

CL-5400

CLIMATE CONTROL
FOR NATURALLY VENTILATED HOUSES



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1 General introduction

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

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

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

1.1 Symbols and definitions



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



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



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



Pressure cleaning is not allowed.



Collect as separate flows



Important note



Additional information



Example of a concrete application of the functionality described.



Example calculation



Manual control



Tips and advice



Screenshot



Application note

1.2 Customer service

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

2 Safety instructions and warnings

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

2.1 Sound, independent alarm system

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



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



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

2.2 During use

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



The device must only be opened by authorized personnel.



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



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



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



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

2.3 Disposal

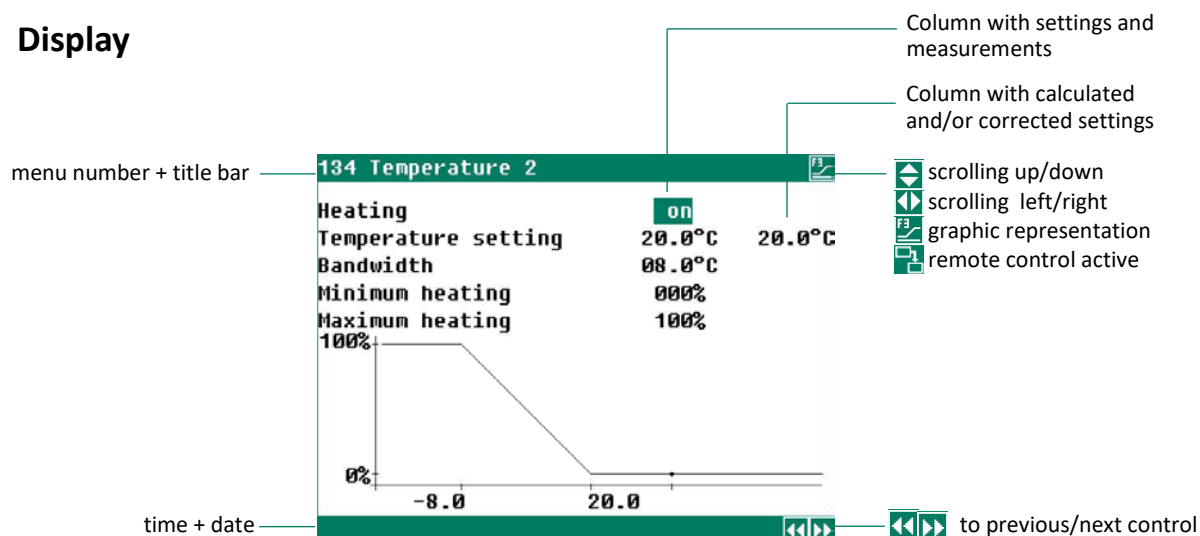
The EU has set up systems for the separate collection of waste electrical and electronic equipment and batteries (Directive 2012/19/EU). If you do not dispose of the device properly, you risk a fine.



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




3 Display and Keyboard

3.1 Display






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




If the text extend beyond the screen,  appears in the title bar. Use   to reach the remaining settings/measurements.



If the text extend beyond the screen,  appears in the title bar. Use   to reach the remaining settings/measurements.

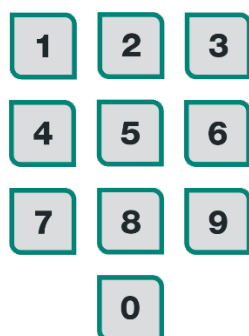


If  is shown in the title bar and you press function key F3, the settings will be displayed graphically. The dot (●) in the graph indicates the calculated value. Pressing F3 again turns off the graphical mode.

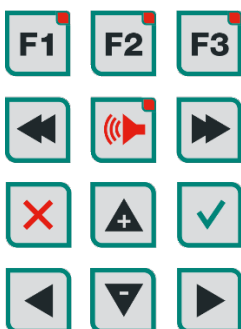


Indication that you can select the previous/next screen pressing  / .

3.2 Keyboard



Numeric keys





Function keys

Navigation keys



Operate the keys with your fingertips and not with sharp objects, such as a pen or screwdriver.











3.3 Function keys

- F1** Press and hold this button and use   to select the previous/next language.
- F2** Displaying house status.
- F3** Selecting graphical mode. When the light in the function key is on, the graph is active. Pressing F3 again turns off the graphical mode and the LED will go off.



3.4 Numeric keys (0...9)



Numeric keys (0 - 9)




The numeric keys allow to enter a screen number, valve number, value or text. Select menu item 10 with .

Key	Character
	_0
	.,1'-:+
	abcääâç2ABCÄÅÂÇ
	defëéèê3DEFËÊË
	ghïîïî4GHIÏÎÎ
	jkl5JKL
	mnoöôöô6MNOÖÔÖÔ
	pqrs7PQRS
	tuvüüüü8TUVÜÜÜÜ
	wxyz9WXYZ

Text input









Use  -  to change the name of a recipe, timer, external alarm (max. 15 characters including spaces). The character is shown in a little box. Press the numeric key repeatedly until the character to be selected is shown.

To enter a punctuation mark, press  repeatedly. Use  to insert spaces.





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

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

3.5 Navigation keys

-  Cancelling menu selection or change.
Press and hold to return to the main menu
-   In control mode, press and hold to move cursor left/right.
In edit mode, move cursor left/right.
-   In control mode, move cursor up/down.
In edit mode, decrease/increase value.
-  Confirming menu selection, starting edit mode and confirming change.
In edit mode, the value to be changed appears in a green rectangle: .
When editing, the cursor changes into a black frame: .

3.6 Inserting/removing breakpoint or period

- Press  to enter edit mode.
- Hold down function key  and press:
 -  to insert a breakpoint/period (provided that the maximum value for periods/breakpoints has not been reached)
 -  to remove a breakpoint/period (provided that there is at least one period/breakpoint)
- The number of breakpoints/periods is adjusted automatically.

3.7 Alarm key



Shortcut key for alarm screen.

Set *Test* to *yes* to test the alarm relay (siren) for 10 seconds. Set *Test* to *no* to clear the alarm test time.

Alarm status	
Main alarm	on
⌚ off	no
Test	no
Reset	no
Alarm code	No alarm
Alarm external house	0
1 Latest alarms house	
2 Communication	

⌚ *off* Option to temporarily disable the alarm (siren). This does not apply to hardware alarms. The main alarm will be switched off for 30 minutes; the alarm LED will flash evenly. After 30 minutes, the main alarm automatically turns back on. If the alarm cause has not been eliminated, the alarm relay de-energizes again (alarm).

Set ⌚ *off* to *no* to delete alarm delay time.

You can delete all alarms by setting *Reset* to *yes*. All active alarms will be reset.

When the alarm relay has tripped (alarm delay time has expired), the cause will appear on the display. You can switch the main alarm on and off. If the main alarm is switched off, the LED in the alarm key will flash. The LED is on when there is an alarm in one of the sections and/or central controls. In addition to the alarm cause, the corresponding control and section number are displayed.

Alarm external house If a message is received via the communication loop that the alarm relay of a connected controller has failed, the *Alarm external house* displays the relevant house number.



Remember to switch the alarm back on after clearing the fault. Preferably use the ⌚ *off* function to solve the problem.

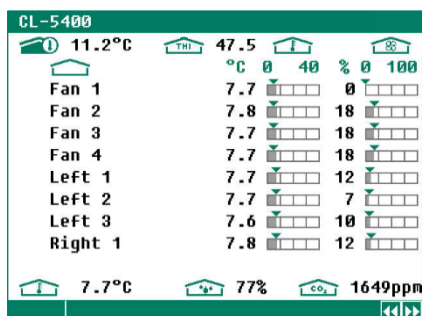
3.8 Terminal numbering for inputs / outputs

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

Letter	Input/output type	Description
A	0-10V output	Analog output: 0-10V or 10-0V
B	Relay output	Relay contact output (<u>not</u> : alarm relays, digital outputs, etc.)
C	Digital output	Optically switched on/off output (maximum 35Vdc 30mA)
D	Open/close output	Open/close control with position feedback. This includes heaters and valves with feedback potentiometer.
F	Controlled triac output	Controlled triac output: 30-230Vac
G	Analog output	Fixed-range 2-10V analog output with position feedback. This includes valves with feedback potentiometer.
K	Temperature sensor	Temperature sensors with a 10K NTC resistor (N10B, BV10B, etc.)
L	0-10V input	Analog 0-10V input for connection of e.g. measuring sensors (RH, pressure, CO ₂ , NH ₃ etc.)
M	Digital input	Measuring fans, counter contacts etc.
N	Meteo station	Module to which wind speed, wind direction and a rain sensor can be connected.
R	Pressure sensor	n.a.

4 Overview screen + Main menu

4.1 Overview screen



Icon	Description
	Alarm (alarm delay time expired)
	Alarm disabled
	Alarm (alarm delay time has not expired)
	Alarm disabled
Fan 1	Ventilation group name
	Ventilation group temperature in °C
	Ventilation group in %
11.2°C	Outside temperature
47.5	THI (Temperature Humidity Index)
10.8°C	House temperature
76%	Relative humidity
1649ppm	CO ₂

4.2 Main menu



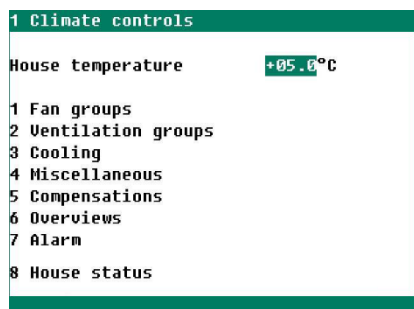
When using an access code, we recommend to write it down and keep it somewhere safe. You will not be able to change any settings if you do not have the access code.

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

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

5 Climate control

5.1 House temperature



Based on the house temperature, the ventilation, cooling and heating systems are controlled.



If you set a low stall temperature, bear in mind that the water may freeze in winter.

Relative or absolute temperature setting

Control	Relative to house temperature	Absolute temperature setting
Fans	yes	n.a.
Ventilation group (left/right etc.)	yes	n.a.
Cooling 1 and 2	n.a.	yes
Recirculation, Temperature 2 ... 4	n.a.	yes

Relative Temperature control operates with a differential temperature with respect to the house temperature setpoint; it follows the house temperature setpoint.

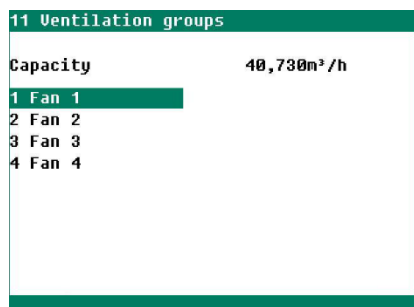


Differential temperature 5.0°C
House temperature is 20.0°C
The temperature rail controls: $20.0^{\circ}\text{C} + 5.0^{\circ}\text{C} = 25.0^{\circ}\text{C}$

Absolute Temperature control is based on absolute temperature settings. If the temperature is set at 5.0°C, the output also controls at 5.0°C. The temperature control works independently of the house temperature setpoint.

