STIENEN
AGRI AUTOMATION

PL-9600 / PL-9600-i

Poultry management computer

PL-9600-i

User manual

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Disclaimer

We accept no liability for the contents of this manual and expressly disclaim any implied warranties of merchantability or fitness for a particular purpose.
We reserve the right to revise or modify this manual without prior notice.
Stienen BE shall not be liable for any damage or injury resulting from improper or negligent use of the product, or from use that is not in accordance with the instructions in this manual, except in cases of intent or gross negligence on our part.

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1 About this manual

This manual is intended for the user of this device. It contains all the information necessary for operating and maintaining this product. Please read all the information and instructions carefully before using the product. Symbols in this manual highlight warnings, important notes, tips, and other relevant information.

This manual has been compiled with the greatest care. If you discover any errors, please inform us.

1.1 Symbols and definitions


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


Warning: danger to product, people, and animals if procedures are not strictly followed.


Warning: risk of damage to products if procedures are not strictly followed.


Pressure cleaning is not permitted.


Collect as separate waste streams.


Important note.


Additional information


Example of a practical application of the described functionality


Example calculation


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Application note

1.2 Customer service

If you have any questions, please contact your installer. Be sure to have all the necessary product information at hand. Always record the cause of a fault (if known) and the circumstances under which it occurred. This will help avoid ambiguities and enable us to resolve issues quickly and effectively.

2 Safety instructions and warnings

Read this chapter carefully before using the device. Installation and troubleshooting may only be performed by certified installers in accordance with applicable guidelines. Improper installation or operation will void the warranty.

2.1 Independent alarm system

Although the device has been carefully designed, technical failures may still occur. Connecting alarm contacts to a central alarm unit is often required. Install an independent alarm device, such as a min/max thermostat, and test the alarm at least once per week.

2.2 During use

All persons operating the device must read this manual carefully and be aware of the potential hazards that may result from incorrect use or improper maintenance.

The device may only be opened by authorised personnel.

Preferably do not switch off the control computer when the device is not *in use*. Instead, set it to *Off* mode. This prevents unnecessary alarms, communication failures, and condensation caused by cooling.

Regularly inspect the device for possible damage. A damaged device is unsafe. Always report any damage to your installer.

The device, which contains electronic components, is splash-proof and must not be cleaned with running water.

In the event of an emergency, record the following: the circumstances under which the emergency occurred, installation settings, software date, software version number, and any possible causes.

2.3 Disposal

The EU has established systems for the separate collection of discarded electrical and electronic equipment and batteries (Directive 2012/19/EU). Incorrect disposal may result in a fine.

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

3 Introduction

3.1 Intended use

The PL-9600 poultry management computer is an advanced solution for poultry house automation. This intelligent and user-friendly system controls ventilation, heating, and cooling in modern poultry farms.

With the help of widgets, graphs, and extensive logbook recording, you can easily monitor and manage key data such as temperature, water consumption, feed intake, weight, production, humidity, light intensity, and CO_2 and NH_3 levels. The graphical display provides immediate insight into essential management information, enabling efficient and clear management of your poultry house.

4 Operation

4.1 Screen layout

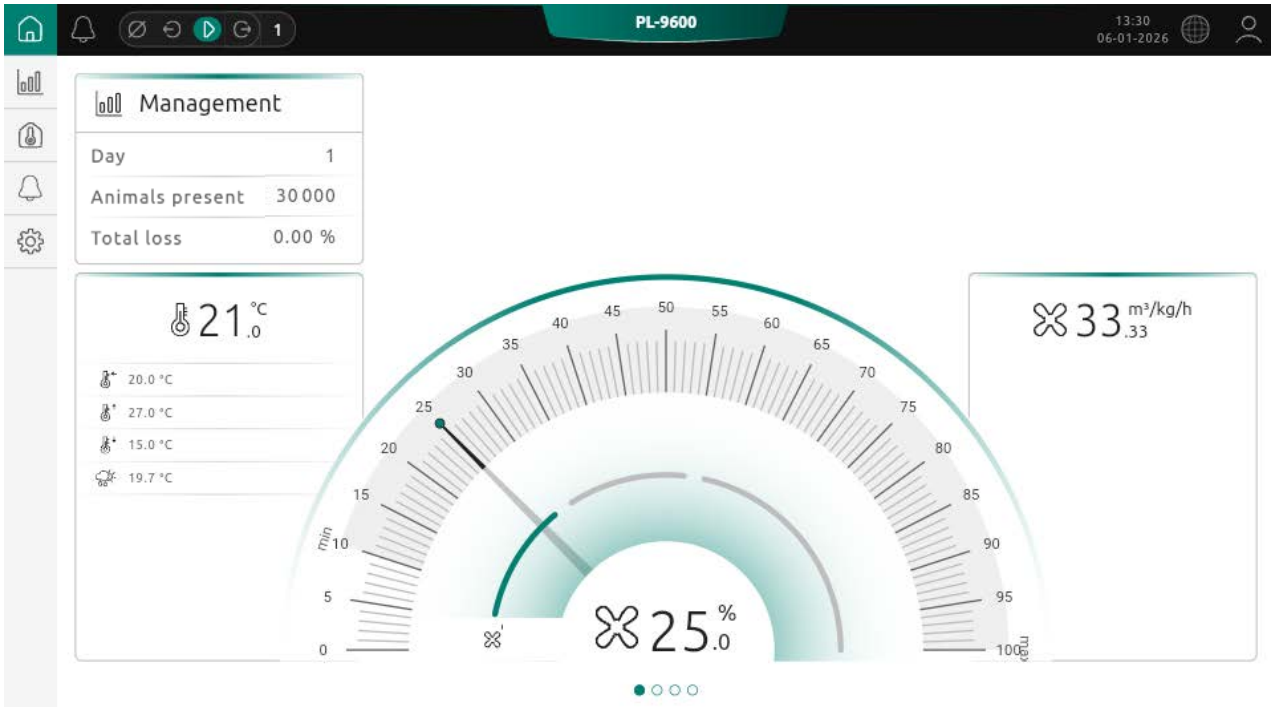


Fig.1PL-9600 Main screen (start-up screen)

4.1.1 Main screen with dashboard

After switching on the PL-9600, the main screen with dashboard appears. You can configure this dashboard yourself; see section 5.3 for details.

You can always return to this overview screen using the Main Screen button .

4.1.2 Display and buttons in the main screen title bar

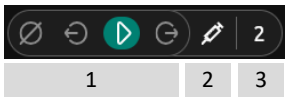
At the top right of the screen, you can see the following buttons, depending on whether you are logged in:

15:42 06-01-2026	*Current date and time.*
	Select language. Allows you to choose the language in which the PL-9600 displays text. This setting can also be accessed via *System > General*.
	Select user/installer mode. itch between user mode and installer mode. In installer mode, (sub)menus are highlighted in orange, as is this icon.
	Log out. Tap this button to return to the PL-9600's main screen (start-up screen). To change settings, you must log in again.
	Log in. This gives you access to user or installer mode.

At the top left of the screen, next to the *Main Screen* button, the following readings are displayed (from left to right):

	*Alarm status.* A flashing red alarm bell indicates that one or more alarms are active. The number shows how many alarms are currently active.

4.1.2.1 Quick menu



The *Quick Menu* shows the current *operating status (1),* the *active program (2),* and the *current day number in the growth curve (3)* using symbols.

***Management* tab**

	*Flock cycle status = Empty (cycle closed)* Possible cycle action: *Create cycle* Possible programs: *Not in use, Disinfecting, Cleaning* and *Drying.* When creating a new flock cycle, the following information is required: *Flock name*, *Animals* (expected number of animals), and *Entry day* (day number in the growth curve). ! All counters are automatically reset when a new flock cycle is created.
	*Flock cycle status = Startup* Possible cycle actions: *Close cycle, Start cycle,* and *Modify day number*. Possible programs: *Not in use, Disinfecting, Setting up* and *Preheating.* When starting a new flock cycle, the following is requested again: *Flock name*, *Animals* (expected number of animals), and *Day* (day number in the growth curve).
	*Flock cycle status = In use* Possible cycle actions: *Stop cycle*, and *Modify day number.* Possible programs: *Brooding, In use, Vaccinating* and *Catching*
	*Flock cycle status = Not in use* Possible cycle actions: *Close cycle* and *Resume cycle* Possible programs: *Not in use, Cleaning* and *Drying*.

***Mutations* tab**

Here you can manage the mutation data (see section 6.1.4).

***Silos* tab (visible only with PFB35/70 en PFA-9400)**

Here you can manage the silo data (see section 8.1.1).

Current program:	*Not in use* *Disinfecting* *Setting up* *Preheating* *Brooding* *In use* *Vaccinating* *Catching* *Cleaning* *Drying*
	Day number. The number of days the animals have been in the poultry house.

4.1.3 Main menu

On the far left of the screen, a vertical column of icons provides access to the main menu options. The color of each icon indicates the active mode:

- **Green** = user mode
- **Orange** = installer mode

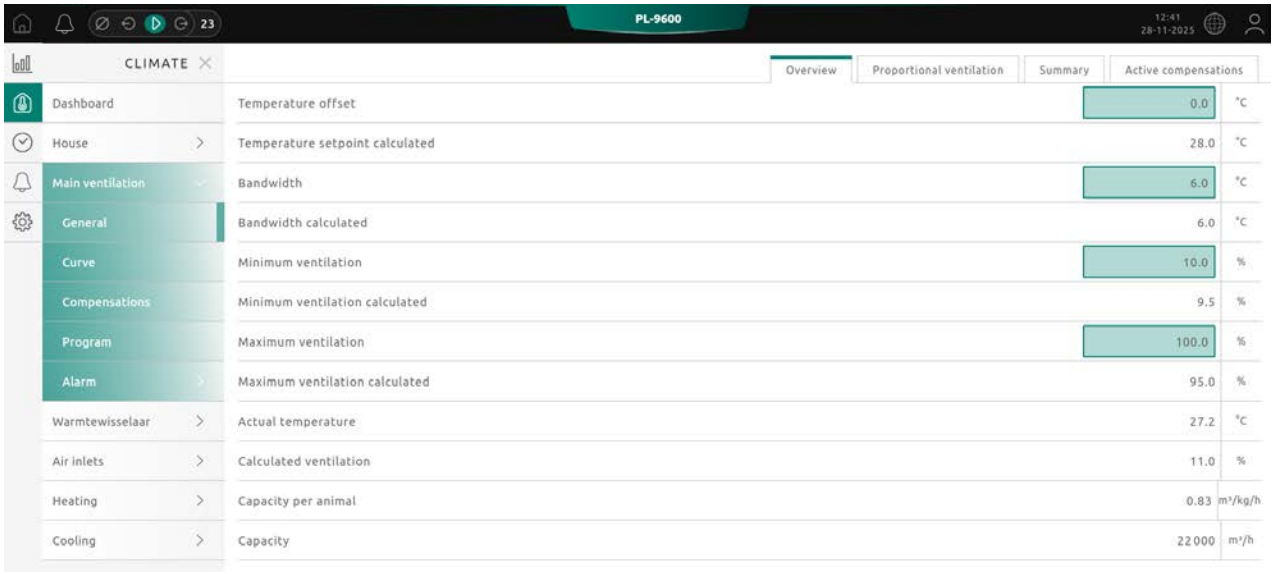
MAIN SCREEN
MANAGEMENT
CLIMATE
WATER/FEED
TIMER SWITCHES
ALARMS
SYSTEM

4.2 Menu navigation

A pointed button ( ) indicates that one or more submenus are available. Tap this button to open the corresponding submenu. A separator (>) after a menu option indicates that further navigation to a deeper submenu is possible.

Navigate step by step through the menus until you reach a final screen showing measurements, settings, and/or controls. This information may be spread across multiple tabs. Only when you tap a specific option in the submenu the overview with the corresponding parameters will be displayed.

The screen below appears after you have made the following selections in sequence:
CLIMATE > *Main ventilation* > *General* > Tab: *Overview.*



When you are logged in, a green frame appears around a text field to indicate that the setting can be edited.

4.3 Changing names

You can change the names of animal groups, mutation classes, and the management computer itself.

Procedure

1. Tap the name with the green frame that you want to change.
2. A virtual keyboard will appear.
3. Enter the desired name (maximum 15 characters).
4. To cancel the change, tap Cancel to return to the previous screen.
5. Tap the reset icon (if necessary) to return to the original name.
6. Confirm the new name by tapping OK . You will then automatically return to the screen showing the updated name.

5 System and basic configuration

5.1 Setting permissions using PIN codes

To protect the PL-9600 from unwanted changes by unauthorised users, To protect the PL-9600 from unwanted changes by unauthorised users, you can create separate users, each with their own PIN code. These users can be configured in the user menu under *SYSTEM > Authorisation* (*Local* and *System* tabs), see section 11.2.

Before you can use the PL-9600, you must log in as a user with the appropriate authorisation.

5.2 Switching controls on and off

For several controls, such as heating and cooling, you can specify whether the control should be active under the first sub-option *General*.

Tap here to disable the option.

Tap here to enable the option.

After each change, a brief confirmation message will appear in the bottom-right corner of the screen.

5.3 Creating a dashboard for a menu item

You can create a separate dashboard for each menu item in the main menu (*Management, Climate, Water/Feed, Timers* and *System*). You can choose which widgets are visible and where they are placed.

Method

1. Select a menu item in the main menu. The *Dashboard* button will now turn green.
2. Press and hold your finger on an empty area of the dashboard. A grid with plus signs will appear.

   ! If the menu is covering part of the grid, close it using the **×** button.
3. If widgets are already installed on a dashboard, you can add an extra dashboard. Swipe left to open a new, empty dashboard.
4. Tap a plus sign in the grid at the position where you want to place a parameter. A list of available widgets will appear.
5. Each widget shows how many grid boxes it requires from the selected position. After adding a widget, you can swipe left to add an extra dashboard:  .
6. Select a widget. The selected field will turn green.

   ! If a widget does not fit, its text will be greyed out and it cannot be selected. In that case, choose another position in the grid or select a smaller widget.
7. Confirm your choice with *OK*.
8. Repeat steps 3 to 5 to add additional widgets.
9. Tap *Save* in the bottom-right corner to save the dashboard.
10. Repeat the above steps for each additional dashboard you want to create.

5.4 System, network and *FarmConnect*

Under the *SYSTEM* option, you can view the current information related to the system, the network, and *FarmConnect*. Settings that can be adjusted are shown with a green field. See section 5.1 and chapter 11.

6 Management

6.1 Animals

Under this menu option, you can set up a new flock of chicks and program growth curves for up to two animal groups (e.g., hens and roosters, installer setting)). You can then enter changes and track overviews for each animal group.

6.1.1 Setting up a new pair of animals

MANAGEMENT > Animals > Setup data

***Settings* tab**

1. Enter the date on which the animals (animal groups) will be placed in the house under *Setup date*.
2. If necessary, change the names (*Name* and *Short name)* of *GROUP 1* and *GROUP 2*. See section 4.3 .
3. Enter the number of animals set up per animal group under *Number at set-up*.
4. Enable (✓) the *New setup* option to confirm the setup data you have entered.

6.1.2 Programming the growth curve

MANAGEMENT > Animals > Growth curve

***Curve* tab**

For each animal group, enter the desired animal weight (in grams) at each breakpoint. The PL-9600 uses these weights as a reference for animal weighing and to calculate ventilation capacity (m^3/kg/hour).

	Day	Hens g	Roosters g
1	1	40	50
2	7	162	202
3	14	410	450
4	21	765	805
5	28	1186	1206
6	35	1666	1816
7	42	2161	2411

Example of a growth curve

***Settings* tab**

Number of breakpoints	Specify how many breakpoints the growth curve should have (up to 20).

6.1.3 Defining mutation classes

MANAGEMENT > Animals > Animal group x > Mutation classes (*Settings* tab)

***Settings* tab**

Number of mutation classes	Enter the number of mutation classes (maximum 10).

***Names* tab**

Assign each mutation class a descriptive name (maximum 20 characters) and an abbreviated name (maximum 3 characters). The abbreviation is used in overviews and reports. See section 4.3.

6.1.4 Entering and updating mutations

MANAGEMENT > Animals > Animal group x > Mutations

***Mutations* tab**

Loss	Enter the number of animals that have died for each mutation class.
Today	Displays the total number of animals that have died today for each mutation class. Incorrect entries can be corrected here.
Total	Displays the total number of animals that have died since the start of the flock (setup date) for each mutation class.

***Settings* tab**

Out	Enter the number of animals that have been removed from the poultry house. These are not dead animals, but for example, animals that have been unloaded. The number of animals entered is added to *Today out* and then reset to 0.
Today out	Displays the total number of animals entered in *Today out*.
Total out	Displays the total number of animals that have been removed from the poultry house since the start of the flock.
In	Enter the number of animals, for example, roosters that you have added to the poultry house in the meantime. The number of animals entered is added to *Today in* and then reset to 0.
Today in	Displays the total number of animals entered in *Today in*.
Total in	Displays the total number of animals that have been added to the poultry house since the start of the cycle.
Number at entry	The number of animals placed in this poultry house at the start of the flock.
Animals present	Displays the current number of animals in the poultry house: *Animals present = Number at entry - Total out + Total in.*
Check performed	To record daily losses in two parts of the day, use the *Check Performed* function. Enable this option to add a check time. The first registration of the day will be recorded in the first column. Subsequent registrations appear in the last column, showing the most recent time of that day.

***Check* tab**

This tab displays an overview of the recorded check times for the past week.

The *first* column displays the first check-in time of the day.
The *second* column displays the last recorded check moment of the same day.
00:00 indicates that no check was performed at that time.

	First hh:mm	Last hh:mm
Today	07:40	00:00
Yesterday	07:50	14:20
Sunday	08:00	15:10
Saturday	7:55	14:08
…		
Tuesday	7:42	13:59

Example of recorded check times

6.1.5 Overviews per animal group

MANAGEMENT > Animals > Animal group x > Overview

***Overview* tab**

Overview of the numbers recorded today and over the past seven days:

Loss	Displays the number of animals that have died today.
Out	Displays the number of animals removed from the poultry house today.
In	Displays the number of animals added to the poultry house on this day.
Animals present	Displays the number of animals currently present in the poultry house.

***Total* tab**

Overview of the numbers recorded this week and the total for this flock:

Week loss	Displays the number of animals that have died this week.
Week out	Displays the number of animals removed from the poultry house this week.
Week in	Displays the number of animals added to the poultry house this week.
Total loss	Displays the total number of animals that have died since the start of the flock.
Total out	Displays the total number of animals removed from the poultry house since the start of the flock.
Total in	Displays the total number of animals added to the poultry house since the start of the flock.

6.1.6 Overview of absolute and relative numbers per animal group and per mutation class

MANAGEMENT > Animals > Animal group x > Overview per class

***Overview* tab**

The first columns show the registered numbers per *mutation class* for today, the past seven days, this week and total in this flock. You will see two columns: the left column shows the absolute numbers and the right column shows the *relative* numbers (%) compared to the *number at start-up*.

6.2 Animal weighing

In combination with the WDP-50 or WDH-250 scales, the PL-9600 forms a poultry weighing system that calculates, records and displays the weighing results on a daily basis. The following values are calculated daily: *average weight, growth, uniformity* and, optionally, the *multi-day average*.

6.2.1 Overview per weighing scale

MANAGEMENT > Animal weighing > Overview

The current daily overview shows the following for each weighing scale: the *average weight (g),* the *standard weight (g),* the *growth (g),* the *weight of the last weighing (g),* the *number of measurements, todays uniformity (%)*, and the *current day number*.

6.2.2 Settings per scale

6.2.2.1 General settings

MANAGEMENT > Animal weighing > Scales 1+2 > General

Under the *General* option, select the desired parameters and configure the scales. Disabled parameters are not displayed.

***Overview* tab**

The *Overview* tab displays the following data for today and the past seven days:

- *Age (days)*
- *Average weight (g)*
- *Standard weight (g)*
- *Growth (g)*
- *Multi-day average*
- *Number of weighings*
- *Uniformity (%)*

Additional columns show percentages from 55% to 110%. These indicate the proportion of animals that have reached at least the specified percentage of the standard weight.

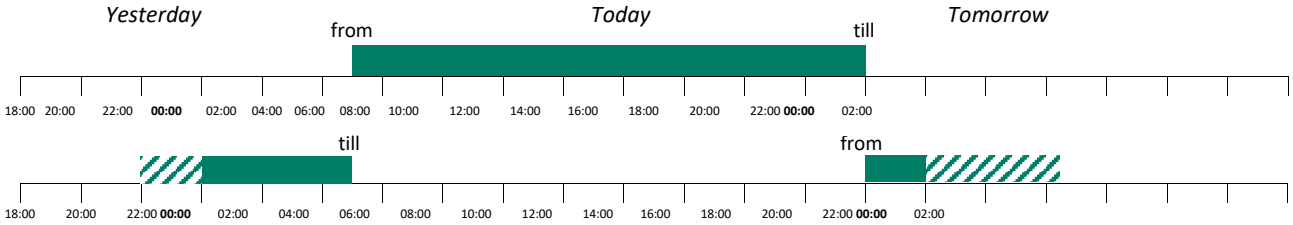
Tap the cross in the top-right corner of the left menu bar to close the window and view the full table.

***Settings* tab**

Defining norm	The computer uses a *standard weight* to calculate an animals weight. This can be determined in five ways:	
	Automatic	The average weight of the previous day.
	Automatic + growth	The average weight from the previous day plus the average daily growth.
	Norm curve	The standard weight is calculated daily from the standard curve.
	Manual	The standard weight is set manually (set point).
	Average of days	The average weight over several days, including the previous day.

Standard weight	The calculated value of the standard weight, based on the selected norm determination. If *Defining norm* is set to *Manual*, you can set the standard weight yourself here.
Scale in group	Select the animal group for this scale.

Weighing period



Weighing period from	Specify the time (hh:mm) from which weighings should be recorded by this weighing scale.
Weighing period till	Specify the time (hh:mm) until which weighings should be recorded. If the end time is the same as the start time, weighings will be recorded throughout the day.
Average weight lower and upper limits	Set separate lower and upper limits for the average weight, as a percentage of the standard weight. Only measurements within these limits will be stored.
Uniformity lower and upper limits	Set separate lower and upper limits for uniformity, as a percentage of the standard weight. Only measurements within these limits are stored. The average weight is calculated by summing all valid measurements and dividing by the number of measurements. Uniformity is calculated in the same way, considering only measurements within the set limits. These limits must fall within the range of the average weight.
Multiple-day average	Activate this option if you want to use this parameter.
Average of *(visible only if Multiple-day average = active)*	Specify the number of days over which the multi-day average should be calculated.
Week program	Activate this option if you want to use this parameter.
Days in cycle *(visible only if Week program = active)*	Specify the number of days in the cycle within the weekly program. Weighings or measurements are performed on specific days, depending on the cycle duration.

***Week program* tab**

Select the days in the cycle when animal weighing is active.

Do not set the *Week Program* if *Defining norm* is set to *Automatic + growth* as growth on a skipped day will be zero or negative.

6.2.2.2 Alarm setting for scales

MANAGEMENT > Animal weighing > Scales 1+2 > Alarm

***Settings* tab**

Alarm	Set the alarm for the scales. Options:	
	Off	Animal weighing alarms are not forwarded to the main alarm.
	On	Animal weighing alarms are forwarded to the main alarm.
	Time	Animal weighing alarms are only forwarded if *ALARMS > Time alarms > Status = active.*

If the alarm status displays *Not calibrated*, please contact your supplier. In this case, the scale must be returned to the factory for recalibration. Scales are calibrated as standard upon delivery.

6.2.3 Setting the standard curve and standard weight

To calculate an animal's weight, the computer requires a target value: the *standard weight*. This standard weight can be entered manually or determined automatically using the standard curve, depending on the setting under *Defining norm* (see section 6.2.2).

If you use the standard curve, the standard weight is calculated every day at midnight based on the day number and the selected curve. At the start of a new flock, you must manually set the correct day number.

MANAGEMENT > Animal weighing > Norm curve

***Curve* tab**

For a maximum of 20 breakpoints (adjustable via the *Settings* tab), enter the day number and animal weight (in grams) for each breakpoint. This can be done for up to two animal groups, for example, roosters and hens. You can use the data from the flock card, available from your supplier.

See section 6.1.2.

6.3 Water and feed consumption

6.3.1 Historical weekly overview

MANAGEMENT > Water/feed > Overview

Overview tab

The historical weekly overview provides insight into:

- daily water consumption (litres per day and millilitres per animal),
- daily feed consumption (kilograms per day and grams per animal),
- the daily water/feed ratio (W/F).

At the bottom of the table, you can see the weekly totals and the cumulative totals since the start of the current flock or the last reset.

6.3.2 Amount of distributed feed

MANAGEMENT > Water/feed > Fed

Overview tab

Contains	The type of feed or component in the relevant silo.
Contents (kg)	The current quantity in the silo, in kilograms. This value can be adjusted manually, for example after a new delivery or to correct discrepancies.
Fed (kg)	The total quantity of this component that has been fed to the animals since the specified reference date.

This gives a clear overview of both the current stock per silo and the consumption over the selected period.

6.3.3 Filling the silo

MANAGEMENT > Water/feed > Filled > Silo x (up to 16 silos)

Overview tab

The overview shows the *dates (DD-MM-YYYY)* and *times (hh:mm)* when the silo was filled, as well as the quantity of the component added at each filling.

6.4 Feed and water counters

6.4.1 Consumption per animal group

MANAGEMENT > Counters > Group total

***Overview* tab**

This tab shows the following for each animal group:
- *Today*'s consumption
- Consumption for each of the *past seven days*
- *Total weekly consumption,* calculated from the *first day of the week* (see section 11.1)
- *Total consumption* since the last counter reset or since the start of the flock.

6.4.2 Consumption per counter

6.4.2.1 Overview

MANAGEMENT > Meters > Meter name > Overview

***Overview* tab**

This tab shows the following for each counter:
- *Today*'s consumption
- Consumption for each of the *past seven days*
- *Total weekly consumption* calculated from the *first day of the week* (see section 11.1)
- *Total consumption* since the last meter reset or since the start of the flock.

***Settings* tab**

Clear counter	Activate this option to reset this counter.
Current consumption	Displays the current consumption per hour.

⚠ When this counter is cleared, all data from this counter will be deleted.

6.4.2.2 Alarm settings

MANAGEMENT > Counters > Counter name > Alarm

***Settings* tab**

Alarm	Set the counter alarm: *Off* Counter position alarms are not forwarded to the main alarm. *On* Counter position alarms are forwarded to the main alarm. *Night off* Counter position alarms are forwarded only if *Night period status = Not active*.
Maximum	The maximum consumption allowed during the period (*In)*. If a growth curve is active, the system automatically determines the maximum allowed consumption based on the values defined in the curve. If no growth curve is being used, you can manually set the maximum consumption according to your requirements. Exceeding this limit within the set time frame triggers a *Maximum Supply Alarm*, for example in the event of a pipe break or leak.
In	The time period (minutes) over which the set maximum consumption applies. If a growth curve is active, the duration is automatically calculated based on the curve; otherwise, it must be set manually.
Minimum	The minimum consumption that must be recorded during the period (In). If a growth curve is active, the system automatically determines the minimum based on the values defined in the curve; otherwise, it can be set manually. Failing to reach this minimum within the specified time frame triggers a *Minimum Supply Alarm*, for example if a water valve does not open or a feed screw fails to start.
In	The time period (minutes) over which the set minimum consumption applies. If a growth curve is active, the duration is calculated automatically from the curve; otherwise, it must be set manually.

The *Minimum Supply Alarm* must be enabled by your installer. This allows you to monitor the *minimum water supply*, for example during the light period.

If the meter is connected to a *dosing timer*, the output of the timer will also be switched off when an alarm occurs.

6.4.3 Resetting meter readings

MANAGEMENT > Counters > Reset

***Settings* tab**

Clear all counters	Enable this option to reset all counter readings to zero.

6.5 Egg counters

6.5.1 General

MANAGEMENT > Egg counters > General

Laying percentage tab

Overview of the total number of eggs counted and the calculated laying percentages (%) for today and the past 7 days.

Total row tab

Overview of the number of eggs counted per row today and over the past 7 days.

Total tier tab

Overview of the number of eggs counted per tier today and over the past 7 days.

Overview tab

Clear counters	Activate this option to reset all egg counters.

6.5.2 Weekly totals

MANAGEMENT > Egg counters > Total week > Today

Today tab

Overview of the number of eggs counted today at each row and tier position.

MANAGEMENT > Egg counters > Total week > Day-x

Day-x tab

Overview of the number of eggs counted on each individual day at every row and tier position.

s

6.6 Hour counters

MANAGEMENT > Hour counters > Heat exchanger/Heating-x/Cooling-x/Mixing air/ …

The PL-9600 records the operating hours of heating and cooling systems, heat exchangers, manure belt aerators, recirculation fans, humidification systems, and other equipment.

Overview **tab**

The *Overview* tab shows the (weighted) operating hours in hours and minutes (hh:mm) for today, the past seven days, and the total operating hours since the last reset or the start of the current flock.

Settings **tab**

Clear operating hours	Activate this option to reset the hour counter.
Total operating hours	Displays the total number of operating hours of the system since the last reset of the hour counter.
Total weighted operating hours *(option for regulated systems)*	This value is visible only if your installer has enabled tracking of weighted operating hours. It represents the effective operating time of a system, corrected to full capacity (100%). For example, one hour at half power counts as 0.5 hours. This provides a realistic view of the system's load and wear.
Status *(only for hour meter with digital input)*	Displays the current status of the hour meter.

6.7 Minimum and maximum measured values

6.7.1 Overview with times

MANAGEMENT > Min/Max > House/Outside/RH/CO_2 /NH_3 /Sensors

Overview tab

Displays a weekly overview of the minimum and maximum daily values, including the times at which these values were recorded. The PL-9600 can track the minimum and maximum values for the following parameters:

- *House temperature*
- *Outside temperature*
- *RH > indoor RH + outside RH*
- *CO_2*
- *NH_3*
- *Sensors > Sensor 1-20*

Measurements tab

Displays the currently measured value.

6.7.2 Reset

MANAGEMENT > Min/Max > Reset

Settings tab

Reset min/max	Enable this option to clear all recorded minimum and maximum values.

6.8 Heat exchanger

Some authorities require proof that the heat exchanger is functioning correctly. This means that the temperature and ventilation at various measuring points must be recorded and stored.

MANAGEMENT > Heat exchanger

***Logging* tab**

Hour counter	The total number of operating hours of the heat exchanger since the last reset of the counter.
Temperature setpoint calculated	poultry house temperature calculated by the control system, based on the set target value and adjusted for influencing factors.
Actual temperature	The currently measured poultry house temperature.
Outside intake	The temperature of the outside air entering the heat exchanger.
House exhaust	The temperature of the warm air from the poultry house directed to the heat exchanger.
House intake	The temperature of the air blown into the poultry house after heat exchange.
Outside exhaust	The temperature of the cooled poultry house air exiting the heat exchanger to the outside.
Heater exhaust	The actual temperature of the air after the heater block, measured behind the heat exchanger.
Actual heat exchanger ventilation	The ventilation capacity calculated by the control system based on set values.
Recirculation fans 1	The ventilation output of the intake fans 1.
Recirculation fans 2 *(visible only if installed)*	The ventilation output of the intake fans 2.

6.9 Programs

6.9.1 General

The PL-9600 distinguishes between different house programs for which specific settings apply, optimizing the operation of ventilation, heating, cooling and other systems. Correct settings ensure healthy house and climate management and prevent malfunctions and unwanted alarm messages. The following programs are available:

Not in use	Poultry house is not in use; no animals are present
Disinfecting	The poultry house is being disinfected; no animals should be present..
Setting-up	The poultry house is being prepared; no animals should be present.
Preheating	The house is being warmed, usually 12–24 hours before animals are placed.
Brooding	The poultry house is partially in use for young chicks.
In use	Operating status: animals are present in the poultry house and systems are active.
Vaccinating	Animals are being vaccinated.
Catching	Animals are being loaded or added.
Cleaning	The poultry house is being cleaned.
Drying	The poultry house is drying after cleaning.

MANAGEMENT > Programs > General

Settings tab

Activate the programs you want to use. The *In-use* and *Not-in-use* phases are always active and cannot be disabled. The current program cannot be deactivated.

6.9.2 Configuring poultry house programs

MANAGEMENT > Programs > Not in use/Disinfecting/Setting up/Preheating/Brooding/ ...

Overview tab

The *Overview* tab displays a list of all configured settings.

For each program, specify which settings are relevant and enter the corresponding target values for the appropriate poultry house phase. You also determine which functions — such as *main ventilation, heating, cooling*, and *timers* — you want to use and set the desired operating mode for these functions.

7 Climate controls

7.1 House climate

This menu option contains all settings and measurements that are important for correct and accurate control of the poultry house climate.

7.1.1 General

CLIMATE > House > General

***Overview* tab**

Day	The day number that must be set manually at the start of a new flock.
Climate growth curves	Enable this option to activate climate growth curves. The climate curves can be configured under *CLIMATE > House > Curves > General.*
House temperature *(Climate growth curves = off)*	Manually set the target value for the poultry house temperature.
Growth curve offset *(Climate growth curves = on)*	Set the offset for the growth curve relative to the poultry house temperature. This is useful, for example, for sick animals, allowing a temporary manual increase in temperature. The house temperature curve can be set under *CLIMATE > House > Curves > House temperature.*
Temperature setpoint house	The calculated target value for the poultry house temperature, based on: *Temperature setpoint house + Growth curve offset + any corrections* such as night setting and increase due to RH.
ACTUAL STATUS	
Actual temperature	The currently measured poultry house temperature.
Actual THI *(visible only if installed)*	The calculated *Temperature-Humidity Index (THI)*, which indicates the combined effect of temperature and humidity. A higher THI value reflects an increased risk of heat stress in the animals.
Outside temperature	The currently measured outdoor temperature.

7.1.2 Curves

7.1.2.1 Climate curves

CLIMATE > House > Curves > General

Curve tab

On this tab, you can configure the curves for the following climate controls:

- House temperature (part of main curve)
- Main ventilation
- Tunnel ventilation
- Auxiliary ventilation
- Heat exchanger
- Manure belt aeration
- Mixed air
- Other environmental sensors
- Humidification
- Air inlets: left, right, front, center, rear, tunnel, top, bottom, etc.
- Heating 1 thru 6, 2-stage heating
- Cooling 1 thru 4

Settings tab

Enter the number of breakpoints for the house temperature and climate curves (minimum 2 and maximum 20).

7.1.2.2 Temperature curve (main curve)

CLIMATE > House > Curves > House temperature

Curve tab

Set the curve for the poultry house temperature. This curve is referred to as the *main curve* and appears at the top of the list of climate curves (see section 7.1.2.1).

