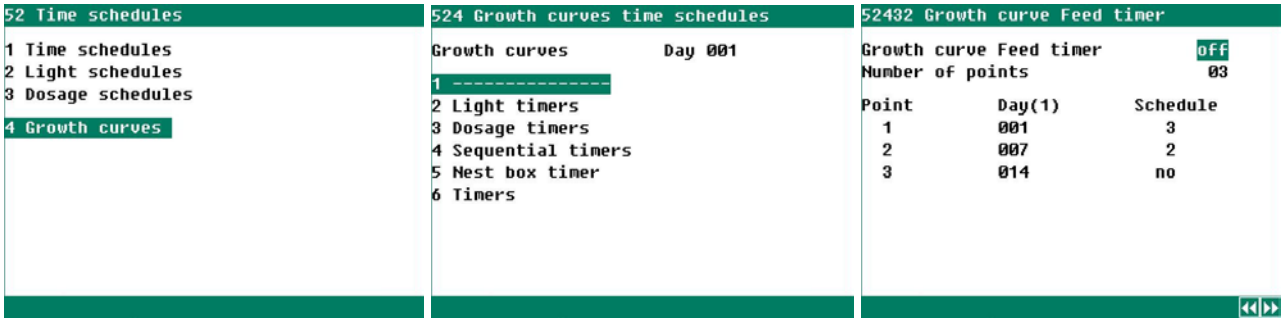




Each dosing schedule consists of up to 24 periods.

If your installer has set *automatic cycle distribution* for a dosage timer, the amount of feed to be fed is divided over the number of periods. In this case, the part is not taken as set in the time schedule (see page 34).

Growth curves



You can include the time schedules in a growth curve. As soon as the day number is reached, another time schedule is selected. If a breakpoint is set to *no*, the times of the original timer will be used, see page 33.

10.8 Date/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 PL-9400 poultry computer is linked to a feed computer, you cannot change the settings *First day of the week* and *Begin new day* on the PL-9400 poultry computer. These settings are taken from the feed computer.

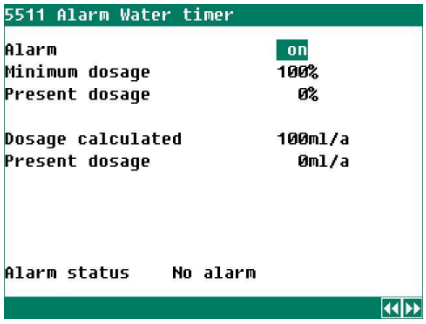
! Be careful when changing the *Begin new day* setting. If this time is within a dosing period, the error message *Beginning day in period* is generated.

10.9 Timer overview

A graphical overview of the time switches appears on the screen. The on/off times are only shown for the activated timers only. If a master timer has been installed, it will be displayed on every screen.

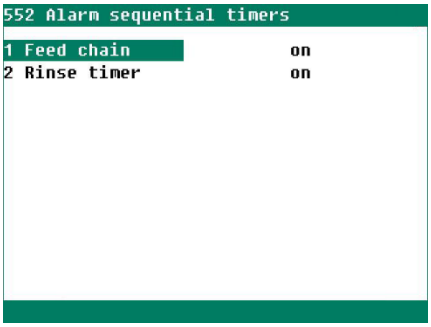
10.10 Alarm

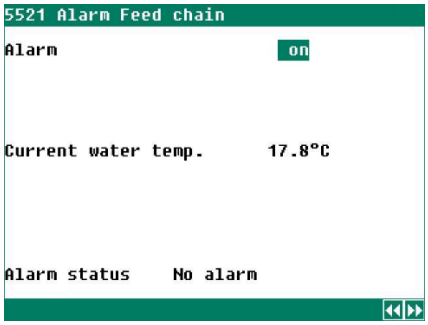
Water and feed timers



With a water/feed timer, you can set the minimum amount to dose. This is a percentage of the total amount to be dosed. If this percentage is not met, a dosing alarm[1] is generated.