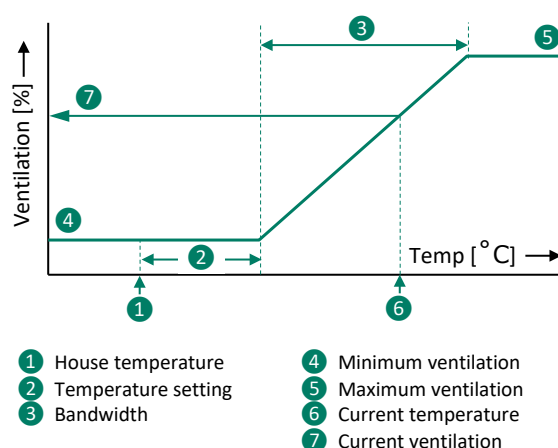
5.2 Ventilation groups

Ventilation groups and fan groups



Fan group control based on temperature

111 Fan 1		
Temperature setting	+00.0°C	+5.0°C
Bandwidth	06.0°C	6.0°C
Minimum ventilation	010.0%	
Maximum ventilation	100.0%	
Current temperature	7.7°C	
Current ventilation	50.7%	50.7%
Capacity	30,390m³/h	
1 Options	2 Options meteo	



Temperature setting

The ventilation group control is based on the temperature setpoint. This setpoint is relative to the house temperature. The second value is the calculated temperature based on which the ventilation group controls.

Bandwidth

The bandwidth determines the 'sensitivity' of the control. With a smaller bandwidth, the computer reacts more strongly to a temperature change. This is not good for the house climate because of too many ventilation fluctuations.

Minimum ventilation

Minimum ventilation setpoint.

Maximum ventilation

Maximum ventilation setpoint.

Current temperature

The ventilation group control is based on the current temperature.

Current ventilation

If a measurement fan is used for the fan control, the measured ventilation is displayed as second value. If no measuring fan has been installed or if the measuring fan is defective, the measured ventilation is equal to the current ventilation.

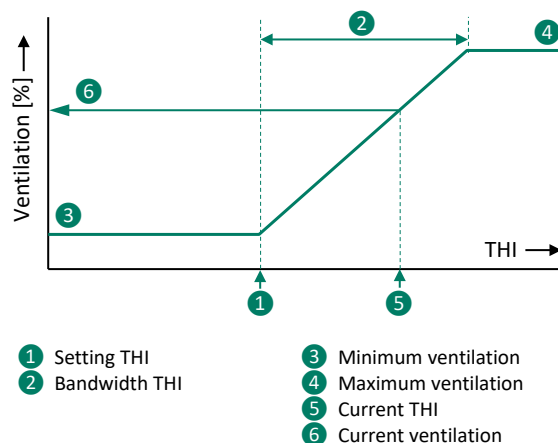
The current ventilation is calculated from the current temperature, the bandwidth and the minimum and maximum ventilation setpoints.

Capacity

The ventilation capacity of the fans is calculated from the ventilation capacities entered by your installer.

Fan group control based on THI basis

111 Fan 1		
Setting THI	60.0	
Bandwidth THI	10.0	
Minimum ventilation	010.0%	
Maximum ventilation	100.0%	
Current temperature	20.0°C	
Current RH	77%	
Current THI	66.7	
Current ventilation	0.0%	0.0%
Capacity	0m³/h	
1 Options	2 Options meteo	



THI setting

The ventilation group control is based on the THI (Temperature Heat Index).

<i>Bandwidth THI</i>	The bandwidth determines the control's 'sensitivity'. With a smaller bandwidth, the computer reacts more strongly to a THI change. Too many ventilation fluctuations are not good for the house climate.
<i>Minimum ventilation</i>	Minimum ventilation setpoint.
<i>Maximum ventilation</i>	Maximum ventilation setpoint.
<i>Current THI</i>	The current THI based on which the ventilation group controls.
<i>Current ventilation</i>	<p>If a measurement fan is used for the fan control, the measured ventilation is displayed as second value. If no measuring fan has been installed or if the measuring fan is defective, the measured ventilation is equal to the current ventilation.</p> <p>The current ventilation is calculated from the current temperature, the bandwidth and the minimum and maximum ventilation setpoints.</p>
<i>Capacity</i>	The ventilation capacity of the fans is calculated from the ventilation capacities entered by your installer.

Fan options

1111 Options Fan 1			
			Max.
Start fan 2	050%	1:100%	
Start fan 3	066%	2: 99%	
AQC-flap	100%		
Proportional	77%		
Proportional	Step	3	
1 Fan period off			

Start fan 2 / 3

If the fans consist of more than one fan control, enter at *Start fan 2* and/or *Start fan 3* the percentage (in relation to the total capacity of the controlled ventilation group) at which the second/third fan control should activate.

Proportional Step shows the currently activated number of ventilation controls:

- 1 = 1st ventilation control,
- 2 = 1st and 2nd ventilation control,
- 3 = 1st, 2nd and 3rd ventilation control.

Fan period-off time

1111 Options Fan 1			
			Max.
Start fan 2	050%	1:100%	
Start fan 3	066%	2: 99%	
AQC-flap	100%		
Proportional	77%		
Proportional	Step	3	
1 Fan period off			

11111 Period off Fan 1			
Fan period off	on	off	
Number of periods	2		
Per.	from	till	
1	07:00	10:00	
2	18:00	21:00	

1111 Options Fan 1			
			Max.
Start fan 2	050%	1:100%	
Start fan 3	066%	2: 99%	
AQC-flap	-0%		
Proportional	0%		
Proportional	Step	0	
1 Fan period off			

11111 Period off Fan 1			
Fan period off	on	active	
Number of periods	2		
Per.	from	till	
1	07:00	10:00	
2	18:00	21:00	

The *Fan period off* setpoint allows to switch off the fan for up to four periods. This prevents overloading the mains connection, e.g. during milking.

Meteo options

1112 Options meteo Fan 1		
Fan stop wind speed		
Setting wind speed	5.0m/s	
Temperature setting	025.0°C	
Windward side	none	
Wind speed	3.9m/s	
Current temperature	20.0°C	
Current status	off	

Fan stop wind speed:

With a sufficiently high natural wind speed, it is often not necessary to mechanically ventilate below a certain house temperature. When there is no wind, it is desirable.

Furthermore, you see the *current wind speed*, the *current house temperature* and the *wind side* setpoint.

The *Current status* changes to *on* if:

- the current wind speed is higher than the wind speed setpoint and
- the current house temperature is lower than the temperature setpoint and
- the current wind direction matches the wind side setpoint.

Ventilation groups without fan group

121 Left 1		
Temperature setting	-02.0°C	+5.0°C
Bandwidth	06.0°C	6.0°C
Minimum flap opening	000%	
Maximum flap opening	100%	
Current temperature	7.8°C	
Calculated flap opening	46%	
Current flap opening	46%	

121 Left 1		
Temperature setting	-02.0°C	+5.0°C
Bandwidth	06.0°C	6.0°C
Minimum flap opening	000%	
Maximum flap opening	100%	
Current temperature	7.8°C	
Calculated flap opening	-0%▲	
Current flap opening	0%	



Emergency stop active

Temperature setting

The ventilation group control is based on the temperature setpoint. This setpoint is relative to the house temperature. The second value is the calculated temperature.

Bandwidth

The bandwidth determines the 'sensitivity' of the control. With a smaller bandwidth, the computer reacts more strongly to a temperature change. This is not good for the house climate because of too many ventilation fluctuations.

Minimum flap opening

Setting the minimum and maximum air inlet opening.

*Maximum flap opening**Current temperature*

Displays the actual average temperature on the basis of which the ventilation group controls.

Calculated flap opening

The air inlet opening is calculated from the current temperature, the bandwidth and the minimum and maximum air inlet opening setpoints.

Current flap opening

Displays the current air inlet opening of the ventilation group.

5.3 Temperature-based cooling control

13 Cooling		
1 Cooling 1	7.7°C	off
2 Cooling 2	7.1°C	-0%

131 Cooling 1		
Cooling 1	on	
Temperature setting	+30.0°C	30.0°C
Maximum RH	100%	
Current RH	77%	
Current temperature	7.7°C	
Current cooling	off	
1 Running hours	2 Options	

132 Cooling 2		
Cooling 2	on	
Temperature setting	+30.0°C	30.0°C
Bandwidth	4.0°C	
Minimum cooling	000%	
Maximum cooling	100%	
Maximum RH	100%	
Current RH	77%	
Current temperature	7.1°C	
Current cooling	off	-0%
1 -----	2 Options	

On/off cooling

Proportional cooling

<i>Cooling x</i>	Switching the cooling on and off.
<i>Temperature setting</i>	Temperature setpoint based on which the cooling controls. This setpoint is - if less than 10.0°C - relative to the house temperature. If the temperature setpoint is set to 10.0°C or higher, the temperature setpoint is an absolute value.
<i>Bandwidth</i>	The bandwidth – within which the cooling is controlled from minimum to maximum – determines the ‘sensitivity’ of the control. With a smaller bandwidth, the cooling system reacts more strongly to a temperature change. This is not good for the house climate because of too many ventilation fluctuations.
<i>Min/max cooling</i>	Minimum and maximum cooling setpoints to limit the capacity of a proportionally controlled cooling system to a minimum and maximum percentage.
<i>Maximum/current RH</i>	To prevent the house from becoming too humid due to cooling, the cooling by RH can be switched off. If the RH rises above the setpoint + hysteresis, cooling will be switched off. If the RH subsequently drops below the setpoint, cooling switches on again. Default hysteresis setpoint = 2%.
<i>Current temperature</i>	The cooling control is based on the current, average temperature.
<i>Current cooling</i>	The current cooling status. With controlled cooling, the percentage on which the cooling is controlled is displayed. 0% = control switched off.

5.4 THI-based cooling control

13 Cooling			131 Cooling 1			132 Cooling 2		
1 Cooling 1	THI		Cooling 1	on		Cooling 2	on	
2 Cooling 2	65.6	off	Setting THI	65.0		Setting THI	65.0	
	65.6	-0%				Bandwidth THI	10.0	
						Minimum cooling	000%	
						Maximum cooling	100%	
			Maximum RH	100%		Maximum RH	100%	
			Current RH	77%		Current RH	77%	
			Current temperature	19.3°C		Current temperature	19.3°C	
			Current THI	65.6		Current THI	65.6	
			Current cooling	off		Current cooling	off	-0%
			1 Running hours	2 Options		1 -----	2 Options	

Switched cooling

Controlled cooling

<i>Cooling</i>	Switching cooling on and off.
<i>Setting THI</i>	THI based on which the cooling control.
<i>Bandwidth THI</i>	The bandwidth – within which the cooling is controlled from minimum to maximum – determines the ‘sensitivity’ of the control. With a smaller bandwidth, the cooling system reacts more strongly to a THI change. This is not good for the house climate because of too many ventilation fluctuations.
<i>Minimum/Maximum cooling</i>	Minimum and maximum cooling setpoints to limit the capacity of a proportionally controlled cooling system to a minimum and maximum percentage.
<i>Maximum/current RH</i>	To prevent the house from becoming too humid due to cooling, the cooling by RH can be switched off. If the RH rises above the setpoint + hysteresis, cooling will be switched off. If the RH subsequently drops below the setpoint, cooling switches on again. Default hysteresis setpoint = 2%.
<i>Current THI</i>	Displays the current THI, based on which the cooling controls.
<i>Current cooling</i>	The current cooling status. With controlled cooling, the percentage on which the cooling is controlled is displayed. 0% = control switched off.