Settings tab

Climate growth curves	Indicates whether the configured climate curves are active. These can be activated or deactivated under *CLIMATE > House > General > Climate growth curves.*
Temperature growth curve	Enable this option to activate the growth curve for the poultry house temperature. This curve can be configured on the *Curve* tab.
Number of breakpoints	Enter the number of breakpoints for the house temperature curve (minimum 2, maximum 20). This is also the number of breakpoints used for the main curve.

7.1.3 Compensations

7.1.3.1 Adjustments based on climate conditions

CLIMATE > House > Compensations

Compensations ensure that the configured climate control is automatically adjusted to specific conditions, such as night settings, weather influences, or gas concentrations in the poultry house. This helps maintain a stable climate even when conditions change.

On the PL-9600, you can set compensations for the following controls:

- Night setting
- Temperature
- Bandwidth
  ! Bandwidth compensation and maximum ventilation compensation are mutually exclusive.
- Minimum and maximum ventilation
- Relative humidity (RH)
- CO_2
- NH_3
- Meteorological factors (wind speed and wind direction)
- Occupancy rate

7.1.3.2 Night setting

CLIMATE > House > Compensations > Night setting

The night setting allows the house temperature and ventilation to be automatically adjusted at night, differing from the daytime settings. This creates a gradual transition between day and night.

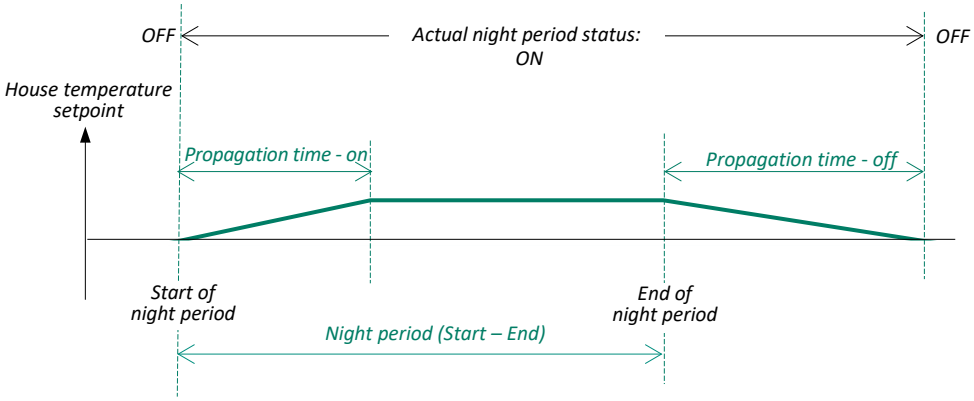
You can configure the following:
- The period during which the night settings are active.
- The number of degrees by which the house temperature is temporarily increased or decreased.
- The percentage by which the minimum ventilation is adjusted.

Ventilation is linked to the house temperature and is automatically adjusted when the temperature changes. The adjustment of the minimum ventilation is applied as a percentage of the set minimum value.

House temperature during the night period	20.0°C - 1.0°C = **19.0°C**
Minimum ventilation during the night period	10% - 20% of 10% = **8%**

***Settings* tab**

Night setting	Enable this option to activate the night setting.
House temperature offset	Number of degrees by which the set house temperature is temporarily increased or decreased during the night period.
Calculated temperature	Sum of the set house temperature and the house temperature offset.
Minimum ventilation compensation	Percentage by which the set minimum ventilation is temporarily increased or decreased during the night period.

Propagation time - on *Propagation time - off*	The duration (hh:mm) over which the temperature and ventilation are gradually adjusted at the start (on) and end (off) of the night period. 
Actual status	Shows the current status of the night period. **Off** indicates that the night period has ended and the ramp-down time has expired: *Off = End of night period + Propagation time - off.*
Number of periods	Number of night periods you want to set (maximum 5).

***Periods* tab**

Begin + End (hh:mm)	Set the start and end times of each night period.

7.1.3.3 Temperature

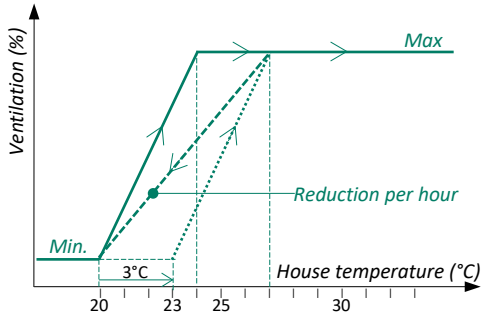
The purpose of temperature compensation is to prevent the poultry house from cooling down too quickly when the actual temperature exceeds the set house temperature plus the ventilation bandwidth.

CLIMATE > House > Compensations > Temperature

***Settings* tab**

Maximum temperature compensation	The temperature correction cannot exceed this value.
Reduce temperature compensation	Determines the rate (°C per hour) at which the temperature compensation is reduced.
Temperature above main ventilation bandwidth	Indicates how much the house temperature exceeds the main ventilation bandwidth.
Temperature compensation	The current calculated value of the temperature compensation.

Set house temperature	20.0 °C
Maximum temperature compensation	3.0 °C
Reduce temperature compensation	0.2 °C/h
Bandwidth	4.0 °C
Actual house temperature	28.1 °C
Corrected set house temperature	23.0 °C



Temperature compensation = *Actual house temperature* − *(Set house temperature + Bandwidth)*
= *28.1 °C* − *(20.0 °C + 4.0 °C) = 4.1 °C*

Since the temperature compensation cannot exceed the maximum, the corrected set house temperature is: 20.0 °C + 3.0 °C = 23.0 °C

The time required to reduce the temperature compensation in this example is:
(Correction / Reduce rate): 3.0 °C / 0.2 °C/hour = 15 hours.

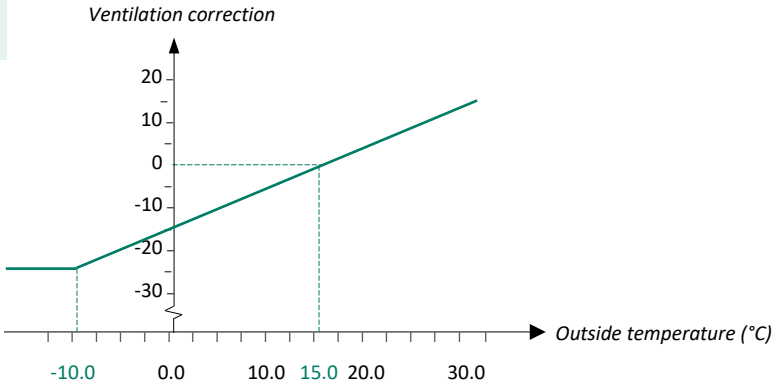
7.1.3.4 Ventilation

CLIMATE > House > Compensations > Ventilation

The calculated compensation for minimum and maximum ventilation is relative and applies to all ventilation groups. Ventilation is automatically adjusted based on the outside temperature: at low temperatures, ventilation is reduced, and at high temperatures, it is increased. This ensures a constant supply of oxygen-rich air that matches the prevailing conditions.

***Settings* tab**

Minimum ventilation compensation	Set the percentage by which the minimum ventilation is adjusted per degree of temperature change.
Maximum ventilation compensation *(visible only if bandwidth compensation = inactive)*	Set the percentage by which the maximum ventilation is adjusted per degree of temperature change. ! Ventilation compensation and bandwidth compensation are mutually exclusive and therefore can never be active at the same time.
From outside temperature	Ventilation compensation is activated from this outside temperature.
Till outside temperature	Ventilation compensation stops at this outside temperature.
Outside temperature	The currently measured outdoor temperature.



Basic settings:

Corrected minimum ventilation	10.0
Minimum ventilation compensation	1.0%/°C
From outside temperature	15.0 °C
Till outside temperature	-10.0 °C

Situation 1:
Current outside temperature: 5.0 °C
ΔT = 15.0 – 5.0 = 10.0 °C
Calculated correction: (10.0% / 100%) × 10.0 × 1.0% = 1.0%
→ *Calculated minimum ventilation: 10.0% – 1.0% = 9.0%*

Situation 2:
Current outside temperature: 30.0 °C
ΔT = 15.0 – 30.0 = –15.0 °C
Calculated correction: (10.0% / 100%) × (–15.0) × 1.0% = –1.5%
→ *Calculated minimum ventilation: 10.0% + 1.5% = 11.5%*

7.1.3.5 Bandwidth

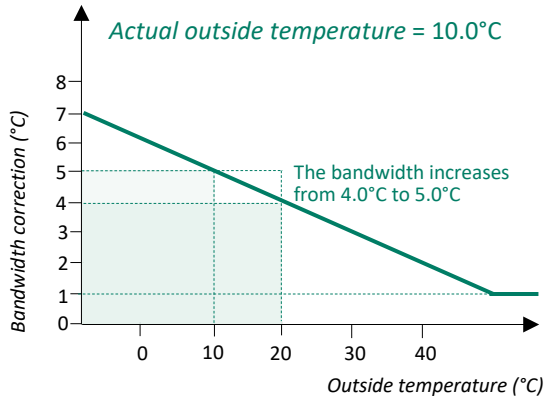
CLIMATE > House > Compensations > Bandwidth

The bandwidth of the main ventilation and individual ventilation groups is automatically adjusted according to the outside temperature: the colder it is, the larger the bandwidth; the warmer it is, the smaller the bandwidth.

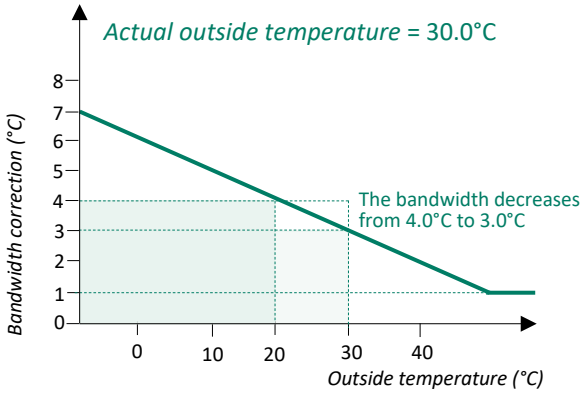
The bandwidth is limited by a *lower limit* (1.0°C) and an *upper limit* (20.0°C).

***Settings* tab**

Bandwidth compensation	Set the percentage by which the bandwidth should be adjusted per degree of outside temperature.
From outside temperature	Specify the outside temperature at which the bandwidth compensation becomes active. Bandwidth compensation and maximum ventilation compensation cannot be used at the same time.
Outside temperature	The currently measured outdoor temperature.
Calculated bandwidth compensation	Displays the bandwidth correction based on the current outside temperature.



Situation 1 – Decreasing outside temperature



Situation 2 – Rising outside temperature

Situation 1 – Decreasing outside temperature

Bandwidth (=100%)	4.0°C
Bandwidth compensation	-2.5%/°C
From outside temperature	20.0°C

If the outside temperature drops to 10.0°C:
ΔT = 10.0 °C - 20.0 °C = -10.0 °C
Correction = (-10 × -2.5%) × (4.0 °C / 100%) = +1.0 °C
→ *Corrected bandwidth = 5.0 °C*

Situation 2 – Rising outside temperature
If the outside temperature rises to 30.0 °C:
ΔT = 30.0 °C - 20.0 °C = +10.0 °C
Correction = (10 × -2.5%) × (4.0 °C / 100%) = -1.0 °C
→ *Corrected bandwidth = 3.0 °C*

7.1.3.6 RH

RH compensation is an important function for dynamically adjusting ventilation in the poultry house based on humidity. By using this function, the humidity in the house can be maintained at an optimal level, which helps create a better climate for the animals and supports their health.

Relative humidity (RH) indicates the amount of water vapour in the air, expressed as a percentage of the maximum amount of water vapour the air can hold at a given temperature. Absolute humidity indicates the actual amount of water vapour in a cubic metre of air, measured in grams per cubic metre (g/m³).

Cold air can hold less water vapour than warm air. For example, at 10 °C, the maximum water vapour content is 9.8 g/m³, whereas at 20 °C, it is 18.6 g/m³.

At an RH of 70%, air at 10 °C contains approximately 6.9 g/m³ of water vapour, while air at 20 °C contains approximately 13.0 g/m³.

7.1.3.6.1 RH compensation without outside air RH

RH compensation only affects ventilation. If the measured relative humidity (RH) is higher than the set RH compensation value, the ventilation level will increase to reduce humidity.

Factor = 0.0 → no effect on ventilation or air inlet position
Factor = 9.9 → maximum effect on ventilation or air inlet position

The type of RH compensation can be configured by the installer:

Absolute	Strong response at low ventilation settings
Relative	Takes the uncorrected ventilation demand into account
Bandwidth	Takes the minimum and maximum ventilation settings into account

House temperature	20.0°C
Actual temperature	21.0°C
Minimum ventilation	10%
Maximum ventilation	50
Bandwidth	4.0°C
Uncorrected calculated ventilation	20
RH compensation from	70
Measured RH	80
RH compensation factor	1.0
Calculated compensation	(80 - 70) × 1.0 = 10%

$$Absolute = (RH - RH\ compensation\ from) \times RH\ compensation\ factor$$

$$Relative = \frac{((RH - RH\ compensation\ from) \times RH\ compensation\ factor)}{100} \times Uncorrected\ calculated\ ventilation$$

$$Bandwidth = \frac{((RH - RH\ compensation\ from) \times RH\ compensation\ factor)}{100} \times (Max.\ ventilation - Min.\ ventilation)$$

Corrected ventilation:

Absolute	20% + 10% = **30%**
Relative	20% + 10% /100% × 20% = **22%**
Bandwidth	20% + 10% /100% × (50% - 10%) = **24%**

7.1.3.6.2 RH compensation with outside air RH

When the relative humidity (RH) in the poultry house is too high, this can affect ventilation and temperature control. The control system therefore considers the absolute humidity (AH). Two situations are distinguished based on the ratio between the AH of the outside air and that of the poultry house.

Situation 1: AV outside < AV house
If the absolute humidity of the outside air is lower than that of the house, moisture can be removed by increasing ventilation. The degree of adjustment is determined by an adjustable compensation factor, which regulates the influence on ventilation and air inlet position.

Factor = 0.0 → No influence on ventilation or air inlets, regardless of the moisture difference.
Factor = 9.9 → Maximum influence; ventilation increases to the maximum to remove moisture when the outside air contains less moisture.

Calculated RH compensation = (RH – RH compensation from) × factor × (AV house – AV outside)/10

The type of compensation (*absolute, relative* or *bandwidth*) can be set by the installer:

Absolute Strong response at low ventilation settings
Relative Takes the uncorrected ventilation demand into account
Bandwidth Takes the minimum and maximum ventilation settings into account

Outside temperature	10.0°C
Set house temperature	20.0°C
Actual house temperature	21.0°C
Minimum ventilation	10
Maximum ventilation	50
Bandwidth	4.0°C
Uncorrected calculated ventilation	20
RH compensation from	70
Actual RH	80
Actual RH absolute	15.8 g/m^3
Actual RH outside	90
Actual outside RH absolute	8.8 g/m^3
Compensation factor RH house	1
Calculated RH compensation	(80-70) × 1.0 × ((15.8-8.8) / 10) = 7.0%

$$Absolute = Calculated\ RH\ compensation$$

$$Relative = Calculated\ RH\ compensation \times \frac{Uncorrected\ calculated\ ventilation}{100}$$

$$Bandwidth = Calculated\ RH\ compensation \times \frac{(Maximum\ ventilation - Minimum\ ventilation)}{100}$$

Corrected ventilation:

Absolute	20.0% + 7.0% = **27.0%**
Relative	20.0% + 7.0% × (20.0 / 100) = **21.4%**
Bandwidth	20.0% + 7.0% × ((50-10) / 100) = **22.8%**

Situation 2: Outside RH ≥ RH in the poultry house

In this situation, the outside air contains more moisture than the air inside the house. Increasing ventilation would introduce additional moisture, which is undesirable. Therefore, ventilation is no longer adjusted by RH compensation. Instead, the temperature is temporarily increased through temperature compensation, causing the heating system to activate and making the house climate drier.

Outside temperature	20.0°C
Set house temperature	20.0°C
Actual house temperature	21.0°C
Minimum ventilation	10.0
Maximum ventilation	50.0
Bandwidth	4.0°C
Uncorrected ventilation	20.0
RH compensation from	70
Actual RH	80
Actual absolute RH	15.8g/m^3
Actual outside RH	90
Actual outside absolute RH	16.7 g/m^3
RH compensation factor	1.0
Calculated RH compensation	0.0
Temperature compensation	On
RH offset	5
Temperature compensation from RH	75
Factor	0.2°C/%
Maximum	2.0°C
Temperature compensation	1.0°C
Calculated temperature compensation	(75% - 70%) x 0.2 C°/% = 1.0°C
Corrected calculated house temperature	20.0°C+1.0°C=21.0°C

Temperature compensation increases the calculated temperature setpoint when the absolute humidity of the outside air is higher than that of the poultry house. This ensures that the warmer house air can absorb more moisture.

The humidity and outside temperature sensors should be installed next to each other as possible.

If RH, CO_2, and NH_3 compensations are active at the same time, the highest compensation value is used for ventilation adjustment.

CLIMATE > House > Offsets > RH > General

***Settings* tab**

RH compensation	Enable this option to activate the RH compensation.
RH compensation from / Growth curve RH comp. from	Ventilation increases as soon as the measured RH exceeds the percentage set here or the percentage calculated from the growth curve.
RH compensation stop	Enable this option to activate the RH compensation stop.

RH compensation stop offset	When RH compensation is active to reduce excessive humidity in the poultry house, increased ventilation can cause the house temperature to drop too low. This setting defines the temperature difference at which RH compensation should begin to decrease.
Calculated RH compensation stop	The house temperature setpoint (*set house temperature* minus *RH compensation stop offset*) at which RH compensation starts to decrease. From this point, RH compensation is fully phased out in increments of 1.0 °C.
Actual RH	The currently measured relative humidity in the poultry house, expressed as a percentage.
Actual RH absolute	The currently measured absolute humidity in the poultry house, expressed in g/m³.
Actual RH outside	The currently measured relative humidity (%) of the outside air.
Actual RH outside absolute	The currently measured absolute humidity (g/m³) of the outside air.
Maximum compensation factor	Limits the calculated ventilation compensation factor to the maximum set here (0–200%).
VENTILATION GROUP - MAIN VENTILATION	
RH compensation factor	Determines how strongly (factor between 0.0 and 9.9) the ventilation or air inlet responds to excessive RH in the poultry house.
Calculated RH compensation	See section 7.1.3.6.
Calculated RH compensation absolute	See section 7.1.3.6.
TEMPERATURE COMPENSATION	
Temperature compensation	Enable this option to allow the control system to automatically adjust the house temperature based on humidity.
RH offset	Threshold value for temperature compensation; a fixed correction added to the set RH before calculating temperature compensation.
Temperature compensation from RH	The calculated starting point at which temperature compensation begins once the RH rises above this value.
Factor	Determines how strongly temperature compensation affects ventilation; a higher factor produces a stronger adjustment.
Maximum	Maximum allowable temperature compensation (°C) to prevent excessive heating.
Reduction	Speed at which temperature compensation is reduced to zero when conditions return to normal (in °C per unit of time).
Temperature compensation	Displays the calculated temperature compensation (°C).

CLIMATE > House > Compensations > RH > Curve

Settings tab

Climate growth curves	Indicates whether the set climate curves are active. You can activate and deactivate the climate curves under *CLIMATE > House > General.*
Growth curve RH	Enable this option to activate the RH growth curve. The curve can be configured on the *Curve* tab.
Disconnect from main curve	Enable this option to disconnect the RH curve from the main temperature curve.
Number of breakpoints	Displays the number of breakpoints set for the house temperature curve (main curve). If the RH curve is disconnected from the main curve, you can set the number of breakpoints here.

Curve tab

Enter the desired RH percentage in the poultry house for each breakpoint.

7.1.3.7 CO_2 compensation

Ventilation, air inlet positions and house temperature can be adjusted based on CO_2 content.

Compensation formula

$$CO_2\ compensation = \frac{(Actual\ CO_2 - CO_2\ compensation\ from)}{100\ ppm} \times Factor$$

The type of compensation (*absolute, relative* or *bandwidth*) can be set by the installer:

Absolute Strong response at low ventilation settings
Relative Takes the uncorrected ventilation demand into account
Bandwidth Takes the minimum and maximum ventilation settings into account

$$Absolute = Calculated\ CO_2\ compensation$$

$$Relative = Calculated\ CO_2\ compensation \times \frac{Uncorrected\ calculated\ ventilation}{100}$$

$$Bandwidth = Calculated\ CO_2\ compensation \times \frac{(Maximum\ ventilation - Minimum\ ventilation)}{100}$$

When the CO_2 level rises above the threshold, ventilation increases. An increase of 100 ppm CO_2 results in a compensation of 1.0%. The calculated compensation is limited by the *maximum compensation factor*.

Factor = 0.0 → no influence on ventilation or air inlet position
Factor = 9.9 → maximum influence on ventilation or air inlet position

! If CO_2, RH and NH_3 compensations are active at the same time, the highest compensation value is used for ventilation adjustment.

CLIMATE > House > Compensations > CO_2 > General

***Settings* tab**

CO_2 compensation	Activate or deactivate CO_2 compensation.
CO_2 compensation from	Ventilation increases as soon as the CO_2 value exceeds this limit (ppm).
Growth curve CO_2 compensation from	Ventilation increases as soon as the CO_2 value exceeds this limit (ppm) and the growth curve is active.
CO_2 compensation stop	Enable this option to activate the CO_2 compensation stop.
CO_2 compensation stop offset	When CO_2 compensation is active to reduce excessive CO_2 levels in the house, increased ventilation can cause the house temperature to drop too much. This setting defines the temperature difference at which CO_2 compensation should be reduced to prevent excessive temperature drops.
Calculated CO_2 compensation stop	The calculated threshold at which CO_2 compensation begins to decrease: *Set house temperature + CO_2 compensation stop offset*. From this temperature onward, CO_2 compensation is fully reduced in steps of 1.0 °C.
Actual CO_2	The current CO_2 content in the poultry house (ppm).
Maximum compensation factor	Limits the compensation to the maximum value set here (0–200%).

VENTILATION GROUP – MAIN VENTILATION/AUX. VENT.

CO_2 compensation factor	Determines how strongly (factor between 0.0 and 9.9) the selected ventilation group responds to excessive CO_2 levels in the poultry house.
Calculated CO_2 compensation	See section 7.1.3.7.
Calculated CO_2 compensation absolute	See section 7.1.3.7.

CLIMATE > House > Compensations > CO_2 > Curve

Settings tab

Climate growth curves	Indicates whether the set climate curves are active. You can activate or deactivate the climate curves under *CLIMATE > House > General.*
CO_2 growth curve	Enable this option to activate the CO_2 growth curve. The curve can be configured on the *Curve* tab.
Disconnect from main curve	Enable this option to disconnect the CO_2 curve from the main temperature curve.
Number of breakpoints	Displays the number of breakpoints set for the house temperature curve (main curve). If the CO_2 curve is disconnected from the main curve, you can set the number of breakpoints here (2–20).

Curve tab

Enter the desired CO_2 concentration in ppm for each breakpoint.

7.1.3.8 NH_3 compensation

Ventilation, air inlet positions and house temperature can be adjusted based on NH_3 content.

Compensation formula

$$\textit{Calculated } NH_3 \textit{ compensation} = (\textit{Actual } NH_3 - NH_3 \textit{ compensation from}) \times \textit{Factor} \times 10$$

The type of compensation (*absolute, relative* or *bandwidth*) can be set by the installer:

Absolute Strong response at low ventilation settings
Relative Takes the uncorrected ventilation demand into account
Bandwidth Takes the minimum and maximum ventilation settings into account

$$\textit{Absolute} = \textit{Calculated } NH_3 \textit{ compensation}$$

$$\textit{Relative} = \textit{Calculated } NH_3 \textit{ compensation} \times \frac{\textit{Uncorrected calculated ventilation}}{100}$$

$$\textit{Bandwidth} = \textit{Calculated } NH_3 \textit{ compensation} \times \frac{(\textit{Maximum ventilation} - \textit{Minimum ventilation})}{100}$$

In addition to temperature control, ventilation can also be adjusted based on NH_3 levels. When NH_3 rises above the threshold, ventilation increases. An increase of 1 ppm NH_3 results in a 10.0 % compensation. The calculated compensation is limited by a preset maximum.

Factor = 0.0 → no effect on ventilation and/or air inlet position
Factor = 9.9 → maximum effect on ventilation and/or air inlet position

! If NH_3, RH, and CO_2 compensations are active at the same time, the highest compensation value is used for ventilation adjustment.

CLIMATE > House > Compensations > NH_3

Settings tab

NH_3 compensation	Activate or deactivate NH_3 compensation.
NH_3 compensation from	Ventilation increases as soon as the NH_3 value exceeds this limit (ppm).
Growth curve NH_3 compensation from	Ventilation increases as soon as the NH_3 value exceeds this limit (ppm) and the growth curve is active.
NH_3 compensation stop	Enable this option to activate NH_3 compensation stop.
NH_3 compensation stop offset	The offset defines the temperature difference at which compensation is reduced to prevent overcorrection.
Calculated NH_3 compensation	The calculated threshold value at which compensation is phased out: *Set house temperature + NH_3 compensation stop offset*.
Actual NH_3	The current NH_3 content in the poultry house (ppm).
Maximum compensation factor	Limits the corrected ventilation to the maximum value set here (0–200%).
VENTILATION GROUP – MAIN VENTILATION/AUX. VENT.	
NH_3 compensation factor	Determines how strongly (factor between 0.0 and 9.9) the relevant ventilation group responds to excessive NH_3 levels in the poultry house.
Calculated NH_3 compensation	See section 7.1.3.8.
Calculated NH_3 compensation absolute	See section 7.1.3.8.

CLIMATE > House > Compensations > NH_3 > Curve

Settings tab

Climate growth curves	Indicates whether the set climate curves are active. You can activate or deactivate the climate curves under *CLIMATE > House > General.*
NH_3 growth curve	Enable this option to activate the NH_3 growth curve. The curve can be configured on the *Curve* tab.
Disconnect from main curve	Enable this option to disconnect the NH_3 curve from the main temperature curve.
Number of breakpoints	Displays the number of breakpoints set for the house temperature curve (main curve). If the NH_3 curve is disconnected from the main curve, you can set the number of breakpoints here (2–20).

Curve tab

Enter the desired NH_3 concentration in ppm for each breakpoint.

7.1.3.9 Meteo (Wind speed and wind direction)

CLIMATE > House > Compensations > Meteo

For each ventilation group, the installer can set the wind direction that determines when the group should be corrected. Additionally, the installer can choose whether the wind influence should be *relative* or *absolute*.

Wind compensation is applied RH, CO_2 and NH_3 compensations.

Wind influence (absolute)
For each ventilation group, a wind influence factor can be set (range 0.0–9.9) for: *wind side, leeward side* and *crosswind*. If desired, the wind influence can be adjusted based on the outside temperature.

$$\textit{Wind compensation (absolute)} = \frac{(\textit{Actual wind speed} - \textit{Wind influence from})}{(10 - \textit{Wind influence from})} \times \text{factor} \times -10$$

Calculated ventilation per group:

Left	80
Right	80
Front	25
Rear	10

Settings:

Wind influence start	3.0 m/s
Actual wind speed	7.5 m/s
Wind direction towards	Right

Set wind influence factors:

Windward side	6
Leeward side	2
Crosswind (transverse/front gable side)	1

Calculated wind compensation (absolute):

Wind side	(7.5 – 3.0)/(10 – 3.0) × 10 × 6 = **-39%**
Leeward side	(7.5 – 3.0)/(10 – 3.0) × 10 × 2 = **-13%**
Crosswind (front gable side)	(7.5 – 3.0)/(10 – 3.0) × 10 × 1 = **-6%**

Corrected ventilation:

Left	80 - 13 = **67%**
Right	80 - 39 = **41%**
Front	25 - 6 = **19%**
Rear	10 - 6 = **4%**

Wind influence (relative)

$$\textit{Wind compensation (rel.)} = \textit{Actual ventilation} \times \frac{((\textit{Actual wind speed} - \textit{Wind influence from}) \times \textit{factor} \times -10)}{(10 - \textit{Wind influence from})} \div 100$$

Calculated ventilation per group:

Left	80
Right	80
Front	25
Rear	10

Settings:

Wind influence start	3.0 m/s
Actual wind speed	7.5 m/s
Wind direction towards	Right

Set wind influence factors:

Windward side	6
Leeward side	2
Crosswind (transverse/front gable side)	1

Calculated wind influence relative):

Wind side	(7.5 – 3.0)/(10 – 3.0) × 10 × 6 = **-39%**
Leeward side	(7.5 – 3.0)/(10 – 3.0) × 10 × 2 = **-13%**
Crosswind (front gable side)	(7.5 – 3.0)/(10 – 3.0) × 10 × 1 = **-6%**

Corrected ventilation:

Left	80 - 13 × 0.8 (80%) = **70%**
Right	80 - 39 × 0.8 (80%) = **49%**
Front	25 – 6 × 0.25 (25%) = **23%**
Rear	10 - 6 × 0.10 (10%) = **9%**

Due to hysteresis, the calculated values may differ from the displayed values.

CLIMATE > House > Compensations > Weather

***Overview* tab**

Wind influence	Activate this option to include wind influence in the climate control. Ventilation will then be adjusted based on wind speed and direction.
Wind influence start	Enter the wind speed (m/s) at which wind compensation begins.
Wind speed	The actual measured wind speed (m/s).
Wind direction towards	The actual wind direction in which the wind is blowing. This value determines which ventilation groups are considered the *windward side, leeward side,* or *crosswind side*.

***Wind influence* tab**

Windward side	Enter the wind influence factor (value between 0.0 and 9.9) for the side facing the wind. A higher factor results in a greater reduction of ventilation as wind pressure increases.
Windward side compensation	The current, calculated wind influence (%) on the windward side. This value is based on the actual wind speed, the *Wind influence start* setting, and the selected wind influence factor.
Leeward side	Set the wind influence factor (value between 0.0 and 9.9) for the side downwind. This factor is used to increase ventilation on the leeward side during strong winds.
Leeward side compensation	The current, calculated wind influence (%) on the leeward side. This value is based on the actual wind speed, the *Wind influence start* setting, and the selected wind influence factor.
Crosswind	Set the wind influence factor (value between 0.0 and 9.9) for the transverse (crosswind) side. This factor is used to reduce ventilation on this side when strong crosswinds occur.
Crosswind compensation	The current, calculated wind influence (%) on the transverse side. This value is based on the actual wind speed, the *Wind influence start* setting, and the selected wind influence factor.
LEFT/RIGHT/FRONT/REAR	
Wind compensation	The correction (%) calculated by the control system for the *Left, Right, Front* and *Rear* ventilation groups, based on the wind direction, wind speed, and the configured wind influence factors.

7.1.3.10 Occupancy rate

CLIMATE > House > Compensations > Occupancy rate

***Measurements* tab**

Animals present	Displays the current number of animals in the poultry house.
Number at entry	The number of animals that were placed in the house at the start of the production cycle (flock).
Reference number	The number of animals on which the original calculation of occupancy and the ventilation growth curve is based. Using a reference number ensures that the ventilation curve is automatically adjusted if more or fewer animals are placed than originally planned.
Occupancy rate	The calculated occupancy rate: $Bandwidth = \frac{Animals\ present}{Number\ at\ entry} \times 100$

7.1.4 Alarm limits

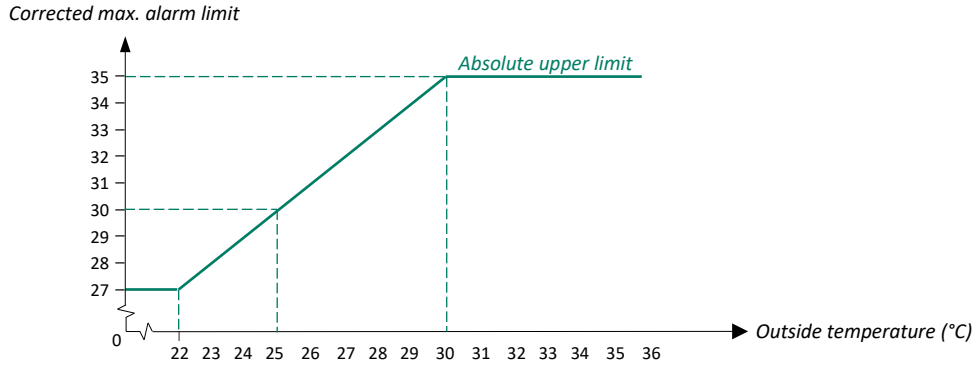
7.1.4.1 General

CLIMATE > House > Alarm

In this menu, you can enable or disable climate-related alarms for the poultry house and set minimum and maximum alarm limits for the following parameters:

- House temperature
- House relative humidity (RH)
- Outside RH
- CO_2 measurement
- NH_3 measurement
- Meteo (wind speed and wind direction)
- Outside temperature
- THI (Temperature-Humidity Index)

7.1.4.2 Dynamic adjustment of the maximum alarm limit in hot weather



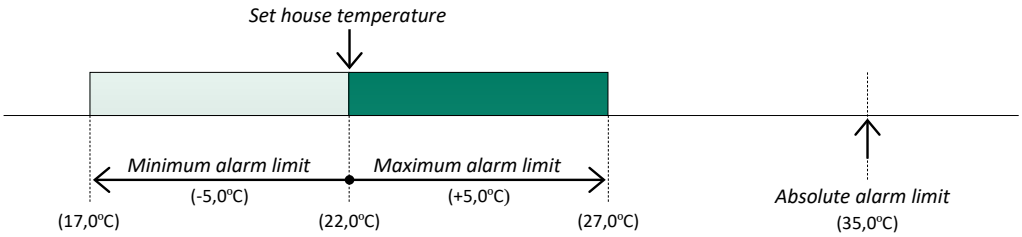
When the outside temperature rises above the set house temperature, the system automatically adjusts the maximum temperature alarm limit upward. This prevents unnecessary alarms during warm weather conditions.

However, the corrected alarm limit can never exceed the absolute maximum alarm limit. This ensures that the system continues to monitor whether the house climate remains within acceptable conditions.