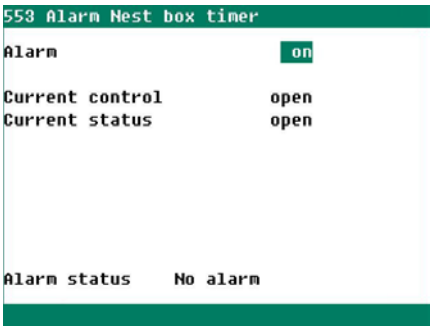
Sequential timers





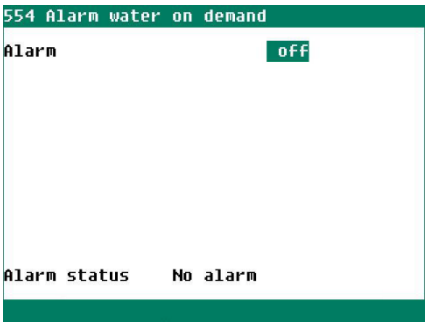
If the sequential timer has a temperature sensor, you can enable/disable the temperature alarm for the sequential timer in this screen[1].

Laying nest clock



Turning the laying nest timer alarm on/off[1].

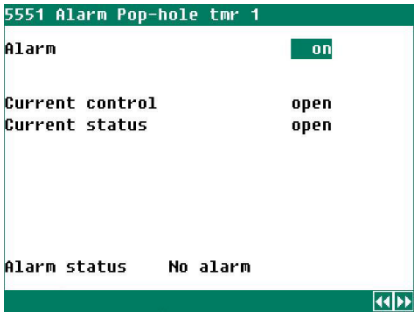
Water on demand



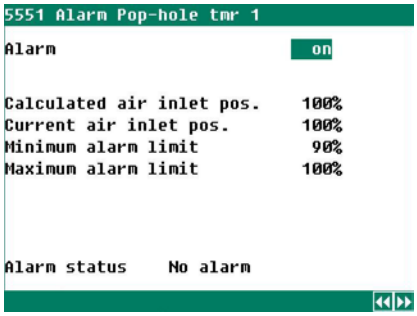
Alarm Turning the water-on-demand alarm on/off[1].

[1]*Alarm*
- *on* Alarms are transmitted to the poultry computer.
- *off* Alarms are not transmitted to the poultry computer.
- *time* Only when the *Alarm schedule* is active, alarms are transmitted to the poultry computer. Alarms that occur when the *Alarm schedule* is off, are not transmitted.

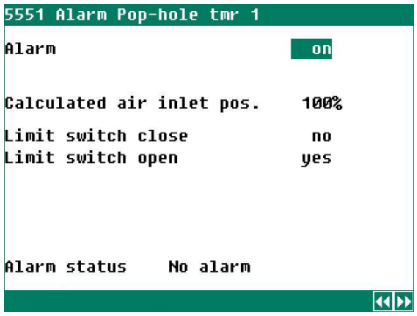
Pop-hole timers



On/off timer



Controlled timer



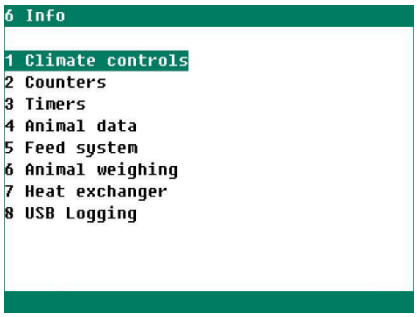
Limit switches (runtime)