Operating hours

1311 Running hours Cooling 1	
Today	0:00
Sunday	0:00
Saturday	0:00
Friday	0:00
Thursday	0:00
Wednesday	0:00
Tuesday	0:00
Monday	0:00
Total	0 hours
Clear running hours	no

With an on/off (non-modulating) cooling system, you can display the operating hours of the cooling system. In addition to today's operating hours, the operating hours of the past seven days and the total number of operating hours are displayed.

Set *Clear running hours* to *Yes* to delete the operating hours of the cooling system.

Options

1312 Options Cooling 1			
Timer		on	
	Point	Begin	End
Monday	active	08:00	17:00
Tuesday	active	08:00	17:00
Wednesday	active	08:00	17:00
Thursday	active	08:00	17:00
Friday	active	08:00	17:00
Saturday	active	08:00	17:00
Sunday	active	08:00	17:00

If the cooling should only be active on certain days or parts of the day, you can set this via the *Timer*.

5.5 Other

14 Miscellaneous controls	
1 Humidification	
2 Thermo-differential	
3 Recirculation 1	
4 Temperature 2	
5 Temperature 3	
6 Temperature 4	

Humidification

141 Humidification	
Humidification	on
RH setting	88%
Current RH	76%
Current status	off

Here you can turn the humidification control on and off. Furthermore, you can enter an RH setpoint (%) below which the control should be active.

Temperature monitoring (thermos-differential)

142 Thermo-differential				
Thermo-differential				
Relative alarm limit	+4.0°C/m			
Absolute alarm limit	58.0°C			
Sensor 1	19.2°C	19.2°C	+0.0°C/m	
Sensor 2	19.1°C	19.1°C	+0.0°C/m	
Sensor 3	19.2°C	19.2°C	+0.0°C/m	
Sensor 4	19.3°C	19.3°C	+0.0°C/m	

Your installer configures the temperature monitoring: max. four sensors. Temperature monitoring alarms only occur with positive differences.

For each sensor, the current measurement is compared with that of the previous minute. If the temperature increase in that minute is equal to or greater than the relative alarm limit setpoint, an alarm is triggered. If the measured value is within the limits, the previous measurement is made equal to the current measurement and a new measurement is started.

An alarm is also triggered when the measured sensor temperature rises above the absolute limit.

Recirculation

143 Recirculation 1		
Cooling	<input checked="" type="checkbox"/>	
Temperature setting	10.0°C	10.0°C
Current temperature	19.3°C	
Current cooling	on	

The recirculation control can be used to cool the house. If the temperature rises above the temperature setpoint, the recirculation control switches on. If the temperature drops below the hysteresis setpoint, the recirculation control switches off again. Your installer can set a hysteresis of up to 5.0°C.

Temperature 2/3/4

144 Temperature 2			145 Temperature 3			146 Temperature 4		
Heating	<input checked="" type="checkbox"/>		Temperature 3	<input checked="" type="checkbox"/>		Cooling	<input checked="" type="checkbox"/>	
Temperature setting	05.0°C	5.0°C	Temperature setting	+02.0°C		Temperature setting	20.0°C	20.0°C
Bandwidth	08.0°C							
Minimum heating	000%							
Maximum heating	100%							
Current temperature	19.1°C		Highest temperature	19.3°C		Current temperature	19.2°C	
Current heating	off	-0%	Lowest temperature	19.2°C		Current cooling	off	
			Temperature difference	0.1°C				
			Current position	off				

Heating/cooling/
Temperature

Here you can switch heating/cooling/temperature control (ΔT) on and off.

Temperature setting

Temperature setpoint based on which the heating/cooling system should control. The temperature setpoint is always an absolute value.

Bandwidth

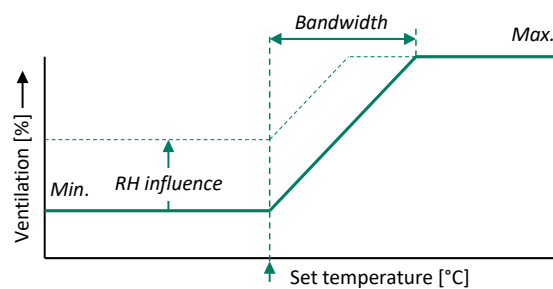
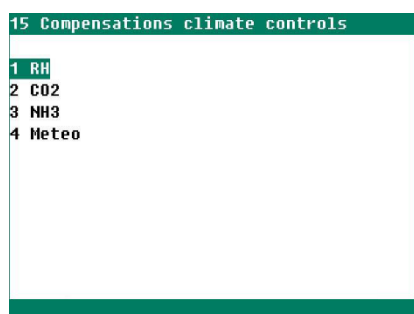
The bandwidth – within which the heating/cooling is controlled from minimum to maximum – determines the 'sensitivity' of the control. With a smaller bandwidth, the heating/cooling system responds very quickly to a temperature change. This is not good for the house climate because of too many ventilation fluctuations.

Maximum heating
Minimum heating

The *Minimum* and *Maximum heating* setpoints allow you to limit the minimum or maximum positions (burning rate) of a controlled heating system.

<i>Minimum cooling</i>	The <i>Minimum</i> and <i>Maximum cooling</i> setpoints allow you to limit the minimum or maximum positions (burning rate) of a controlled cooling system.
<i>Maximum cooling</i>	
<i>Current temperature</i>	Display of the current, average temperature on the basis of which the cooling is controlled.
<i>Current cooling</i>	Displays the current status of the cooling system. In case of a regulated cooling system, you can see the percentage by which the cooling system is controlled: -0% is off.
<i>Highest temperature</i>	Highest measured temperature (ΔT measurement).
<i>Lowest temperature</i>	Lowest measured temperature (ΔT measurement).
<i>Temperature difference</i>	Temperature difference (ΔT) between highest and lowest reading.
<i>Current position</i>	Current control status (ΔT measurement).

5.6 Compensations



If RH compensation, NH_3 compensation and CO_2 compensation are active, the highest compensation value determines the correction of the ventilation/air inlet position.

RV compensation

The RH compensation only affects the ventilation/valve position. This means that ventilation increases as soon as the reading exceeds the set value of *RH compensation*.



The screen always shows the absolute compensation.

151 RH-compensation	
RH-compensation	070%
Current RH	76%
1 Ventilation groups	

1511 RH-compensation factor	
RH-compensation Factor	Max. 100.0%
Fan 1	1.0 7.0%
Fan 2	1.0 7.0%
Fan 3	1.0 7.0%
Fan 4	1.0 7.0%
Left 1	1.0 7.0%
Left 2	1.0 7.0%
Left 3	1.0 7.0%
Right 1	1.0 7.0%
1 Misc. ventilation groups	

15111 RH-compensation factor	
Right 2	1.0 7.0%
Right 3	1.0 7.0%
Front	1.0 7.0%
Rear	1.0 7.0%
Group 9	1.0 7.0%
Group 10	1.0 7.0%
Group 11	1.0 7.0%
Group 12	1.0 7.0%

1511 RH-compensation factor	
RH-compensation Factor	Max. 100.0%
Fan 1	1.0 7.0%
Fan 2	1.0 7.0%
Fan 3	1.0 7.0%
Fan 4	1.0 7.0%
Left 1	1.0 7.0%
Left 2	1.0 7.0%
Left 3	1.0 7.0%
Right 1	1.0 7.0%
Right 2	1.0 7.0%
Right 3	1.0 7.0%

Menu No. 1 appears only for more than 9 ventilation groups.

Menu 1511 has a dynamic structure. Controls without RH compensation or uninstalled controls are not shown.

RH compensation factor

If the factor is set to 0.0, RH compensation has no influence on the ventilation or air inlet valve position. If the factor is set to 9.9, the RH compensation has a maximum effect on the ventilation or the air inlet valve position. The maximum correction is limited by the maximum setpoint (*Max.*).

$$\text{Absolute} = (\text{Current RH} - \text{RH compensation start}) \times \text{RH compensation factor}$$

$$\text{Relative} = ((\text{Current RH compensation start}) \times \text{RH compensation factor}) / 100\% \times \text{Calculated ventilation}$$

CO₂ compensation

The *CO₂ compensation* only influences the ventilation/air inlet valve position. This means that the ventilation increases as soon as the measurement exceeds the *CO₂ compensation* setpoint.



The absolute compensation is always displayed.

152 CO ₂ compensation	
CO ₂ compensation start	1500ppm
Current CO ₂	1649ppm
1 Ventilation groups	

1521 CO2 compensation factor		
CO2 compensation factor	Max.	100.0%
Fan 1	1.0	1.5%
Fan 2	1.0	1.5%
Fan 3	1.0	1.5%
Fan 4	1.0	1.5%
Left 1	1.0	1.5%
Left 2	1.0	1.5%
Left 3	1.0	1.5%
Right 1	1.0	1.5%
1 Misc. ventilation groups		

Menu No. 1 appears only for more than 9 ventilation groups.

15211 CO2 compensation factor		
Right 2	1.0	1.5%
Right 3	1.0	1.5%
Front	1.0	1.5%
Rear	1.0	1.5%
Group 9	1.0	1.5%
Group 10	1.0	1.5%
Group 11	1.0	1.5%
Group 12	1.0	1.5%

1521 CO2 compensation factor		
CO2 compensation factor	Max.	100.0%
Fan 1	1.0	1.5%
Fan 2	1.0	1.5%
Fan 3	1.0	1.5%
Fan 4	1.0	1.5%
Left 1	1.0	1.5%
Left 2	1.0	1.5%
Left 3	1.0	1.5%
Right 1	1.0	1.5%
Right 2	1.0	1.5%
Right 3	1.0	1.5%

Menu 1521 has a dynamic structure. Controls without CO₂ compensation or uninstalled controls are not shown

CO₂ compensation factor

If the factor is set to 0.0, the CO₂ compensation has no influence on the ventilation or the air inlet valve position. If the factor is set to 9.9, the CO₂ compensation has a maximum effect on the ventilation or the air inlet valve position. The maximum correction is limited by the maximum setpoint (*Max.*).

$$\text{Absolute} = (\text{Current CO}_2 - \text{CO}_2 \text{ compensation start}) \times \text{CO}_2 \text{ compensation factor}$$

$$\text{Relative} = ((\text{Current CO}_2 - \text{CO}_2 \text{ compensation start}) \times \text{CO}_2 \text{ compensation factor}) / 100\% \times \text{Calculated ventilation}$$

NH₃ compensation

The *NH₃ compensation* only influences the ventilation/air inlet valve position. This means that the ventilation increases as soon as the measurement exceeds the *NH₃ compensation* setpoint.