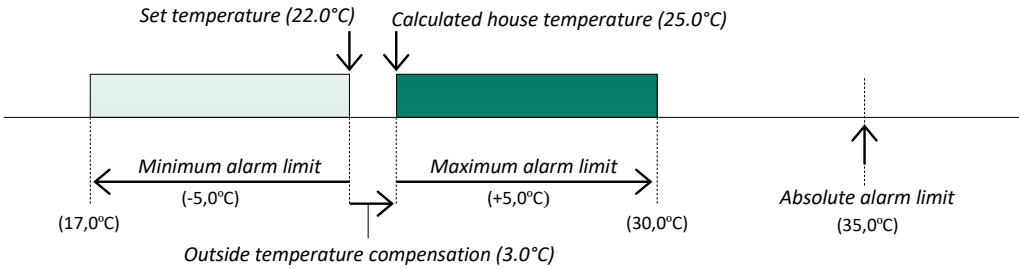
If the house temperature exceeds the absolute alarm limit, an alarm is still triggered and immediate action is required.

Example:	**Situation 1**	**Situation 2**	**Situation 3**
	$T_{OUTSIDE} < T_{HOUSE}$	$T_{OUTSIDE} \geq T_{HOUSE}$	$(T_{OUTSIDE} + T_{ALARM}) > T_{ABS}$
Set absolute alarm limit	35.0°C	35.0°C	**35.0°C**
Set house temperature	**22.0°C**	22.0°C	22.0°C
Set maximum alarm limit	**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**

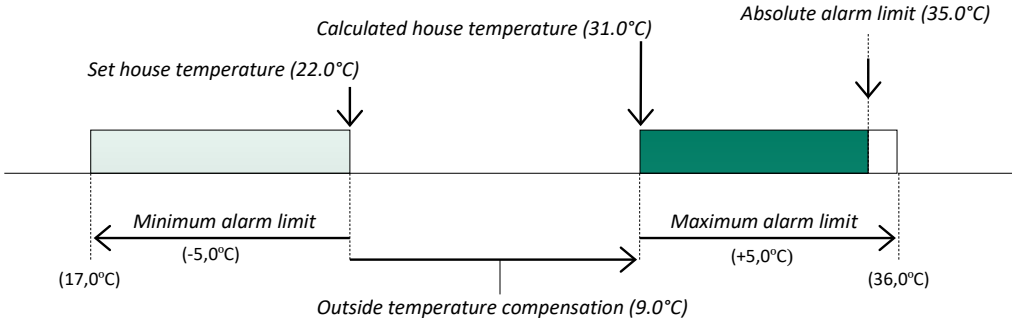
Situation 1: *Outside temperature < Set house temperature →*
Calculated alarm limit = Set house temperature + Set maximum alarm limit.



Situation 2: *Outside temperature > Set temperature → Calculated house temperature = Outside temperature*
The calculated alarm limit shifts upward to prevent unnecessary alarms.



Situation 3: *Maximum alarm limit > Absolute alarm limit → Maximum alarm limit = Absolute alarm limit*
The calculated alarm limit is capped at the absolute maximum.



The alarm limits displayed are calculated values, based on factors such as the set house temperature limits and the control system's temperature settings.

7.1.4.3 Outside temperature compensation during cooling

The outside temperature compensation can be disabled by the installer using the *Maximum alarm limit compensation* setting.

- *Always:* The outside temperature compensation functions as described above, increasing the maximum alarm limit at higher outside temperatures.
- *Auto (default):* The increase in the alarm limit is disabled when cooling is installed and activated (even if the system is not actively cooling).

When no cooling is present, shifting the maximum temperature limit prevents unnecessary temperature alarms at higher outside temperatures.

If cooling is available, it must maintain the temperature within the set limits. In this case, the PL-9600 must not shift the limit, so that an alarm is triggered if the cooling system is not functioning correctly.

Alarm limits can be set separately for each control.

- These house temperature limits apply to all ventilation groups.
- No alarm limits are set for outside RH or outside temperature.

7.1.4.4 House temperature

CLIMATE > House > Alarm > House temperature

***Settings* tab**

Minimum alarm limit	The house temperature must not fall below the calculated target value by more than the specified number of degrees. If the temperature drops below this limit, an alarm is triggered. Default -5.0°C. See also section 7.1.4.1.
Maximum alarm limit	The house temperature must not exceed the calculated target value by more than the specified number of degrees. If the limit is exceeded, an alarm is triggered. In high outside temperatures, the calculated maximum alarm limit may temporarily shift, but it never exceeds the absolute alarm limit. Default 7.0°C. See also section 7.1.4.1.
Absolute alarm limit	The house temperature must never exceed this value. If exceeded, an alarm is triggered regardless of the calculated target value. See also section 7.1.4.1.

7.1.4.5 House RH

CLIMATE > House > Alarm > RH

***Settings* tab**

Alarm RH	Enable this option to activate the set RH alarm limits.
Minimum alarm limit	The relative humidity in the poultry house must not fall below this value. If it does, an alarm is triggered.
Maximum alarm limit	The relative humidity in the poultry house must not exceed this value. An alarm is triggered if this limit is exceeded.
Actual measurement	Displays the current measured RH in the poultry house.
Correction *(only visible if activated by the installer)*	Allows manual adjustment of the measured RH to compensate for any sensor deviations.
Actual RH	The corrected current RH in the poultry house, after applying the manual adjustment.

7.1.4.6 Outside RH

CLIMATE > House > Alarm > Outside RH

***Settings* tab**

Alarm outside RH	Enable this option to activate the set outside RH alarm limits.
Actual measurement	Shows the current measured RH in the stable.
Correction *(only visible if activated by the installer)*	Manual adjustment of the measured outside RH value to compensate for any sensor deviations.
Actual outside RH	The corrected current outside RH value, after applying the set correction.

7.1.4.7 CO_2

CLIMATE > House > Alarm > CO_2

***Settings* tab**

Alarm CO_2	Enable this option to activate the set CO_2 alarm limits.
Minimum alarm limit	The measured CO_2 concentration in the poultry house must not fall below this value. If it falls below this value, an alarm is triggered.
Maximum alarm limit	The measured CO_2 concentration in the poultry house must not exceed this value. If it exceeds this value, an alarm is triggered.
Actual measurement	Displays the measured CO_2 concentration in the poultry house.
Correction *(only visible if activated by the installer)*	Allows manual adjustment of the measured CO_2 concentration to compensate for sensor deviations.
Actual CO_2	The corrected current CO_2 concentration after applying the manual adjustment.

7.1.4.8 NH_3

CLIMATE > House > Alarm > NH_3

***Settings* tab**

Alarm NH_3	Enable this option to activate the set NH_3 alarm limits.
Minimum alarm limit	The measured NH_3 concentration in the poultry house must not fall below this value. If it falls below this value, an alarm is triggered.
Maximum alarm limit	The measured NH_3 concentration in the poultry house must not exceed this value. If it exceeds this value, an alarm is triggered.
Current measurement	Displays the measured NH_3 concentration in the poultry house.
Correction *(only visible after activation by the installer)*	Allows manual adjustment of the measured NH_3 concentration to compensate for sensor deviations.
Actual NH_3	The corrected current NH_3 concentration after applying the manual adjustment

7.1.4.9 Meteo

CLIMATE > House > Alarm > Meteo

***Settings* tab**

Alarm meteo	Enable this option to activate a Meteo alarm in the event of a malfunction.
Wind speed	Displays the current wind speed.
Wind direction towards	Displays the current wind direction.

7.1.4.10 Outside temperature

CLIMATE > House > Alarm > Outside temperature

***Settings* tab**

Outside temperature alarm	Enable this option to activate an outside temperature alarm in the event of a malfunction.
Outside temperature	Displays the current measured outside temperature.

7.1.4.11 THI

CLIMATE > House > Alarm > THI

***Settings* tab**

Alarm THI	Enable this option to activate a THI alarm when the set THI alarm limits are exceeded.
Minimum alarm limit	The THI index must not fall below this value. If it does, an alarm will be triggered.
Maximum alarm limit	The THI index must not rise above this value. If it does, an alarm will be triggered.
Actual THI	Displays the calculated THI index.
Actual RH	Displays the current relative humidity in the poultry house.
Actual temperature	Displays the current measured house temperature.

7.2 Main ventilation

7.2.1 General

CLIMATE > Main ventilation > General

***Overview* tab**

Temperature offset	Temperature setting at which the ventilation group regulates. This setting is relative to the calculated house temperature.
Temperature setpoint calculated	The calculated temperature at which the ventilation unit regulates.
Bandwidth	The control range of the ventilation control for temperature changes. A smaller bandwidth ensures faster responses, but can cause ventilation fluctuations. Bandwidth compensation automatically adjusts this based on the outside temperature (see section 7.1.3.5).
Bandwidth calculated	The bandwidth is automatically adjusted based on temperature and ventilation requirements, so that it better matches the current situation.
Minimum ventilation	The set lower limit for ventilation.
Minimum ventilation curve offset	You can manually correct the minimum ventilation determined from the ventilation curve by entering a correction percentage.
Minimum ventilation calculated	The occupancy rate and set influence factors can affect the minimum ventilation (see section 7.1.3.4). Based on this, the PL-9600 calculates a minimum ventilation that better suits the situation.
Maximum ventilation	The set upper limit for ventilation.
Maximum ventilation curve offset	You can manually correct the maximum ventilation determined from the ventilation curve by entering a correction percentage.
Maximum ventilation calculated	The occupancy rate and set influence factors can affect the maximum ventilation (see section 7.1.3.4). Based on this, the PL-9600 calculates a maximum ventilation that better suits the situation.
Actual temperature	The current, measured temperature.
Actual calculated ventilation	The current ventilation is calculated based on the bandwidth and the set minimum and maximum values.
Actual ventilation	The currently controlled ventilation, expressed as a percentage. With step ventilation, the control is stepwise. When using a measuring fan, the measured value may differ from the controlled value.
Capacity per kg/ Capacity per animal *(depending on installer settings)*	The ventilation capacity of the main ventilation group in m^3/kg/hour or in m^3/animal/hour.
Capacity	The total ventilation capacity (m^3/kg/hour) of the main ventilation group.

***Proportional ventilation* tab**

Group 1 max	Set here the percentage of the first group at which the second proportionally controlled group will switch on when multiple groups are used in the main ventilation system.
Group 2 starts at	Displays the percentage at which the second group is switched on, based on the first group's output.
Group 2 max	Set here the percentage of the second group at which the third proportionally controlled group will switch on.
Group 3 starts at	Displays the percentage at which the third group is switched on, based on the second group's output.
Setpoint	Displays the current setpoint value of the proportionally controlled group (%).
Step	Indicates which fan outputs are active: 1 = Fan output 1 is switched on 2 = Fan outputs 1 and 2 are switched on 3 = Fan outputs 1, 2 and 3 are switched on

***Summary* tab**

This tab provides an overview of the various components of the ventilation system, including the heat exchanger, controlled groups, and step ventilation.

Standard ventilation capacity *(visible with tunnel ventilation)*	Displays the maximum ventilation airflow, excluding the portion used exclusively by tunnel ventilation.
Total capacity	Displays the total flow rate at 100% ventilation.
Capacity	Displays the current flow rate.
HEAT EXCHANGER	
Calculated ventilation	Displays the current calculated ventilation of the heat exchanger (%).
Capacity	Displays the current capacity of the heat exchanger (m^3/h).
PROPORTIONAL VENTILATION	
Setpoint	Displays current setpoint value of the proportionally controlled group (%).
Step	Displays the current step of the proportionally controlled group.
Capacity	Displays the current flow rate of the proportionally controlled group (m^3/h).
STEP CONTROL	
Step	Displays the current step of the step control.
ECO STEP	
ECO step	Displays the current speed of the ECO-step fans.
Step	Displays the current number of ECO-STEP fans turned on. When all fans are active, the last five steps are displayed: 60%, 70%, 80%, 90% and 100%.
TUNNEL VENTILATION	
Step	Displays the current step of the tunnel ventilation.

***Active compensations* tab**

MINIMUM VENTILATION COMPENSATION	
Minimum ventilation	Displays the set minimum ventilation.
Minimum ventilation curve	Displays the minimum ventilation calculated from the growth curve, if enabled.
Growth curve offset	Displays the set offset relative to the growth curve
Occupancy rate	Displays the compensation based on the occupancy rate.
Outside temperature	Displays the compensation based on the minimum outside temperature.
RH	Displays the compensation based on the relative humidity (RH).
CO_2	Displays the compensation based on the CO_2 value.
NH_3	Displays the compensation based on the NH_3 value.
Manual ventilation compensation	Displays the current manual ventilation increase.
Minimum ventilation calculated	Displays the calculated minimum ventilation, taking all active compensations into account.
MAXIMUM VENTILATION COMPENSATION	
Maximum ventilation	Displays the set maximum ventilation.
Maximum ventilation curve	Displays the maximum ventilation calculated from the growth curve, if enabled.
Growth curve offset	Displays the set offset relative to the growth curve
Occupancy rate	Displays the compensation based on the occupancy rate.
Outside temperature	Displays the compensation based on the minimum outside temperature.
RH	Displays the compensation based on the relative humidity (RH).
CO_2	Displays the compensation based on the CO_2 value.
NH_3	Displays the compensation based on the NH_3 value.
Manual ventilation compensation	Displays the current manual ventilation increase.
Maximum ventilation calculated	Displays the calculated maximum ventilation, taking all active compensations into account.

7.2.2 Main ventilation with curve

CLIMATE > Main ventilation > Curve

Curve tab

For each breakpoint, you can set the temperature difference relative to the house temperature setpoint. For each breakpoint, you can also set the minimum and maximum ventilation, expressed in % or m³/kg/h. When one of these values is changed, the computer automatically converts the other unit.

If tunnel ventilation with a wind chill factor is installed, an additional column for the chill factor will appear. For chicks, the wind chill factor is usually set according to age. Young chicks are more sensitive to draughts and temperature drops than older birds. Therefore, the chill value is set higher for young chicks and decreases as they grow older.

Settings tab

Climate growth curves	Indicates whether the set climate curves are active. You can activate or deactivate the climate curves under *CLIMATE > House > General.*
Growth curve	Enable this option to activate the growth curve for the main ventilation. You can configure this curve on the *Curve* tab.
Disconnect from main curve	Enable this option to disconnect the main ventilation curve from the main curve.
Number of breakpoints	Displays the number of breakpoints on the main curve. If the curve is disconnected from the main curve, you can set the number of breakpoints here.

7.2.3 Compensations based on RH, CO_2 and/or NH_3

CLIMATE > Main ventilation > Compensations

You can control the main ventilation based on RH, CO_2 and/or NH_3 and set the corresponding compensation factors.

Overview tab

MANUAL VENTILATION COMPENSATION	
Ventilation compensation	Enter the percentage by which the main ventilation is manually adjusted relative to the automatic control. The value may be positive or negative, depending on whether you want to increase or decrease the ventilation. Positive value (+%) → more ventilation than the calculated value. Negative value (–%) → less ventilation than the calculated value. *Calculated ventilation* 40 *Ventilation compensation* +10 Ventilation is temporarily increased to: 40 + (100 /40 × 10) = 44%.
Actual status	Indicates whether manual compensation is currently active.
Compensation stops at	Set the time (hh:mm) at which the set manual compensation will automatically end. After this time, the set compensation is gradually phased out.

Compensation reduction	Set the duration (hh:mm) over which the manual compensation is gradually phased out to prevent fluctuations in climate or comfort. *Ventilation compensation* +10 *Compensation stops at* 14:30 *Compensation reduction* 00:10 From 14:20 to 14:30, the compensation will be gradually reduced to 0%. At 14:30, the manual compensation will have completely ended, and full automatic control will resume.
RH COMPENSATION	
RH compensation factor	Determines how strongly the main ventilation responds to excessive RH levels in the poultry house. See section 7.1.3.6.
Calculated RH compensation	Displays the calculated RH compensation. See section 7.1.3.6.
Calculated RH compensation absolute	Displays the calculated absolute RH compensation. See section 7.1.3.6.
Actual RH	The current, measured relative humidity in the poultry house.
CO_2 -COMPENSATION	
CO_2 compensation factor	Determines how strongly the main ventilation responds to excessive CO_2 levels in the poultry house. See section 7.1.3.7.
Calculated CO_2 compensation	Displays the calculated relative CO_2 compensation. See section 7.1.3.7.
Calculated CO_2 compensation absolute	Displays the calculated absolute CO_2 compensation. See section 7.1.3.7.
Actual CO_2	The current, measured CO_2 concentration in the poultry house.
NH_3 COMPENSATION	
NH_3 compensation factor	Determines how strongly the main ventilation responds to excessive NH_3 levels in the poultry house. See section 7.1.3.8.
Calculated NH_3 compensation	Displays the calculated relative NH_3 compensation. See section 7.1.3.8.
Calculated NH_3 compensation absolute	Displays the calculated absolute NH_3 compensation. See section 7.1.3.8.
Actual NH_3	The current, measured NH_3 concentration in the poultry house.

7.2.4 Main ventilation during the various poultry house programs

CLIMATE > Main ventilation > Program

***Settings* tab**

DISINFECTING, SETTING UP, PREHEATING …. DRYING	
Setpoint	Enter the desired main ventilation positions (%) for the following poultry house statuses: *Disinfecting, Setting up, Preheating, Vaccinating, Catching, Cleaning* and *Drying*.

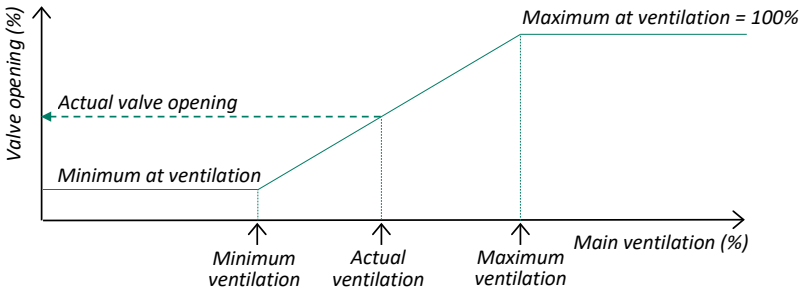
***Sensors* tab**

The sensor(s) used for Preheating/Brooding can be activated or deactivated here.

7.2.5 Control characteristic AQC valve without measuring fan

CLIMATE > Main ventilation > AQC valve

The control characteristic can only be set for an AQC valve without a measuring fan. In this case, the unit controls ventilation proportionally based on the calculated main ventilation. If a measuring fan is present in the proportionally controlled ventilation group, this menu option will not be available.



***Overview* tab**

Minimum at ventilation	The minimum position of the AQC valve at the lowest ventilation level, expressed as a percentage (0–100%).
Maximum at ventilation	The maximum position of the AQC valve at the highest ventilation level, expressed as a percentage (0–100%).
Minimum valve position	The absolute lower limit of the physical valve opening. This value prevents the valve from closing completely, for example to ensure basic ventilation or maintain negative pressure protection.
Proportional ventilation	Displays the current output percentage of the controlled main ventilation, indicating the strength of the fan control (%).
Actual valve position	The current position of the AQC valve, calculated based on the current calculated ventilation level.

7.2.6 Pulse-pause ventilation based on interval or duty-cycle ventilation

CLIMATE > Main ventilation > Interval ventilation/Duty cycle ventilation

Pulse-pause ventilation is used when the main ventilation at its minimum setting still provides too much airflow for the animals.

With this method, the fans switch on and off at high speed, allowing short bursts of fresh air into the poultry house. During the pause periods (when the fans are off), the air inlets close to prevent unwanted heat loss.

There are two types of pulse-pause ventilation, which are configured by the installer:

- *Interval ventilation*: Features a fixed pulse duration and a variable pause, meaning the overall cycle time can change. The goal is to maintain a consistent airflow pattern during each pulse.
- *Duty cycle ventilation:* Features a fixed overall cycle time, resulting in variable pulse and pause durations.

Operation of air inlet valves and AQC valves

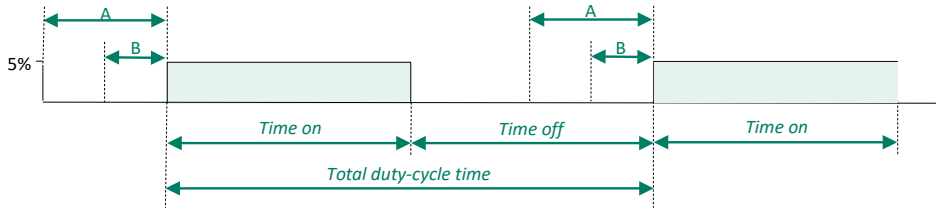
Air inlet valves and AQC valves require time to open and close. To prevent excessive pressure buildup in the poultry house when the fans start, the air inlet vales open slightly before the fans. When ventilation stops, the valves remain open until the required closing and reopening times have elapsed.

Specific operation per ventilation type

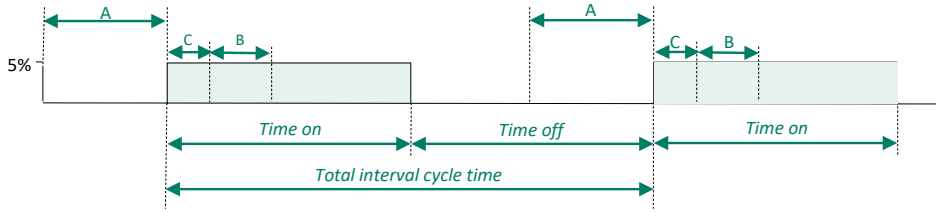
Interval ventilation: During each cycle, the pause duration may vary depending on poultry house conditions such as temperature, CO_2 levels, and relative humidity (RH). The currently calculated ventilation rate influences the pause duration.

Duty cycle ventilation: Once a cycle begins, the cycle time does not change, regardless of changes in poultry house conditions.

- *Open air inlets = Lead (installer setting)*
  When fans are switched on, the air inlets immediately move to a preset open position (*active during interval = always*). When fans switch off, the air inlets return to their minimum position.



- *Open air inlets = Delay (installer setting)*
  Air inlets open after a preset delay, allowing pressure to build up first. When fans switch off, the air inlets close again.



With a preset *lead time,* the AQC valve opens before the fans switch on.

7.2.6.1 Pulse-pause ventilation based on interval ventilation

***Settings* tab**

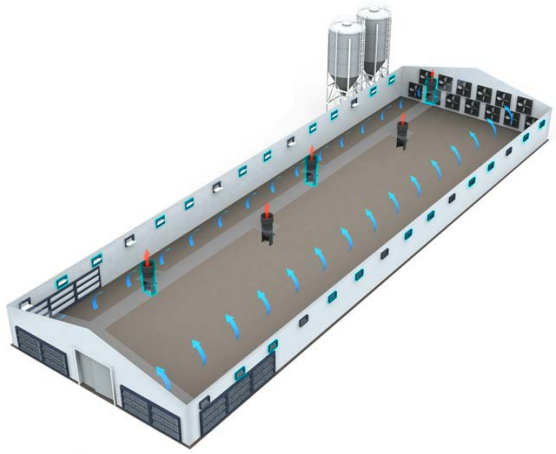
Interval ventilation till	Interval ventilation remains active until the calculated main ventilation exceeds the limit set here.
Maximum cycle time	Set the maximum duration (hh:mm) of a complete interval cycle (*pulse duration + pause duration*).
Interval ventilation	Indicates whether interval ventilation is active or disabled.
Cycle time on	The percentage of the total interval cycle time that the fans are on.
Duty-cycle time	Total duration of an interval cycle, consisting of *time on + time off.*
Pulse duration	Indicates the duration (mm:ss) that the fans are switched on during a cycle. The pulse duration remains the same, while the *pause duration* varies depending on the calculated ventilation.
Pause duration	Indicates the duration (mm:ss) that the fans remain switched off during a cycle. The pause duration is calculated automatically based on the calculated main ventilation.
Status	Indicates whether the fans are currently running (*active*) or switched off (*inactive*).
Duration	Indicates how long the displayed status of interval ventilation (*active* or *off*) will continue.
AIR INLET CALCULATED POSITION	
Step x	Set the position of the air inlet valves for each step, which is used during interval ventilation. This determines how far the air inlets open with each pulse.
PRESSURE CONTROL	
Actual status	Displays the current pressure control status.

7.2.6.2 Pulse-pause ventilation based on duty cycle

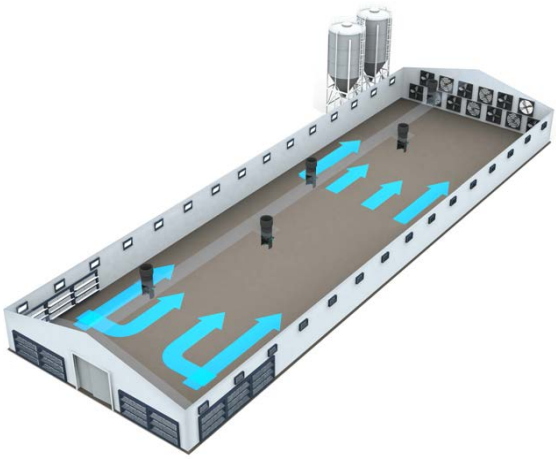
***Settings* tab**

Duty cycle	Enable this option to activate interval ventilation based on a duty cycle.
Duty-cycle ventilation till	Duty cycle ventilation remains active until the calculated main ventilation exceeds the limit set here.
Duty-cycle time	Set the maximum duration (hh:mm) of a complete cycle (*pulse duration + pause duration*).
Duty-cycle ventilation	Indicates whether duty-cycle ventilation is currently active or inactive.
Cycle time	Indicates the current position within the active cycle.
Period on	Indicates the percentage of the *duty-cycle time* during which the fans are switched on.
Pulse duration	Indicates the duration (mm:ss) that the fans remain switched on during a cycle. The duration is calculated automatically based on the calculated main ventilation.
Pause duration	Indicates the duration (mm:ss) that the fans remain switched off during a cycle. The duration is calculated automatically based on the calculated main ventilation.
Status	Indicates whether the fans are currently running (*active*) or switched off (*inactive*).
Duration	Indicates how long the current interval-ventilation status (*active* or *off*) will continue.
AIR INLET POSITION	
Step 1-3	Set the position of the air inlet valves for each step, which is used during interval ventilation. This determines how far the air inlets open with each pulse.
PRESSURE CONTROL	
Actual status	Indicates the current pressure control status.

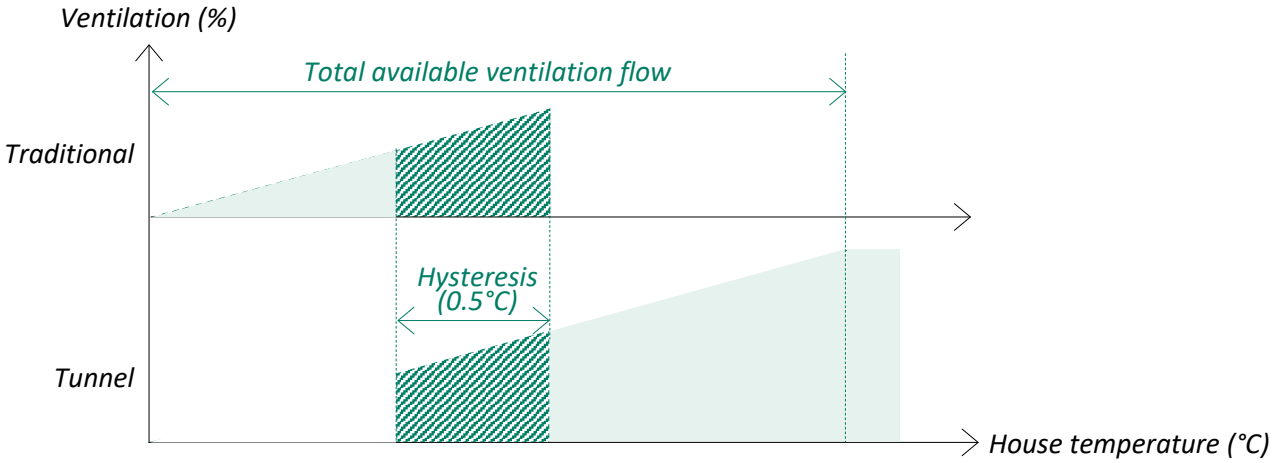
7.2.7 Tunnel ventilation



Traditional ventilation



Tunnel ventilation



! When switching automatically between *tunnel* and *traditional ventilation*, the controller remains in the new mode for at least the set minimum time (default: 20 minutes). Only after this period can it switch back. The delay time can be configured by your installer.

Manual switching between *traditional ventilation (off)* and *tunnel ventilation (on)* is possible without any delay. When returning to automatic mode, the delay period starts again.

Conditions for switching to tunnel ventilation:

- *Day number of the growth curve:* higher than the set *Active from day* value (default: day 8).
- *Outside temperature:* higher than the set *minimum outside temperature* (default: +6.0°C, relative to the house temperature).
- *Simple tunnel ventilation:* the installer has disabled wind chill, and the measured house temperature is higher than the set *Start tunnel* value (default: +4.0°C, relative to the house temperature).
- *Extensive tunnel ventilation:* the installer has enabled wind chill; airspeed is higher than the set minimum air speed (default: 0.6 m/s); tunnel ventilation is enabled; and the calculated wind chill is not lower than the house temperature setting.

Conditions for switching back to traditional ventilation:

- The measured house temperature falls below the set house temperature minus the hysteresis value (*Stop tunnel mode, House temperature*), or
- The measured outside temperature falls below the set house temperature plus the set minimum outside temperature minus the hysteresis value (*Stop tunnel mode, Outside temperature*).

7.2.7.1 Simple tunnel ventilation (without wind chill)

CLIMATE > Main ventilation > Tunnel ventilation > General

***Overview* tab**

Tunnel ventilation	*Off*	Switch off tunnel ventilation.
	Auto	In automatic mode, the system itself determines when to switch between traditional and tunnel ventilation.
	On	Switch on tunnel ventilation manually (the system will not switch back to traditional ventilation automatically).
Tunnel ventilation status	Displays the current status of tunnel ventilation: *On* or *Off*.	
Active from day	Enter the day number from which tunnel ventilation may be activated.	
Day	Displays the current day number.	
Minimum outside temp. offset *(visible only if growth curve is disabled)*	The minimum temperature difference required for tunnel ventilation to start. Tunnel ventilation will only activate if the outside temperature is higher than the house temperature plus this *offset*.	
Minimum outside temperature calculated	The calculated minimum outside temperature above which tunnel ventilation may activate.	
Outside temperature	The currently measured outside temperature.	
Minimum ventilation	The set minimum ventilation capacity during tunnel ventilation.	
Temperature setpoint house	The target house temperature.	
Temperature offset tunnel ventilation	The set temperature difference that triggers tunnel ventilation.	
Calculated start tunnel ventilation	The calculated temperature at which tunnel ventilation switches on.	
Actual temperature	The currently measured house temperature.	

7.2.7.2 Extensive tunnel ventilation (with wind chill)

In this mode, the wind chill effect (perceived temperature) is taken into account when determining the need for tunnel ventilation. The system considers not only the measured temperature and airspeed but also the additional cooling effect caused by airflow around the animals.

Wind chill factor 3.0 °C/m/s
Air velocity 2.5 m/s

Effective temperature adjustment = 3.0 × 2.5 = 7.5 °C

Overview* tab *(additional settings)

Minimum air speed	The air speed at which tunnel ventilation can be switched on.
Minimum ventilation	The calculated ventilation above which tunnel ventilation may be activated.
Calculated start tunnel ventilation	The temperature limit above which tunnel ventilation is switched on.
Actual temperature	The actual measured house temperature.
Wind chill factor *(visible only if the growth curve is disabled)*	This factor allows you to increase the influence of the wind chill effect. A higher value gives a greater cooling effect.
Growth curve wind chill *(visible only if the growth curve is enabled)*	Displays the wind chill factor calculated from the growth curve.
Actual air speed	The air velocity currently calculated in the house.
Wind chill effect	The calculated cooling based on the current air speed.
Wind chill temperature	The temperature as experienced by the animals, calculated based on the measured temperature in combination with the wind chill effect.

CLIMATE > Main ventilation > Tunnel ventilation > Curve

***Curve* tab**

For each breakpoint within the growth curve, you set two values:

- *Outside temperature* (°C): The reference temperature at which tunnel ventilation is activated.
- *Wind chill* (°C/m/s): The wind chill sensitivity, representing the influence of airspeed on perceived temperature. This value determines how strongly airflow reduces the animals' perceived temperature.

By configuring these values for each breakpoint, the system can accurately adjust tunnel ventilation based on the animals' age and their sensitivity to both temperature and air movement.

***Settings* tab**

Climate growth curves	Indicates whether the climate curves are active. You can enable or disable the climate curves under *CLIMATE > House > General.*
Growth curve	Enable this option to activate the growth curve for tunnel ventilation. You can configure this curve on the *Curve* tab.

Disconnect from main curve	Enable this option to disconnect the tunnel ventilation curve from the main house temperature curve (main curve).
Number of breakpoints	Displays the number of breakpoints in the main curve. If the curve is disconnected from the main curve, you can set the number of breakpoints here.

7.2.8 Temperature and ventilation alarm for main ventilation

CLIMATE > Main ventilation > Alarm > Temperature

***Settings* tab**

Temperature alarm	Enable this option to activate the configured temperature alarm limits.
Minimum alarm limit	The calculated minimum temperature alarm limit. See section 7.1.4.
Maximum alarm limit	The calculated maximum temperature alarm limit. See section 7.1.4.
Absolute alarm limit	The absolute temperature alarm limit. See section 7.1.4.
Outside temperature	The currently measured outside temperature.
Temperature setpoint calculated	The calculated target house temperature.
Actual temperature	The currently measured house temperature.

CLIMATE > Main ventilation > Alarm > Ventilation

***Settings* tab**

Measuring fan x	Enable this option to activate the configured ventilation alarm limits.
Actual ventilation measuring fan x	Displays the current ventilation measured by fan x.
Setpoint	The calculated target ventilation value.
Minimum alarm limit	The calculated minimum ventilation alarm limit. See section 7.1.4.
Maximum alarm limit	The calculated maximum ventilation alarm limit. See section 7.1.4.