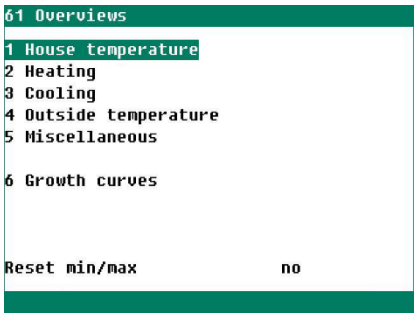
Alarm[1]	Enabling and disabling the pop-hole timer alarm.
Current control	Actual control of the pop-hole door.
Current status	Actual status of the pop-hole door: *closed, running* or *open.*
Calculated flap opening	With a controlled pop-hole door, the maximum pop-hole opening can be set at *Pop-hole timer*. In other cases, the maximum position is 100% (fully open).
Current flap opening	Actual pop-hole opening. 0% = closed.
Minimum alarm limit	Calculated pop-hole opening – 10% (minimal 0%)
Maximum alarm limit	Calculated pop-hole opening +10% (maximal 100%)
Limit switch close	Actual status of the limit switch close.
Limit switch open	Actual status of the limit switch open.
Alarm status	Actual alarm status.

[1]*Alarm*
- *on* — Alarms are transmitted to the poultry computer.
- *off* — Alarms are not transmitted to the poultry computer.
- *time* — Only when the *Alarm schedule* is active, alarms are transmitted to the poultry computer. Alarms that occur when the *Alarm schedule* is off, are not transmitted.

11 Info

11.1 Overviews

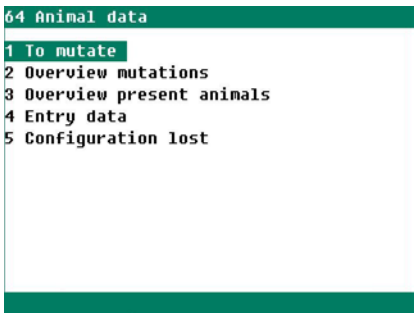




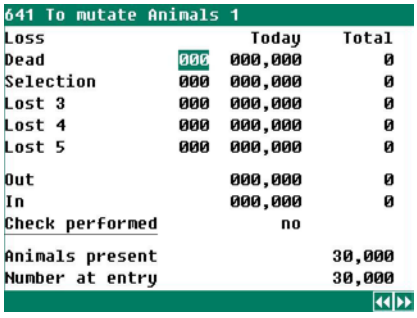
The screens of menu options *Climate Controls, Counters, Timers, Animal Data* and *Feed System* are identical to those of menu options 17 *Overviews*, 48 *Overview counters* and 54 *Overview timers* (see pages 22, 30 and 41).

Reset min/max temp. Here you can clear the min/max readings in all temperature views. The current value then appears at *Today*.

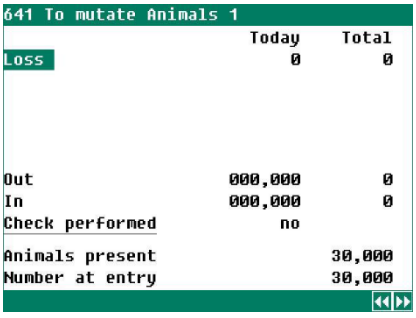
11.2 Animal data



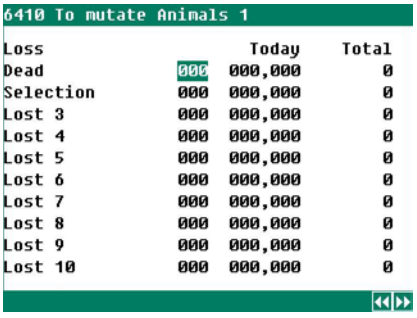
Mutations



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.

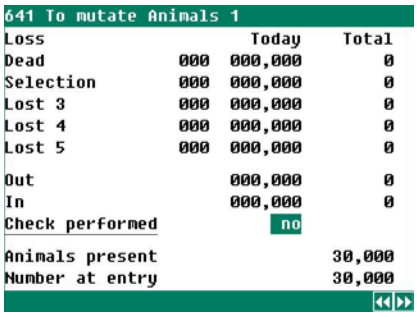
Lost You can set up to five loss categories.