The absolute compensation is always displayed.

153 NH3 compensation		
NH3 compensation start	10.00ppm	
Current NH3	10.77ppm	
1 Ventilation groups		

1531 NH3 compensation factor		
NH3 compensation factor	Max.	100.0%
Fan 1	1.0	7.4%
Fan 2	1.0	7.4%
Fan 3	1.0	7.4%
Fan 4	1.0	7.4%
Left 1	1.0	7.4%
Left 2	1.0	7.4%
Left 3	1.0	7.4%
Right 1	1.0	7.4%
1 Misc. ventilation groups		

Menu No. 1 appears only for more than 9 ventilation groups.

15311 NH3 compensation factor		
Right 2	1.0	7.4%
Right 3	1.0	7.4%
Front	1.0	7.4%
Rear	1.0	7.4%
Group 9	1.0	7.4%
Group 10	1.0	7.4%
Group 11	1.0	7.4%
Group 12	1.0	7.4%

1531 NH3 compensation factor		
NH3 compensation factor	Max.	100.0%
Fan 1	1.0	7.4%
Fan 2	1.0	7.4%
Fan 3	1.0	7.4%
Fan 4	1.0	7.4%
Left 1	1.0	7.4%
Left 2	1.0	7.4%
Left 3	1.0	7.4%
Right 1	1.0	7.4%
Right 2	1.0	7.4%
Right 3	1.0	7.4%

Menu 1531 has a dynamic structure. Controls without NH₃ compensation or uninstalled controls are not shown.

NH₃ compensation factor

If the factor is set at 0.0, the NH₃ compensation has no influence on the ventilation or the air inlet valve position. If the factor is set to 9.9, the NH₃ compensation has a maximum effect on the ventilation or the air inlet valve position. The maximum correction is limited by the maximum setpoint (*Max.*).

$$\text{Absolute} = (\text{Current NH}_3 - \text{NH}_3 \text{ compensation start}) \times \text{NH}_3 \text{ compensation factor}$$

$$\text{Relative} = ((\text{Current NH}_3 - \text{NH}_3 \text{ compensation start}) \times \text{NH}_3 \text{ compensation factor}) / 100\% \times \text{Calculated ventilation}$$



Never clean the sensors with a high-pressure cleaner. This may damage them.



Remove the RH, CO₂ and NH₃ sensors before cleaning the house.

Meteo

Wind compensation takes place after any RH, CO₂ and NH₃ compensation.

Wind influence (not adjustable per ventilation group)

154 Meteo compensation	1541 Influence wind	1541 Influence wind
1 Influence wind	Influence wind start 3.0m/s	Influence wind start 3.0m/s
2 Influence rain	Wind speed 7.5m/s	Wind speed 7.5m/s
	Wind direction front	Wind direction front
	Influence wind outside temp. no	Influence wind outside temp. yes
		Max. influence below +05.0°C
		No influence above +20.0°C
		Outside temperature 11.2°C
	Influence wind	Influence wind
	Windward side 06 -39%	Windward side 06 -23%
	Leeward side 02 -13%	Leeward side 02 -8%
	Crosswind 02 -13%	Crosswind 02 -8%

Without wind outside temp. influence

With wind outside temp. influence

Influence wind start

When the wind exceeds the setpoint, the ventilation/ air inlet valve position will be affected.

Wind speed

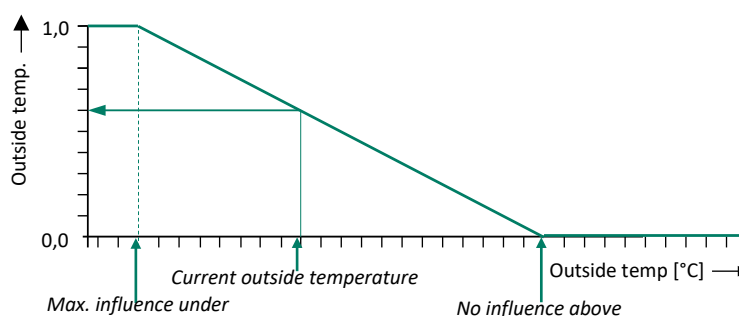
The current wind speed in metres/second.

Wind direction

The current wind direction.

Influence wind outside temp.

The wind influence is corrected by the outside temperature.



Max. influence below

Below this value, the wind influence on the ventilation/air inlet position is at its maximum.

No influence above

Above this value, there is no wind influence on the ventilation/air inlet position.

Influence wind

Wind influence setpoint: 0 = no influence 20 = maximum influence.
Per side you can set a factor: *Windward*, *Leeward* and *Crosswind* side.

Wind influence (adjustable per ventilation group)

The wind influence on the ventilation group can be set for each ventilation group. You can only enter the *Influence meteo ventilation group* if your installer has activated this setting.


154 Meteo compensation 1 Influence wind 2 Influence rain	1541 Influence wind Influence wind start 3.0m/s Wind speed 7.5m/s Wind direction 135° Influence wind outside temp. no 1 Influence meteo ventilation group	1541 Influence wind Influence wind start 3.0m/s Wind speed 7.5m/s Wind direction 135° Influence wind outside temp. yes Max. influence below +05.0°C No influence above +20.0°C Outside temperature 11.2°C 1 Influence meteo ventilation group
15411 Influence meteo ventilation group 1 Left 1 2 Left 2 3 Left 3 4 Right 1 5 Right 2 6 Right 3 7 Front Flap closes 8 Rear No influence 9 Misc. ventilation groups	154111 Influence wind Left 1 Influence wind Windward side 06 -39% Leeward side 02 -13% Crosswind 02 -13% Wind speed 7.5m/s Wind direction Crosswind 135°	154111 Influence wind Left 1 Influence wind Windward side 06 -23% Leeward side 02 -8% Crosswind 02 -8% Wind speed 7.5m/s Wind direction Leeward side 135°

Without Influence wind outdoor temp.

With Influence wind outdoor temp.

Wind influence (absolute)

The wind influence (0-9) can be adjusted per ventilation group: 0 = no influence, 20 = maximum influence. You can set the wind influence for each side: wind, lee, and cross. This can be corrected by the outside temperature (see page 17).

	Calculated ventilation Left	30%
	Calculated ventilation Right	30%
	Calculated ventilation Front	5%
	Calculated ventilation Rear	5%
	Influence wind start	3.0 m/s
	Current wind speed	7.5 m/s
	Current wind direction	Right
	Influence outside temperature	No
	Influence wind (factor)	
	Windward side 6	$((7.5-3.0) / (10-3.0)) \times 6.0 \times 10 = 39\%$ (38.57%)
	Leeward side 2	$((7.5-3.0) / (10-3.0)) \times 2.0 \times 10 = 13\%$ (12.86%)
	Crosswind side 2	$((7.5-3.0) / (10-3.0)) \times 2.0 \times 10 = 13\%$ (12.86%)
	Corrected ventilation Left	30 - 13 = 17%
	Corrected ventilation Right	30 - 39 = -9% becomes 0%
	Corrected ventilation Front	5 - 13 = -8% becomes 0%
	Corrected ventilation Rear	5 - 13 = -8% becomes 0%

Influence outside temperature

Influence outside temperature	Yes
Current outside temp.	11.2°C
Max. influence below	+5.0°C
No influence above	+20.0°C

Outside temperature correction

$$(20.0 - 11.2) / (20.0 - 5.0) = \mathbf{0.6} \text{ (0.586)}$$

Influence wind (factor)

Windward side	6	$((7.5-3.0) / (20.0 - 5.0)) \times 6.0 \times 10 \times \mathbf{0.586} = \mathbf{23\%}$ (22.62%)
Lee side	2	$((7.5-3.0) / (20.0 - 5.0)) \times 2.0 \times 10 \times \mathbf{0.586} = \mathbf{8\%}$ (7.53%)
Transverse side	2	$((7.5-3.0) / (20.0 - 5.0)) \times 2.0 \times 10 \times \mathbf{0.586} = \mathbf{8\%}$ (7.53%)
Corrected ventilation Left		$30 - (12.86 \times \mathbf{0.6}) = \mathbf{22.3\%}$ becomes 22%
Corrected ventilation Right		$30 - (38.57 \times \mathbf{0.6}) = \mathbf{6.86\%}$ becomes 7%
Corrected ventilation Front		$5 - (12.86 \times \mathbf{0.6}) = \mathbf{-2.72\%}$ becomes 0% .
Corrected ventilation Rear		$5 - (12.86 \times \mathbf{0.6}) = \mathbf{-2.72\%}$ becomes 0% .

$$\text{Wind compensation (absolute)} = ((\text{Cur. wind speed} - \text{Influence wind start}) / (10 - \text{Influence wind start})) \times 10 \times \text{factor}$$

$$\text{Influence outside temperature} = (\text{No influence above} - \text{Cur. outside temp.}) / (\text{No influence above} - \text{max influence below})$$

The calculated values may differ from the displayed values due to the hysteresis.

Flap (air inlet) closes when there is wind

15411 Influence meteo ventilation groups	
1 Left 1	
2 Left 2	
3 Left 3	
4 Right 1	
5 Right 2	
6 Right 3	
7 Front	Flap closes
8 Rear	No influence
9 Misc. ventilation groups	

154117 Influence wind Front	
Flap closes when wind	

1541 Influence wind	
Influence wind start	3.0m/s
Wind speed	7.5m/s
Wind direction	135°
Influence wind outside temp.	no
1 Influence meteo ventilation group	

127 Front	
Temperature setting	+00.0°C +5.0°C
Bandwidth	06.0°C 6.0°C
Minimum flap opening	00%
Maximum flap opening	100%
Current temperature	5.2°C
Calculated flap opening	0%
Current flap opening	0%

If the wind blows harder than the wind influence setpoint, the air inlet valve is moved to the minimum valve position setpoint.

No impact

15411 Influence meteo ventilation groups	
1 Left 1	
2 Left 2	
3 Left 3	
4 Right 1	
5 Right 2	
6 Right 3	
7 Front	Flap closes
8 Rear	No influence
9 Misc. ventilation groups	

154118 Influence wind Rear	
No influence	

The text *No influence* is displayed if your installer has switched off the compensation for a ventilation group.

Rain influence

If the rain influence has been activated by the installer and the current rain level exceeds the rain level setpoint, the calculated air inlet valve position is made equal to the *Max. vent.* setpoint (desired air inlet valve position during rain). This only happens if the rain valve position setpoint is lower than the actually calculated air inlet position based on temperature.

Rain influence (not adjustable per ventilation group)

1542 Influence rain	
Influence rain	on
Current rain level	9
Wait after rain	30m 29m57s
Maximum ventilation	050%

No meteostation but rain sensor

1542 Influence rain	
Influence rain	on
Current rain level	9
Setting rain level	2
Wait after rain	30m 29m57s
	Start Max.vent.
Windward side	2.0m/s 050%
Crosswind	4.0m/s 060%
Wind speed	7.5m/s
Wind direction	right

With meteostation and rain sensor

→ Current waiting time after rainfall

Rain influence

Here you can turn the rain influence on the air inlet position on and off. When it rains, the air inlet opening/ventilation is reduced to prevent rain from entering.