7.3 Auxiliary ventilation control

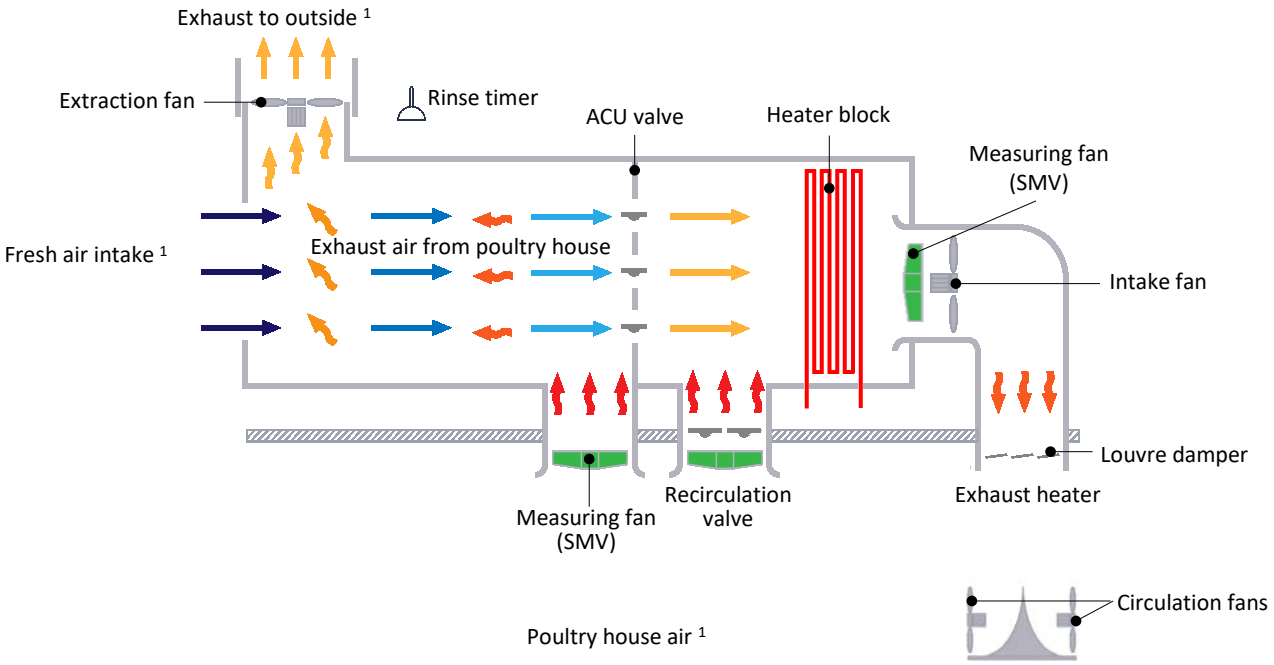
The auxiliary ventilation control, which uses proportionally controlled groups and step control, operates independently of the main ventilation system. For an explanation of the measurements and settings in the submenus, see section 7.2.

7.4 Heat exchanger

7.4.1 General

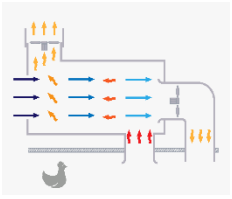
A heat exchanger ensures efficient ventilation and energy savings in poultry houses. It recycles heat from the outgoing ventilation air and uses it to heat the incoming fresh air. This reduces heat loss, lowers energy costs and contributes to a better house climate.

Some authorities require proof of the heat exchangers proper functioning. That is why logging functions have been added.

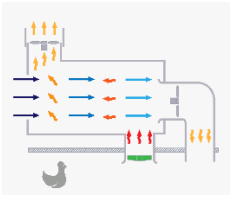


1 These temperatures are only displayed if logging is enabled and the sensors are installed.

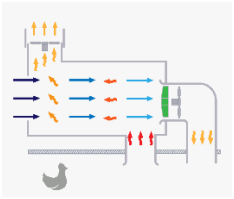
Five alternative examples of a heat exchanger:



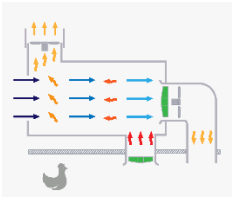
Standard heat exchanger



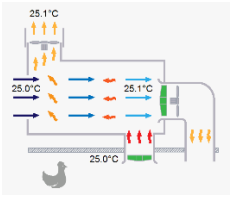
Exhaust fan with measuring fan



Supply fan with measuring fan



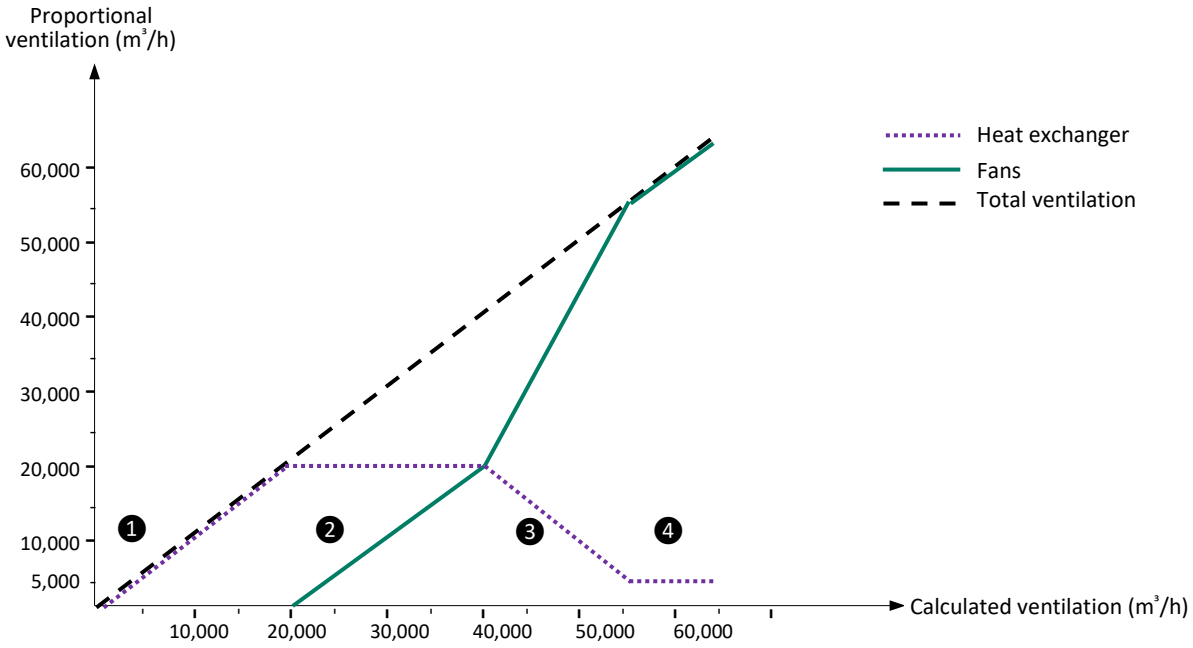
Extractor and intake fan with measuring fan



Logging: temperature sensors

The heat exchanger control first directs the required ventilation for the poultry house through the heat exchanger. If this is not sufficient, the main ventilation is activated. Afterwards, the heat exchanger can be switched off again if desired.

When the ventilation demand increases, the control system with a heat exchanger operates through four phases:



The condition for operation is that the temperature difference between the poultry house and the outside must be greater than 5.0 °C.

❶ *Increase*	The heat exchanger regulates the ventilation demand; the fans in the poultry house remain off.
❷ *Energy transfer*	The heat exchanger operates at maximum capacity, and the fans in the poultry house provide additional ventilation. This phase continues until the fans provide the same capacity as the heat exchanger.
❸ *Reduction*	The heat exchanger is switched back, while the fans in the poultry house compensate for the extra ventilation demand (only active if the reduction setting is enabled).
❹ *Ventilation*	The fans in the poultry house regulate the ventilation demand, while the heat exchanger either switches off or operates at minimum capacity. See the *Reduce until* setting.

If the outside sensor is defective, the reduction phase will not be activated.

The two white dots in the *Main Cockpit* widget indicate the minimum and maximum range of the heat exchanger. When the two white dots change into an arrow with a line, the heat exchanger is in the ramp-down phase.

CLIMATE > Heat exchanger > General

Overview tab

Heat exchanger	Enable this option if you want to activate the heat exchanger.
External control	Displays whether external control is enabled or disabled.
External control setpoint	Set the percentage of the maximum ventilation capacity at which the heat exchanger operates under external control. When external control is active, the heat exchanger follows this setpoint.
Increase until	Displays the highest ventilation level (%) that the heat exchanger can reach.
Calculated increase until	Displays the current ventilation buildup calculated by the system based on the set ventilation requirements and settings.
Calculated minimum	Displays the minimum ventilation of the heat exchanger, calculated from current settings and measured values.
Calculated maximum	Displays the maximum ventilation of the heat exchanger, calculated from current settings and measured values.
Calculated ventilation	Displays the current ventilation through the heat exchanger, calculated from settings and measured values.
Capacity	Displays the maximum ventilation capacity of the heat exchanger in m^3/h.
Capacity per kg	Displays the ventilation capacity of the heat exchanger per kilogram of live weight in $m^3/h/kg$.

Reduction tab

Reduce until	Displays the lowest ventilation setting (%) of the heat exchanger: = 0% → The heat exchanger switches off as soon as the ventilation drops further. If the heat exchanger can reduce to 0%, its capacity is not included in the total ventilation capacity. > 0% → The corresponding capacity is included in the total ventilation capacity.
Calculated reduce until	Displays the actual value calculated by the control system based on settings and measured values.
REDUCTION BASED ON BANDWIDTH	
Start reduction	The percentage of the main ventilation bandwidth at which the heat exchanger begins to reduce toward the *Reduce until* setting.
Calculated start reduction	Displays the current calculated start point of the reduction.
Start relative	Displays the temperature difference relative to the *Start reduction* setting.
Start absolute	Displays the calculated temperature at the moment the heat exchanger begins to reduce.

REDUCTION BASED ON OUTSIDE TEMPERATURE	
Offset temperature house setpoint	Set the outside temperature offset relative to the house temperature setpoint. At this value, the heat exchanger begins to reduce its maximum output.
Start outside temperature	Displays the outside temperature at which the maximum output of the heat exchanger begins to decrease.
Reduction compensation	Set the percentage by which the maximum ventilation capacity of the heat exchanger is adjusted per °C. The reduction increases or decreases proportionally depending on the outside temperature.

7.4.2 Intake fan

CLIMATE > Heat exchanger > Intake fan

***Overview* tab**

The settings under *INCREASE INTAKE* are designed to increase the airflow over the heater block, allowing the poultry house to warm up more quickly when it is very cold, for example during the preheating phase.

These settings are only available for heat exchangers equipped with a heater block.

INCREASE INTAKE	
Temperature setpoint calculated heater	Enter a difference value relative to the set house temperature. The blow-in fan regulates airflow based on the calculated target value for the poultry house temperature.
Temperature setpoint	Enter a difference value relative to the calculated temperature of the heater block.
Temperature setpoint calculated	Displays the target temperature at which the intake fan automatically increases, calculated based on the set temperature offset relative to the house temperature.
Bandwidth	Set how quickly the intake fan responds to temperature changes. A smaller bandwidth results in a faster and more intensive response.
Minimum ventilation	Sets the lowest intake fan setting (%). The fan will never operate below this value.
Maximum ventilation	Sets the highest intake fan setting (%). The fan will never exceed this value.

Actual temperature	Displays the current house temperature.
Actual heating	Displays the current status of the heater block, if installed.
Calculated ventilation	Displays the ventilation calculated based on the increase in the intake fan.

Calculated ventilation	Displays the theoretically required intake fan setting (%) based on animal numbers, age, weight, increase, and climate data.
Actual ventilation	The actual ventilation value measured via the measuring fan for the intake fan.
SLAVE	
Actual ventilation	When supply ventilation is controlled by a measuring fan, displays the measured ventilation of the slave (secondary) fan.
Min. water temperature	The minimum heating water temperature (°C) required to activate the intake fan. If the water temperature is below this value, the fan remains off to prevent cold air from being blown in.
Actual water temperature	Displays the current temperature (°C) of the heating water.

7.4.3 Extraction fan

CLIMATE > Heat exchanger > Extraction fan

***Overview* tab**

Calculated ventilation	Displays the theoretically required air exchange based on animal numbers, age, weight, and climate data. This value indicates the desired ventilation for an optimal poultry house climate.
Actual ventilation	Displays the actual measured ventilation of the air being extracted to the outside via the heat exchanger at this moment.
SLAVE	
Calculated ventilation	Displays the theoretically required air exchange based on animal numbers, age, weight, and climate data. This value indicates the desired ventilation for an optimal poultry house climate.
Actual ventilation	Displays the actual measured ventilation of the poultry house air being extracted directly to the outside at this moment.

7.4.4 Heater block

CLIMATE > Heat exchanger > Heater block

***Overview* tab**

Heater block	Enable this option to activate the heater block.
Temperature setpoint house	Displays the calculated target temperature for the poultry house.
Temperature offset	Enter a difference value relative to the set house temperature. The heater block operates based on the calculated target value for the house temperature.
Temperature setpoint calculated	Displays the calculated target temperature on the basis of which the heater block operates automatically.
Bandwidth *(not visible with PID control or on/off heating)*	Set how quickly the heater block should respond to temperature changes. A smaller bandwidth means a faster and more intensive response.
Minimum heating *(not visible with on/off heating)*	Set the minimum setting (%) of the heater block. The heater block will never heat below this value.
Maximum heating *(not visible with on/off heating)*	Set the maximum setting (%) of the heater block. The heater block will never heat above this value.
Actual temperature	Displays the current temperature of the poultry house.
Actual status	Displays the current heater block status: *On* or *Off*.
Actual heating *(only visible with proportional heating)*	Displays the current heater block position (%).
Frost guard	Indicates whether frost protection is currently active.
Actual water temperature	Displays the current heating water temperature (°C).

7.4.5 Recirculation valve

A recirculation valve is often used in combination with a heater block. This valve allows stable air to flow over the heater block instead of outside air, enabling the heater block to provide sufficient heat to effectively warm the poultry house.

CLIMATE > Heat exchanger > Recirculation valve

***Overview* tab**

Recirculation valve	Enable this option to activate the recirculation valve.
Calculated ventilation	Displays the calculated ventilation of the recirculation valve.
Actual ventilation	Displays the actual measured ventilation when using a measuring fan.
SLAVE (if installed)	
Actual ventilation	Displays the measured ventilation of the slave fan when the recirculation valve is controlled by a measuring fan.
Capacity	Displays the total ventilation capacity of the recirculation valve (m^3/h).
Capacity per kg	Displays the ventilation capacity of the recirculation valve per kilogram of live weight ($m^3/h/kg$).
Capacity per animal	Displays the ventilation capacity of the recirculation valve per animal (m^3/h).
ACU valve	Displays the current position of the ACU valve in the heat exchanger (%). The valve automatically regulates airflow for optimal heat transfer and ventilation: 0% = fully closed; 100% = fully open. See section 7.4.1 for the location of the ACU valve in the heat exchanger.

7.4.6 Louvre damper

CLIMATE > Heat exchanger > Louvre damper

***Overview* tab**

Calculated damper opening	Displays the calculated open position (%) of the louvre damper.
SLAVE	
Calculated damper opening	Displays the calculated open position (%) of the louvre dampers for the heat exchanger configured as the slave.

7.4.7 Circulation fans

CLIMATE > Heat exchanger > Circulation fans

***Overview* tab**

CIRCULATION FAN 1 and 2	
Circulation fan	Enable this option to activate the circulation fans.
Ventilation setpoint	Enter the target ventilation value (%) of the circulation fans.
Calculated ventilation	Displays the calculated ventilation (%) of the circulation fans.
Actual ventilation	Displays the current ventilation setting (%) of the circulation fans.
Actual status	Displays the current status of the circulation fans.

Temperature setpoint	The temperature at which the circulation fans should switch on, set as a relative difference from the house temperature. This parameter appears only if temperature compensation is used.
Temperature setpoint calculated	Displays the calculated target temperature at which the circulation fans operate.
Increase	Set the extra ventilation above the calculated setpoint (%/°C) to compensate for local temperature fluctuations.
Actual temperature	Displays the measured temperature of the air passing through the circulation fans.

7.4.8 Curve

CLIMATE > Heat exchanger > Curve

***Curve* tab**

Max	Displays the maximum ventilation capacity of the heat exchanger as a percentage of the total possible ventilation.
Decrease	Displays the ventilation percentage at which the heat exchanger starts to reduce toward the set minimum ventilation.
Circ.1 / Circ.2	Displays the settings for circulation fan 1 and 2, indicating the extent to which air is circulated through the poultry house to maintain a uniform climate.

***Settings* tab**

Climate growth curves	Indicates whether the set climate curves are active. You can activate or deactivate the climate curves under *CLIMATE > House > General.*
Growth curve	Enable this option to activate the growth curve for the heat exchanger. You can configure this curve on the *Curve* tab.
Disconnect from main curve	Enable this option to disconnect the heat exchanger curve from the house temperature curve (main curve).
Number of breakpoints	Displays the number of breakpoints on the main curve. If the curve is disconnected from the main curve, you can set the number of breakpoints here.

7.4.9 Rinse timer

CLIMATE > Heat exchanger > Rinse timer

***Overview* tab**

Rinse timer	Enable this option to activate the rinse timer (also called rinse timer).
Number of periods	Enter the desired number of rinse periods.
Actual status	Displays the current status of the rinse timer: *On* or *Off.*
Active output	Displays the current output controlled by the rinse timer.
Remaining time	Indicates how much time remains before the active output changes status. Depending on the situation, this can mean: *Active time:* The remaining time the output will stay switched on. *Pause time:* The remaining time the output will stay switched off before it is activated again.
Pulse	The maximum duration (mm:ss) that an output remains active. See section 9.4.1 for more information.
Pause	The duration (mm:ss) the system waits before activating the next output. See section 9.4.1 for more information.
Active from day *(visible only if this option has been activated by your installer)*	Set the day number (between -9 and 999) from which the rinsing function becomes active. With young animals, rinsing the heat exchanger is often unnecessary in the first few days.
Day	Displays the current day number. You can adjust this if necessary.
Extraction fan	Displays the current ventilation setting of the extraction fan (%).
Intake fan	Displays the current ventilation setting of the intake fan (%).

! If your installer has set the sequential timer as a rinse timer, the rinse timer settings will be used for rinsing.

***Schedule* tab**

Begin	The start time of the rinse period (hh:mm). You can set this manually.
End	The end time of the rinse period (hh:mm). This is calculated automatically based on *Pulse*, *Pause* and *Number of periods.*

7.4.10 Alarm parameters

7.4.10.1 Intake fan

CLIMATE > Heat exchanger > Alarm > Intake fan

***Overview* tab**

Measuring fan	Enable this option to activate the intake fan ventilation alarm.
Calculated ventilation	Displays the calculated ventilation of the intake fan.
Minimum alarm limit	The minimum intake fan setting (%) at which an alarm is triggered. The alarm activates when the current intake fan setting falls below this value.
Maximum alarm limit	The maximum intake fan setting (%) at which an alarm is triggered. The alarm activates when the current intake fan setting exceeds this value.
Actual ventilation	Displays the actual measured ventilation of the intake fan (%).
SLAVE	
Measuring fan	Enable this option to activate the alarm function for the slave intake fan.
Actual ventilation	Displays the actual measured ventilation of the slave intake fan (%).

7.4.10.2 Extraction fan

CLIMATE > Heat exchanger > Alarm > Extractor fan

***Overview* tab**

See section 7.4.10.1 for a description of the parameters that apply to the extraction fan.

7.4.10.3 Recirculation valve

CLIMATE > Heat exchanger > Alarm > Recirculation valve

***Overview* tab**

See section 7.4.10.1 for a description of the parameters that apply to the recirculation valve.

7.4.10.4 Louvre damper

CLIMATE > Heat exchanger > Alarm > Louvre damper

***Overview* tab**

Ventilation alarm	Enable this option to activate the ventilation alarm.
Minimum alarm limit	The minimum louvre damper position (%) at which an alarm is triggered. The alarm activates when the current damper opening falls below this value, indicating a possible malfunction or blockage.
Maximum alarm limit	The maximum louvre damper position (%) at which an alarm is triggered. The alarm activates when the current damper opening exceeds this value, which may indicate a control error or mechanical problem.
Actual damper opening	Displays the current open position of the louvre damper (%).
Calculated damper opening	Displays the calculated open position of the louvre damper (%).
SLAVE	
Ventilation alarm	Activate this option to enable the ventilation alarm of the slave louvre damper
Actual damper opening	The current open position of the slave louvre damper (%).
Calculated damper opening	The calculated open position of the slave louvre damper (%).

7.5 Air inlets

7.5.1 Four control principles

Each air inlet group can be controlled by up to three motors, each of which can have its own temperature sensors. Control can be implemented according to one of the following four principles:

- *Temperature* – The air inlets are controlled based on the measured temperature (up to 4 sensors per group).
- *Pressure* – Ventilation is controlled based on the pressure difference in the poultry house.
- *Main ventilation* – The air inlets follow the position of the main ventilation system, such as fans or tunnel ventilation.
- *Ventilation in tunnel mode* – Specific control for tunnel ventilation, in which the air inlets work together with the tunnel fans to achieve maximum airflow.

These four control principles form the basis for additional control strategies, such as *cascade control*.

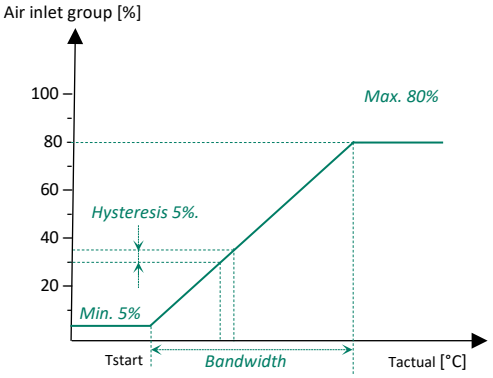
Operating principle of cascade control

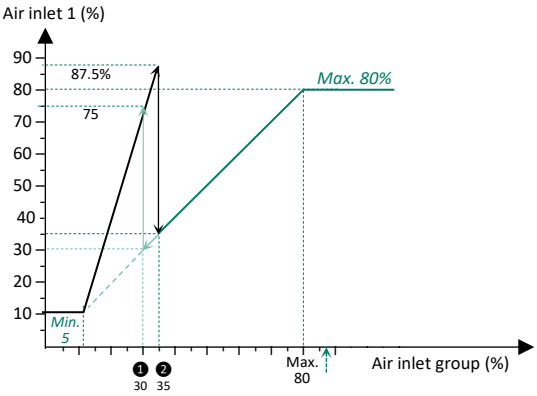
The total ventilation of the group is controlled based on temperature, main ventilation, and/or pressure control. The positions of the air inlets are controlled as follows:

1. First air inlet opens:
   Air inlet 1 opens first to the set value, while air inlets 2 and 3 remain closed.
2. Second air inlet switches on:
   When additional capacity is required and air inlet 2 needs to be activated, air inlets 1 and 2 are set to the same opening position. This ensures that the total inlet capacity remains constant during the switchover.
3. Equal further opening:
   Both inlets then open further together, evenly, until the required ventilation capacity is reached.

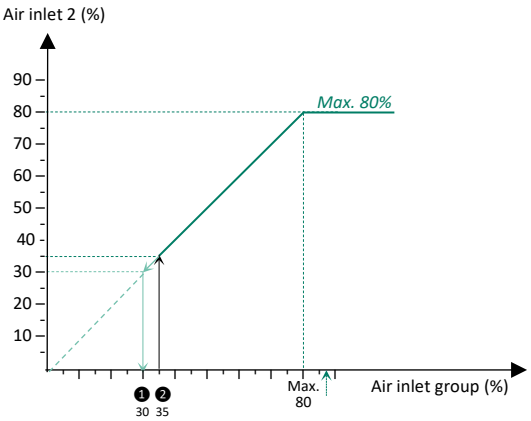
Air inlet 1 opens first to the set position, air inlet 2 remains closed.

From that point onward, air inlets 1 and 2 open simultaneously and evenly until the required ventilation capacity is achieved.





❶ = air inlet 1 closes further
❷ = air inlet 1 opens further



❶ = air inlet 2 closes further
❷ = air inlet 2 opens further

7.5.2 Air inlet control based on temperature

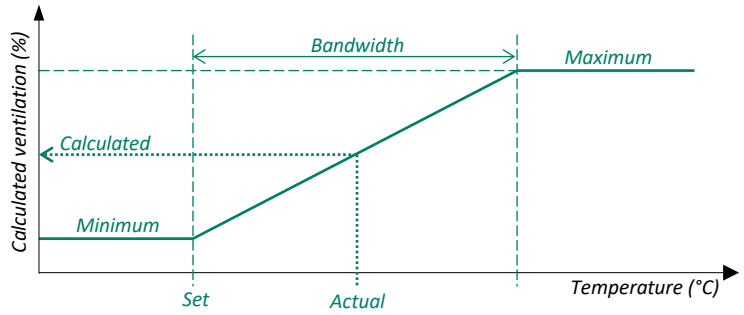


Fig.2 Graphical relationship between calculated ventilation and measured house temperature

All air inlet groups have identical settings and are configured in the same way. An air inlet group can consist of up to three separate controls (e.g., motor-controlled damper, curtain control). The temperature setpoint, bandwidth, minimum and maximum ventilation apply to all three controls (1, 2 and 3).

CLIMATE > Air inlet groups > Left, Right ... Top, Bottom > General

***Overview* tab**

Temperature setpoint house	Displays the set house temperature.
Temperature offset *(visible only if Growth curve = off)*	The target temperature, set as a difference (relative) compared to the set house temperature.
Temperature setpoint calculated	The automatically calculated target house temperature, based on the manually set target value or the value derived from the growth curve, including all relevant influences.
Bandwidth	Determines how sensitively the air inlet control responds to temperature changes. A smaller bandwidth ensures faster responses but may cause large fluctuations in ventilation, which can negatively affect the house climate.
Bandwidth calculated	A new bandwidth calculated based on influences such as temperature and ventilation requirements. Bandwidth compensation adjusts this value according to the outside temperature (see section 7.1.3.5).
Minimum air inlet position *(visible only if Growth curve = off)*	The calculated minimum air inlet setting, based on the manually set or curve-derived minimum, taking into account house temperature, ventilation percentage, and other relevant factors.
Calculated minimum	The calculated minimum air inlet position based on all relevant influences, assuming the manually set or curve-derived minimum.
Maximum air inlet position *(visible only if Growth curve = off)*	The calculated maximum air inlet setting, based on the manually set or curve-derived maximum, including all relevant influences.
Calculated maximum	The calculated maximum air inlet position, based on all relevant influences, assuming the manually set or curve-derived maximum.

CONTROL 1/2/3	
Actual temperature	Displays the measured house temperature for controls 1, 2 and 3, respectively.
Calculated position	Displays the calculated position for controls 1, 2 and 3, respectively.
Corrected position	Displays the air inlet position corrected on based on the output characteristic for controls 1, 2 and 3, respectively.
Actual position	Displays the currently measured air inlet position for controls 1, 2 and 3, respectively.

***Cascade control* tab**

Inlet control 1 max	Maximum ventilation percentage of the first air inlet group in the first step.
Inlet control 2 start	Displays the calculated position of the total air inlet opening at which the second air inlet group is activated.
Inlet control 2 max	Maximum ventilation percentage of the first and second air inlet groups in the second step.
Inlet control 3 start	Displays the calculated position of the total air inlet opening at which the third air inlet group is activated.
Calculated total air inlet opening	Displays the current calculated total position of the air inlet group.
Step	Displays the current step in the cascade sequence (e.g., first group 1 active, then group 2, then group 3).

In practice, ratios such as 1:2 (where the second step provides twice the inlet capacity) or 1:3 have been found to work well within cascade control.

7.5.3 Air inlet control based on pressure

In a pressure-based air inlet control system, ventilation is regulated by a pressure sensor that measures the negative pressure in the poultry house. When fans extract air, negative pressure is created, causing fresh air to flow in through the air inlets. The control system automatically adjusts the inlet openings to maintain the house pressure difference as constant as possible.

Pressure control features

- The pressure setting automatically adjusts to the outside temperature.
- Temperature differences within the poultry house affect the air inlet positions.
- In the event of a main ventilation alarm, the pressure control switches off immediately.
- In the event of a pressure alarm, the pressure control switches off with a delay.

***Overview* tab**

The Overview tab displays the same parameters as for temperature-based air inlet control (see section 7.5.2). Additionally, the current pressure status is now visible.

PRESSURE CONTROL	
Actual status	Displays the current pressure control status: *On* or *Off*.

7.5.4 Air inlet control based on main ventilation

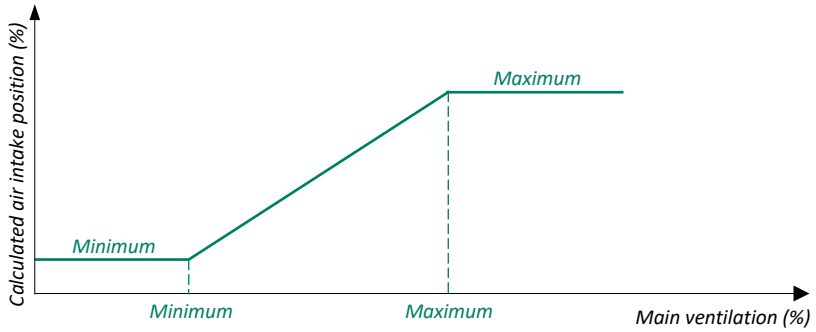


Fig.3 Graphical relationship between the calculated air inlet position and the measured main ventilation

***Overview* tab**

Minimum at ventilation	The air inlet remains at the set minimum position as long as the main ventilation stays below this percentage. Once this percentage is exceeded, the air inlet opens further.
Maximum at ventilation	The air inlet opens to the set maximum position when the main ventilation exceeds this percentage.
Minimum air inlet position *(visible only if Growth curve = off)*	The minimum air inlet setting corresponding to the *Minimum at ventilation* value.
Calculated minimum	The calculated minimum air inlet position based on the manually set or curve-derived minimum, including all relevant influences.
Maximum air inlet position *(visible only if Growth curve = off)*	The maximum air inlet setting corresponding to the *Maximum* setting *for ventilation* value.
Calculated maximum	The calculated maximum air inlet position based on the manually set or curve-derived maximum, including all relevant influences.
Main ventilation	Displays the current main ventilation value (%).
CONTROL 1/2/3	
Calculated position	Displays the calculated air inlet position for controls 1, 2, and 3, respectively.
Corrected position	Displays the air inlet position corrected based on the output characteristic for controls 1, 2 and 3 respectively.
Actual position	Displays the currently measured air inlet position for controls 1, 2 or 3, respectively.

! Air inlets controlled solely by main ventilation do not use temperature sensors.

7.5.5 Air inlet control based on tunnel ventilation

With tunnel ventilation control, the airflow in the poultry house is managed by opening large tunnel inlets at the front, while powerful fans at the rear extract the air. This creates a directed airflow along the length of the house (the tunnel effect), ensuring intensive air exchange and providing a cooling effect for the animals.

The control system automatically switches to tunnel ventilation as soon as house conditions exceed the set thresholds. Tunnel inlets open, side inlets close, and a stable, uniform airflow is established (see section 7.2.7).

A tunnel inlet can be configured by the installer in two different modes:

1. Tunnel mode - In this mode, the side inlets supply all fresh air until tunnel ventilation is activated. When tunnel control switches on:

- The side inlets close completely.
- The tunnel inlet takes over the entire air supply.

2. Transition function

Transition mode allows a gradual shift between *normal ventilation* and *tunnel ventilation*.

- *Normal ventilation mode:* Side inlets open to the maximum set position. When additional ventilation is needed, the tunnel inlets open step by step.
- *Tunnel ventilation mode:* Side inlets close completely, and the tunnel inlet takes over the entire air supply.

Overview tab

TRANSITION (only if *Inlet group mode = Transition* (installer setting) **/ TUNNEL**	
Minimum at ventilation	The air inlet remains at the set minimum position as long as the measured main ventilation remains below this percentage. Once this percentage is exceeded, the air inlet opens further.
Maximum at ventilation	The air inlet opens to the set maximum position when the main ventilation exceeds this percentage.
Minimum air inlet position *(visible only if Growth curve = off)*	The minimum air inlet setting corresponding to the *Minimum at ventilation* value.
Calculated minimum	The calculated minimum air inlet position based on the manually set or curve-derived minimum, including all relevant influences.
Maximum air inlet position *(visible only if Growth curve = off)*	The maximum air inlet setting corresponding to the *Maximum at Ventilation* value.
Calculated maximum	The calculated maximum air inlet position based on the manually set or curve-derived maximum, including all relevant influences.
Main ventilation	Displays the current main ventilation value (%).
Tunnel ventilation status	Indicates whether tunnel ventilation is currently active (*On*) or inactive (*Off*).

CONTROL 1/2/3	
Calculated position	Displays the calculated air inlet position for control 1, 2 and 3 respectively.
Corrected position	Displays the air inlet position corrected on the basis of the output characteristic for control 1, 2 and 3 respectively.
Actual position	Displays the currently measured air inlet position for control 1, 2 and 3, respectively.

7.5.6 Setting curve per air inlet group

CLIMATE > Air inlet groups > Left, Right, Top, Bottom, Tunnel > Curve

On the *Curve* tab, you can program the *house temperature setpoint* and/or *minimum* and *maximum air inlet positions* for each air inlet group in a growth curve, based on animal age.

On the *Settings* tab, you can specify whether to use the growth curve and set the desired number of breakpoints for the curve (see also section 7.1.2).

7.5.7 Setting compensation factors

CLIMATE > Air inlet groups > Left, Right ... Top, Bottom, Tunnel > Compensations

The temperature-based air inlet control can also take RH, CO_2, and NH_3 into account. The degree of influence of each factor can be set using compensation factors.

***Settings* tab**

RH COMPENSATION	
RH compensation factor	Determines how strongly (factor between 0.0 and 9.9) the main ventilation should respond to excessive relative humidity levels in the poultry house (section 7.1.3.6).
Calculated compensation	See section 7.1.3.6.
Calculated compensation absolute	See section 7.1.3.6.
CO2 COMPENSATION	
CO_2 compensation factor	Determines how strongly (factor between 0.0 and 9.9) the main ventilation should respond to excessive CO_2 levels in the poultry house (section 7.1.3.7).
Calculated compensation	See section 7.1.3.7.
Calculated compensation absolute	See section 7.1.3.7.

NH3 COMPENSATION	
NH_3compensation factor	Determines how strongly (factor between 0.0 and 9.9) the main ventilation should respond to excessive NH_3 levels in the poultry house (section 7.1.3.8).
Calculated compensation	See section 7.1.3.8.
Calculated compensation absolute	See section 7.1.3.8.

7.5.8 Setting the program per air inlet group

CLIMATE > Air intake groups > Left, Right …. Top, Bottom, Tunnel > Program

***Settings* tab**

Here you can set the desired ventilation levels (%) during the following house statuses: *Disinfecting, Seting-up, Preheating, Vaccinating, Catching, Cleaning,* and *Drying.* The current poultry house status is also displayed. See section 7.1.1.