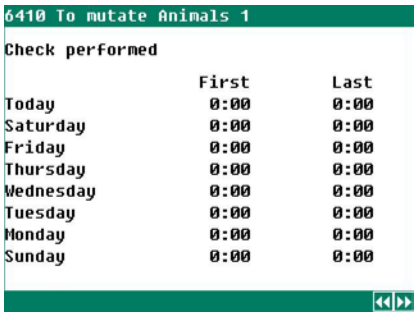
Dead Enter the number of animals which have lost at this moment (per group of animals). *Dead: Today* (today's mortality) is increased automatically by the value entered, after which the entry is erased.

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	*Number at entry – Total lost – Total out + Total in*.
Number at entry	The number of animals set-up in the house.

Check performed

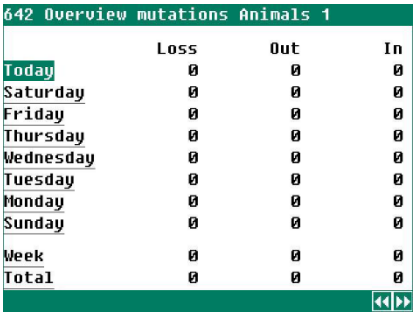
If it is necessary to record the mortality in two periods per day, you can use the function *Check performed*. *00:00* = not checked.





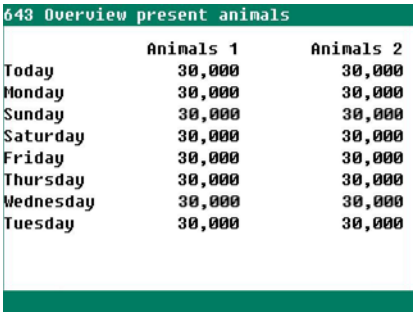
Check performed	Change *no* to *yes*: the table is filled. If you have not pressed the button today, the time is shown in the *First* column. If you have pressed the button several times today, the time is shown in the *Last* column.

Mutations overview



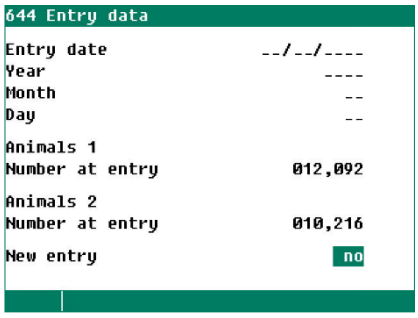
Displayed are the mortality, the number of animals unloaded (*Out*) and number of animals added (*In*), per day per animal group.

Overview of animals present



Display of the current number of animals in the barn per day by animal group.

Setting-up data



This data is entered at the beginning of each new round. The PL-9400 poultry computer uses this data to calculate the current number of birds, feed dosage, etc.

For two or more animal groups, the fill ratio depends on the sum of the total number of animals of all animal groups added together.

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.

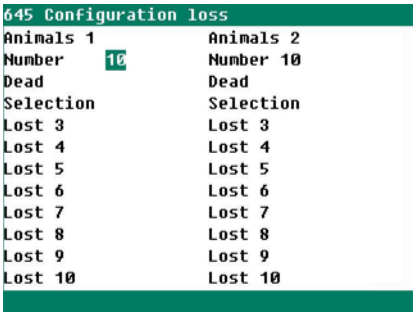
Number at entry The number of animals (per animal group) set-up in the house.

New entry When setting up the animals, *New entry* has to be set to *Yes.* After that:

- the setup date is given today's date;
- mortality tables are cleared;
- the corrections entered at *growth curve min/max main ventilation* and *auxiliary ventilation* are cleared;
- the *house temperature, min/max main ventilation* and *auxiliary ventilation* are recalculated from the growth curve;
- the occupancy rate is recalculated, if it depends on the setup data;
- the feed dosing will be started, if a feeding cycle is active.