Current rain level

Readout of the current rain level.

Setting rain level

The rain level setpoint (value between 1 and 9) at which the control should activate: 1 = little rain, 9 = heavy rain.

Wait after rain

After a rain shower, the control waits for a certain time before resuming valve position control based on temperature. The waiting time setpoint is entered here. The second value displays the current remaining waiting time, which is only visible if it is greater than 0.

Maximum ventilation

If no meteo station is installed, the maximum air inlet position can be set here.

Windward side / Crosswind

Here you can set the maximum air inlet position for the windward side and crosswind during rain. If the rainfall is higher than the *rain level* setpoint and the wind blows harder than the value set at *Start*, the maximum air inlet position is limited to *Maximum ventilation* setpoint.

Start

The wind speed setpoint at which the air inlet positions (curtains) start to be controlled to their maximum rain position setpoint entered at *Max. Vent.*

Wind speed

The current wind speed.

Wind direction

The current wind direction.

Rain influence adjustable per ventilation group

1542 Influence rain	
Influence rain	on
Current rain level	9
Wait after rain	30m 29m57s
1 Influence rain ventilation group	

No meteo station, but rain sensor

1542 Influence rain	
Influence rain	on
Current rain level	9
Setting rain level	2
Wait after rain	30m 29m57s
1 Influence rain ventilation group	

With meteostation and rain sensor

→ Current waiting time after rainfall

Influence rain

Here you can turn the rain influence on the air inlet position on and off. The control limits the air inlet (ventilation) when it rains to prevent rain from entering the house.

Current rain level

Readout of the current rain level.

Setting rain level

The rain level setpoint at which the control should be activated: 1= light rain, 9 = heavy rain.

Wait after rain

After a rain shower, the control waits a certain time before resuming the air inlet position control based on temperature. Here you can change the waiting time. The second value displays the current remaining waiting time, which is only visible if it is greater than 0.

Without meteo station with separate rain sensor

1542 Influence rain	15421 Influence rain ventilation groups	154211 Influence rain Left 1
Influence rain on	1 Left 1	Maximum ventilation 050%
Current rain level 9	2 Left 2	
Wait after rain 30m 29m57s	3 Left 3	
	4 Right 1	
	5 Right 2	
	6 Right 3	
	7 Front Flap closes	
	8 Rear No influence	
1 Influence rain ventilation group	9 Misc. ventilation groups	

Maximum ventilation

If no meteo station is installed, the maximum air inlet positions can be set here per ventilation group.

With meteo station and rain sensor

1542 Influence rain	15421 Influence rain ventilation groups	154211 Influence rain Left 1
Influence rain on	1 Left 1	Start Max.vent.
Current rain level 9	2 Left 2	Windward side 2.0m/s 050%
Setting rain level 2	3 Left 3	Crosswind 4.0m/s 060%
Wait after rain 30m 29m57s	4 Right 1	Wind speed 7.5m/s
	5 Right 2	Wind direction Leeward side 135°
	6 Right 3	
	7 Front Flap closes	
	8 Rear No influence	
1 Influence rain ventilation group	9 Misc. ventilation groups	

Windward site / crosswind

Set the maximum air inlet position during rain for each ventilation group in the wind and transverse directions. If the rain exceeds the set level and the wind speed is higher than the set value for *From*, the air inlet position will be limited to the value set at *Max. vent.*

Start

The wind speed setpoint at which the air inlet positions (curtains) start to be controlled to their maximum rain position setpoint entered at *Max. Vent.*

Wind speed

The current wind speed.

Wind direction

The current wind direction.

Air inlet closes when it rains

15421 Influence rain ventilation groups	154217 Influence rain Front
1 Left 1	Flap closes when it rains
2 Left 2	
3 Left 3	
4 Right 1	
5 Right 2	
6 Right 3	
7 Front Flap closes	
8 Rear No influence	
9 Misc. ventilation groups	

If your installer has set the ventilation group to close when the rainfall reaches the *rain level* setpoint, the text *Flap closes when it rains* will be displayed.

If it rains harder than the entered rain level setpoint, the air inlet (curtain of valve) closes completely.
Calculated air inlet position = Minimum air inlet position (default 0%).

No influence

15421 Influence rain ventilation groups	154218 Influence rain Rear
1 Left 1 2 Left 2 3 Left 3 4 Right 1 5 Right 2 6 Right 3 7 Front Flap closes 8 Rear No influence 9 Misc. ventilation groups	No influence

If your installer has turned off the ventilation group compensation, the screen on the right will appear.

5.7 Overviews

16 Overviews
1 Fan 1 2 Fan 2 3 Fan 3 4 Fan 4 5 Outside temperature 6 Cooling 7 Sensors Reset min/max temp. no

Displayed is an overview of the temperature selected control, cooling or sensors.

For the selected temperature, a table appears on the screen with the minimum and maximum temperatures measured during the past week. In addition, the table indicates the time at which these minima and maxima were measured.

-99,9 °C → temperature sensor defective

???,? °C → invalid temperature

Reset min/max temp.

The *Reset min/max temp.* setting deletes the min/max readings in all temperature overviews, the current value is entered under *Today*.



The house temperature is equal to the temperature of *Fan 1*.

Fan 1

161 Overview Fan 1				
Temperature		0.0°C		
Day	Min.°C	Time	Max.°C	Time
Today	0.0	0:00	0.0	0:00
Saturday	0.0	0:00	0.0	0:00
Friday	0.0	0:00	0.0	0:00
Thursday	0.0	0:00	0.0	0:00
Wednesday	0.0	0:00	0.0	0:00
Tuesday	0.0	0:00	0.0	0:00
Monday	0.0	0:00	0.0	0:00
Sunday	0.0	0:00	0.0	0:00

Overview Fan 1/House temperature

Fan 2

162 Overview Fan 2				
Temperature		0.0°C		
Day	Min. °C	Time	Max. °C	Time
Today	0.0	0:00	0.0	0:00
Saturday	0.0	0:00	0.0	0:00
Friday	0.0	0:00	0.0	0:00
Thursday	0.0	0:00	0.0	0:00
Wednesday	0.0	0:00	0.0	0:00
Tuesday	0.0	0:00	0.0	0:00
Monday	0.0	0:00	0.0	0:00
Sunday	0.0	0:00	0.0	0:00

Overview Fan 2

Fan 3

163 Overview Fan 3				
Temperature			0.0°C	
Day	Min. °C	Time	Max. °C	Time
Today	0.0	0:00	0.0	0:00
Saturday	0.0	0:00	0.0	0:00
Friday	0.0	0:00	0.0	0:00
Thursday	0.0	0:00	0.0	0:00
Wednesday	0.0	0:00	0.0	0:00
Tuesday	0.0	0:00	0.0	0:00
Monday	0.0	0:00	0.0	0:00
Sunday	0.0	0:00	0.0	0:00

Overview Fan 3

Fan 4

Outside temperature

164 Overview Fan 4				
Temperature 0.0°C				
Day	Min. °C	Time	Max. °C	Time
Today	0.0	0:00	0.0	0:00
Saturday	0.0	0:00	0.0	0:00
Friday	0.0	0:00	0.0	0:00
Thursday	0.0	0:00	0.0	0:00
Wednesday	0.0	0:00	0.0	0:00
Tuesday	0.0	0:00	0.0	0:00
Monday	0.0	0:00	0.0	0:00
Sunday	0.0	0:00	0.0	0:00

Overview Fan 4

165 Overview outside temperature				
Temperature 0.0°C				
Day	Min. °C	Time	Max. °C	Time
Today	0.0	0:00	0.0	0:00
Saturday	0.0	0:00	0.0	0:00
Friday	0.0	0:00	0.0	0:00
Thursday	0.0	0:00	0.0	0:00
Wednesday	0.0	0:00	0.0	0:00
Tuesday	0.0	0:00	0.0	0:00
Monday	0.0	0:00	0.0	0:00
Sunday	0.0	0:00	0.0	0:00

Outside temperature overview

Cooling

166 Overview coolers	
1 Cooling 1	
2 Cooling 2	

1661 Running hours Cooling 1	
Today	0:00
Saturday	0:00
Friday	0:00
Thursday	0:00
Wednesday	0:00
Tuesday	0:00
Monday	0:00
Sunday	0:00
Total	0 hours
Clear running hours	no

1662 Running hours Cooling 2	
Today	0:00
Saturday	0:00
Friday	0:00
Thursday	0:00
Wednesday	0:00
Tuesday	0:00
Monday	0:00
Sunday	0:00
Total	0 hours
Clear running hours	no

If the cooling is an on/off (non-modulating) control, the operating hours of the cooling system can be viewed. In addition to today's operating hours, you can also see the operating hours for the past seven days and the total number of operating hours.

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

Sensors

167 Sensors	
Sensor 1	13.2°C
Sensor 2	13.2°C
Sensor 3	13.0°C
Sensor 4	13.0°C

1671 Overview Sensor 1				
Day	Min. °C	Time	Max. °C	Time
Today	0.0	0:00	0.0	0:00
Saturday	0.0	0:00	0.0	0:00
Friday	0.0	0:00	0.0	0:00
Thursday	0.0	0:00	0.0	0:00
Wednesday	0.0	0:00	0.0	0:00
Tuesday	0.0	0:00	0.0	0:00
Monday	0.0	0:00	0.0	0:00
Sunday	0.0	0:00	0.0	0:00

In the same way you can display the summaries for sensors 2 to 4.

5.8 Alarm

17 Alarm climate controls	
1 Alarm limits	
2 Groups temperature	
3 Groups ventilation	
4 Cooling	
5 Miscellaneous	

Alarm limits

171 Alarm limits	
Minimum alarm limit	-05.0°C
Maximum alarm limit	+05.0°C
Absolute alarm limit	35.0°C

These temperature limits apply to *fan groups* and *ventilation groups*.

Temperature groups

172 Alarm groups temperature	
1 Fan 1	
2 Fan 2	
3 Fan 3	
4 Fan 4	
5 Left 1	
6 Right 1	
7 Front	
8 Rear	

172 Alarm groups temperature	
1 Fan 1	
2 Fan 2	
3 Fan 3	
4 Fan 4	
5 Left 1	
6 Left 2	
7 Left 3	
8 Right 1	
9 Misc. ventilation groups	

172 Alarm groups temperature	
1 Fan 1	
2 Fan 2	
3 Left 1	
4 Right 1	
5 Front	
6 Rear	

Menu No. 9 appears only for more than 9 temperature groups.

Menu 172 has a dynamic structure. Uninstalled controls are not shown.