7.5.9 Alarm settings per air inlet group

CLIMATE > Air inlet groups > Alarm

***Temperature* tab**

Minimum alarm limit	The calculated minimum alarm limit. If the house temperature falls below this value, an alarm is triggered. See also section 7.1.4.1.
Maximum alarm limit	The calculated maximum alarm limit. If the house temperature exceeds this value, an alarm is triggered. At high outside temperatures, the calculated maximum limit may temporarily shift but will never exceed the set absolute alarm limit. See also section 7.1.4.1.
Absolute alarm limit	The house temperature must never exceed this value. If it does, an alarm is activated regardless of the target temperature. Default: 35.0°C. See also section 7.1.4.1.
Outside temperature	Displays the current measured outside temperature.
Temperature setpoint calculated	Displays the target house temperature as calculated by the system, based on set influences, compensations, and current conditions.

CONTROL 1/2/3	
Temperature alarm	Enable this option to activate the temperature alarm for the relevant control (motor) of this air inlet group.
Actual temperature	The current house temperature measured by the sensor assigned to this control.

***Ventilation* tab**

CONTROL 1/2/3	
Ventilation alarm	Enable this option to activate the ventilation alarm for the relevant control (motor) of this air inlet group.
Actual position	Displays the current position of this air inlet group.
Corrected position	Displays the air inlet position corrected based on of the output characteristic for controls 1, 2 or 3, respectively.
Minimum alarm limit	The calculated minimum alarm limit. If the ventilation falls below this minimum limit, an alarm is triggered. See also section 7.2.1.
Maximum alarm limit	The calculated maximum alarm limit. If the ventilation exceeds this maximum limit, an alarm is triggered. See also section 7.2.1.
Limit switch open *(only visible with open/close control with limit switches)*	Displays the current status of the OPEN limit switch.
Limit switch closed *(only visible with open/close control with limit switches)*	Displays the current status of the CLOSED limit switch.

7.5.10 Pressure control

7.5.10.1 General

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

CLIMATE > Air inlet groups > Pressure control > General

***Overview* tab**

Pressure control	Enable this option to activate pressure control.
Pressure setpoint	Enter the desired negative pressure in the poultry house (Pa).
Calculated pressure	Displays the target pressure value as calculated by the system, based on the outside temperature and current conditions.
Actual pressure	The current, measured pressure in the poultry house.
Actual status	Indicates whether pressure control is currently active.
Calculated air inlet position	Displays the calculated air inlet opening based on the set and measured pressure. You can manually fine-tune the air inlet valves by adjusting the *calculated air inlet position*.

7.5.10.2 Compensations

CLIMATE > Air inlet groups > Pressure control > Compensations

***Overview* tab**

Pressure compensation	Here you can set how the pressure control should respond to changes in the outside temperature. This allows the system to automatically adjust the pressure when it becomes warmer or colder outside.
From outside temperature	Indicates the outside temperature at which the compensation starts to take effect. For example, if this is set to 15 °C, the pressure control will only compensate when the outside temperature rises above or falls below this value..
Minimum pressure	Determines the lowest pressure value at which compensation may be applied based on the outside temperature. This prevents the ventilation system from maintaining too little pressure, which could negatively affect air distribution.
Maximum pressure	Determines the highest pressure value at which compensation may be applied based on the outside temperature. This prevents the pressure from becoming too high, which could also disrupt air distribution.

7.5.10.3 Alarm settings

CLIMATE > Air inlet groups > Pressure control > Alarm

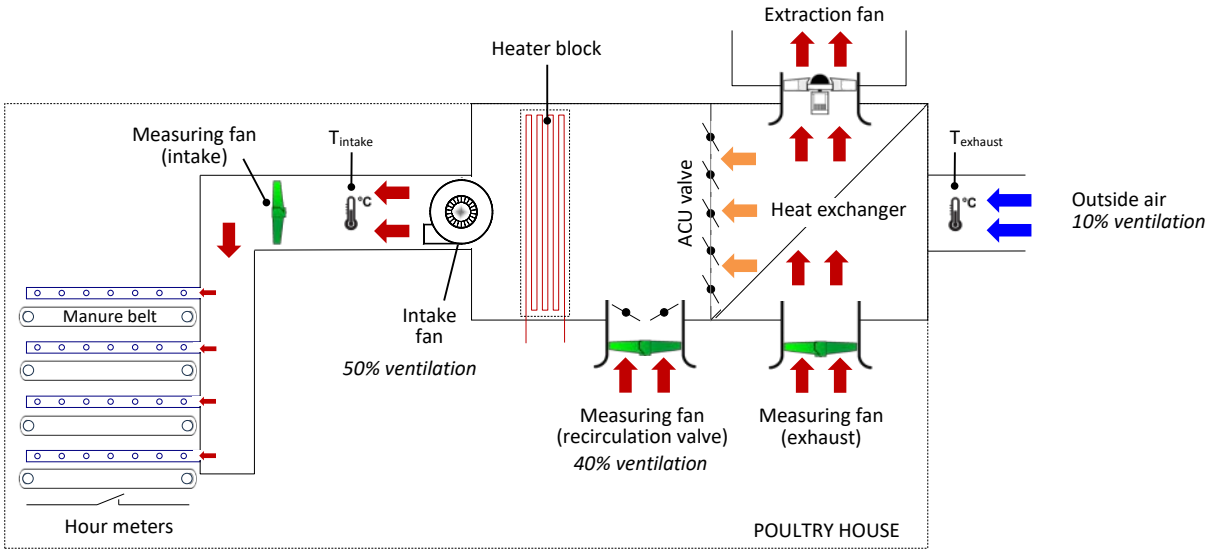
***Overview* tab**

Pressure alarm	Enable these options to activate the pressure alarm.
Minimum alarm limit	Enter the minimum relative alarm limit for the negative pressure.
Calculated minimum alarm limit	Displays the calculated minimum alarm limit based on the set value, including outside temperature compensations. When the measured negative pressure in the poultry house falls below this limit, an alarm is triggered.
Maximum alarm limit	Enter the maximum relative alarm limit for the negative pressure.
Calculated maximum alarm limit	Displays the calculated maximum alarm limit based on the set value, including outside temperature compensations. When the measured negative pressure in the poultry house exceeds this limit, an alarm is triggered.
Absolute alarm limit	The pressure in the poultry house must never exceed this value. If it does, an alarm is triggered, regardless of the target value.
Delay time	Enter the number of minutes and seconds (mm:ss) that the PL-9600 waits before an alarm is actually activated.
Actual delay time	Displays the number of minutes and seconds (mm:ss) remaining after the delay time has started before the PL-9600 triggers an alarm.
Actual pressure	The current measured negative pressure in the poultry house.

7.6 Manure belt aeration

Manure drying in poultry houses can be carried out effectively using manure belt aeration. By directing air over the manure belt in a controlled manner, ammonia emissions are reduced and the overall house climate is improved. Optionally, manure belt aeration can be combined with a heat exchanger for additional efficiency.

Below is an example of the most comprehensive configuration.



7.6.1 Intake fan

CLIMATE > Manure belt aeration > Intake fan

***Overview* tab**

Intake fan	Enable this option to activate the blow-in fan.
House temperature setpoint *(visible if temperature setting = relative, installer setting)*	Displays the set house temperature.
Temperature offset *(visible if temperature setting = relative, installer setting)*	Set the temperature difference relative to the house temperature. This is mainly used during the rearing period, when the house temperature is determined using a growth curve.
Temperature setpoint *(visible if temperature setting = absolute, installer setting)*	Set the fixed temperature at which the intake fan operates. This is usually applied for adult animals.
Temperature setpoint calculated	Displays the calculated target value at which the intake fan operates.
Bandwidth	Determines how sensitively the intake fan responds to temperature changes (range: 1–20.0°C). A smaller bandwidth results in faster adjustments.
Minimum ventilation	Set the minimum ventilation limit for the intake fan.
Minimum ventilation calculated	Displays the calculated minimum ventilation limit of the intake fan.
Maximum ventilation	Set the maximum ventilation limit for the intake fan.

Maximum ventilation calculated	Displays the calculated maximum ventilation limit of the intake fan.
Actual temperature	Displays the current supply air temperature, measured in the air duct behind the intake fan.
Actual ventilation	Displays the current calculated position of the intake fan. If reduction is active, the maximum is limited by the corrected reduction. The calculated ventilation percentage can be used by the heater block and recirculation valve, depending on the highest value of the individual controls. This calculated percentage may exceed the set maximum. *Heater block = ON*: When the calculated ventilation of the intake fan is lower than the set minimum ventilation, the intake fan must run to distribute the heat produced by the heater block. Even when the intake fan is switched off, the heater block can control the intake fan. *Recirculation valve = ON*: When the calculated ventilation of the intake fan is lower than the calculated ventilation of the recirculation valve, the intake fan is controlled based on the recirculation valve's calculated ventilation. Even when the intake fan is switched off, the recirculation valve continues to control it.
Actual ventilation *(only visible when using a measuring fan)*	Displays the actual measured ventilation before the intake fan.
Capacity	Displays the current capacity of the intake fan.
Capacity per kg	Displays the current capacity of the intake fan in m^3/kg/hour.
REDUCTION	**To save energy, the intake fan can be set to run at a lower speed for a specific period.**
Begin	Set the start time for the reduction period, during which the maximum setting of the intake fan is reduced.
End	Set the end time for the reduction period, after which the fan can operate at its normal maximum setting again.
Reduction	Set the percentage by which the speed of the intake fan should be reduced during the reduction period.
Maximum ventilation calculated	Displays the current calculated maximum ventilation limit of the intake fan, taking into account the set reduction period.

7.6.2 Extraction fan

CLIMATE > Manure belt aeration > Extraction fan

***Overview* tab**

Extraction fan	Enable this option to activate the extraction fan.
Temperature setpoint intake fan	Displays the calculated target temperature for the intake fan.
Temperature offset	The extraction fan operates based on this house temperature-dependent target value, set as a relative difference compared to the intake fan.
Temperature setpoint calculated	Displays the calculated temperature at which the extraction fan operates.
Actual temperature	Displays the current average measured temperature of the supply air.
Bandwidth	Determines how sensitively the extraction fan responds to temperature changes (range: 1–20.0°C). A smaller bandwidth results in faster adjustments.
Minimum ventilation	Set the minimum ventilation limit for the extraction fan.
Minimum ventilation calculated	Displays the calculated minimum ventilation limit of the extraction fan.
Maximum ventilation	Set the maximum ventilation limit for the extraction fan.
Maximum ventilation calculated	Displays the calculated maximum ventilation limit of the extraction fan.

Actual temperature	Displays the current measured temperature; usually the outside temperature.
Calculated ventilation	Displays the current calculated ventilation based on bandwidth and the set minimum and maximum ventilation limits.
Actual ventilation *(only visible when using a measuring fan)*	Displays the actual ventilation measured before the extraction fan.
Capacity	Displays the total ventilation capacity of the main ventilation group (m^3/hour).
Capacity per kg	Displays the current supply capacity per kilogram of live weight.
REDUCTION	**An installer can activate reduction to limit the extractor output when the house temperature drops too low. This prevents excessive extraction of warm air from the poultry house.**
Temperature setpoint house	Displays the target temperature for the poultry house.
Temperature offset	Set the temperature difference relative to the temperature setpoint for the poultry house.
Temperature setpoint calculated	Displays the calculated target temperature for the poultry house.

House temperature	Displays the current house temperature.
Reduction	Set the percentage by which the extraction fan should reduce its output per degree when the temperature falls below the set house temperature.
Calculated reduction	Displays the percentage by which the extraction fan is reduced based on the set values.

7.6.3 Heater block

CLIMATE > Manure belt aeration > Heater block

***Overview* tab**

Heater block	Enable this option to activate the heater block.
Temperature setpoint intake fan	Displays the calculated target temperature of the blow-in fan.
Temperature offset	The heater block operates based on this house temperature-dependent target value, set as a relative difference from the intake fan setpoint temperature.
Temperature setpoint calculated	Displays the calculated target temperature at which the heater block operates.
Actual temperature	Displays the current temperature measured behind the heater block.
Actual status	Displays the current heater block status.
Actual heating	Displays the current heater block position.
INTAKE FAN	
Minimum ventilation	Set the minimum ventilation limit for the intake fan.
Calculated ventilation	Displays the calculated setting of the intake fan.
Actual ventilation *(only visible when using a measuring fan)*	Displays the actual measured ventilation of the intake fan.

7.6.4 Recirculation valve

CLIMATE > Manure belt aeration > Recirculation valve

***Overview* tab**

Recirculation valve	Enable this option to activate the recirculation valve.
Temperature setpoint intake fan	Displays the calculated target temperature for the blow-in fan.
Temperature offset	The recirculation valve operates based on this house temperature-dependent target value, set as a relative difference from the intake fan setpoint temperature.
Temperature setpoint calculated	Displays the calculated target temperature at which the recirculation valve operates.
Bandwidth	Displays the set bandwidth of the recirculation valve.
Minimum ventilation	Set the minimum ventilation limit for the recirculation valve.
Maximum ventilation	Set the maximum ventilation limit for the recirculation valve.
Actual temperature	Displays the current measured temperature of the intake fan.
Calculated ventilation	Displays the calculated ventilation of the recirculation valve.
Calculated ventilation	Displays the calculated ventilation of the recirculation valve.
Actual ventilation *(only visible when using a measuring fan)*	Displays the actual measured ventilation of the recirculation valve.
Heater block status	Displays the current status of the heater block.
Capacity	Displays the current capacity of the recirculation valve.
Capacity per kg	Displays the ventilation capacity per kilogram of live weight (m^3/kg/hour) of the recirculation valve.

7.6.5 Curve

CLIMATE > Manure belt aeration > Curve

On the *Curve* tab, you can program the *temperature offset* as well as the *minimum* and *maximum ventilation* for the manure belt aeration in a growth curve, depending on the age of the animals.

On the *Settings* tab, you can specify whether to use the growth curve and set the desired number of breakpoints for the curve (see also section 6.1.2).

7.6.6 Programs

CLIMATE > Manure belt aeration > Programs > Intake fan + Extraction fan

Here you can set the desired ventilation levels (%) for the intake fan and extraction fan during the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Vaccinating, Catching, Cleaning* and *Drying.*

7.6.7 Alarm parameters

7.6.7.1 Intake fan

CLIMATE > Manure belt ventilation > Alarm > Intake fan

Here you can switch the temperature alarm on and off and set the alarm limits for the intake fan.

***Overview* tab**

Temperature alarm	Switch on this option to activate the temperature alarms for the blow fan.
Temperature setpoint calculated	Displays the calculated target temperature for the intake fan.
Minimum alarm limit	Relative setting of the minimum alarm limit in relation to the intake fan setpoint temperature.
Calculated minimum alarm limit	An alarm is triggered if the measured temperature falls below the calculated minimum alarm limit.
Maximum alarm limit	Relative setting of the maximum alarm limit in relation to the intake fan setpoint temperature. This value is limited by the *absolute alarm limit*.
Calculated maximum alarm limit	An alarm is triggered if the measured temperature exceeds this calculated maximum alarm limit.
Absolute alarm limit	The absolute maximum setting. The calculated maximum alarm limit can never exceed this value.
Outside temperature	Displays the current outside temperature.
Actual temperature	Displays the current measured temperature of the air in the intake fan

Measuring fan	Enable this option to activate the ventilation alarm for the intake fan.
Minimum alarm limit	Set the minimum ventilation (%) at which an alarm is triggered. The alarm is activated if the intake fan's current ventilation falls below this value.
Maximum alarm limit	Set the maximum ventilation (%) at which an alarm is triggered. The alarm is activated if the intake fan's current ventilation exceeds this value.
Calculated ventilation	Displays the calculated ventilation of the intake fan
Actual ventilation	The actual ventilation measured before the intake fan (%).

7.6.7.2 Extraction fan

CLIMATE > Manure belt aeration > Alarm > Extraction fan

Overview tab

For a description of the extraction fan alarm settings, see section 7.6.7.1, as these settings are identical.

7.6.7.3 Heater block

CLIMATE > Manure belt aeration > Alarm > Heater block

Here you can enable or disable the temperature alarm and set the alarm limits for the heater block.

Overview tab

Temperature alarm	Enable this option to activate the temperature alarms for the heater block.
Temperature setpoint calculated	Displays the calculated setpoint temperature for the heater block.
Minimum alarm limit	Relative setting of the minimum alarm limit in relation to the intake fan setpoint temperature.
Calculated minimum alarm limit	An alarm is triggered if the measured temperature falls below the calculated minimum alarm limit.
Maximum alarm limit	Relative setting of the maximum alarm limit in relation to the intake fan setpoint temperature. This is limited by the *absolute alarm limit*.
Calculated maximum alarm limit	An alarm is triggered if the measured temperature exceeds this calculated maximum alarm limit.
Absolute alarm limit	The absolute maximum setting. The calculated maximum alarm limit cannot exceed this value.
Outside temperature	Displays the current outside temperature.
Actual temperature	Displays the current measured temperature of the air in the intake fan.

7.6.7.4 Recirculation valve

CLIMATE > Manure belt aeration > Alarm > Recirculation valve

Here you can enable or disable the ventilation alarm and set the alarm limits for the recirculation valve.

***Overview* tab**

Measuring fan	Enable this option to activate the ventilation alarm for the measuring fan.
Minimum alarm limit	Relative setting of the minimum alarm limit in relation to the ventilation setpoint for the recirculation valve.
Calculated minimum alarm limit	An alarm is triggered if the measured ventilation falls below this calculated minimum alarm limit.
Actual ventilation	Displays the current measured ventilation of the recirculation valve.
Calculated ventilation	Displays the calculated ventilation of the recirculation valve.

7.7 Mixed air control

7.7.1 General

The mixed air control reduces ammonia emissions. Warm air from the ridge of poultry house is blown horizontally over the manure litter via ventilation ducts and fans. This accelerates the drying of the manure litter, resulting in lower ammonia release.

CLIMATE > Mixed air > General

Overview tab

Mixed air	Enable this option to activate the mixed air control.
Ventilation setting	Manually set the ventilation percentage of the mixed air fan.
Actual ventilation	Displays the current percentage of the mixed air fan.
Capacity per kg/ Capacity per animal *(depending on installer settings)*	Depending on installer settings, displays the ventilation capacity of the mixed air fan in m^3/kg/hour or m^3/animal/hour.

7.7.2 Curve

CLIMATE > Mixed air > Curve

Overview tab

On the *Curve* tab, you can program the ventilation levels for the mixed air control as a growth curve, depending on the age of the animals.

On the *Settings* tab, you can choose whether to use the growth curve and set the desired number of breakpoints for the curve if it is disconnected from the main house curve (see also section 6.1.2).

7.7.3 Program

CLIMATE > Mixed air > Program

Overview tab

Here you can set the desired ventilation levels (%) for the mixed air fan during different poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.* You can also view or change the current poultry house status here (see section 7.1.1).

7.8 Heating control

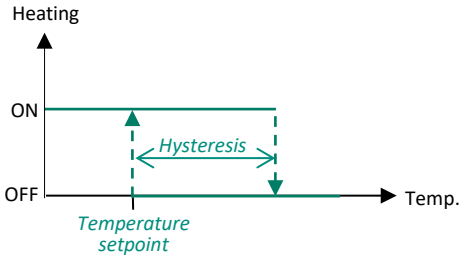
7.8.1 Standard heating controls

The PL-9600 supports three standard methods for controlling heating in the poultry house. The most suitable method depends on the type of heating system and the desired temperature control accuracy:

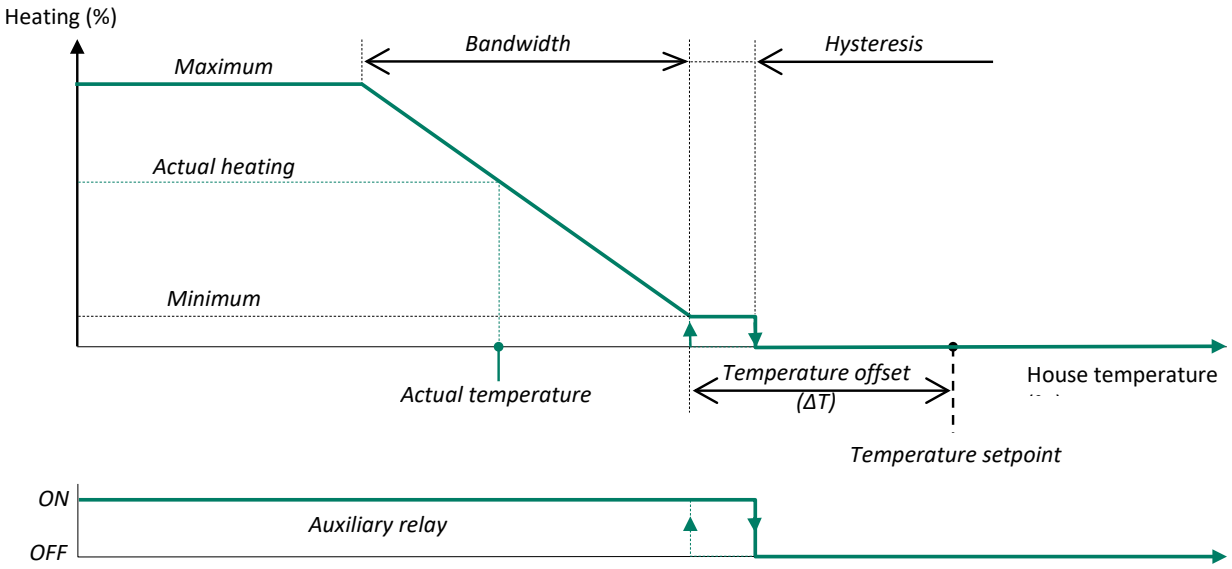
- *On/off heating* – Simple control where the heating is either fully on or fully off.
- *Proportional heating (0–10 V or pulse-pause)* – Continuous or pulsed proportional control, where heating power is adjusted between a minimum and maximum value.
- *Time-controlled heating* – Pulsed control with a fixed cycle time, where power is determined by the ratio of on-time to off-time.

7.8.1.1 On/off heating

The on/off heating is connected to a relay output. The switching hysteresis can be adjusted by your installer (for example, 0.5°C).



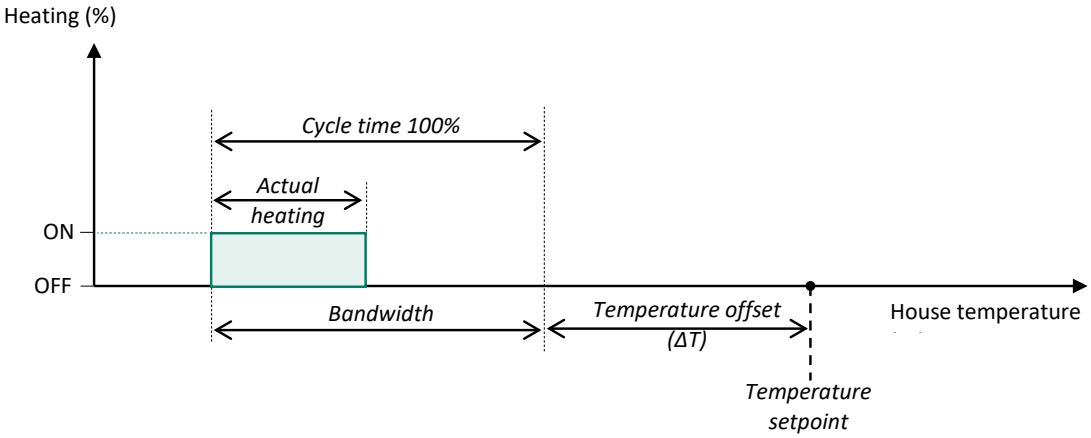
7.8.1.2 Proportional heating (0-10V or pulse-pause)



The climate control system adjusts the heating power continuously between the minimum and maximum settings. The speed at which the system moves from minimum to maximum depends on the set bandwidth.

If the measured temperature exceeds the set temperature, the heating output is switched off.

7.8.1.3 Time-controlled heating



The bandwidth determines how sensitively the heating responds to temperature changes. Within this bandwidth, the cycle time is adjusted from minimum to maximum (standard: 2 minutes). A smaller bandwidth causes the heating to respond more quickly to temperature fluctuations.

Cycle time The heating is controlled in pulses. The set cycle time corresponds to 100% output (fully controlled heating).

7.8.2 Standard heating control settings

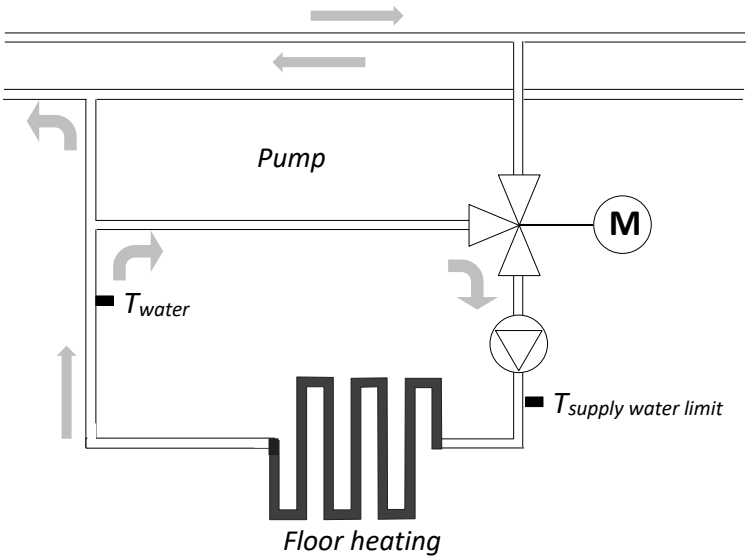
CLIMATE > Heating > Standard heating > General

***Overview* tab**

Heating	Enable this option to activate the heating control.
Temperature setpoint house	Displays the target house temperature.
Temperature offset *(only visible if growth curve is disabled)*	Set the temperature difference relative to the house temperature setpoint.
Temperature setpoint calculated	Displays the calculated target temperature at which the heating is controlled.
Bandwidth *(only visible with proportional heating)*	Set the control range for temperature changes. A smaller bandwidth ensures faster responses but may cause temperature fluctuations.
Minimum heating *(only visible with proportional heating)*	Set the minimum heating output.
Maximum heating *(only visible with proportional heating)*	Set the maximum heating output.
ACTUAL STATUS	
Actual temperature	Displays the current measured temperature of the heating system.
Actual status	Displays the current status of the heating: *On* or *Off*.
Actual heating *(only visible with proportional heating)*	Displays the current heating output in %.

7.8.3 Floor heating

The floor heating is controlled via a 0–10 V heating controller with a mixing valve.

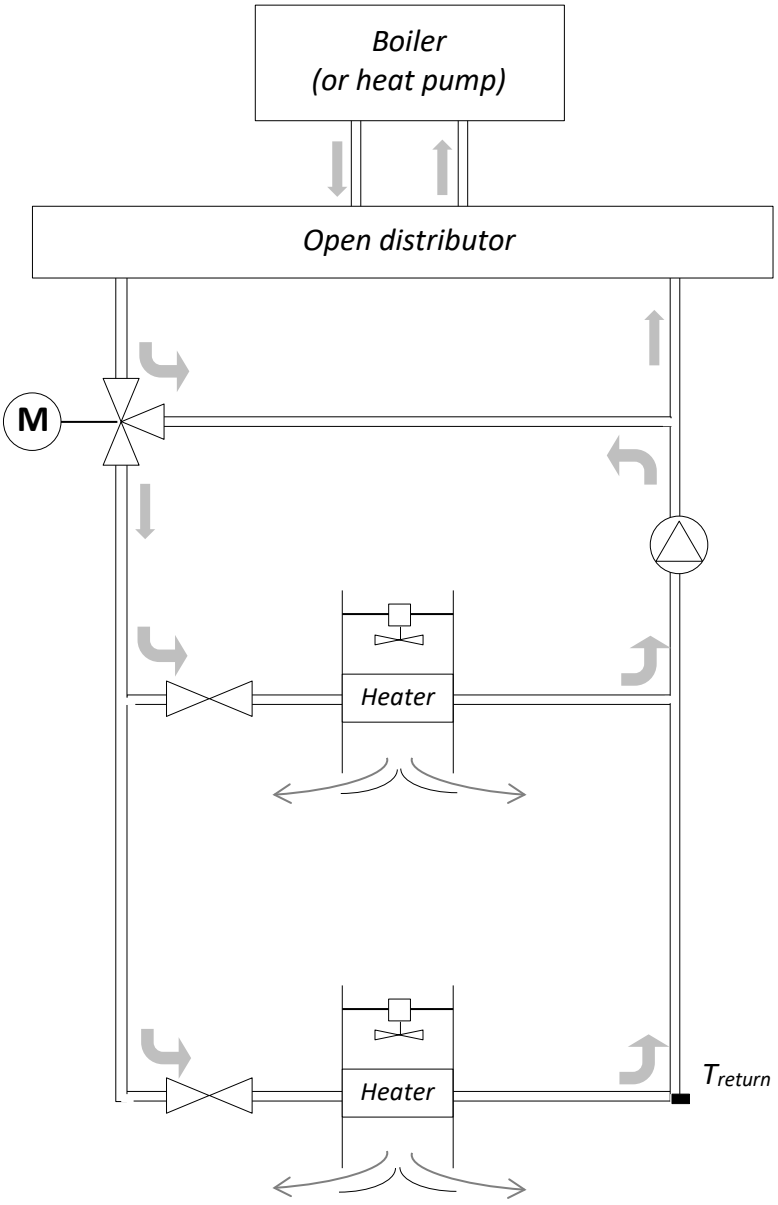


***Settings* tab**

Heating	Enable this option to activate the heating control.
House temperature setpoint	Displays the house temperature setpoint.
Temperature offset *(visible when growth curve is disabled)*	Set the temperature difference relative to the *house temperature setpoint.*
Calculated temperature setpoint	Displays the calculated house temperature setpoint on which the heating control is based.
Minimum heating	Set the minimum heating output.
Maximum heating	Set the maximum heating output.
CURRENT STATUS	
Current temperature	Displays the current measured temperature of the heating system.
Current status	Displays the current status of the heating: *On* or *Off*.
Current heating *(visible with proportional heating)*	Displays the current heating output as a percentage (%).

7.8.4 Hot water system

In a hot water heating system, heat is generated by a central heat source, such as a high-efficiency boiler, biomass boiler, or heat pump. This heat is distributed via circulating water through a heater (air heater) equipped with a fan.



The system consists of the following components:

- *Boiler* – the heat source for the system;
- *Pump* – circulates the heating water;
- *Mixing valve* – regulates the supply temperature to the heater;
- T_{return} – temperature sensor mounted in the return pipe or in the supply pipe just before the last heater. Optionally, an open/close valve can be installed at the heater block, for example when multiple heating zones exist in the house;
- *Fan* – mounted above or below the heater block, controlled by a frequency converter to adjust the air flow.

***Settings* tab**

Heating	Enable this option to activate the heating control.
House temperature setpoint	Displays the house temperature setpoint.
Temperature offset *(visible when growth curve is disabled)*	Set the temperature difference relative to the *house temperature setpoint.*
Calculated house temperature setpoint	Displays the calculated house temperature setpoint on which the heating control is based.
Fan low	Set the minimum fan speed.
Fan high	Set the maximum fan speed.

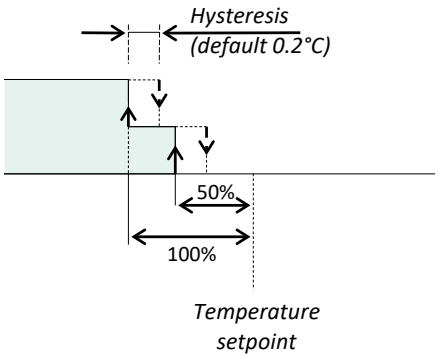
RETURN WATER	
Start heating	Set the return water temperature at which the heating may start running at high speed.
Current temperature	Current temperature of the water in the supply line to the floor.

CURRENT STATUS	
Current temperature	Displays the current measured temperature of the heating system.
Current status	Displays the current status of the heating: *On* or *Off*.
Current heating *(visible with proportional heating)*	Displays the current heating output as a percentage (%).

7.8.5 2-stage heating

A 2-stage heating system operates at two levels: 50% and 100% heating capacity. The heating starts at 50% by default, as this low power is usually sufficient to maintain the desired house temperature.

However, if the temperature drops below the permitted level, the heating automatically switches to the second stage (100% capacity) to quickly compensate for the heat loss. This 2-stage control minimises temperature fluctuations in the house.



CLIMATE > Heating > 2-stage heating > General

Overview tab

Heating	Enable this option to activate 2-stage heating control.
Temperature setpoint house	Displays the target house temperature.
Temperature setpoint 50% *(only visible if growth curve is disabled)*	Determines how much the measured temperature may deviate from the target before the heating switches to 50% output. This setting defines the sensitivity of the lower heating stage.
Temp. 50%	Displays the calculated temperature at which the 50% heating stage is activated.
Temperature setpoint 100% *(only visible if growth curve is disabled)*	Determines how much the measured temperature may deviate from the target before the heating switches to 100% output. This defines the sensitivity of the upper heating stage.
Temp. 100%	Displays the calculated temperature at which the 100% heating stage is activated.

Grid tab

Displays a status overview of all installed 2-stage heaters.

7.8.6 Curve

CLIMATE > 2-stage heating > Curve

***Overview* tab**

On the *Curve* tab, you can program the 50% and 100% temperature offsets for 2-stage heating in a growth curve based on age.
On the *Settings* tab, you can choose whether to use the growth curve and set the desired number of breakpoints if the curve is disconnected from the main house curve (see also section 6.1.2).

7.8.7 Program

CLIMATE > 2-stage heating > Program

***Overview* tab**

Here you can set the desired operating status for the following poultry house conditions: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*
For the poultry house statuses *Not in use, Vaccinating, Catching, Cleaning* and *Drying,* you can also specify the *Temperature-setpoint-50%* and the *Temperature-setpoint*-100% values.

7.8.8 Alarm parameters

CLIMATE > 2-Step heating > Alarm

Here you can switch the temperature alarm on and off and set the alarm limits.

***Settings* tab**

Temperature alarm	Enable this option to activate the temperature alarm.
Temp. 100%	Displays the calculated target temperature for the 100% heating stage.
Minimum alarm limit	Relative setting of the minimum alarm limit in relation to the calculated 100% target temperature.
Calculated minimum alarm limit	If the measured temperature falls below this value, an alarm will be triggered.
Temp 50%	Displays the calculated target temperature for the 50% heating stage.
Maximum alarm limit	Relative setting of the maximum alarm limit in relation to the 50% heating target. This is limited by the absolute alarm limit.
Absolute alarm limit	Set the absolute alarm limit here. The calculated maximum alarm limit can never exceed this value.
Outside temperature	Displays the current outside temperature.
Calculated maximum alarm limit	If the measured temperature exceeds this value, an alarm will be triggered.