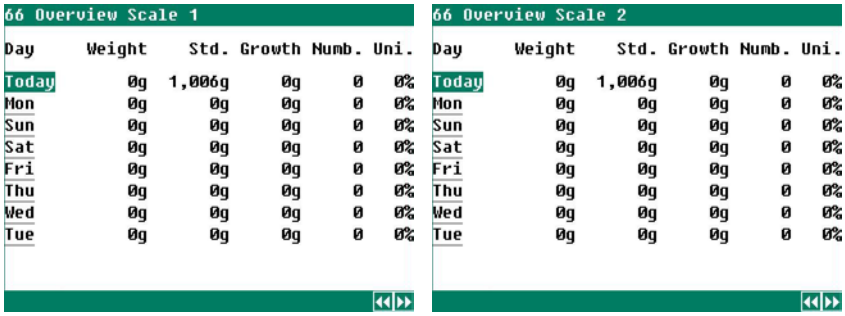
! The day number is not automatically updated.

Configuration of the mortality categories



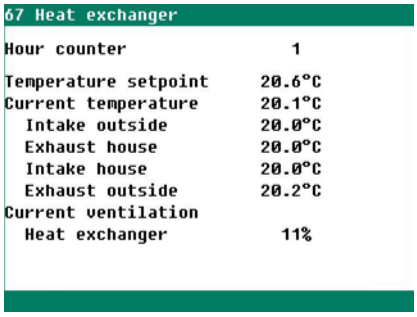
In this screen you set the number of failure categories (maximum 10) per animal group. These mortality categories appear in the mutation screen. For each category you enter the number of animals that have dropped out.

11.3 Weekly animal weighting overviews



You can view the data per scale. Use the ◀◀ ▶▶ keys to select the previous/next scale.

11.4 Heat exchanger overview screen

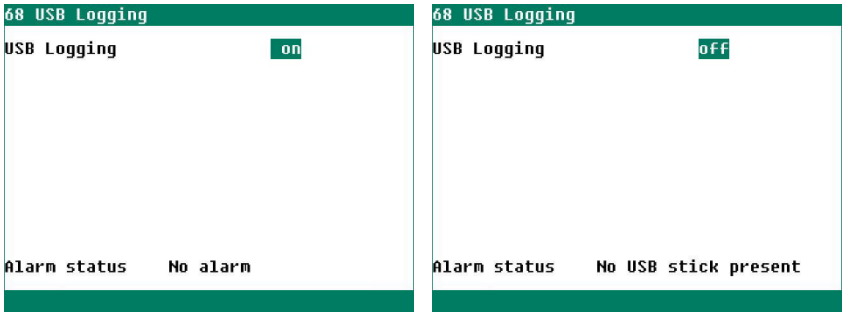


Some authorities require proof of proper functioning of the heat exchanger. Therefore, the temperatures of the heat exchanger must be recorded. The data is stored on USB.

The USB logging of the heat exchanger must therefore be on (installer setting).

ANote-HeatExcP-N-ENxxxxx

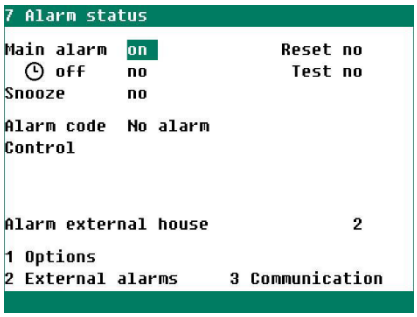
11.5 USB logging



If you turn off the USB logging alarm (no USB stick present), no more data will be saved from the poultry house, heat exchanger, manure belt, mixed air control and heating (heating control with fan).