Temperature

1721 Alarm Fan 1	
Alarm temperature	on
Minimum alarm limit	0.0°C
Maximum alarm limit	16.2°C
Absolute alarm limit	35.0°C
Outside temperature	11.2°C
Temperature setting	+5.0°C
Current temperature	10.3°C
Alarm status	No alarm

1725 Alarm Left 1	
Alarm temperature	on
Minimum alarm limit	-5.0°C
Maximum alarm limit	16.2°C
Absolute alarm limit	35.0°C
Outside temperature	11.2°C
Temperature setting	+5.0°C
Current temperature	10.3°C
Alarm status	No alarm

- The alarm can only be switched on or off.
- The alarm limits displayed are calculated alarm limits and depend, among other things, on the entered alarm limits (menu 171) and the temperature setpoint of the control.

THI

1721 Alarm Fan 1	
Alarm THI	on
Maximum alarm limit	+15.0 → 75.0
Outside temperature	11.2°C
Current temperature	13.1°C
Current RH	76%
Current THI	55.9
Alarm status	No alarm

111 Fan 1	
Setting THI	60.0
Bandwidth THI	10.0
Minimum ventilation	010.0%
Maximum ventilation	100.0%
Current temperature	13.1°C
Current RH	76%
Current THI	55.9
Current ventilation	17.7% 17.7%
Capacity	10,620m³/h
1 Options	2 Options meteo

- The alarm can only be switched on or off.
- The alarm limit displayed is a calculated alarm limit and depends, among other things, on the entered *Maximum Alarm Limit* and the *THI setpoint* of the control. In this example: $15 + 60 = 75$.

Ventilation groups

173 Alarm groups ventilation	
1 Fan 1	
2 Fan 2	
3 Left 1	
4 Left 2	
5 Right 1	
6 Right 2	
7 Front	
8 Rear	

Menu No. 9 appears only if there are more than 9 ventilation groups.


173 Alarm groups ventilation	
1 Fan 1	
2 Fan 2	
3 Fan 3	
4 Fan 4	
5 Left 1	
6 Left 2	
7 Left 3	
8 Right 1	
9 Misc. ventilation groups	

173 Alarm groups ventilation	
1 Fan 1	
2 Fan 2	
3 Left 1	
4 Right 1	
5 Front	
6 Rear	

Screen 173 has a dynamic menu structure. Controls without a measurement fan and uninstalled controls are not shown.

1731 Alarm Fan 1	
Measuring fan	on
Current ventilation	97%
Calculated ventilation	97%
Minimum alarm limit	58%
Maximum alarm limit	136%
Alarm status 1	No alarm

1733 Alarm Left 1	
Ventilation alarm	on
Current flap opening	100%
Calculated Flap opening	100%
Minimum alarm limit	60%
Maximum alarm limit	110%
Alarm status	No alarm

 This menu appears only if a measuring fan is installed at the fan group.

If the measuring fan is switched off, it no longer affects the control and the alarm of the ventilation group.

Only if you have connected air inlet valves on a DMS module, you can turn the ventilation alarm ON and OFF on the CL-5400.

Cooling

Temperature

174 Alarm coolers	
1 Cooling 1	on
2 Cooling 2	on

1741 Alarm Cooling 1	
Alarm temperature	on
Maximum alarm limit	+05.0°C 35.0°C
Absolute alarm limit	35.0°C
Current temperature	11.4°C
Alarm status	No alarm

1742 Alarm Cooling 2	
Alarm temperature	on
Maximum alarm limit	+05.0°C 35.0°C
Absolute alarm limit	35.0°C
Current temperature	13.0°C
Alarm status	No alarm

THI

1741 Alarm Cooling 1	1742 Alarm Cooling 2	132 Cooling 2
Alarm THI on	Alarm THI on	Cooling 2 on
Maximum alarm limit +15.0 80.0	Maximum alarm limit +15.0 80.0	Setting THI 65.0
Current temperature 11.4°C	Current temperature 13.0°C	Maximum RH 100%
Current THI 53.2	Current THI 55.8	Current RH 76%
Current RH 76%	Current RH 76%	Current temperature 13.0°C
Alarm status No alarm	Alarm status No alarm	Current THI 55.8
		Current cooling off
		1 Running hours 2 Options

- You can enable and disable the alarm individually for each cooling unit.
- The alarm limit displayed is a calculated alarm limit and depends, among other things, on the *Maximum Alarm Limit* set and the *THI setting* at the control itself. In this example: $15 + 65 = 80$.

Other

175 Alarm miscellaneous controls
1 RH on
2 CO2 on
3 NH3 on
4 Meteo on
5 Temperature control
6 Outside temperature on
7 Thermo-differential on
8 Emergency stop

RH

1751 Alarm RH
Alarm RH on
Minimum alarm limit 020%
Maximum alarm limit 100%
Current RH 76%
Alarm status No alarm

Here you can activate and deactivate the RH control alarm. At *Minimum alarm limit* you set the lower RH limit, at *Maximum alarm limit* the upper RH limit. Furthermore are displayed the current RH and the current alarm status of the RH control.

CO2

1752 Alarm CO2
Alarm CO2 on
Minimum alarm limit 0000ppm
Maximum alarm limit 5000ppm
Current CO2 1649ppm
Alarm status No alarm

Here you can enable or disable the alarm for the CO₂ control. At *Minimum alarm limit* you set the CO₂ lower limit, at *Maximum alarm limit* you set the CO₂ upper limit. Furthermore are displayed the current CO₂ and the current alarm status of the CO₂ control.

NH₃

1753 Alarm NH3	
Alarm NH3	<input checked="" type="checkbox"/>
Minimum alarm limit	00.00ppm
Maximum alarm limit	30.00ppm
Current NH3	10.77ppm
Alarm status	No alarm

Here you can enable or disable the alarm for the NH₃ control. At *Minimum alarm limit* is set the NH₃ lower limit, at *Maximum alarm limit* you set the NH₃ upper *limit*. Furthermore are displayed the current NH₃ and the current alarm status of the NH₃ control.

Meteo

1754 Alarm meteo	
Alarm meteo	<input checked="" type="checkbox"/>
Wind speed	7.5m/s
Wind direction	135°
Rain level	1
Alarm status	No alarm

Here you can enable or disable the alarm for the meteo station. Furthermore are displayed the current wind speed and direction, the current rain level and the current alarm status of the meteo station.

Temperature control

1755 Alarm temperature control	
1 Recirculation 1	<input checked="" type="checkbox"/>
2 Temperature 2	<input checked="" type="checkbox"/>
3 Temperature 3	<input checked="" type="checkbox"/>
4 Temperature 4	<input checked="" type="checkbox"/>

17551 Alarm Recirculation 1	
Alarm temperature	<input checked="" type="checkbox"/>
Minimum alarm limit	-10.0°C 10.0°C
Maximum alarm limit	+10.0°C 30.0°C
Absolute alarm limit	35.0°C
Outside temperature	11.2°C
Temperature setting	20.0°C
Current temperature	20.1°C
Alarm status	No alarm

17552 Alarm Temperature 2	
Alarm temperature	<input checked="" type="checkbox"/>
Minimum alarm limit	-10.0°C 10.0°C
Maximum alarm limit	+10.0°C 30.0°C
Absolute alarm limit	35.0°C
Outside temperature	11.2°C
Temperature setting	20.0°C
Current temperature	11.3°C
Alarm status	No alarm

Here you can enable or disable the temperature control alarm. You can also set the alarm limits for the temperature control here. In addition to the current outside temperature, you can also see the set and actual measured values of the temperature control. *Alarm status* shows the current alarm status of the temperature control.

Outside temperature

1756 Alarm outside temperature	
Alarm outside temperature	<input checked="" type="checkbox"/>
Outside temperature	11.2°C
Alarm status	No alarm

Here you can enable or disable the *Outside Temperature* alarm. In addition to the outside temperature, the current alarm status is displayed.

Thermo-differential

1757 Alarm thermo-differential	
Alarm temperature	on
Relative alarm limit	+4.0°C/m
Absolute alarm limit	58.0°C
Alarm status	No alarm

If you disable the temperature monitoring alarm, the current temperature measurement is deleted and the alarm is automatically reactivated.

Emergency stop

1758 Alarm emergency stop	
1 Central emergency stop	
2 Left 1	
3 Left 2	
4 Left 3	
5 Right 1	
6 Right 2	
7 Right 3	
8 Front	
9 Rear	

1758 Alarm emergency stop	
1 Central emergency stop	
2 Left 1	
3 Left 2	
4 Left 3	
5 Right 1	
6 Right 2	
7 Right 3	
8 Front	
9 Rear	
10 Misc. alarm emergency stop	

1758 Alarm emergency stop	
1 Central emergency stop	
2 Left 1	
3 Right 1	
4 Front	
5 Rear	
6 Group 9	

Menu No. 10 appears only for more than 9 emergency stop groups.

Menu 1758 has a dynamic structure; uninstalled controls or controls without an emergency stop are not shown.

17581 Alarm central emergency stop	
Alarm	on
Input	closed
Emergency stop active	no
Release emergency stop	no
Alarm status	No alarm

17581 Alarm central emergency stop	
Alarm	on
Input	closed
Emergency stop active	no
Release emergency stop	no
Alarm status	No alarm

Alarm

Central emergency stop

Once the central emergency stop is active, all controls equipped with an emergency stop are stopped (frozen).

Emergency stop control

If the emergency stop is activated for a control, only the control for which the emergency stop was activated stops.

Input

Current input status.

Emergency stop active

Current status of the emergency stop.

Release emergency stop

If the emergency stop was active, you can deactivate the alarm by setting *Release emergency stop* to *yes*. The alarm will be deleted and the text will automatically change to *no*).

Alarm status

Current alarm status.

5.9 House status

18 House status	
House temperature	11.3°C
Outside temp.	11.2°C
RH	77%
CO2	1649ppm
NH3	10.77ppm
Wind speed	7.5m/s
Wind direction	135°
Rain level	1

Overview of current measurements.

6 Timers

2 Timers	21 Timers
1 Timers	1 Timer 1
2 Close curtains	2 Timer 2
3 Light control	3 Timer 3
4 Overview	4 Timer 4
	5 Timer 5
	6 Timer 6
	Inspection light active
	Cycle time on 23m47s 30 min

Inspection light

A push button allows you to manually turn on the light to inspect the houses. The light stays on for the time entered. Pressing the button again turns the light off.

6.1 Proportionally controlled timer

A proportionally controlled timer can be used for lighting control. The lighting can then be switched on and off gradually (dawn switching).

211 Timer 1
Timer 1 on
Current status on 100%
Number of points 03
Point Begin %
1 05:30 :30 100
2 23:00 :30 010
3 23:30 :00 000

- At the first time setpoint (05:30), the lighting switches on. The intensity is controlled to 100% in 30 minutes (:30).
- Dimming starts at the second time setpoint. In 30 minutes (:30), the lighting is reduced to 30% and the after-burning period starts.
- At the third time setpoint, the lighting switches off and:
 - switches on again based on time or
 - switches on again based on time and the twilight switch is on.