7.9 Cooling control

7.9.1 General

There are several methods to cool the poultry house:

- *Water atomisation*

  Water is atomised into very fine droplets, which lowers the house temperature because energy is absorbed during evaporation. Water atomisation is not recommended in conditions of high humidity. An RH sensor should be installed to monitor relative humidity and switch off the cooling system if the humidity becomes too high.
- *Pad cooling*

  Fresh air is drawn through a cooling pad over which water is pumped, lowering the incoming air temperature. This system is always installed before the (tunnel) air inlets.
- *Air cooling*

  Incoming air is cooled via a heat exchanger. An additional benefit is that the same heat exchanger can also be used for heating the incoming air.
- *Floor cooling*

  Pipes or panels are integrated into the concrete floor. When the measured temperature exceeds the setpoint, cool groundwater is pumped through the pipes or panels to reduce the floor temperature.

Cooling and humidification can be controlled using the same output (relay or digital output).

If humidity control (RH) is active in the house, the cooling system will also regulate based on RH. To prevent the cooling from switching off at high humidity, set the RH limit to 100%.

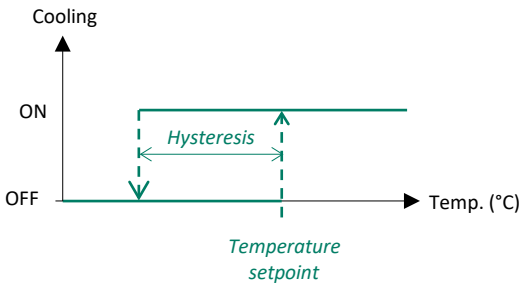
7.9.2 Standard cooling controls

The PL-9600 supports three standard methods for controlling cooling in the poultry house. The most suitable method depends on the type of cooling system and the desired temperature control accuracy:

- *On/Off cooling* – simple on/off control where the cooling system is either fully switched on or off.
- *Proportional cooling (0–10 V)* – analog control in which the cooling capacity is gradually adjusted between a minimum and maximum value.
- *Modulating cooling* – the output is controlled for a percentage of the set *cycle time*.
- *Cooling off based on RH – (optional, depending on system configuration).*

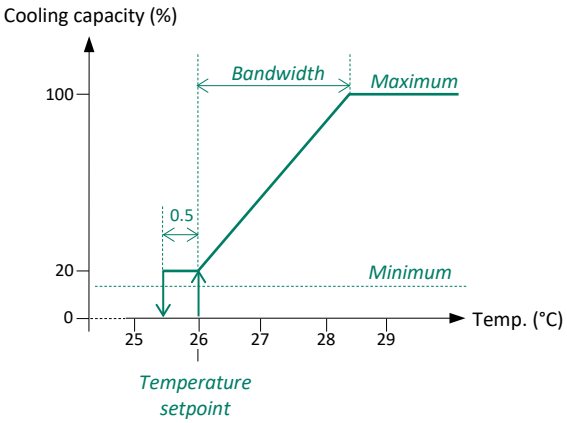
7.9.2.1 On/off cooling

On/off cooling is connected to a relay output. The switching hysteresis can be adjusted by your installer (0.5°C in the example).



7.9.2.2 Proportional cooling (0-10V)

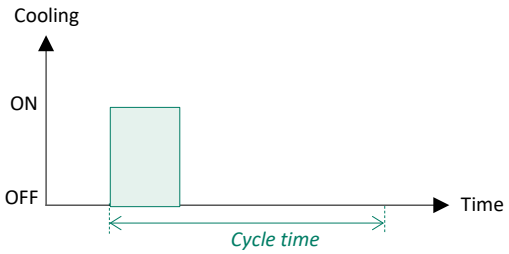
The climate control regulates the cooling capacity between the set minimum and maximum. The speed of adjustment depends on the set bandwidth.
The output is reduced to 0 V as soon as the measured temperature falls below the *temperature setpoint* minus the *hysteresis* (installer setting).



7.9.2.3 Modulating cooling

With modulating cooling control, the output is activated for a percentage of the set cycle time (actual cooling).

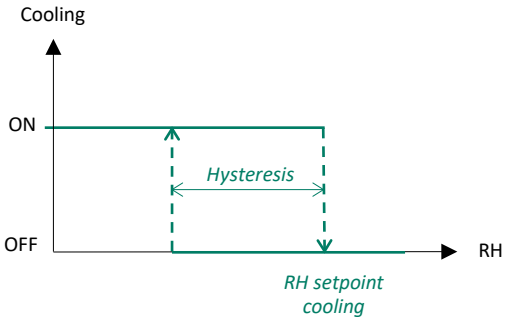
Cycle time	10 min
Actual cooling	25 %
Output active	10 × 25/100 = 2.5 min.
Output inactive	10 - 2.5 = 7.5 min.



7.9.2.4 Cooling off based on relative humidity (RH)

When cooling is active and the measured RH exceeds the target value for cooling, the cooling switches off. This prevents the humidity in the poultry house from becoming too high.

As soon as the RH falls below the *RH setpoint cooling* minus *hysteresis*, and the temperature is still above the set value, the cooling automatically switches back on.



7.9.3 Standard cooling control settings

CLIMATE > Cooling > General

***Overview* tab**

Cooling	Enable this option to activate the cooling control.
Temperature setpoint house	Displays the target house temperature.
Temperature offset *(only visible if growth curve is disabled)*	Set the temperature difference relative to the *target house temperature.*
Temperature setpoint calculated	Displays the calculated target temperature at which the cooling system regulates.
Maximum RH *(only visible when using an RH sensor)*	Set the maximum RH limit in the poultry house. When the *actual RH* exceeds this limit, the cooling switches off.

Bandwidth *(only visible with proportional cooling)*	Set the control range of the cooling system for temperature changes. A smaller bandwidth ensures faster responses, but may cause temperature fluctuations.
Minimum cooling *(only visible with proportional cooling)*	Set the minimum cooling level.
Maximum cooling *(only visible with proportional cooling)*	Set the maximum cooling level.
CURRENT STATUS	
Actual temperature	Displays the current measured temperature of the cooling system.
Actual RH *(only visible when using a RH sensor)*	Displays the current measured RH in the poultry house.
Actual status	Displays the current status of the cooling system: *On* or *Off*.
Actual cooling *(only visible with proportional cooling)*	Displays the current cooling level in %.

7.9.4 Curve

CLIMATE > Cooling > Curve

Overview tab

On the *Curve* tab, you can program the *Temperature offset, Minimum cooling* and *Maximum cooling* for the heating system in an age-dependent growth curve.

On the *Settings* tab, you can indicate whether you want to use the growth curve and set the desired number of breakpoints for the curve if it is disconnected from the main curve (see also section 6.1.2).

7.9.5 Program

CLIMATE > Cooling > Program

Overview tab

Here you can set the desired operating status during the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

7.9.6 Alarm parameters

CLIMATE > Cooling > Alarms

Here you can switch the temperature alarm on and off and set the alarm limits.

***Settings* tab**

Temperature alarm	Enable this option to activate the temperature alarm.
Setpoint temperature calculated	Displays the calculated target temperature for the cooling system.
Maximum alarm limit	Relative setting of the maximum alarm limit in relation to the calculated setpoint temperature. The calculated maximum alarm limit can never exceed the set *absolute alarm limit.*
Calculated maximum alarm limit	If the measured temperature exceeds this calculated maximum alarm limit, the system will trigger an alarm.
Absolute alarm limit	The calculated maximum alarm limit can never exceed the *absolute alarm limit*.
Outside temperature	Displays the current outside temperature.
Actual temperature	Displays the current temperature of the cooling system.

7.10 Humidification control

7.10.1 General

CLIMATE > Humidification > General

***Overview* tab**

Humidification	Enable this option to activate humidification control.
RH setpoint	Manually set the relative humidity (RH) percentage at which humidification control becomes active.
RH growth curve	The RH percentage calculated from the growth curve at which humidification control becomes active.
Bandwidth *(only visible with Duty cycle, installer setting)*	Determines how quickly the humidification control adjusts from minimum to maximum output..
Minimum position *(only visible with Duty cycle, installer setting)*	When the RH is equal to the *Minimum setting,* the humidification control operates at its minimum output.
Maximum position *(only visible with Duty cycle, installer setting)*	When the RH reaches the *Minimum setting* minus *Bandwidth,* the humidification control operates at maximum output.
ACTUAL STATUS	
Actual RH	Displays the current RH value (%).
Actual status	Displays the current status of the humidification control: *On* or *Off.*
Actual position	Displays the current output level (%) of the humidification control.
Cooling *(visible only if humidification control is linked to cooling, installer setting)*	Displays the current status of the cooling control: *On* or *Off.*

7.10.2 Curve

CLIMATE > Humidification > Curve

***Settings* and *Curve* tab**

On the *Curve* tab, you can program the RH for heating using a growth curve based on age.

On the *Settings* tab, you can specify whether to use the growth curve and set the desired number of breakpoints for the curve if it is disconnected from the main curve (see also section 6.1.2).

7.11 Temperature controls

A temperature control can be configured by your installer as one of the following:

- On/off heating
- Proportional heating
- On/off cooling
- Proportional cooling

7.11.1 Temperature control configured as heating control

If the temperature control is configured for heating, it operates in the same way as a heating system. See section 7.8 for details.

CLIMATE > Temperature controls > Temperature x

Temperature control settings: Section 7.8.2
Program settings: Section 7.8.5
Alarm parameters: Section 7.8.6

7.11.2 Temperature control configured as cooling control

If the temperature control is configured for cooling, it operates in the same way as a cooling system. See section 7.9 for details.

CLIMATE > Temperature controls > Temperature x

Temperature control settings: Section 7.9.3
Program settings: Section 7.9.5
Alarm parameters: Section 7.9.6

7.11.3 Temperature control configured as *delta-T* control

This control monitors the temperature difference between two sensors, for example house temperature sensors. When the difference between these sensors exceeds the set limit, the control can activate a recirculation fan to reduce temperature differences.

CLIMATE > Temperature controls > Temperature x > General

***Overview* tab**

Control name	Enable this option to activate the delta-T control.
Setpoint temperature difference	Set the temperature difference at which the control is activated.
Bandwidth *(visible with proportional delta-T control)*	Set the control range of the delta-T control for temperature variations. A smaller bandwidth results in a faster response but may cause temperature fluctuations
Minimum position *(visible with proportional delta-T control)*	Set the minimum output level of the delta-T control.
Maximum position *(visible with proportional delta-T control)*	Set the maximum output level of the delta-T control.

ACTUAL STATUS	
Highest temperature	Displays the currently highest measured temperature in the delta-T control.
Lowest temperature	Displays the currently lowest measured temperature in the delta-T control.
Actual temperature difference	Displays the current difference between the highest and lowest temperature readings.
Actual status	Displays the current status of the heating: *on* or *off*.
Actual heating *(visible with proportional delta-T control)*	Displays the current heating level as a percentage.

7.11.4 Program settings per temperature control

CLIMATE > Temperature controls > Temperature x > Program

See section 6.9.1.

7.11.5 Alarm per temperature control

CLIMATE > Temperature controls > Temperature x > Alarm

***Settings* tab**

Temperature alarm	Enable this option to activate monitoring of the temperature sensors.

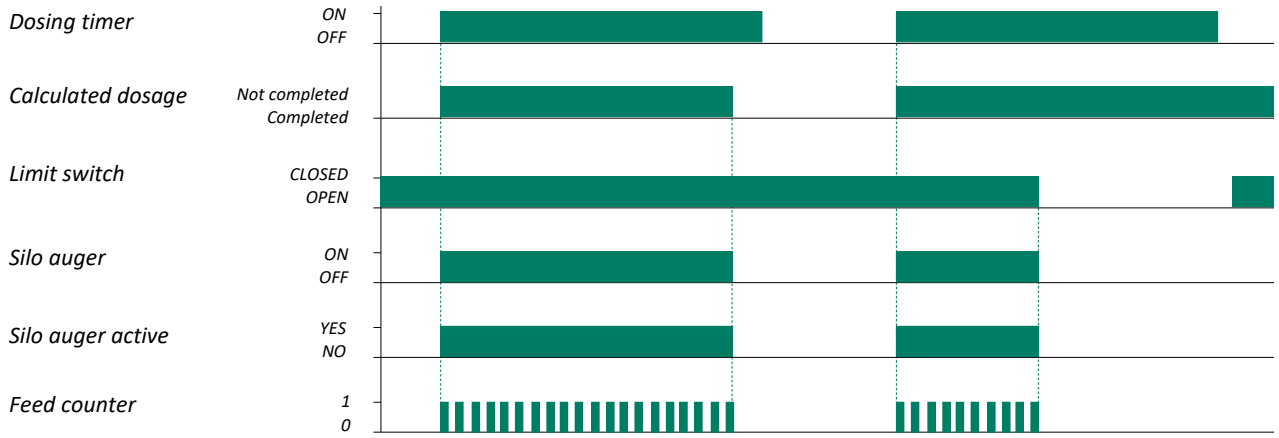
8 Feed

8.1 Possible feeding systems

The PL-9600 poultry management computer can be connected to a feeding system that continuously measures the amount of feed taken from the silos. The feeding system ensures that animals receive exactly the preset amount of feed. This is essential, as both overfeeding and underfeeding can negatively affect animal health and feed efficiency.

The feeding system can consist of:

- *PFB-35/70 feed weigher*
  Controlled directly by the *PL-9600*. All settings are entered on the computer itself.
- *PSW-1 silo weigher(s)*
  A maximum of two silo weighers can be connected to the *PL-9600*.
- *PFA-9400* with a connected *PFB-35/70 feed weigher* or *PSW-1 silo weigher(s)*
  In this configuration, the feed weigher is controlled by the *PFA-9400*. The poultry management computer controls the dosing timers, which are synchronised with the *PFA-9400*. Counter readings and silo data are received via RS-485 communication from the *PFA-9400*.
- *PFV-9xxx* with a connected *PFB-35/70 feed weigher or PSW-1 silo weigher(s)*
  Here, the feed weigher is controlled by the *PFV-9xxx*. Animal data and counter readings are synchronised with the *PFV-9xxx* via RS-485 communication.



8.1.1 PFB-35/70 feed weigher

In combination with the PL-9600 and I/O modules, the PFB-35/70 can:

- Mix up to 8 different components from a maximum of 16 silos;
- Distribute the daily feed ration over 24 feeding times using a dosing timer.

Do not set more component types than necessary. If there are more component types than silos and you change the component type in a silo, the mixture, feed curve settings, silo contents, and silo allocation must also be adjusted. Failure to do so will result in the error message *Component not in silo.*

You have four component types but only three silos. Silo 3 contains component 3. If you change the component type in silo 3 from component 3 to component 4, follow these steps:

1. Adjust the mixture.
2. Adjust the mixture if a feed curve has been set.
3. Adjust the silo contents.
4. Adjust the silo allocation.

FEED > Feed weighing > Overview

***Measurements* tab**

Here you can see an overview of the current silo contents (kg) of all connected and allocated silos.
Tap on the relevant parameter for the historical daily overviews.

Actual silo	Displays which silo is currently being used to supply feed. For systems with multiple silos, this field indicates the active silo that is feeding the weighing bunker.
Actual status	Displays the current operating phase of the feed weigher. Possible statuses are:

Feed weigher status	Description
Weighing bunker standby	The feed weigher is waiting for a start command to begin a new weighing cycle.
Waiting for release	Feed is detected in front of the feed sensor, so the weighing cycle cannot start yet.
Closing discharge hatch	The discharge hatch is being closed to start a new weighing cycle. This repeats until the entire feed cycle is complete.
Calculating dosage	The quantity to be dosed per component is determined based on the configured feed mixture.
Taring weighing hopper	The empty weighing bunker is set to zero to ensure accurate measurement.
Filling weighing hopper	After taring, the silo screw conveyor starts, and the hopper is filled with the required components.
Unloading weighing hopper	Once the correct quantity of each component is weighed, the discharge valve opens to release the feed.
End of weighing cycle	The entire feed cycle is complete.
Restarting weighing cycle	After a malfunction, the weighing cycle may need to be restarted manually. Change the setting from *No* to *Yes* to restart.

Weighing hopper contents	Displays the current weight of the feed in the weighing hopper, in kilograms. This represents the measured quantity that is ready for dosing.

Actual dosage	Displays the amount of feed currently being dispensed, based on the configured feeding schedules. This can be shown per cycle, per animal group, or per time unit, depending on the settings.
To be fed	Displays the amount of feed that still needs to be dispensed or distributed, according to the set feeding schedules.

To feed **tab**

This overview shows the calculated total quantities per component, expressed in kilograms. Component names can be changed if desired.

FEED > Feed weighing > Alarm

Overview **tab**

Alarm	You can configure the *PFB-35/70* feed weigher alarms using the following options: *On* All feed system alarms are transmitted to the *PL-9600*. *Off* The main alarm on the *PFB-35/70* (version ≥ 1.44) is deactivated. The alarm LED on the *PFB-35/70* continues to flash. No feed system alarms are transmitted to the PL-9600. *Time* Feed system alarms are transmitted only during the active period of the alarm schedule. Alarms outside this period are ignored. ! Deactivating the alarm also switches off the main alarm on the *PFB-35/70* feed weigher. The alarm LED will continue to flash.
Restart weigher	If an alarm is active and this option is enabled, the following occurs: ▪ The active alarm is reset; ▪ The system attempts to complete the remaining portion of the feed cycle.
Tare alarm	Deactivating this alarm switches off the tare alarm on the PFB-35/70 (alarm code 2: *AL2*).
Feed alarm	Deactivating this alarm switches off the feed alarm on the PFB-35/70 (alarm code 5: *AL5*). ! When the feed alarm is deactivated, the system will no longer switch to another silo containing the same (or an alternative) feed type.
Alarm status	Displays the current alarm status of the *PFB-35/70* feed weigher.

FEED > Components > General

Settings **tab**

Number of components	Set how many different components (up to 8) you want to mix.
Alternative components	Enable this option to automatically switch to an alternative component if a feed alarm lasts 30 seconds or longer. Disable it to prevent automatic switching. ! Always enter the silo order for each component via *WATER/FEED > Silos > Allocation > Silo order*. Active components are not stored separately; they are automatically determined from this order.
Reset alternative comp.	This setting clears all configured alternative components; all statuses are set to OFF. After a reset, it may take several minutes before feeding resumes, as the new feed composition must be recalculated.

FEED > Components > Component names

Settings tab

Component	Give a name to each component (up to 15 characters) and an abbreviated name (up to 3 characters). See section 4.3.

FEED > Components > Alternative components

Settings tab

Component + Alternative	For each component, specify which alternative should be used if the original component is temporarily unavailable.

FEED > Silos > General

Overview tab

Silo mix remainder	When a silo is nearly empty, the remaining material mainly consists of salts, minerals, and finely ground feed. If the silo weight falls below the set point, the system will attempt to mix the residue with feed from another silo. Conditions: The *Silo mix remainder* option must be activated and another silo must contain a similar feed type (component). If these conditions are met, the residue is mixed: 50% residue + 50% feed from another silo. If not, the remainder is mixed as follows: 50% remainder + stop (search for similar feed type) + 50% remainder.

Contents tab

For each silo, you can see which component it contains and its current status.
Content kg shows the current quantity in the silo. This can be a positive value (stock) or a negative value (shortage). When feed is bulk loaded, enter the quantity in the *Bulk loaded kg* column. After confirmation, this amount is automatically added to the silo content, and the Bulk Loaded kg value resets to 0.000 kg.

Status	You can manually change the silo status, for example from *Free* or *Empty* to *Blocked*. It may take up to ten seconds for the change to be communicated to the PFB-35/70. Status changes from *Free* to *Empty*: ▪ When you change it manually. ▪ When feed is supplied from the selected silo. ▪ When the feed supply speed from the silo is too low. *Empty* status is cancelled when: ▪ You change it manually. ▪ A new day begins. ▪ The feed weigher is restarted. ▪ The reset button on the PFB-35/70 is briefly pressed. ▪ Alternative component reset is performed. ▪ Feed is bulk loaded. Status changes from *Free* to *Blocked*: ▪ When you change it manually. A blocked silo cannot be used for feeding. If an alternative feed type is set, it will be used instead. *Blocked* status is lifted: ▪ When you manually change it to *Free* or *Empty*. ▪ When feed is bulk loaded.

FEED > Silos > Assignment

***Overview* tab**

Component	*Current silo*	*1*	*2*	*3*	*4*
Component 1	Silo 1	Silo 1	Silo 6	No	No
Component 2	Silo 2	Silo 2	No	No	No
Component 3	Silo 3	Silo 3	Silo 7	Silo 8	No
Component 4	Silo 4	Silo 4	No	No	No
Component 5	Silo 5	Silo 5	Silo 9	No	No

Current silo

The *Current silo* column shows the active silo from which a component is being dispensed. In the example above, component 1 is normally taken from Silo 1. If this silo is empty or blocked, the system automatically switches to Silo 6. Component 3 can be fed from three possible silos: Silo 3, 7, and 8. Components 2 and 4 have only one active silo each. Component 5 switches to Silo 9 if Silo 5 is unavailable.

1, 2, 3, 4
(silo order)

If multiple silos contain the same feed type (component), enter the correct silo numbers in the *Silo order* columns. When a silo becomes empty (e.g., due to a silo alarm or a weight of 0 kg), the system automatically switches to the next silo with the same feed type.

If no order is entered and a silo is blocked, an *Invalid silo* alarm will appear.

If you have four component types but only three silos and want to change the component type in silo 3 from component 3 to component 4, follow these steps:

1. Change the mixture.
2. Adjust the mixture when using a feed curve.
3. Change the silo contents.
4. Change the silo allocation.

FEED > Silos > Residual mixing

***Overview* tab**

When a silo is nearly empty, the remaining material mainly consists of salts, minerals, and finely ground feed. If the silo weight falls below the set value (*Start kg*), the system attempts to mix the remainder.
Conditions: The *Silo Mix Remainder* option must be active and another silo must contain the same component. The *Contents kg* column shows the current quantity in the silo in kilograms.

Conditions
The *Silo Mix Remainder* option must be enabled, and another silo must contain a similar feed type (component).

- If these conditions are met: the remainder is mixed 50% remainder + 50% feed from the other silo.
- If not, the remainder is mixed as 50% remainder + stop (search for a similar feed type) + 50% remainder.

***Settings* tab**

Silo mix remainder	Enable this option to allow mixing of the silo remainder.

FEED > Silos > Alarm

Overview tab

Minimum g/s	This sets the minimum average feed rate in grams per second. If the average feed rate falls below this minimum, the system triggers a feed alarm.

FEED > Feed mixture > General

Settings tab

Feed mixture curve	Here you can enable or disable the feed mixture curve of the feed timer.
Number of breakpoints	Enter the number of breakpoints (minimum 2, maximum 15) for the feed mixture curve.

Mixture tab

Depending on whether the feed composition curve of the feed timer is active, you can view or set the mixing ratio for each feed timer. If the curve is active, the current composition is automatically calculated based on this curve. You can adjust this calculated ratio by entering a correction value for the number of units in the *Corr.* column.

With feed curve

The values in the *Curve* and *Corr.* columns represent the relative dosage ratios of the different components, not the percentage of each component in the mixture. The percentage (*Perc.*) for each component is calculated based on these relative ratios.

Without feed curve

You manually set the relative dosage ratios (*Units*) of the different components. The corresponding percentage per component is automatically calculated from these ratios.

! The values in the % column are rounded. As a result, they may differ from the actual calculated percentages by approximately 0.1%. If a feed timer is linked to the feed counter, the name of the corresponding feed timer is displayed in the tab title.

Curve tab

Several curves are available to gradually and automatically adjust feed quantities and mixing ratios for different feed types. Each curve can have up to 15 breakpoints.

You can set the desired feed quantity (in grams per animal) using the dosing curve of the corresponding feed timer. Additionally, you can adjust the feed composition according to the age of the animals by setting the mixing ratios of the components on this tab. Note that these ratios are not percentages of the total dosage, but represent the proportions between individual components.

! If you change the number of components, the feed composition (mixing ratio) will also change.

The current setting is determined from the curve based on the current day number. This setting is used to control the feed quantity, provided the curves are enabled).

!
- The day numbers in the growth curve must be consecutive.
- If the day number of the first breakpoint is greater than 1, the setting of that first breakpoint is maintained until the specified day number is reached.

8.1.2 PSW-1 silo weigher

With the PSW-1, you can only weigh the feed quantity in a single silo. A maximum of two PSW-1 silo scales can be connected to the PL-9600.

FEED > Feed weighing > Overview

Here you can see an overview of the current silo contents (kg) of the connected silos.
Tap on the relevant parameter for the historical daily overviews.

***Measurements* tab**

Silo x	Displays the current silo contents (stock or shortage).

FEED > Components > General

***Settings* tab**

Number of components	Set how many different components you want to use (maximum 8).

FEED > Components > Component names

***Overview* tab**

Component + Short name	You can assign each component a name (maximum 15 characters) and a short name (maximum 3 characters). See section 4.3 .

FEED > Silo x > General

***Overview* tab**

Contents	Displays the current silo contents.
Zeroing silo	Enable this option to reset the current silo content to zero (0 kg). The switch automatically turns off afterwards. ! This setting can only be changed when the auger is not active and the silo is not being filled. A cleared value cannot be restored.
Minimum silo contents	When the silo content falls below the configured minimum and the *Message Active* notification is enabled, the corresponding relay (notification) is triggered.
Message active	Enable or disable this notification function. ! Reactivate the notification after bulk filling if you want to receive a notification the next time the silo level falls below the minimum.
Filling silo active	Bulk weight is determined automatically. If the silo content increases by more than 50 kg within 30 seconds, the PL-9600 assumes bulk filling is in progress (bulk mode is activated and the countdown starts). ! ▪ You cannot reset the silo content to zero during bulk filling. ▪ If no weight increase is detected for 5 minutes, bulk mode is automatically deactivated.

FEED > Silo x > Alarm

***Overview* tab**

Alarm	You can configure the alarm for the *PSW-1 silo weigher* using the following options: *On* — All feed system alarms are transmitted to the *PL-9600*. *Off* — No feed system alarms are transmitted to the *PL-9600*. *Night off* — Feed system alarms are transmitted to the *PL-9600* only if the *Night period status* is disabled.
Minimum supply alarm	Enable this option to generate an alarm when the feed supply rate falls below the configured minimum supply rate.
FEED COUNTER	
Minimum	Set the minimum supply rate (kg/h). If the measured rate remains below this value for more than 60 seconds, a supply rate alarm is activated.
Supply rate	If the silo weigher is connected to a counter, the current supply rate is displayed here.

If the silo weigher is connected to a counter, the feed rate measurement is also displayed on this screen. When the feed rate remains below the configured minimum feed rate (kg/hour) for 60 seconds, a feed rate alarm is triggered.

You can clear this alarm by:

- identifying and resolving the cause of the alarm
- disabling off the *silo weigher alarm*
- disabling off the *minimum feed alarm*

8.1.3

8.1.4 PFV-0xxx and PFA-9400 feeding systems

The *PFB 35/70 feed weigher,* in combination with the *PFA-9400* or *PFV-9xxx feed weighing computer,* forms a highly accurate feed weighing system. The system can control up to 16 feed augers, enabling different feed components to be mixed and dosed for multiple animal groups.

The feed weighing computer can mix up to 8 different components supplied from 16 silos. Once the required quantities have been entered for the silos, the current silo contents can be retrieved. The feed weighing computer can be connected to the PL-9600 poultry management computer, allowing data exchange between both systems for feeding system control. The feed weighing computer can also be controlled by multiple poultry management computers. As a result, certain settings, such as bulk data and component names, can only be entered or modified directly on the feed weighing computer.

	Settings can be adjusted on:		
	PL-9600	***PFA-9400***	***PFV-9xxx***
Feed system	Yes[1]	Yes	Yes
Silo capacity	No, copy of *PFA-9400*	Yes	Not applicable
Component names	No, copy of *PFA-9400*	Yes	Not applicable
Silo assignment	No, copy of *PFA-9400*	Yes	Not applicable
Alternative components	No, copy of *PFA-9400*	Yes[2]	Not applicable
Silo mix remainder	No, copy of *PFA-9400*	Yes	Not applicable
Silo status	No, copy of *PFA-9400*	Yes	Not applicable
Filled	No, copy of *PFA-9400*	Yes	Not applicable
Feed weigher status	Menu selection disabled	Yes	Not applicable
Feed composition	Yes	No, copy of *PL-9600*	Not applicable
Feed composition curve	Yes	No, copy of *PL-9600*	Not applicable
Curve overview	Yes	Yes	Not applicable
Dosing timer	Yes	No, copy of *PL-9600*	Not applicable
Dosing curves	Yes	No, copy of *PL-9600*	Not applicable
Growth curve animal weight	Yes	No, copy of *PL-9600*	Not applicable
Animal data	Yes	No, copy of *PL-9600*	No, copy of *PL-9600*
Clear counters (dosage)	No, copy of feed computer	Yes	Yes
Clear counter (dosage)	No, copy of feed computer	Yes	Yes
First day of the week	No, copy of *PFA-9400*	Yes	Yes
Start of new day	No, copy of *PFA-9400*	Yes	Yes

FEED > Feed weighing > Overview

***Measurements* tab**

This tab provides an overview of the current contents (kg) of all connected and assigned silos.

Silo weigher x	Displays the current silo content (stock or shortage). You can also enter the bulk quantity here. Once the bulk quantity is added to the silo content, it is automatically reset to 0.
Active silo	Displays the silo from which the component is currently drawn.

FEED > Components > General

Settings tab

Number of components	Set the number of different components (max. 8) to be mixed.
Alternative components *(PFA-9400 only)*	Enable this option to automatically switch to an alternative component if a supply alarm lasts 30 seconds or longer. Disable this option to prevent automatic switching. ! Always set the silo order for each component via *WATER/FEED > Silos > Assignment > Silo order*. The active components are not stored separately; they are automatically determined from this order.
Reset alternative comp. *(PFA-9400 only)*	This setting clears all configured alternative components; all statuses are set to *OFF*. After a reset, feeding may be paused for several minutes while the new feed composition is recalculated.

FEED > Components > Component names

Settings tab

Component + Short name	Assign a name (maximum 15 characters) and a short name (maximum 3 characters) to each component. See section 4.3 for details.

FEED > Silos > General

Overview tab

Silo mix remainder	When a silo is nearly empty, the remaining feed mainly consists of salts, minerals, and finely ground material. If the silo weight falls below the configured threshold, the system will attempt to mix the residue with feed from another silo. Conditions: The *Silo mix remainder* option must be activated and another silo must contain a similar feed type (component). Mixing behaviour: ▪ If both conditions are met: 50% residue + 50% feed from another silo. ▪ If conditions are not met: 50% residue + stop (search for similar feed type) + 50% residue.

Contents tab

For each silo, you can view the component it contains and its status. The *Content kg* column shows the current silo quantity, which may be positive (stock) or negative (shortage).
When feed is bulk loaded, enter the quantity in the *Filled kg* column. After confirmation, this quantity is automatically added to the silo content, and the *Filled kg* value is reset to 0.000 kg.

Status

You can change the silo status manually, for example from *free* or *empty* to *blocked*. It can take up to ten seconds for the change to be communicated to the *PFB-35/70*.

The status changes from *free* to *empty* when:
- you change it manually;
- feed is supplied from the selected silo;
- the feed supply speed from the silo is too low.

The *empty* status is cancelled when:
- you change it manually;
- a new day begins;
- the feed weigher is restarted;
- the reset button on the *PFB-35/70* is pressed briefly;
- *alternative comp. reset* is performed;
- feed is bulked.

The status changes from *free* to *blocked* when:
- you change it manually. Feed can no longer be dispensed from a blocked silo. If you have set an alternative feed type, this will be dispensed.

The *blocked* status is lifted when:
- you manually change it to *free* or *empty*;
- when feed is bulk loaded.

FEED > Silos > Assignment

Component	Silo	Silo order	Power sequence	Order of precedence	Silovolgorde
Component 1	Silo 1	Silo 1	Silo 6	No	No
Component 2	Silo 2	Silo 2	No	No	No
Component 3	Silo 3	Silo 3	Silo 7	Silo 8	No
Component 4	Silo 4	Silo 4	No	No	No
Component 5	Silo 5	Silo 5	Silo 9	No	No

Silo

The *Silo* column shows the active silo from which the component is dispensed. In the example above, component 1 is normally taken from Silo 1. If this is empty or blocked, the system automatically switches to Silo 6. Component 3 even has three possible silos from which it can be fed: Silo 3, 7 and 8. For Components 2 and 4, only one silo is active. Component 5 switches to Silo 9 if Silo 5 is unavailable.

Silo order

If there are multiple silos with the same feed type (component), enter the correct silo numbers in *Silo order*. When a silo becomes empty (e.g. due to a silo alarm or a weight of 0 kg), the system automatically switches to the next silo with the same feed type.

If you do not enter an order and a silo is blocked, the *Invalid silo* alarm will appear.

You have four component types and only three silos. Follow the steps below to change the component type in silo 3 from component 3 to component 4:

1. Change the mixture;
2. Adjust the mixture when using a feed curve;
3. Change the silo contents;
4. Change the silo allocation.

FEED > Silos > Residual mixing

When the silo is almost empty, the remainder in the silo consists mainly of salts, minerals and finely ground feed. When the silo weight falls below the set value (*From kg*), the computer attempts to mix the remainder. This requires that the *Silo mix reminder* option is active and that an identical component is present in another silo. *Contents kg* shows the current silo contents in kilograms.

FEED > Feed composition > General

***Composition* tab**

You manually set the mutual dosage ratios (*Units*) of the various components. The corresponding percentage per component is automatically calculated from these ratios.

! The values in the % column are rounded numbers. As a result, they may deviate by approximately 0.1% from the actual calculated percentages.

If a feed clock is linked to the feed counter, the name of the feed clock in question will appear in the tab title.

8.2 Overview of possible feed alarms

Alarm code	Description
Feed rate	The feed rate has been lower than the set minimum rate for the past 60 seconds.
Feed rate alarm	The feed rate is too low (60 seconds below the minimum). The silo status has been set to blocked.
External house alarm	Alarm from another poultry house (only with communication loop). This alarm does not activate the alarm contact of the PL-9600.
Unknown alarm (xxx)	An unknown and undocumented alarm code has occurred. Note the number displayed and contact your supplier.
Alarm silo x	Silo x is blocked.
Start of new day falls within period	▪ The set time for *Start of new day* falls within a period; this is not permitted. This time must be before the first period. ▪ The times set for the filling clock must be ascending.
Mixer capacity too low	The calculated dosage exceeds the maximum amount of feed that fits in the mixer. Adjust the dosage on the *PFV-9xxx*.
Silo capacity too low	The calculated feed dosage is higher than the weighing capacity of the mixing silo.
Component not in silo	▪ The silo number is set to 0; this is not permitted. Enter a valid silo number for an active component. ▪ According to the silo contents, the silo with the selected component is blocked. ▪ The component is not located in the selected silo. ▪ A mixing value has been entered for a component that is not assigned to a silo. ▪ The component assigned to the silo according to the silo contents does not match the silo assignment.
Dosage too high	▪ The calculated dosage is the sum of the collection tray contents of the valves assigned to the animal group. If the total feed quantity is calculated from the management data, the collection trays must be sufficiently large. Only then can the calculated dosage be fed within the number of feed periods set. If it quickly becomes apparent that this can never be achieved, a dosage alarm is triggered in advance. ▪ It is possible that the maximum capacity of the valve has not been entered or that the value is smaller than the portion size (see PFV-9xxx screen 8325).