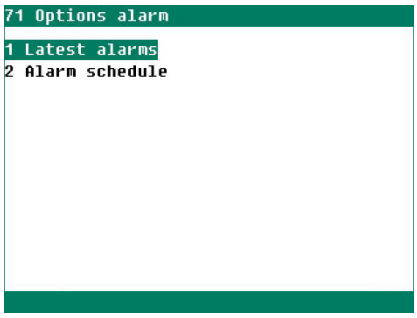
12 Alarm

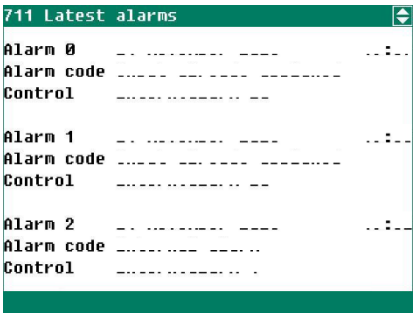
12.1 General



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

12.2 Latest alarms



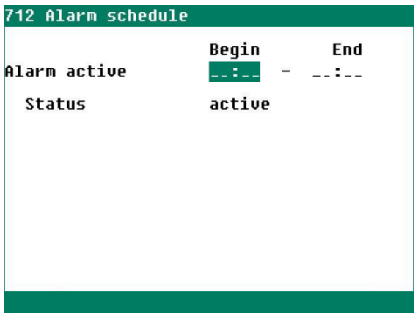


Alarm 0 The cause of the latest alarm with the time until when the alarm is/was active.

Alarm code The poultry computer stores the latest five alarm causes that have de-energized the alarm relay. Next to the alarm cause are displayed the corresponding date and time.

Press to display previous alarm data.

12.3 Alarm schedule

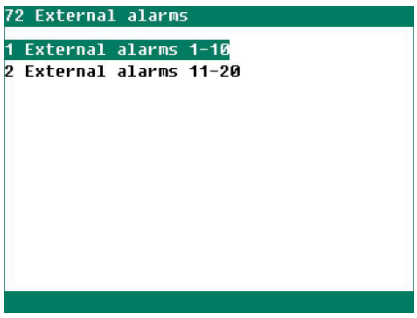


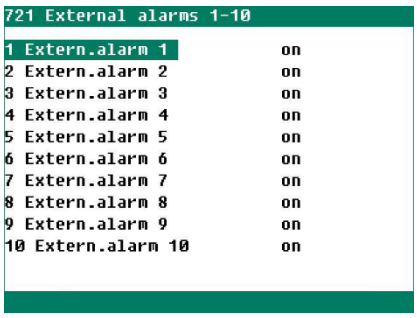
Alarm active With *Begin* and *End* you enter the period, during which the time-dependant alarms should be active.

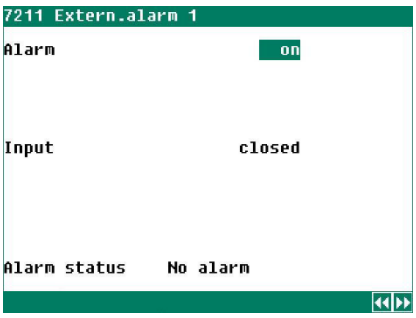
Status Only when the *Status* is active, time-dependant alarms will be transmitted to the poultry computer. Alarms that occur during the off-status will no longer be transmitted.

12.4 External alarms

Your installer can change the names of the *External alarms* (max. 15 characters per name).



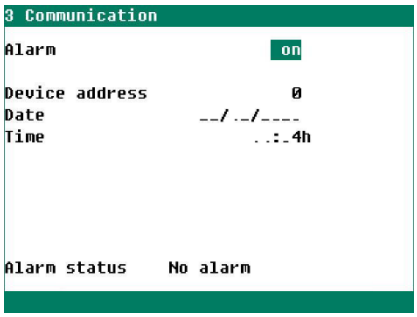




You can enable and disable the external alarms (up to 20). The follow-up screen shows the current alarm status and current input status.

Alarm	*on*	Alarms are transmitted to the poultry computer.
	off	Alarms are not transmitted to the poultry computer.
	time	Only if the *Alarm Schedule* is active, alarms will be transmitted to the poultry computer.

12.5 Communications



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.

Remember to turn the alarm back *on* after it has been turned off for troubleshooting. Preferably use the function *off* (*temporarily disable alarm*) 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.