211 Timer 1
Timer 1 on
Current status on 95%
Number of points 03
Point Begin %
1 05:30 :30 100
2 23:00 :30 010
3 23:30 :00 000

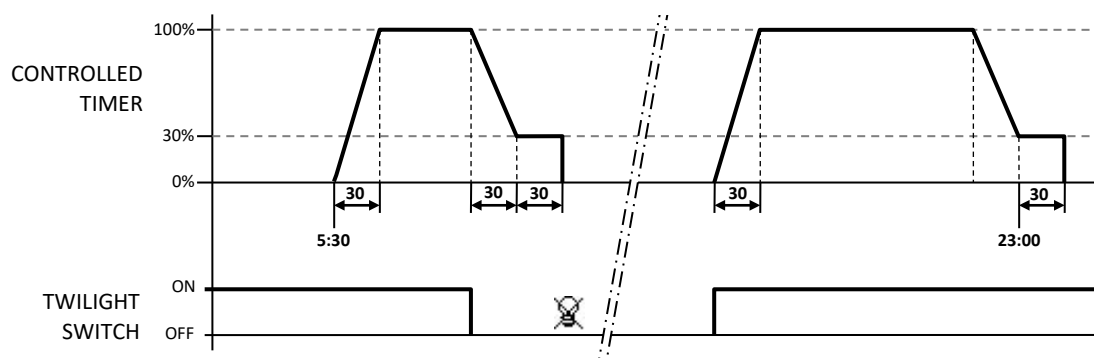
switches ON to reduce light intensity based on the twilight switch

211 Timer 1
Timer 1 on
Current status off -0%
Number of points 03
Point Begin %
1 05:30 :30 100
2 23:00 :30 010
3 23:30 :00 000

switches OFF based on the twilight switch

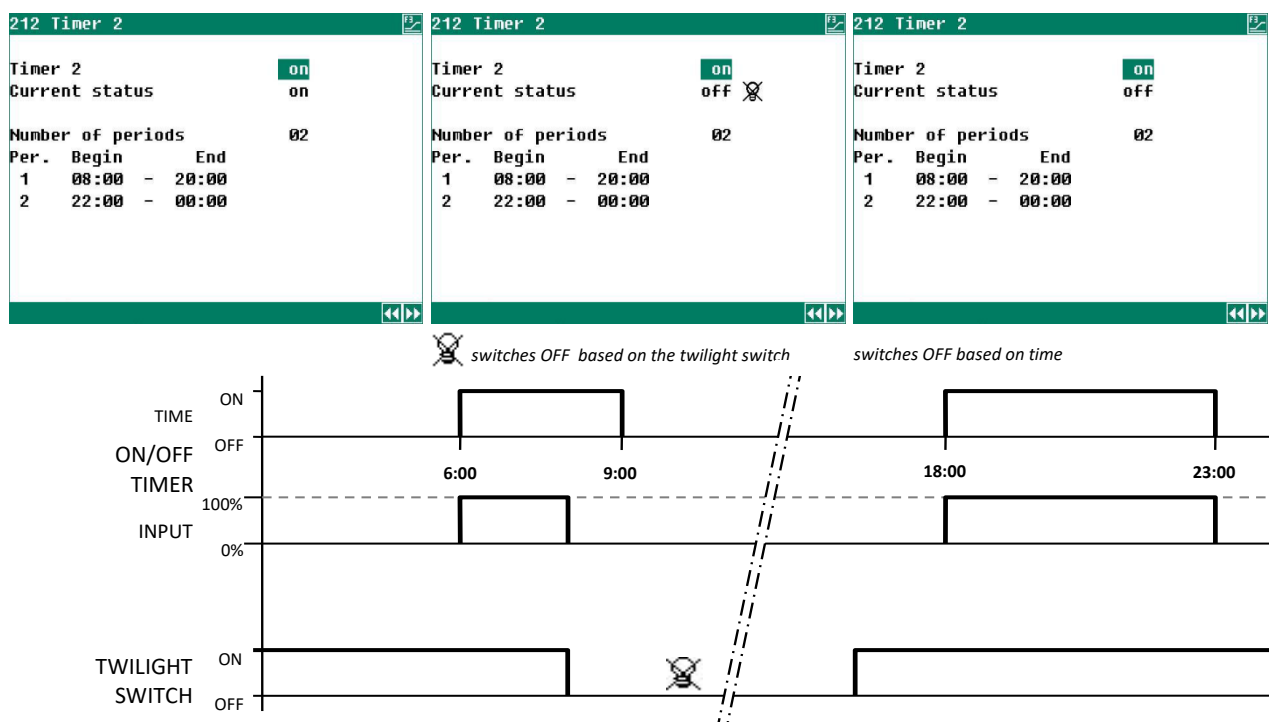
211 Timer 1
Timer 1 on
Current status off -0%
Number of points 03
Point Begin %
1 05:30 :30 100
2 23:00 :30 010
3 23:30 :00 000

switches OFF based on time



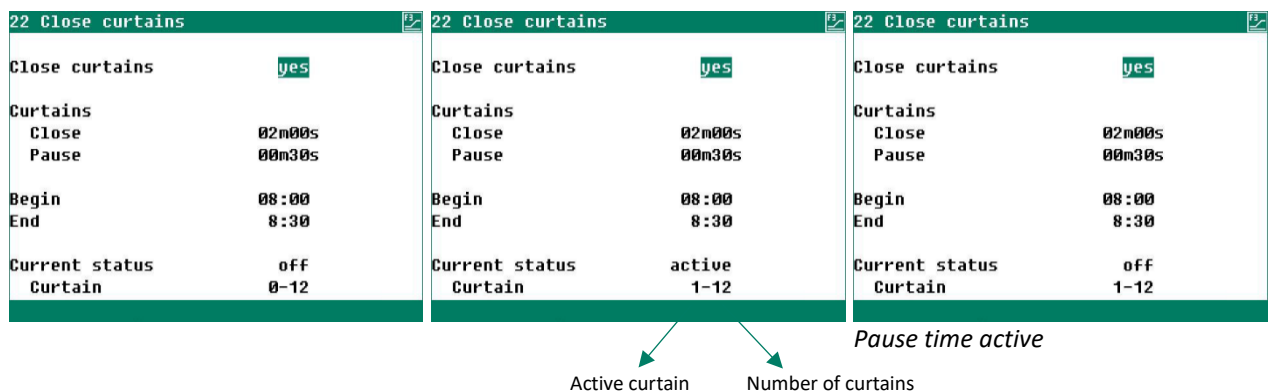
With a twilight switch, you can switch the light on and off in between.

6.2 On/Off timer

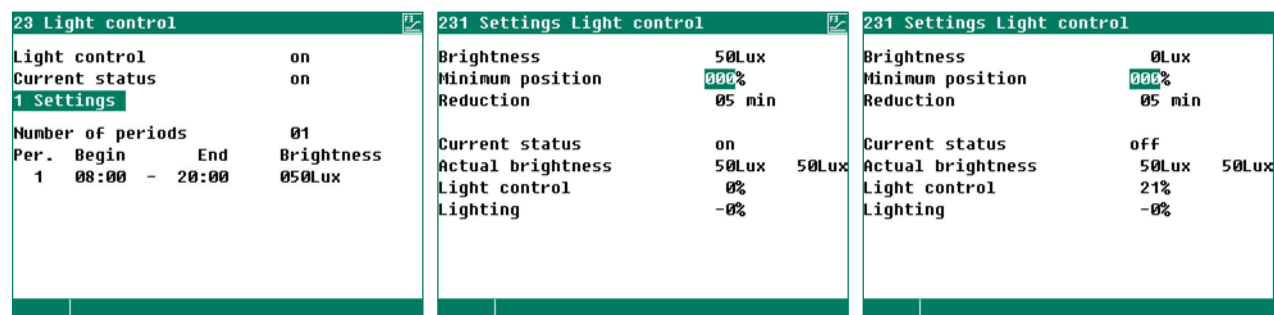


6.3 Closing the curtains

You can gradually open and close the curtains each day to prevent mice or other vermin from nesting between them. Each curtain is opened slightly one by one, and after the pause time, they return to their previous positions.



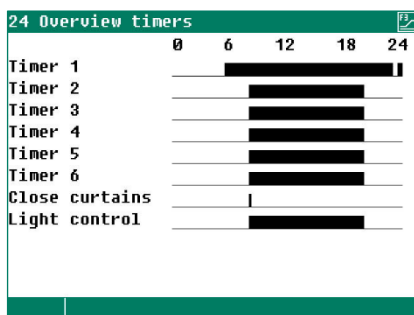
6.4 Lighting control



If the light control is active and the brightness in the barn falls below the set value, the control will keep switching the lights off until the desired brightness is achieved. If the brightness remains too low when the system is completely switched off, the lights will turn back on until the set brightness level is reached.

<i>Lighting control</i>	Switching the <i>lighting control</i> on and off.
<i>Current. status</i>	The current status of the lighting control system. It is determined from the times entered at <i>Start</i> and <i>End</i> .
<i>Number of periods</i>	Number of lighting control periods; up to 24 periods.
<i>Per.</i>	Period number.
<i>Start</i>	Start time of the period number concerned.
<i>End</i>	End time of the period number concerned.
<i>Brightness</i>	Required light intensity in the house.
<i>Minimum position</i>	Minimum output (%) of the lighting control.
<i>Completion</i>	Time in which the lighting controls are output from minimum to maximum.
<i>Current status</i>	Current status of the lighting control.
<i>Actual brightness</i>	Current brightness in the house
<i>Lighting control</i>	Current status of lighting control in %.
<i>Lighting</i>	Current lighting output; 0% = off.

6.5 Overview



The graphical overview of the time switches shows the times when the installed timers are active.

7 Counters

3 Counters

1 Water counter
2 Feed counter
3 Counter 3

4 Overview
5 Alarm

Clear all counters no

7.1 Clearing all counters

In this screen you can clear all counter readings with a single operation.

This is in contrast to the *Clear counter* setting for individual counters, which only clears the positions of the counter selected.



When clearing a counter, today's data is also cleared. In addition, the overviews of the quantities fed and the feeding times are cleared.

7.2 Water, feed and other counters

31 Water counter	32 Feed counter	33 Counter 3
Today 0 l	Today 0 kg	Today 0
Monday 0 l	Monday 0 kg	Monday 0
Sunday 0 l	Sunday 0 kg	Sunday 0
Saturday 0 l	Saturday 0 kg	Saturday 0
Friday 0 l	Friday 0 kg	Friday 0
Thursday 0 l	Thursday 0 kg	Thursday 0
Wednesday 0 l	Wednesday 0 kg	Wednesday 0
Tuesday 0 l	Tuesday 0 kg	Tuesday 0
Week 0 l	Week 0 kg	Week 0
Total 0 l	Total 0 kg	Total 0
Clear counter no	Clear counter no	Clear counter no

For each counter, you see an overview of the last seven days, the calculated weekly total and the total from the last time you cleared this counter. Furthermore, you can clear the counter readings of the individual counters here.