Alarm code	Description
Dosage too low	The dosed amount of feed and/or water is lower than the set minimum dose.
External alarm x	The contact input of external alarm x is interrupted, causing an external alarm to be activated.
Incorrect input type	The set input type does not correspond to the type supported by the control.
Incorrect output type	The set output type does not correspond to the type that the control can drive.
Incorrect terminal setting	The assigned function is not supported by the selected module type.
No weight reduction	The weight in the mixer does not decrease or decreases insufficiently during emptying. Check the mixer and/or discharge screw.
No input assigned	No input terminal number has been entered.
No PFA-9400	An input or output refers to a PFA-9400, but this is not present. Go to screen 932 and set *Feed Weigher Present* to *PFA-9400.*
No PFB-35/70	An input/output refers to the PFB 35/70 feed weigher, but this is not installed.
No silo weigher	The counter is set to PSW-1, but no PSW-1 is installed. No silo number or an invalid silo number has been entered.
No output assigned	No output terminal number has been entered
No feed weigher	Counter is set to *PFB-35/70* (feed or water), but no *PFB-35/70* is installed.
Input already assigned	The input has been assigned to two or more functions.
Run time expired	The isolation valve received a new signal, but the position has not changed for 60 seconds (standard maximum run time). Check the operation of the valve. Reset the valve to automatic operation if necessary.
Discharge valve closed	Valve not opened after 10 seconds, even though it was commanded to open.
Unloading valve open	Valve not closed after 10 seconds, even though it was commanded to close.
Unloading valve not free	The hopper under the valve contains feed at the start of the feeding period. Remove the feed.
Maximum feed alarm	The counter exceeds the set maximum value within the set time.
Mixer not empty	There is too much residual feed in the mixer during filling. Check the cause (e.g. caking) and empty the mixer manually. Then restart the feeding system.
Multiple PFA-9400s used	The poultry computer can only work with one PFA-9400, because general data such as *First day of the week* or *Start new day* are taken from this one PFA-9400.
Minimum feed alarm	The counter has not reached the set minimum value within the set time.
Feed weigher (xx)	xx = alarm code of the PFB 35/70 feed weigher. See the PFB 35/70 manual for more information.
Unknown terminal type	This type of terminal does not exist.
Invalid combination	Both the dosing timer and the animal group are set to *communication*. This is not permitted. Choose either communication from the dosing timer (augers) or communication of animal data (valves).
Invalid input	The specified input number does not exist on the module.
Invalid valve position	No position specified for the separation valve (set to 0).
Invalid mixing percentages	The set percentages at which the mixer is briefly active must be ascending. Check the mixing percentages.
Invalid mixture	▪ All components are set to 0.0%, while feed must be dispensed. ▪ The feed mixture does not correspond to the silo contents; you are trying to feed a component from a silo that does not contain this component. Check the mixture and any curve corrections.
Invalid measurement	The measured weight is lower than -1000 kg or higher than 110% of the maximum weighing capacity of the mixer. Check the physical operation of the weigher, the PSW-1/WDS-6 and/or the loadcells.

Alarm code	Description
Invalid period	▪ The set times must be ascending; the difference between *Start* and *End* must be at least 1 minute. ▪ The date and/or time of the feed computer do not match those of the PL-9600. ▪ The PL-9600 is linked to a feed computer with filling times and dispensing times.
Invalid poultry computer	Incompatible software version on the poultry computer. Contact your installer and perform a software update.
Invalid valve	The valve assigned to the animal group is not active (is off).
Invalid feed weigher	Incompatible software version on the PFB 35/70 feed weigher. Update the software of the PFB 35/70.
Invalid silo	The selected silo does not contain the specified component.
Invalid silo output	The specified output number does not exist on the module.
Invalid silo weighing computer	Incompatible software version of the silo weighing computer. Contact your installer for an update.
Invalid counter	The counter type does not match the timer type (e.g. a feed counter selected for water dosing or the timer is set to *communication* while no PFA-9400 is connected).
Invalid output	The specified output number does not exist on the module.
Invalid search sequence	▪ Silo number does not exist; ▪ Silo allocation has been changed; ▪ Silo number is set to 0; each component must be linked to a valid silo number; ▪ Non-existent silo number entered.
Period skipped	If a feeding period has not been completed and completely overlaps with the next one, this message will appear.
Sensor defective	The measured values (e.g. from a feed sensor or loadcell) are outside the set limits.
Silo already assigned	The same silo number has been entered multiple times in the search sequence for silo allocation.
Silo number already in use	The silo number entered has already been assigned to another silo.
Sum of valves > 100%	The total distribution across the valves for the animal group exceeds 100%.
Tare: unstable value	▪ The weight of the PFB 35/70 is unstable, for example due to fluctuations in the weighing hopper. ▪ Vibrations are affecting the measurement
Tare: value too high	The measured value after taring the PFB-35/70 feed weigher is too high.
Tare: value too low	The measured value after taring the PFB-35/70 feed weigher is too low.
Counter already assigned	The counter has been assigned to two or more functions.
Dosing alarm	The contents of the mixing silo have not changed in the last 60 seconds, even though a control command has been given to the feed system.
Output already assigned	The output is already linked to multiple functions.
Valve already assigned	▪ The same valve has been assigned to one animal group multiple times. ▪ One valve number is linked to multiple animal groups. ▪ The number of allocated valves exceeds the total number available.
Valve not assigned	The valve number is not linked to an animal group.
Feed detected by sensor	The feed sensor is covered with feed when the discharge valve opens.
Loadcell x defective	▪ Loadcell x is not connected. ▪ The voltage between E- and S+ and/or E- and S- is not between 2.0 V and 3.0 V. Check the wiring and voltage.

! Installation errors such as *Output already assigned, Incorrect output type, Input already assigned*, etc. must be resolved before the system can be put into operation.

9 Timers

You can set up to 24 periods (breakpoints) per on/off timer. The periods must be consecutive and at least one minute apart. Using a growth curve, you can automatically activate a different schedule with different timers depending on the age of the animals.

Installed timers can also be linked to a master timer. This is primarily used to program multiple light timers with an offset based on the switch-on and switch-off times of the main timer.

By adjusting the time on the master timer, all linked timers are updated simultaneously.

9.1 Master timer

The master timer synchronizes all timers set as slaves. The times of a slave timer follow the master timer, but the start and end times of each slave timer can still be adjusted locally.

9.1.1 General

TIMERS > Master timer > General

***Settings* tab**

Master timer	*Off* *Auto* *On*	The timer is switched off. The timer follows the configured time schedule. The timer is manually switched on and does not follow the configured time schedule.
Actual status	Displays the current status of the timer.	
Time schedule *(visible only if the Time schedule option is enabled, installer setting)*	*No* *Time schedule x*	The time schedule for the master timer is set manually. Select a pre-programmed time schedule to use.
Number of periods	Displays the number of periods in the selected time schedule. If *Timetable = no*, enter the number of periods for the master timer manually.	

***Schedule* tab**

Displays the start and end times of the selected time schedule.

If *Time schedule = no*, enter the start and end times of the period(s) for the master timer periods here.

	Begin hh:mm	End hh:mm
1	02:00	06:00
2	08:00	12:00
3	14:00	6:00 p.m.
4	8:00	00:00

9.1.2 Time schedule curve

TIMERS > Master timer > Time schedule curve *(visible only if your installer has enabled the Time schedules option)*

***Schedule* tab**

Enter the day number for each breakpoint and select the desired time schedule.

***Settings* tab**

Growth curve	Enable this option to use the growth curve of the time schedules for the master timer.
Number of breakpoints	Enter the number of breakpoints for the *Time schedule curve.*

9.1.3 Program

TIMERS > Master timer > Program

***Overview* tab**

Set the desired operating status for the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	The master timer is switched off.
Auto	The master timer follows the configured schedule.
On	The master timer is continuously on; set the desired intensity.

9.2 Light timers

9.2.1 General

There are four types of light timers, depending on the settings configured by your installer:

- *On/off* - The lighting is switched fully on or off (100%) with a maximum of 24 periods.
- *Proportional* - A variable light pattern can be set throughout the day with a maximum of 48 points.
- *Growth curve* - Lighting is controlled to a target light intensity using an age-dependent growth curve. The rise, fall, and delay times are adjustable.
- *Skylights* - Light intensity in the house is regulated by opening or closing skylights based on a light sensor. If insufficient natural light enters through the skylights, it is supplemented with regulated artificial lighting.

9.2.1.1 Inspection light

The light timers can be temporarily switched on at a preset light intensity using a push button. This function is intended for inspections via the *inspection light control* (installer setting).

9.2.2 On/off lighting settings

9.2.2.1 General

TIMERS > Light > Light timer x > General

***Overview* tab**

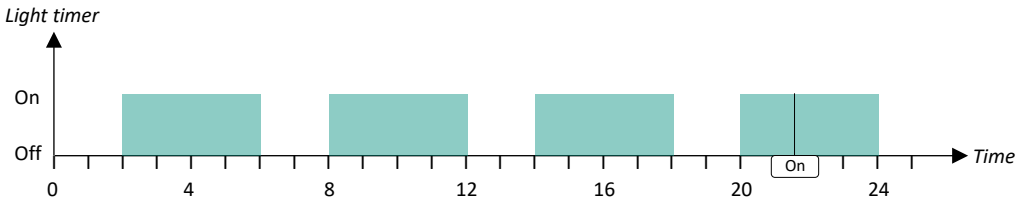
Mode	Set the light timer to: *Off, Auto* or *On*.	
	Off	The timer is switched off.
	Auto	The timer follows the configured schedule.
	On	The timer is manually switched on and does not follow the configured schedule.
Slave *(only visible if a master timer is installed)*	Enable this option to link the light timer to the master timer.	
Actual status	Displays the current status of the timer: *On* or *Off*.	
Light schedule *(visible only if the Time schedule option is enabled, installer setting)*	*No*	The time schedule for the light timer is set manually.
	Light schedule x	Select a pre-programmed light schedule to use.
Number of breakpoints	Displays the number of breakpoints for the selected light schedule. If *Light schedule = no*, enter the number of breakpoints for the light timer manually.	

***Schedule* tab**

Displays the start and end times of the selected light schedule.

If *Light schedule = no*, enter the start and end times of the breakpoints for the light timer schedule manually.

	Begin hh:mm	End hh:mm
1	02:00	06:00
2	08:00	12:00
3	14:00	18:00
4	8:00	00:00



9.2.2.2 Time schedule curve

TIMERS > Light > Light timer x > Time schedule curve *(visible only if your installer has enabled the Time schedule option)*

***Schedule* tab**

Enter the day number for each breakpoint and select the desired light schedule.

***Settings* tab**

Growth curve	Enable this option to use the growth curve of the time schedules for the master timer.
Number of breakpoints	Enter the number of breakpoints for the *Time schedule curve.*

9.2.2.3 Program

TIMERS > Light > Light timer x > Program

***Settings* tab**

Set the desired operating mode for the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off The light timer is switched off.
Auto The light timer follows the configured schedule.
On The light timer is continuously on; set the desired intensity.

9.2.3 Proportional lighting settings (not linked to master timer)

9.2.3.1 General

TIMERS > Light > Light timer x > General

***Overview* tab**

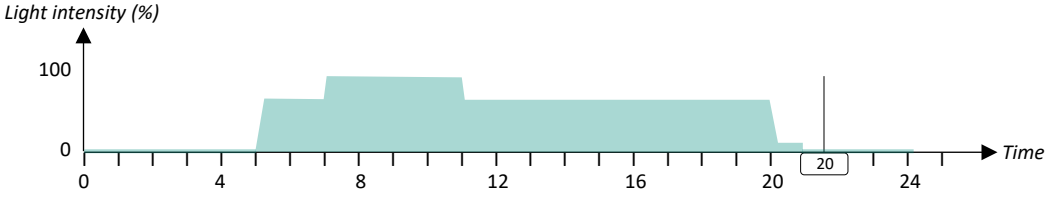
Mode	Set the light timer to: *Off, Auto* or *On*.	
	Off	The timer is switched off.
	Auto	The timer follows the configured schedule.
	On	The timer is switched on manually and does not follow the configured schedule.
Slave *(only visible when a master timer is installed)*	Enable this option to link the light timer to the master timer.	
Actual status	Displays the current status of the timer: *On* or *Off*.	
Actual status	Displays the current light intensity setting of the timer (in %).	
Growth curve schedule	Displays the light schedule currently being followed.	
Light schedule *(visible only if the Time schedule option is enabled, installer setting)*	*No*	The time schedule for the light timer is set manually.
	Light schedule x	Select a pre-programmed time schedule to use.
Number of breakpoints	Displays the number of breakpoints for the selected light schedule. If *Light schedule = no*, enter the number of breakpoints for the light timer manually.	
Inspection light intensity *(visible only if the Inspection light option is enabled, installer setting)*	Enter the light intensity to be used during inspections.	

***Schedule* tab**

Displays the start times, durations, and light intensity levels of the selected light schedule.

If *Light schedule = no*, enter the start and end times of the breakpoints for the light timer schedule manually.

	Begin hh:mm	Duration hh:mm	Level %
1	05:00	00:20	70
2	07:00	00:05	100
3	11:00	00:05	70
4	20:00	00:20	20
5	21:00	00:00	0



9.2.3.2 Time schedule curve

TIMERS > Light > Light timer x > Time schedule curve *(visible only if your installer has enabled the Time schedule option)*

***Schedule* tab**

Enter the day number for each breakpoint and select the desired light schedule.

***Settings* tab**

Growth curve	Enable this option to use the growth curve of the time schedules for the master timer.
Number of breakpoints	Enter the number of breakpoints for the *Time schedule curve.*

9.2.3.3 Program

TIMERS > Light > Light timer x > Program

***Settings* tab**

Set the desired operating mode for the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	The light timer is switched off.
Auto	The light timer follows the configured schedule.
On	The light timer is continuously on; set the desired intensity.

9.2.4 Settings for proportional lighting (linked to master timer (*slave*))

9.2.4.1 General

TIMERS > Light > Light timer x > General

***Overview* tab**

Mode	Set the light timer to: *Off, Auto* or *On*. *Off* The timer is switched off. *Auto* The timer follows the configured schedule. *On* The timer is switched on manually and does not follow the configured schedule.
Slave *(only visible when a master timer is installed)*	Enable this option to link the light timer to the master timer.
Actual status	Displays the current status of the timer: *On* or *Off*.
Actual position	Displays the current light intensity setting of the timer (in %).
Growth curve schedule	Displays the light schedule currently being followed.

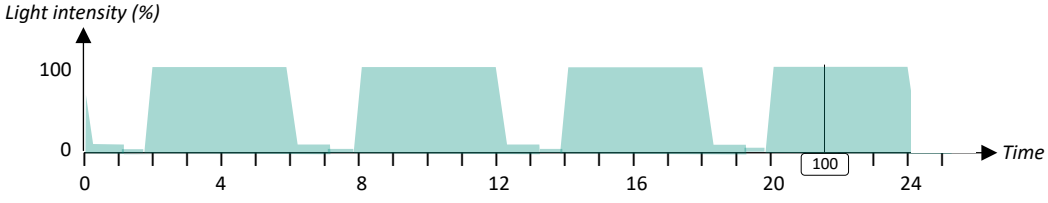
Light schedule *(visible only if the Time schedule option is enabled, installer setting)*	*No* *Light schedule x*	The time schedule for the light timer is set manually. Select a pre-programmed time schedule to use.
Minimum brightness	Set the minimum light intensity when switching the period on or off.	
Maximum brightness	Set the maximum light intensity.	
Light-on dimming time	Set the duration for the lighting to increase from minimum to maximum at the start of the period.	
Light-off dimming time	Set the duration for the lighting to decrease from maximum to minimum at the end of the period.	
Off delay	Set the time during which the lighting remains on after reaching the minimum light intensity at the end of the period.	
Number of breakpoints	Displays the number of breakpoints in the selected light schedule. If *Light schedule = no*, enter the number of breakpoints for the light timer manually.	
Inspection light brightness *(visible only if the Inspection light option is enabled, installer setting)*	Enter the light intensity to be used during inspections.	

Schedule **tab**

Displays the start and end times of the selected light schedule.

If *Light schedule = no*, enter the start and end times of the breakpoints for the light timer schedule manually.

Begin hh:mm	End hh:mm	Begin hh:mm	End hh:mm
-00:10	00:00	01:50	06:00
+00:10	00:00	08:10	12:00
00:00	00:00	14:00	18:00
00:00	-01:00	8:00	23:50



9.2.4.2 Time schedule curve

TIMERS > Light > Light timer x > Time schedule curve

***Curve* tab**

Enter the day number, minimum and maximum light intensity for each breakpoint.

Growth curve	Enable this option to use the growth curve of the time schedules for the master timer.
Number of breakpoints	Enter the number of breakpoints for the *Time Schedule Curve*.

9.2.4.3 Time schedule curve

TIMERS > Light > Light timer x > Time schedule curve *(visible only if your installer has enabled the Time schedule option)*

***Schedule* tab**

For each breakpoint, enter the day number and select the desired light schedule.

***Settings* tab**

Growth curve	Enable this option to use the growth curve of the time schedules for the master timer.
Number of breakpoints	Enter the number of breakpoints for the *Time schedule curve.*

9.2.4.4 Program

TIMERS > Light > Light timer x > Program

***Settings* tab**

Set the desired operating mode for the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	The light timer is switched off.
Auto	The light timer follows the configured schedule.
On	The light timer is continuously on; set the desired intensity.

9.2.5 Growth curve lighting settings

Lighting is controlled to a target light intensity using an age-dependent growth curve.

9.2.5.1 General

TIMERS > Light > Light timer x > General

***Overview* tab**

Mode	Set the light timer to: *Off, Auto* or *On*. *Off* The timer is switched off. *Auto* The timer follows the configured schedule. *On* The timer is switched on manually and does not follow the configured schedule.
Slave *(only visible when a master timer is installed)*	Enable this option to link the light timer to the master timer.
Actual status	Displays the current status of the timer: *On* or *Off*.
Actual position	Displays the current light intensity in percent (%).
Growth curve schedule	Displays the light schedule currently being followed.
Minimum light intensity	Set the minimum light intensity when switching the period on and off.
Maximum light intensity	Set the maximum light intensity.
Light-on dimming time	Set the duration during which the light intensity increases from minimum to maximum at the start of the period.
Light-off dimming time	Set the duration during which the light intensity decreases from maximum to minimum at the end of the period.
Off delay	Set the time during which the lighting remains on after reaching the minimum light intensity at the end of the period.
Number of breakpoints	Displays the number of breakpoints in the selected light schedule. If *Light schedule = no*, enter the number of breakpoints for the light timer manually.

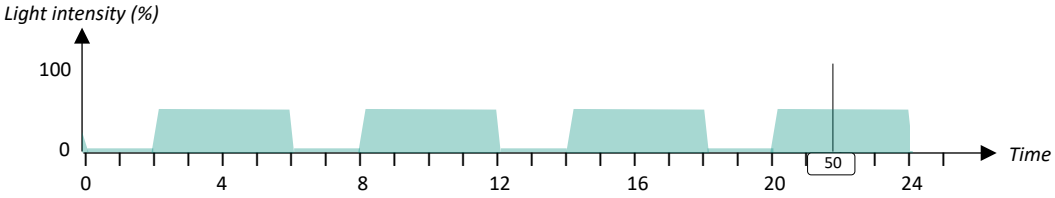
Inspection light brightness *(visible only if the Inspection light option is enabled, installer setting)*	Set the light intensity to be used during inspections.

Schedule tab

Displays the start and end times of the selected light schedule.

If *Light schedule = no*, enter the start and end times of the breakpoints for the light timer schedule manually.

	Begin hh:mm	End hh:mm
1	01:50	06:00
2	08:10	12:00
3	14:00	18:00
4	8:00	11:50



9.2.5.2 Brightness curve

TIMERS > Light > Light timer x > Brightness curve *(visible only if your installer has enabled the Time schedule option)*

Schedule tab

Enter the day number for each breakpoint and select the desired light schedule.

Settings tab

Growth curve	Enable this option to use the growth curve of the time schedules for the master timer.
Number of breakpoints	Enter the number of breakpoints for the *light schedule curve.*

9.2.5.3 Program

TIMERS > Light > Light timer x > Program

Settings tab

Set the desired operating mode for the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	The light timer is switched off.
Auto	The light timer follows the configured schedule.
On	The light timer is continuously on; set the desired intensity.

9.2.6 Skylight lighting settings

9.2.6.1 General

The skylight control ensures constant brightness at animal level through the use of a light sensor. The control responds slowly to light fluctuations, such as a passing cloud, and uses an intelligent algorithm to control the skylights. If the skylights are fully open and the brightness is insufficient, the lighting switches on.

TIMERS > Light > Skylights > General

***Settings* tab**

Mode	You can set the skylight control to: *Off* Skylight control is switched off. *Auto* Skylight control follows the set schedule. *On* Skylight control is switched on and is set manually.
Actual status	The current status of the skylight control: *On* or *Off*.
Calculated position skylights	Current calculated position (%) of the skylights.
Calculated brightness	Current calculated light intensity (%) of the lighting.
Reduction	Time period during which the light intensity is reduced from the current intensity to the minimum intensity. After that, the skylight is closed.
Minimum position skylights	Setting (%) of the minimum position of the skylights.
Number of periods	Here you enter the number of periods for the schedule to be programmed on the *Schedule* tab.
INSPECTION LIGHT	
Lighting	Set the light intensity (%) to be used during inspections.

TIMERS > Light > Skylights > Program

***Settings* tab**

Set the desired operating mode for the following poultry house statuses: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off The light timer is switched off.
Auto The light timer follows the configured schedule.
On The light timer is continuously on; set the desired intensity manually.

9.2.7 Inspection light

When you want to inspect the poultry houses, you can — if installed by your installer — manually switch the lighting on and off using an external push button or via the *Inspection light* menu. The lights will automatically turn off after the set time to prevent unnecessary operating hours.

TIMERS > Light > Inspection light

***Overview* tab**

Eable / Disable	Enable this option to turn on the inspection light. Disabling it will turn the inspection light off.
Cycle time on	Set the maximum duration the light remains on after pressing the inspection-light button.
Inspection light	Displays the current status of the inspection light: *On* or *Off*.
Cycle time on *(visible only when the inspection light is turned on)*	Displays the remaining time the inspection light will stay on (mm:ss).

9.3 Water and feed timers

9.3.1 General

A water or feed timer is used, for example, to switch a water or feed system on or off.

Your installer can connect a meter to the water or feed timer to manage the dosage. The dispensed amount is compared to the set value. Once this amount has been reached, the supply stops, regardless of the configured end time. If the end time is reached before the set amount is delivered, a water or feed dispensing alarm is triggered.

Using a programmed curve, timetables and water or feed quantities can be adjusted for each animal depending on its age.

A water or feed timer that is linked as a slave to the master timer follows the times set on the master timer. The start and end times can then be adjusted locally.

TIMERS > Water/Feed > Water Timer or *Feed Timer > General*

***Settings* tab**

Mode	You can set the water and feed clock to: *Off, Auto* or *On*. *Off* The dosing timer is switched off. *Auto* The dosing timer follows the assigned *dosing schedule*. *On* The dosing timer is manually switched on.
Slave	Enable this option if the on/off times of the dosing timer are to follow those of the master timer.
Actual status master timer *(visible only if the Slave option is enabled)*	Displays the current status of the master timer: *Off, Auto* or *On*.
Actual status	Displays the current status of the dosing timer: *Off, Auto* or *On*.
Today per animal *(without dosing curve)*	If the dosage curve is not active, set the amount per animal manually.
Calculated per animal today *(with dosing curve)*	Displays the amount per animal for today calculated from the dosage curve.
Water/Feed *(water dosing W/F without dosing curve)*	If the dosage curve is disabled, enter the water/feed ratio manually..
Water/Feed *(water dosing W/F with dosing curve)*	The water/feed ratio calculated from the dosage curve.
Calculated per animal today *(water dosing W/F)*	Displays the amount per animal for today calculated from the water/feed ratio.
Curve correction +/-	When using a dosage curve, enter a manual correction here.
Today per animal dosed	Displays the amount already dosed per animal today.
Active period	Displays the dosing period that is currently active.
Dosage calculated	Displays the total amount to be dosed during the active period.

Present dosage	Displays the amount already dosed in the current active period.
Dosing schedule	Indicates whether a dosage schedule is used and, if so, which one. The *Schedule tab* shows the selected dosage schedule for this timer.
Number of periods	Displays the number of periods in the selected dosage schedule. If no schedule is used, enter the desired number of periods manually.

***Schedule* tab**

Displays the dosing schedule for the selected dosing timer. If dosing timers are not used, the Schedule tab displays either the current time schedule or the growth curve schedule, depending on your selection (*Time schedule* > *Settings* tab > *Growth curve* on/off).
In the first two columns, you can adjust the start and end times by entering a time offset value.

	Begin hh:mm	End hh:mm	Begin hh:mm	End hh:mm	Part %	Ready hh:mm	Dosage ml or g
1	00:00	00:00	06:30	07:30	50	09:50	0
2	00:00	00:00	13:00	3:00	30	00:00	0
3	00:00	00:00	6:00 p.m.	8:30	10	00:00	0

If your installer has disabled the *Auto. partition period* setting, you can manually distribute the total daily amount across the configured number of periods.

Automatic partition period

- The quantity to be dispensed is recalculated between periods.
- When *Automatic partition period* is enabled (configured by the installer), the total daily amount is automatically distributed across the configured number of periods. The *Part (%)* column is then visible.
- When *Automatic partition period* is disabled, the percentages entered in Share (%) are used. If the total dosage falls below the minimum dosage, a *Dosage alarm* is triggered.
- The final column (*Dosage ml or g*) shows the dosage per animal per period. Once the dosage for a period has been completed, the *Ready* column displays the completion time.
- If a deviation occurred in previous periods, it is corrected in the final period where possible, ensuring that the total daily amount is still dispensed.

9.3.2 Dosing curve

If you use growth curves, you can define the day numbers for the dosage curve here. Activate the *Dosing curve* option on the *Settings* tab and enter the desired number of breakpoints. On the *Schedule* tab, enter the day number and the dosage per animal for each breakpoint: *Water: ml/animal, Feed: g/animal*. When dosing based on the water/feed ratio, the water/feed ratios are entered instead of the quantities.

This ensures that the amount of water or feed per animal automatically adjusts according to the age of the animals. The total daily dosage is calculated each day based on the current day number and the number of animals in the poultry house.

You can configure a separate dosing curve for each dosing timer. Each curve can contain up to 15 breakpoints. The day number ranges from 1 to 999 and automatically increments daily at midnight.

9.3.3 Timetables based on growth curves

TIMERS > Water/Feed > Water timer or *Feed timer > Time schedule curve*

On the *Settings* tab, you can enable the growth curve to automatically apply a different dosing schedule based on the age of the animals. The *number of breakpoints* defines how often the dosing schedule changes within a flock.

9.3.4 Weekly program or Skip-a-day principle

TIMERS > Water/Feed > Water timer or *Feed timer > Weekly program*

Depending on your feeding strategy, you can configure each dosing timer to use a weekly program and specify the number of dosing days in the cycle. For example, a 7-day weekly program where the dosing timer is active 6 days and inactive 1 day (skip-a-day principle).

9.3.5 Programming dosing timer settings during different poultry house statuses

TIMERS > Water/Feed > Water timer or *Feed timer > Program*

Here you can configure the desired operating mode for each poultry house status: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	The dosing timer is switched off.
Auto	The dosing timer follows the configured schedule.
On	The dosing timer is continuously on.

9.3.6 Alarm

TIMERS > Water/Feed > Water timer or *Feed timer > Alarm*

***Settings* tab**

Alarm	*On*	All dosing alarms are transmitted to the *PL-9600*.
	Off	No dosing alarms are transmitted to the *PL-9600*.
	Time	Dosing alarms are only transmitted when the *Alarm Schedule* is active. Alarms occurring during off periods are not transmitted.
Minimum dosage	For a water or feed timer, you can set the minimum dosage as a percentage of the total daily dosage. If this threshold is not reached, a *Dosage alarm* is triggered.	
Present dosage	Displays the current dosage as a percentage of the total daily dosage.	
Dosage calculated	Displays the remaining amount that still needs to be dosed.	
Present dosage	Displays the current dosage.	

9.4 Sequential timers

A sequential timer activates the assigned outputs one after another, starting from the configured start time. Each output begins only after the previous one has finished. These sequential actions are often referred to as phases or steps.

With a sequential timer, you only need to enter the start time; the end time is automatically calculated based on the total pulse and pause time, as well as the number of outputs.

Sequential timers are commonly used to control devices such as feed chains or flush water pipes.

9.4.1 Rinse timer

9.4.1.1 General

The rinse timer can be used, for example, for preventive flushing of water systems or administering medication.

To avoid medication wastage during flushing, the amount of water to be flushed can be set individually for each outlet (*Stop at amount of water* set by your installer). Once the set quantity is reached, the flush valve closes automatically. After the configured pause time, flushing of the next pipe begins.

If the set amount is not reached within the pulse time, the flush valve will still close, and flushing of the next pipe will start after the pause time.

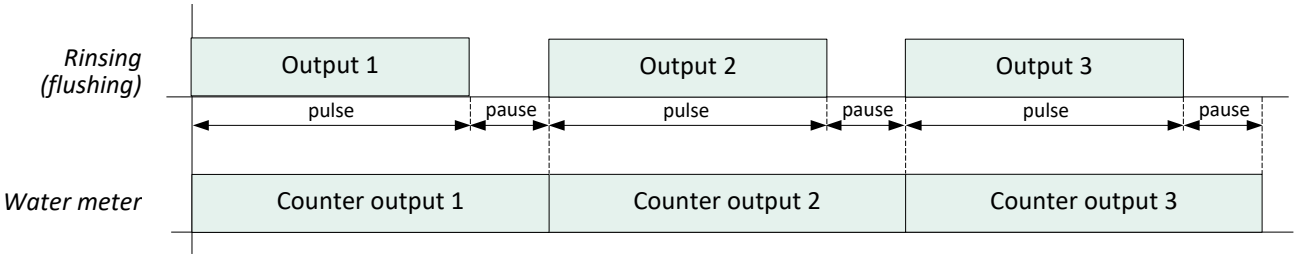


Fig.4 Flushing based on pulse

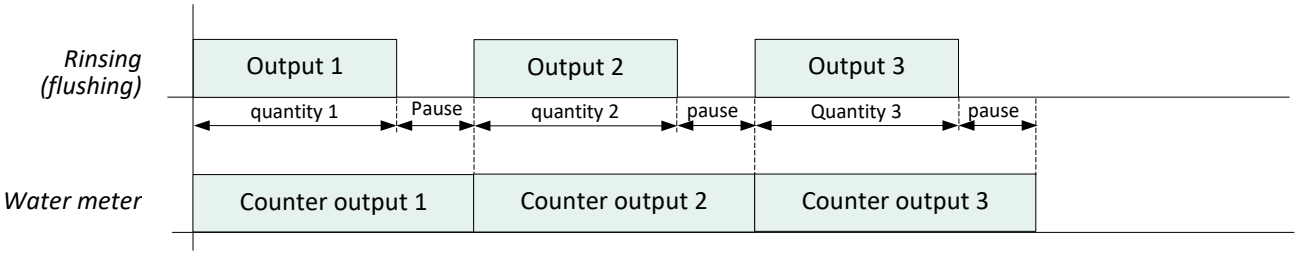


Fig.5 Flushing based on quantity

TIMERS > Sequential timers > Rinse timer > General

Overview tab

Mode	Set the rinse timer to one of the following: *Off* The rinse timer is switched off. *Auto* The rinse timer follows the assigned *dosing schedule*. *On* The rinse timer is switched on manually.
Slave	Enable this option if the rinse timer should follow the on/off times of the master timer.
Actual status master timer *(visible only if the Slave option is enabled)*	Displays the current status of the master timer: *Off, Auto* or *On*.
Actual status	Displays the current status of the rinse timer: *Off, Auto* or *On*.
Pulse	Enter the maximum duration (mm:ss) that an output remains active.
Pause	Specify how long (mm:ss) the system should wait before activating the next output.
Temperature *(visible only if sensor is installed, installer setting)*	Enable this option to use the installed temperature sensor. The rinse timer will not switch on if the temperature is too high.
Temperature setpoint	The rinse timer will activate once the measured temperature rises above this setting.
Duty-cycle time	Minimum time interval between two switch-on events based on temperature.
Status	Displays the current cycle status: *On* or *Off*.
Growth curve schedule	Displays the pre-programmed schedule that determines when the rinse timer activates.
Number of periods	Displays the number of periods in the selected schedule. If no schedule is used, enter the desired number of periods here.

Schedule tab

Displays the schedule for the selected rinse timer. In the first column, you can adjust the start time by entering an offset value.

9.4.1.2 Time schedule based on growth curves

TIMERS > Sequential timers > Rinse timer > Schedule curve

On the *Settings* tab, you can enable the *growth curve* to automatically apply a different dosing schedule based on the age of the animals.

The *number of breakpoints* determines how often the dosing schedule changes within a flock.

On the *Schedule curve* tab, you can enable the rinse timer according to a programmed timetable. Select the desired timetable here.

9.4.1.3 Weekly program or Skip-a-day principle

TIMERS > Sequential timers > Rinse timer > Week program

On the *Settings* tab, depending on your flushing strategy, you can configure each rinse timer to use a weekly program and define the number of flush days per cycle.
For example, a 7-day weekly program where the rinse timer operates 6 days and is off 1 day (skip-a-day principle).

On the *Program* tab, you can select the days on which the rinse timer should be active.

9.4.1.4 Programming rinse timer settings during different poultry house statuses

TIMERS > Water/Feed > Water timer or *Feed timer > Program*

Here you can configure the desired operating mode for each poultry house status: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	The rinse timer is switched off.
Auto	The rinse timer follows the configured schedule.
On	The rinse timer is continuously on.

9.4.2 Feed chain

If installed, the feed chain is configured in the same way as the rinse timer. See section 9.4.1 for details.