12.6 Alarm codes

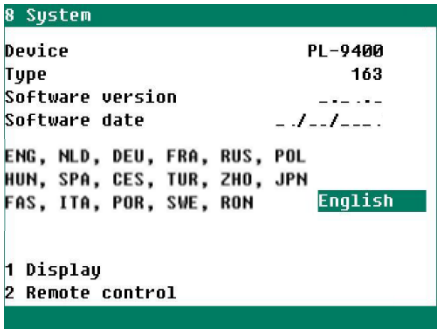
Alarm code	Description
Alarm unknown (xxx)	This alarm code cannot be translated into text. Please note the number displayed and contact your supplier.
CO2 too high	Measured CO2 exceeds the calculated maximum alarm limit
CO2 too low	The measured CO2 is lower than the calculated minimum alarm limit
CO2 sensor faulty	Measurement of CO2 sensor is outside the set limits.
Communication address x	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	Dosed water/feed volume is lower than minimum dosing amount, page 39.
External alarm	An external alarm has occurred, see screen 72.
Input already assigned	The input has been assigned to two or more controls.
Invalid combination	Dosage timer and animal group are both set to communication. This is not allowed. You can either set only dosing timers via communication (augers) or you can send the animal data via communication (valves).
Invalid component	In the silo assignment, a component has a silo number that does not contain the correct component. The component in one of the silos has changed.
Invalid counter	If you have two animal groups and the feed weigher is a PFV-9xxx, you need to assign each animal group to a separate counter.
Invalid input	The input number does not exist on the module.
Invalid mixing percentage	The set mixing percentages where the mixer is active for a short time should be increasing. Check the mixing percentages.
Invalid output	This output number does not exist on this module.
Invalid period (x) *x = period number*	▪ The times of a timer must be incremental. The difference between *Start* and *End* and between two periods must be at least 1 minute. ▪ With a lighting control, starting time + running time may not fall after the next starting time. However, the time may coincide with next start time.
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 found	▪ The module number set for the terminal does not exist. ▪ Poor or no connection between PL-9400-MODULE and module. ▪ The connection cable between the PL-9400-MODULE and the PL-9400 bottom PCB is missing or is loose.
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	A controller has been installed that requires an outside sensor which has not been installed.
No pressure control	The control installed requires a pressure control which has not been installed.

Alarm code	Description
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.
Not closed	Laying nest is still open after the runtime has been expired.
Not open	Laying nest is still not open after the runtime has been expired.
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 periods[1]	Several dosage timers are active at the same time.
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 detects feed	When opening the unloading valve, the feed sensor is covered with feed.
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 20 and 26.
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.

13 System

13.1 General

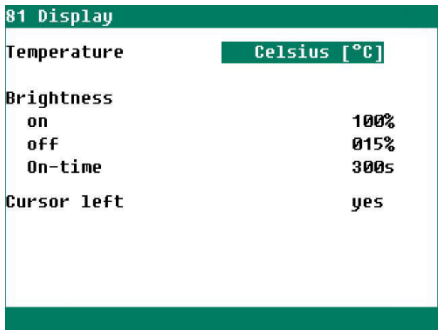


Device Type name of the device. In this example PL-9400.

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

Type	The type number of the device. The PL-9400 has type number 163.
Program version	The version number of the software in the PL-9400.
Program date	The date of the software.
ENG, NLD, DEU, ...	Setting of the language required of the screen texts: NLD=Dutch, ENG=English, DEU-Deutsch, etc.

13.2 Display

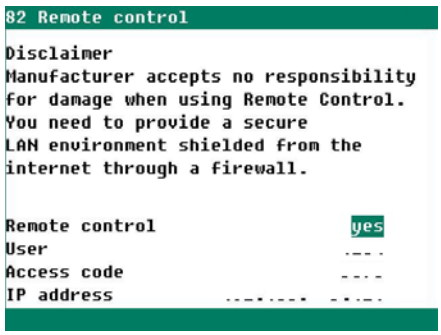


Temperature

Fahrenheit (°F)	Temperatures are displayed in degrees Fahrenheit.
Celsius (°C)	Temperatures are displayed in degrees Celsius.

Brightness	*on*	Setting of the display's brightness in operation mode.
	off	Setting of the display's brightness 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.

13.3 Remote control



ANote-Remote-N-ENxxxxx

14 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. ⚠ 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.