9.5 Other timers

This includes timers with on/off times for various applications. These are set in a similar way to the standard on/off timer switches.

9.5.1 Nest box timer

The nest box timer allows to open and close the laying nests at fixed times. Opening and closing can even take place in pulses according to the pulse-pause principle. The pulse and pause times are set by your installer so that the nest boxes function at the desired rate.

The nest box timer is set in the same way as the standard on/off timers.

9.5.2 Pophole timers

TIMERS > Popholes > Pophole x > General

***Overview* tab**

Mode	*Off* *Auto* *On*	The pophole timer is switched off and the popholes are closed. The pophole timer operates automatically. The pophole timer is switched on and the popholes are opened.
Begin	Set the time at which the popholes should open.	
End	Set the time at which the popholes should close.	
Position *(visible only if a proportional pophole timer is installed)*	Set the desired position of the popholes controlled by the proportional pophole timer.	
Start outside temperature *(visible only if this function has been installed by your installer)*	The popholes will open if the outside temperature at the start time is higher than the specified value.	
Actual status	Displays the current status of the pophole timer.	
Actual position pophole x *(visible only if a proportional pophole timer is installed)*	Displays the current pophole position.	

9.6 Time, light and dosing schedules

9.6.1 General

TIMERS > Schedules > General

You can configure the following types of schedules:

- time schedules – Up to 24 schedules, each with a maximum of 24 periods.
- light schedules – Up to 24 schedules, each with a maximum of 48 periods.
- dosing schedules (water/feed) – Up to 24 schedules, each with a maximum of 24 periods.

In the examples below, the number of periods is set to 3 in all cases.

TIME SCHEDULE

Period (max. 24)	Begin HH:MM	End HH:MM
1	08:00	10:00
2	12:00	14:00
3	7:00	8:00

LIGHT SCHEDULE

Period (max. 48)	Begin HH:MM	Duration HH:MM	Level %
1	05:00	00:05	80
2	19:50	00:05	20
3	20:00	00:00	0

DOSING SCHEDULE (water/food)

Period (max. 24)	Begin HH:MM	End HH:MM	Share %
1	06:30	07:30	50
2	13:00	15:00	30
3	18:00	8:30	100

* If your installer has enabled *Auto. partition period* for a feed timer, the total feed amount will be distributed across the configured number of periods. In this case, the portion defined in the schedule will not be used.

***Settings* tab**

Number of timetables	Enter the number of timetables you want to use.
Number of dosing schedules	Enter the number of dosing schedules you want to use.

9.6.2 On/Off

TIMERS > Schedules > On/Off > Time schedule x

On the *Schedule* tab, enter the start and end times for the periods.

On the *Settings* tab, give the time schedule a suitable name and abbreviation and enter the *Number of periods* for each time schedule.

9.6.3 Water/feed

TIMERS > Schedules > Water/feed > Dosing schedule x

On the *Schedule* tab, enter the percentage and the start and end times for the periods.

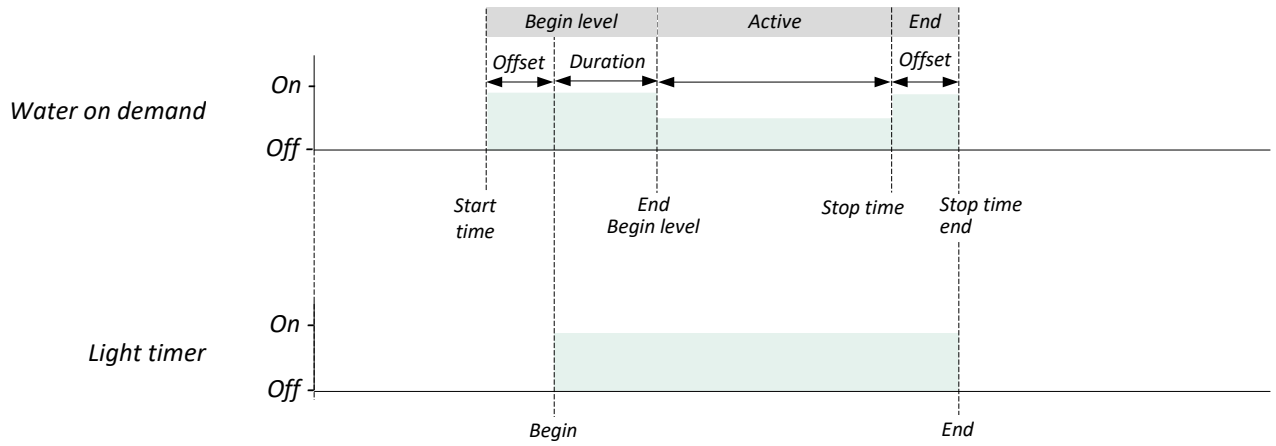
On the *Settings* tab, give the dosing schedule a suitable name and abbreviation and enter the *Number of periods* for each dosing schedule

9.7 *Water on demand*

9.7.1 General

The water on demand control regulates the water level in a *Plasson* drinking nipple system.

In *traditional* drinking systems, the water pressure remains constant throughout the day. With a *pressure curve*, the water pressure can be automatically increased as the animals grow older. At the beginning and end of the Water on Demand period, the system pressure can be temporarily raised to accommodate higher water intake by the animals.



TIMERS > Water on demand > General

***Overview* tab**

Mode	*Off*	Water on demand is switched off.
	Auto	The water level is controlled automatically. If the curve is not active, there is no difference between *Auto* and *Manual*.
	Manual	The water level is set manually.
Pressure setpoint		Set the desired water level for the water-on-demand period.
Rinse timer active *(if installed)*		If a rinse timer is present, you can set the water level for flushing. The rinse timer may start at any time without triggering an alarm.

Actual status	*Off*	The drinking system is not active.
	Manual	Manual adjustment of the water level.
	Start	Start of the water dosing period.
	Active	Water dosing is active (between *Start* and *End*).
	End	End of water dosing period.
	Rinsing	The rinse timer is active.
Calculated level	*Curve not active*	The level shown equals the value set under *Pressure setpoint* and remains constant throughout the water-on-demand period.
	Curve active	Displays the water level calculated from the growth curve (see *Growth curve level*).
	Rinse timer active	Displays the water level for the rinse timer.
Actual level	Displays the current, measured water level of the drinking system.	

Start time offset	The start time of the light timer selected by the installer is used as a reference. A *negative offset* brings forward the start of the water-on-demand period.
Start time	The calculated start time of the Water on Demand period. The system begins to raise the water level at this time.
Begin level duration *(visible only if curve is active)*	Here you can set the duration for which the water level in the system remains increased.
End of begin level *(visible only if curve is active)*	Calculated end time of the initial water level increase. The system will begin returning the water level to the active level.
Stop time offset	The end time of the light timer is used as a reference. A negative offset brings forward the end of the water-on-demand period.
Stop time	Calculated end time at which the system starts reducing the temporary water level increase.
Stop time end	Displays the end of the Water on Demand period. At this point, no additional pressure is applied to the drinking nipple system.

! The *active* water-on-demand period is between *End of Begin level* and *Stop time.*

The active period must be at least 1 minute, otherwise the error message *Invalid period (x) Water on demand* will occur.

9.7.2 Curve

TIMERS > Water on demand > Curve

A curve allows you to set the water pressure (in cm H_2O) according to the animals' age for the start level, active period, and end level of the drinking period.

On the *Settings* tab, activate the *Water on demand growth curve* and enter the number of breakpoints.

On the *Curve* tab, set the desired water pressure for the start level, active period and end level of the drinking period at each breakpoint.

9.7.3 Programming water-on-demand settings during different poultry house statuses

TIMERS > Water on demand > Programs

Here you can configure the desired operating mode for each poultry house status: *Not in use, Disinfecting, Setting-up, Preheating, Brooding, In use, Vaccinating, Catching, Cleaning* and *Drying.*

Available options:

Off	*Water on demand* is switched off.
Auto	*Water on demand* follows the configured schedule.
On	*Water on demand* is continuously on.

9.7.4 Alarm

TIMERS > Water on demand > Alarm

***Overview* tab**

Alarm	Configure whether and when the Water on demand alarm is active:	
	Off	Water-on-demand alarm is not transmitted to the *PL-9600*.
	On	Water-on-demand alarm is transmitted to the *PL-9600*.
	Time	Water-on-demand alarm is transmitted only when the *Alarm Schedule* is active.

10 Alarm

10.1 General

ALARMS > General

***Overview* tab**

Reset	Enable this option to clear all alarms at once. Alarms that are still active will be triggered again immediately.
Temporarily off	Allows you to temporarily disable alarm outputs, such as the siren. Alarms are suppressed for 30 minutes (installer setting), while the alarm LED flashes irregularly. After this period, the alarm is automatically reactivated. If the alarm condition has not been resolved, the alarm will sound again. You can also end the delay period manually by disabling the *Temporarily Off* option. ! This function does not apply to hardware alarms.
Time remaining	Displays how long the alarm will remain disabled after activating Temporarily Off. The time counts down from 30 minutes to zero, showing the remaining time in mm:ss until the alarm is automatically reactivated.
Test alarm	Activates the alarm relay (for example, the siren) for 10 seconds to test its operation. The test can be stopped at any time by disabling the *Test alarm* option.
Snooze	The snooze function (*no, 08:00, 12:00, 16:00, 20:00* or *clear*) suppresses an alarm notification until the selected time. If the selected time has already passed, the alarm is snoozed until the next occurrence of that time. ! ▪ Setting errors, such as incorrect input or output assignments, cannot be snoozed. ▪ Snoozed alarms remain visible until the selected time, after which they are automatically removed from the list. ▪ A maximum of 20 alarms can be snoozed simultaneously. ▪ At the set time, the snoozed alarm is removed from the list. ▪ Recurring alarms that are snoozed are not recorded in the alarm log. ▪ The snooze list can be cleared using the *Clear* option. Active alarms will then be regenerated.

⚠ Always ensure that the alarm is switched back on after being disabled. Preferably use the *Temporarily Off* option to address temporary malfunctions.

Before putting the installation into operation, all installation errors must be resolved, such as already assigned outputs, incorrect output types, or already assigned inputs.

10.2 Night period

To prevent alarms from being triggered immediately for every fault during the night period, some alarms provide the *Night off* option in addition to *Off* and *On*.

When an alarm is set to *Night off*, no alarm notification is generated during the configured night period. Any alarm that occurs during this time is recorded with the status *Blocked*.

ALARMS > Night period

***Overview* tab**

Night period from	Enter the start time (hh:mm) of the night period.
Night period until	Enter the end time (hh:mm) of the night period.
Night period status	Displays whether the night period is currently active.

10.3 Climate alarms

10.3.1 General

ALARMS > Climate > General

***Overview* tab**

This page provides an overview of all available *climate alarms*, grouped into subcategories. Here you can activate or deactivate each alarm as required (see section 5.2).

STABLE	
RH alarm	☑
THI alarm	☑
CO_2 alarm	☑
NH_3 alarm	☑
Outside temperature alarm	☑
MAIN VENTILATION	
Temperature alarm	
Measuring fan 1	☑
Measuring fan 2	☑
Measuring fan 3	☑
AUXILIARY VENTILATION	
etc.	

10.3.2 Air inlet groups

ALARMS > Climate > Air inlet groups > Left/Right/Front/Rear/….

***Overview* tab**

This page provides an overview of all climate controls, divided into subgroups. You can activate or deactivate the alarms for each group as needed (see section 5.2).

10.4 Feed system alarms

ALARMS > Feed system

***Overview* tab**

FEED SYSTEEM

Alarm	Configure whether and when the feed system alarm is active:	
	Off	Feed system alarm is not transmitted to the *PL-9600*.
	On	Feed system alarm is transmitted to the *PL-9600*.
	Night off	Feed system alarm is transmitted only if *Night period status = Not active*.

10.5 Timer alarms

ALARMS > Timers

This page provides an overview of all timers for which alarms can be activated or deactivated (see section 5.2).

***Overview* tab**

Timer	Configure whether and when the timer system alarm is active:	
	Off	Timer alarm is not transmitted to the *PL-9600*.
	On	Timer alarm is transmitted to the *PL-9600*.
	Night off	Timer alarm is transmitted only if *Night period status = Not active*.

10.6 External alarms

ALARMS > External alarms

This page provides an overview of all external alarm inputs for which alarms can be activated or deactivated (see section 5.2).

***Overview* tab**

External alarm	Configure whether and when the external system alarm is active:	
	Off	External alarm is not transmitted to the *PL-9600*.
	On	External alarm is transmitted to the *PL-9600*.
	Night off	External alarm is transmitted only if *Night period status = Not active*.

10.7 Pressure alarms

ALARMS > Pressure

In addition to the main pressure sensor that controls house pressure via the air inlets, up to two additional pressure sensors can be installed. These additional sensors can, for example, be used to measure the pressure drop across an inlet filter.

***Overview* tab**

PRES. MEAS. 1	
Pressure alarm	Enable this option to activate alarms for the pressure sensor.
Minimum alarm limit	Set the minimum pressure threshold below which an alarm is triggered.
Maximum alarm limit	Set the maximum pressure threshold above which an alarm is triggered.
Delay time	Enter the number of minutes and seconds (**mm:ss**) that the PL-9600 waits before triggering the alarm.
Actual pressure	Displays the currently measured pressure.

10.8 Thermo-differential alarm

ALARMS > Thermo-differential

The current temperature measurement is compared with the measurement from one minute earlier for up to eight sensors. The following situations may occur:

- If the temperature increase within one minute is equal to or greater than the set relative alarm limit, an alarm is triggered.
- If the measured temperature remains within the set limits, the previous measurement is updated to the current temperature, and a new measurement cycle begins.
- If the measured temperature exceeds the absolute alarm limit, an alarm is also triggered.

! The temperature monitoring alarm only sounds for positive temperature differences.

***Settings* tab**

Temperature alarm	Disabling this option resets an active alarm. The option is automatically reactivated afterward.
Relative alarm limit	Displays the maximum allowed temperature increase within one minute compared to the previous measurement. When the increase equals or exceeds this value, an alarm is triggered. This limit is intended to detect rapid temperature changes.
Absolute alarm limit	Displays the maximum permitted temperature. If the measured temperature exceeds this absolute limit, an alarm is triggered regardless of the rate of change. This limit monitors the maximum temperature that must not be exceeded.

***Sensors* tab**

Min	Lowest temperature measured by the sensor since the last measurement or reset.
Act.	Displays the temperature measured by the sensor at that moment.
Dif.	Temperature difference between the current measurement and the measurement taken one minute earlier.

10.9 Communication alarm

A communication alarm occurs in the following situations:

- The *Master* has not received any data from a device in the same RS-485 data communication loop.
- Central controls are installed, but the PL-9600 has not received any data from the relevant central control (e.g. central heating).
- A *PFB-35/70* feed weigher is installed, but the PL-9600 has not received any data from it.
- An *SW-2* animal weigher is installed, but the PL-9600 has not received any data from it.
- A *PSW-1* silo weigher has been installed, but the PL-9600 has not received any data from the *PSW-1-D*. Check that the dip switch *SW1-6* on the *PSW-1-D* silo weigher is in the *OFF* position (slave mode).

ALARMS > Communication

***General* tab**

Alarm	Enable this option to activate the communication alarm.
Device address	Displays the address of the device associated with the communication alarm. This corresponds to the device identification within the RS-485 loop, so it is clear which device is not sending data.
Alarm Status	Indicates whether a communication problem has been detected for the device. If the status is *active*, no data is being exchanged between the *PL-9600* and the device. Once communication is restored, the value 0 is displayed.

10.10 Possible alarm messages

Code	Alarm text	Description
. . .	*Unknown alarm*	Alarm code cannot be translated into text. Record the displayed code and contact your supplier.
1	*Manual alarm test*	During alarm testing, code 1 appears on the screen.
2	*No mains voltage*	No mains voltage detected.
3	*Wrong RTCPU version*	RTCPU board version is too old.
4	*Module x not installed*	The configured module number at the terminal is not present: – Poor or no connection between the PL-9600 and the module. – The connection cable between the PL-9600 and the PL-9600 base board is missing or loose.
5	*Module x not responding*	– The module at this address is no longer responding. Check the module settings. – Poor or no connection between the PL-9600 and the module.
6	*Module x reset alarm*	Module keeps resetting due to a fault. Check the module.
7	*No communication address*	The device address of the PL-9600 and/or the PFB-35/70 is missing; applicable for animal weighing (PW) or silo weighing (PSW).
8	*Module x changed*	Module configuration (inputs/outputs etc.) has been changed. Reload the module.
9	*SW1 pressed for factory details*	SW1 pressed for factory settings
10	*Output already assigned: x*	This otput is assigned to two or more controls.
11	*Input already assigned: x*	This input is assigned to two or more control systems.
12	*Invalid output: x*	Output number does not exist on the module.
13	*Invalid input: x*	Input number does not exist on the module.
14	*No output assigned*	No output terminal number has been entered.
15	*No input assigned*	No input terminal number has been entered.
16	*Wrong output type: x*	The configured output type does not match the type of output the controller can drive.
17	*Wrong input type: x*	The configured input type does not match the type of input the controller can accept.
18	*Unknown terminal type: x*	The selected terminal type does not exist.

Code	Alarm text	Description
19	*Unknown terminal type: x*	The selected terminal type does not exist.
20	*Wrong terminal configuration: x (input)*	Incorrect assignment. The module does not support the function assigned to the terminal.
21	*Wrong terminal configuration: x (output)*	Incorrect assignment. Module does not support the function assigned to the terminal.
22	*Invalid value: x*	Fan speed not entered.
23	*Counter already assigned*	Meter has been assigned to two or more schemes.
24	*Invalid communication no.*	Device address not entered.
25	*No addresses in loop*	The master station has not added any devices to the communication loop.
26	*No fan assigned*	No fan linked to step or output.
27	*Controlled group x not assigned*	Controlled group is not assigned to a step of the main ventilation.
28	*Invalid controlled group*	Non-existent controlled group assigned to a stage of the main ventilation.
29	*No output assigned controlled group x*	Output not entered.
30	*Communication address x*	No communication with feed weigher.
31	*Invalid feed weigher*	The software version in the PFB-35/70 and/or feed computer is not up to date. Contact the supplier for a software update.
33	*Invalid silo weigher*	The software version number in the PSW-1 silo weigher does not meet the requirements of the PL-9600 control software . Update the software of the PSW-1.
40	*No outside temperature sensor*	Control based on an external sensor is installed, although no external sensor is present.
41	*No pressure control*	A control system requiring pressure control has been installed, although no pressure control is present.
42	*No tunnel ventilation*	The inlet valve is set to tunnel mode, but no tunnel ventilation is installed.
43	*Invalid counter*	No valid counter assigned.
44	*No feed weigher*	Counter set to feed weigher, while no feed weigher is installed.
45	*Silo no. already used*	Silo number already assigned.
46	*No PFB-35/70*	Counter set to *PFB-35/70 feed* or *PFB-35/70 water,* while no PFB-35/70 is installed.

Code	Alarm text	Description
47	*No silo weigher*	– Counter set to PSW-1, while this is not installed. – No silo number or incorrect silo number entered in the counter.
48	*No PFV-9xxx*	Counter assigned to PFV-9xxx, although no PFV-9xxx feed weigher is installed.
49	*No PFA-9400*	Counter assigned to PFA-9400, although no PFA-9400 feed weigher is installed.
50	*No counter*	No counter assigned for sequential clock.
51	*Invalid group of animals*	The feed weigher is set to PFV-9xxx. In the feed counter, *'Counter in group'* is set to *'Both groups*', while the PFV-9xxx can only be assigned to one animal group.
52	*Animal group double*	Animal group already assigned.
55	*Invalid cooling*	Cooling not installed has been assigned.
56	*Invalid light timer*	Light timer not installed has been assigned.
57	*Invalid rinse timer*	Uninstalled flush timer assigned.
58	*Invalid sequential timer*	Uninstalled sequential clock assigned.
59	*Feed weigher x*	xx = alarm code from PFB-35/70 feed weigher. Further information: PFB-35/70 feed weigher manual.
60	*Too many silos*	More than 16 silos assigned.
61	*Invalid silo output*	Output number does not exist on the module.
62	*Too many components*	More than 8 feed types assigned.
70	*Load cell x not active*	Control not activated.
71-74	*Load cell x faulty*	– Bending rod x is not connected. – The measured voltage between E- and S+ or E- and S- is not between 2.0 V and 3.0 V. Check the voltage and the wiring.
80	*Invalid PFV-9xxx*	Incompatible version for message exchange.
81	*Invalid PFA-9400*	Incompatible version for exchanging messages.
83	*Invalid combination*	Dosing timer and animal group are both set to *communication*. This is not permitted. Select *'Dosing timers via communication*' (augers) or *'Send animal data via communication*' (valves).
84	*Multiple PFA-9400s used*	It is not possible to exchange data with multiple PFA-9400s.
90	*Step double*	More than 1 fan assigned to the same step.

Code	Alarm text	Description
91	*Step x not assigned*	No fan assigned to step.
92	*Measurement fan not assigned: group (x)*	No measurement fan assigned to group.
101	*Communication address x*	No communication with device address x (*Main station*, *Feeding system*, *Animal weighing, Silo weigher*).
102	*Communication FA-MSG, WEB-485*	If the master station has no communication with FA-MSG or WEB-485.
103	*House x without AQC*	The house with the displayed number does not have a valve with a measuring fan, while the central ventilation is set to *a section with AQC*.
104	*No info from houses*	A central control system has been installed on the poultry computer , but it has not received any data from the external controller for operating the central control system; for example, an incorrectly set feed computer or an incorrect central control number. If the poultry computer is linked to a feeding system : – *Animal group* in poultry computer is not set to *communication* – *Feeding system* in poultry computer is not set to *PFA-9400* – *Feed counter* in poultry computer is not set to *PFA-9400* – Feeding is controlled by valves and the timer in the PL-9600 is set to *PFA-9400* instead of *'switched on/off'*. – Dosing timers are being used and, for one of the associated counters, the setting for *'Counter in group'* is set to *'Both groups'*. This is not permitted; select *'Animals 1'* or *'Animals 2'*. – The software version in the poultry computer is not up to date; please update the software. – The poultry house is out of operation.
105	*Maximum supply alarm*	Counter exceeds specified maximum within set time.
106	*Minimum supply alarm*	Counter remains below specified minimum within the set time.
150	*Thermo-differential*	– The temperature difference between the last two sensor readings is greater than the maximum permitted difference. – Sensor temperature above absolute limit, see section 10.4.
211	*Ventilation too low*[1]	Measured ventilation is lower than the calculated minimum alarm limit.
212	*Ventilation too high*[1]	Measured ventilation is higher than the calculated maximum alarm limit.
243	*Position ouside limits*	Potentiometer measurement is outside its limits (EGM-100P, winch motor).
250	*Limit switches*	Both limit switches are in the closed position.
251	*Limit switch close*	Switch continues to indicate closed position.

Code	Alarm text	Description
252	*Limit switch open*	Switch continues to indicate open position.
300	*Temperature sensor faulty: x*	Main ventilation temperature sensor faulty.
301	*Outside sensor faulty*	Outdoor temperature sensor reading < -50.0°C or > +50.0°C
302	*Temperature sensor faulty*	Temperature sensor reading < -50.0°C or > +100.0°C.
303	*Pressure sensor faulty*	Pressure sensor reading is outside the set limits.
304	*RH sensor faulty*	RH sensor reading is outside the set limits.
305	*CO_2 sensor faulty*	CO_2 sensor reading is outside the set limits.
306	*NH_3 sensor faulty*	NH_3 sensor reading is outside the set limits.
307	*Potentiometer faulty: x*	Potentiometer reading is outside the set limits
308	*Sensor faulty*	Both open and closed contacts are closed.
309	*Meteo faulty*	▪ The weather station reading (wind direction, wind speed and/or rainfall level) is outside the set limits. These limits depend on the type of sensor: ME-54 or PL-MWA. ▪ Wire bridge missing, PL-Meteo without rain sensor. For wire bridge, see PL-Meteo appendix.
310	*Light sensor faulty*	Light sensor reading is outside the set limits.
311	*Invalid period x* *(x = period number)*	▪ The times on a timer must be in ascending order, and the difference between *Start* and *End,* and between two periods, must be at least 1 minute. ▪ For light control, *the start time + duration* must not fall after the subsequent *start time*. The time may, however, coincide with the subsequent start time. ▪ *The date* and/or *time* on the poultry computer do not correspond with the date and/or time on the PFA-9400 feed computer. ▪ The poultry computer is connected to a PFA-9400 feed computer that uses *filling and run-on times*. For more information, see the PFA-9400 feed computer user manual. ▪ *Water on demand*: The difference between the *Start Level* and the *Stop Time* must be at least 1 minute.
312	*Beginning day in period*	*Start of new day* falls within a period. The *Start of new day* time must be before the first period.
313-314	*Conflicting periods*[2]	The error message *'Overlapping periods'* appears if one or more feed timers are scheduled to be active at the same time.
320	*Preheating / Brooding: no sensor active*	*Preheating / Brooding*: no sensor active.
324	*RHsensor not removed*	Remove the RH sensor before cleaning the poultry house.

Code	Alarm text	Description
325	*CO_2 sensor not removed*	Remove the CO_2 sensor before cleaning the poultry house.
326	*NH_3 sensor not removed*	Remove the NH_3 sensor before cleaning the poultry house.
341	*Frost*	Frost protection of the heater block heat exchanger has been activated.
401	*Temperature too low*	Measured temperature < calculated minimum alarm limit.
402	*Temperature too high*	Measured temperature > calculated maximum alarm limit.
403	*Pressure too low*	Measured pressure < calculated minimum alarm limit.
404	*Pressure too high*	Measured pressure > calculated maximum alarm limit.
405	*RH too low*	Measured RH < calculated minimum alarm limit.
406	*RH too high*	Measured RH > calculated maximum alarm limit.
407	*CO_2 too low*	Measured CO_2 < calculated minimum alarm limit.
408	*CO_2 too high*	Measured CO_2 > calculated maximum alarm limit.
409	*NH_3 too low*	Measured NH_3 < calculated minimum alarm limit.
410	*NH_3 too high*	Measured NH_3 > calculated maximum alarm limit.
411	*THI too low*	Measured THI < calculated minimum alarm limit.
412	*THI too high*	Measured THI > calculated maximum alarm limit.
413	*Not closed*	Laying nest / pophole is not yet closed after the expiry of the propagation time.
414	*Not open*	Laying nest / pophole is not yet open after the expiry of the propagation time.
450	*External alarm*	External alarm triggered.
451	*Fan alarm*	Fan alarm via contact input.
600	*Communication address x*	No communication with weighing scale x.
601	*Scale not found*	Scale number does not exist.
602	*Not calibrated*	The scale has not been calibrated. It is calibrated at the factory as standard. Please contactservice@stienen.com.

Code	Alarm text	Description
701	*Component not in silo*	– Silo number is 0. Enter a valid silo number (not equal to 0) for an active component. – In the silo contents, the silo containing the selected component is marked as *empty* or *blocked*. – Component is not in the selected silo. – The component is not assigned to a silo, even though a value has been entered for the component in the composition. – A different component has been assigned in the silo contents. – In the silo allocation, a silo number is listed behind a component in the first column (*active silo*) that no longer contains the specified component.
702	*Invalid mixture*	The composition is set to 0.0 % for all components, yet a dosing quantity is still being calculated.
703	*Invalid component*	A non-existent component has been selected for an alternative feed type
704	*Silo already assigned*	The silo number entered has already been assigned in the search sequence.
705	*Invalid search sequence*	– Silo number does not exist. – Silo assignment changed. – The silo number is 0, whereas a valid silo number (not equal to 0) must follow an active component. – A non-existent silo number follows the component.
706	*Invalid search sequence*	Not all silo search sequences for components of the active recipe are valid.
707	*Dosage too low*	The dispensed quantity of feed or water is lower than the set minimum dispensing quantity; see section 9.3.6.
751	*Supply rate*	The feed rate has been below the set minimum feed rate for the last 60 seconds.
752	*No silo available*	No silo available for auger control.
1500	*Alarm silo x*	– Silo number x is blocked/empty. – Alternative component is not in any of the available silos; more components than silos.

[1] For air inlet control, first ensure that the air inlet valve is not set to manual operation.
[2] If all feed dosing timers operate with release contacts, the periods may overlap.

11 System

11.1 General

SYSTEM > General

***Overview* tab**

Controller type	Type of the poultry management computer.
Package version	Version of the package software in the PL-9600.
Controller version	Version of the software running on thePL-9600.
Name	Tap the field to open a virtual keyboard and change the name of the poultry climate and management computer (max. 15 characters, default: PL-9600). See section 4.3 for more details.
Language	Select the language in which all configurable, language-dependent factory settings are displayed.
Keyboard layout	Select the type of keyboard used for text input on the screen. Options: *QWERTY, AZERTY, QWERTZ, ABC*.
Date	Set the current system date (dd-mm-yyyy).
Time	Set the current system time (hh:mm).
First day of the week	Select which day the week starts on (*Sunday, Monday*, etc.). Weekly totals are registered starting from this day.
Beginning of new day	Set the hour (0–23) at which a new day begins.
Theme	Select the screen display theme: *Dark* White text on a dark background *Light* Black text on a white background
Measurement system	Select the unit for temperature, distance, weight, etc.: *Metric* °C, meter, kilogram, litre (UK and most countries) *Imperial* °F, inch, pound, gallon (US and some other countries)

11.2 Authorisation

You can define permissions for each user of the PL-9600. Permissions can be applied locally to the device itself or system-wide across the network.

All authorised users are displayed in an overview, allowing you to easily see who has which rights.

This menu is only visible to users with *manager* level or higher.

SYSTEM > Authorisation

Standard user **tab**

The standard user is the user who can operate the computer without logging in.

Default language *(visible only when logged in as Installer)*	Select the language in which all texts on the screen are displayed (excluding language-dependent factory settings).
Default user role *(visible only when logged in as Installer)*	Select the user role. You cannot assign a role higher than your own.
Default user can edit *(visible only when logged in as Installer)*	Enable this option to allow the standard user to change role-dependent settings.

Local **and** ***System*** **tabs**

1. Tap the *Local* or *System* tab, depending on the type of permission.
2. Tap the *Add* button at the bottom left.
3. Enter the user's name.
4. Enter a *short name* (minimum 2 characters, maximum 4 characters). This abbreviation will be used in overviews.
5. Set the PIN code (minimum 4 digits, maximum 8 digits).
6. Select the role for this user. Options:

Role	Description
Guest	Can view data only; cannot make changes.
User	Daily use of the system with limited operating rights.
Manager	Access to management functions and overview of multiple rooms or poultry houses.
Installer	For installation and technical configuration of the system.
Partner	External party (e.g., consultant or supplier) with limited management rights.
Administrator	Full access to all system functions and settings.

7. Select the *language* in which this user will see the settings.
8. Tap the *Save* button at the bottom right to confirm the permissions. The user will then appear in the overview.
9. You can later edit the role or PIN code (✎) or delete the user entirely (🗑).

11.3 Network

SYSTEM > Network

Adapter name	Name of the network adapter used for the connection (e.g., *eth0* for a wired Ethernet connection).
Active IP	The unique IPv4 address assigned to the PL-9600 within the network. This address identifies the device.
Active netmask	Indicates which part of the IP address is the **network address** and which part identifies devices within that network. For example, **255.255.255.0** means the first three octets form the network address, and the last octet identifies the device. Each octet can range from 0 to 255, as 8 bits allow 256 combinations
Active default gateway	IP address of the router or another device that forwards traffic to other networks, such as the internet.
Mac address	Unique hardware address of the network adapter, used to identify the device within the local network.

11.4 FarmConnect

SYSTEM > FarmConnect

***System* tab**

Device ID	Unique identification number of your *PL-9600*. This ID is used by *FarmConnect* to recognize your device.
Device PIN	Personal access code required to pair the device or access *FarmConnect* features. Think of it as a secure password used only by you to connect your *PL-9600.*

12 Maintenance and inspection

12.1 Climate system

Effective climate control is essential for smooth farm management. Disease prevention starts with optimizing the climate inside the poultry house. Therefore, it is important to regularly inspect and clean fans, valves, measuring fans, ventilation chimneys, sensors, and climate controllers to ensure proper operation.

What	When	Action
Alarm system	Monthly	Check the operation of the alarm system
Air leaks	Regularly	Check for air leaks. Air leaks are undesirable.: ▪ In summer, warm outside air can enter, causing fans to run faster and increasing energy consumption. ▪ In winter, cold air can enter, causing the house to become too cold and stressing the animals.
Measuring fans and settings	Regularly	Measuring fans can become sluggish due to wear and tear. At a constant speed, this can result in increased ventilation. Have them checked by an expert in time.
Negative pressure in the poultry house	Regularly	Clogged filters or air intake valves (still in winter mode) can cause back pressure, forcing fans to work harder. Check by opening/closing the house door and feeling the resistance. Inspect filters and valves if necessary.
Temperature sensors	Monthly	Clean the temperature sensors with a damp cloth.
Ventilation chimneys	Annually	Clean at least once a year to remove dust and dirt.
Cleaning the ventilation system	During cleaning of the poultry house	Keep fans, valves, and ventilation ducts clean to reduce energy consumption. Use a damp cloth for climate controllers, measuring fans, and valves. ⚠ Never clean climate controllers, measuring fans, valves, or other electrical equipment with a high-pressure sprayer. Ducts may be cleaned with a high-pressure sprayer, but avoid directing the jet at sensitive components
Fans	Weekly	Briefly switch on all fans, even in winter, to prevent them from seizing.

12.2 Other equipment

A properly functioning feeding, weighing, and egg counting system is essential for an efficient and healthy poultry farm. Regular maintenance prevents malfunctions, improves measurement accuracy, and contributes to animal welfare. This schedule provides an overview of the most important components, recommended check frequencies, and the corresponding actions to keep the systems running optimally.

What	When	Action
Feeding systems (tubes, screws, hoses)	Weekly	Check for blockages and wear. Clean if necessary to prevent obstructions.
Feed troughs and nipples	Weekly	Inspect for damage or blockages. Clean thoroughly to prevent mould or bacterial growth.
Weighing systems (sensors, display, software)	Monthly	Calibrate the weighing systems and check for accuracy. Update software if necessary.
Egg detection systems (counters, sensors, software)	Monthly	Clean the sensors and counters. Check software for updates and calibrate if needed.
Feed computer / central control	Monthly	Check for malfunctions or error messages. Perform system updates and back up settings.
Feed and egg conveyor belts	Monthly	Inspect for wear or damage. Clean and adjust belt tension if necessary.
Power supply (batteries, fuses, cables)	Monthly	Check for damage or wear. Replace batteries and fuses proactively to prevent malfunctions.