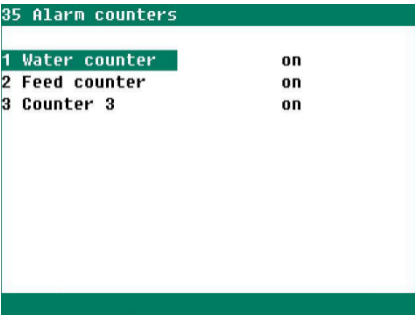
7.3 Overview

34 Overview counters total

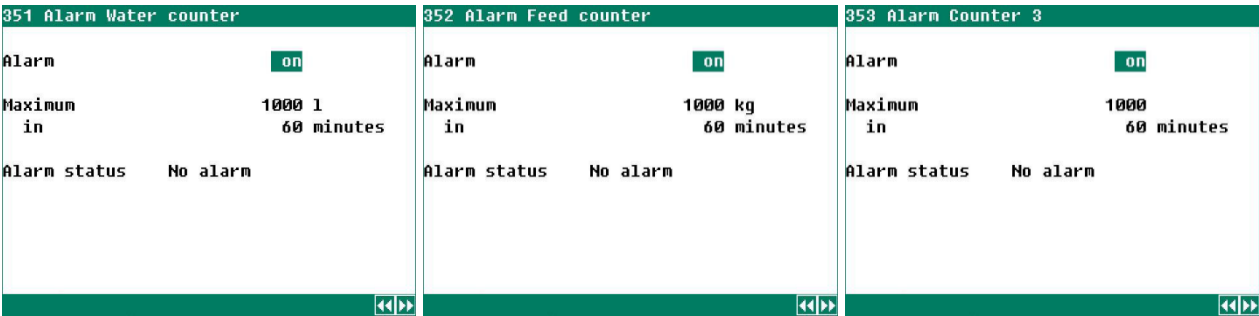
	Water [l]	Feed [kg]	Misc.
Today	0	0	0
Monday	0	0	0
Sunday	0	0	0
Saturday	0	0	0
Friday	0	0	0
Thursday	0	0	0
Wednesday	0	0	0
Tuesday	0	0	0
Week	0	0	0
Total	0	0	0

Total overview of the three counter positions.

7.4 Alarm



You can switch the dosing alarm on and off per counter



These screens allow you to set the maximum amount of water/feed that can flow through the water/feed pipes during the set period. If this maximum is exceeded, an alarm is triggered. In this way, you can detect possible pipe breaks or leaks at an early stage.

8 Alarm

4 Alarm status	4 Alarm status	4 Alarm status
Main alarm on ⌚ off no	Main alarm on ⌚ off no	Main alarm on ⌚ off yes 29m57s
Reset no Test no	Reset no Test no	Reset no Test no
Alarm code No alarm	Alarm code Emergency stop active Control Left 1	Alarm code Emergency stop active Control Left 1
Alarm external house 0	Alarm external house 0	Alarm external house 0
1 Latest alarms house	1 Latest alarms house	1 Latest alarms house
2 Communication	2 Communication	2 Communication
	11:11 16 October 2023	

Confirm

no yes

When you want to turn the main alarm on/off, a pop-up window appears to confirm your selection.

Main alarm

Switching the main alarm on and off.



off

Temporary alarm switch-off function. By setting ⌚ off to **yes** you can temporarily turn off the alarm (siren). Hardware alarms cannot be turned off.

The main alarm will be switched off for 30 minutes; the alarm LED will blink irregularly. After 30 minutes, the main alarm will be switched on again automatically. If the alarm cause has not been eliminated, the alarm relay will trip again (alarm).

Reset

All alarm messages are cleared.

Test

Here you can test the function of the alarm relay (siren). Set *Test* to **yes** to activate the siren for 10 seconds. Set *Test* to **no** to stop testing.

Alarm code

Description of the alarm.

Control

The control to which the alarm code relates.

Terminal

The terminal number to which the alarm refers.

Control

The second control to which the alarm code relates.

Alarm external house

If an alarm occurs at another control, the address of that control is displayed here.

1 Latest alarms house

An overview of the last five alarm codes that have activated the alarm relay.

2 Communication

This option only appears on the main station. A screen will appear where you can enable or disable the communication alarm.



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



Do not forget to turn the alarm back on after solving a malfunction.

Preferably use the ⌚ off function to solve a malfunction.

8.1 Last alarms in the house

41 Latest alarms house

Alarm 0	-----	----
Alarm code	-----	----
Control	-----	----
Alarm 1	-----	----
Alarm code	-----	----
Control	-----	----
Alarm 2	-----	----
Alarm code	-----	----
Control	-----	----

Overview of the last five alarm causes that caused the alarm relay to de-energize. The dates and times of the alarms are displayed in addition to their causes.

Alarm 0 The cause of the most recent alarm and the time until which this alarm has been/was active.

Use  to access the data of the previous alarms.

8.2 Communication alarm

42 Communication

Alarm	on
Device address	0
Alarm status	No alarm

Enabling and disabling the communication alarm

A communication alarm can only occur with a CL-5400 set as the main station. If the main station does not receive data from a device in the same communication loop, a communication alarm occurs.

8.3 Alarm codes

Alarm code	Description
<i>Alarm unknown (xxx)</i>	This alarm code cannot be translated into a text. Write down the number displayed and contact your supplier.
<i>CO₂ too high</i>	The CO ₂ measured is higher than the maximum alarm limit calculated
<i>CO₂ too low</i>	The CO ₂ measured is lower than the minimum alarm limit calculated
<i>CO₂ sensor defective</i>	The CO ₂ sensor value measured is outside the preset limits.
<i>Counter already assigned</i>	The counter has been assigned to two or more controls.
<i>Invalid input</i>	The input number does not exist on the module.
<i>Invalid period (x)</i> <i>x = period number</i>	<ul style="list-style-type: none"> The times of a timer must be incremental and the difference between <i>Begin</i> and <i>End</i> and between two periods must be at least 1 minute. With a <i>lighting control</i>, the starting time plus running times must not be after the next starting time. The time may coincide with the next starting time.
<i>Invalid output</i>	The output number does not appear on the module.
<i>Invalid wind direction vg: x</i>	The corners of the wind directions must not overlap. In case of overlap, the error message <i>Invalid wind direction vg:x</i> will appear. For example: vg:1 = ventilation group 1.
<i>Input already assigned</i>	The input has been assigned to two or more controls.
<i>Meteo faulty</i>	Meteo station measurement (wind direction, wind speed and/or rain level) is outside the set limits; these limits depend on the type of sensor: ME-54 or PL-MWA.
<i>Module x changed</i>	Module configuration (inputs/outputs etc.) changed. Read in the module number again.

Alarm code	Description
<i>Module not found</i>	<ul style="list-style-type: none"> ▪ The module number set for the terminal does not exist. ▪ Poor or no connection between CL-5400 and module.
<i>Module not responding</i>	Meteo station measurement (wind direction, wind speed, rain level) outside set limits. These limits depend on the type of transducer ME-54 or PL-MWA.
<i>Module reset alarm</i>	Module keeps resetting due to a fault. Check the module.
<i>NH₃ too high</i>	The NH ₃ measured is above the maximum alarm limit calculated.
<i>NH₃ too low</i>	The NH ₃ measured is below the minimum alarm limit calculated.
<i>NH₃ sensor faulty</i>	The NH ₃ sensor value measured is outside the preset limits.
<i>No outside sensor</i>	You have installed a control that requires an outside sensor. However, the outside temperature sensor has not been installed.
<i>No comm. address</i>	Device address CL-5400 computer is missing.
<i>No input assigned</i>	No input terminal number has been entered.
<i>No output assigned</i>	No output terminal number has been entered.
<i>Output already assigned</i>	The output is already used for another control.
<i>Outside sensor faulty</i>	Outside temperature sensor measurement < -50.0°C or > +50.0°C
<i>Potentiometer faulty</i>	Value measured by potentiometer outside limits (EGM 100P, winch motors ..)
<i>RH too high</i>	The RH measured is above the maximum alarm limit calculated.
<i>RH too low</i>	The RH measured is below the minimum alarm limit calculated.
<i>RH sensor faulty</i>	The RH sensor value measured is outside the preset limits.
<i>Sensor faulty</i>	Sensor measurement (temperature, RH, rain, etc.) is outside set limits.
<i>Temperature too high</i>	The temperature measured is above the maximum alarm limit calculated.
<i>Temperature too low</i>	The temperature measured is below the minimum alarm limit calculated.
<i>Temp. sensor faulty</i>	Measurement temperature sensor < -50.0°C or > +100.0°C
<i>Thermo-differential Sensor x</i>	The temperature difference between the last two readings from the sensor exceeds the maximum permissible difference or the sensor temperature is above the absolute limit.
<i>THI too high</i>	<ul style="list-style-type: none"> ▪ Too high RH and/or temperature ▪ RH or temperature sensor faulty ▪ Entered alarm limit too low
<i>Unknown terminal type</i>	The terminal type selected does not exist.
<i>Ventilation too high¹</i>	The ventilation measured is above the maximum alarm limit calculated.
<i>Ventilation too low¹</i>	The ventilation measured is below the minimum alarm limit calculated.
<i>Wind sensor faulty</i>	<ul style="list-style-type: none"> ▪ If the wind speed exceeds 10m/s, the ME-54W meteo station will display the message <i>Invalid wind speed</i>. ▪ Faulty wind sensor
<i>Wrong input type</i>	The input type entered does not match the input type on which the control is based.
<i>Wrong output type</i>	The output type entered does not match the output type on which the control is based.
<i>Wrong terminal setting</i>	Incorrect assignment. The function assigned to the terminal is not supported by the module.

¹ In case of a valve control, first check that the valve is not in manual mode.

9 System

```
5 System
Device          CL-5400
Type            256
Software version -----
Software date   ..../-/-
ENG, NLD, DEU, FRA, RUS
POL, HUN, SPA, CES  English
1 Date/Time      3 Display
2 Remote control
```

The first four lines show the device name, the device type (256 = CL-5400), the program version number and the program date.

You can set the language in which texts appear on the screen.

The language can be changed by holding down function key F1 and pressing the left or right cursor key at the same time.

9.1 Date/Time

```
51 Date/Time
Time          --:--h
Year          ----
Month         --
Day           --
First day of the week  ---
Beginning new day  --h
```

In addition to date and time, you can set the *First day of the week* here. The *first day of the week* is used to calculate the weekly totals. For example, if you set the *First day of the week* to Su (Sunday), the weekly totals will be calculated on Sunday. A weekly total is the sum of the past seven weekdays; Sunday, Saturday through Monday.

You can also set the start of a new day by entering the time at which the new day should start at *Beginning new day*. At *Beginning new day* all day-dependent data (overviews, counters, etc.) are moved forward one day. The data of today will be cleared afterwards.

9.2 Remote control

```
52 Remote control
Disclaimer
Manufacturer accepts no responsibility
for damage when using Remote Control.
You need to provide a secure
LAN environment shielded from the
internet through a firewall.

Remote control  yes
User            ----
Access code     ----
IP address      ----
```



ANote-Remote-N-ENxxxxx

9.3 Display

```
53 Display
Temperature    Celsius [°C]
Brightness
  on           100%
  off          015%
  On-time      300s
Cursor left    yes
```

Temperature Setting the temperature unit: Celsius or Fahrenheit.

Brightness Backlight brightness.

on Brightness during the screen-on period.

off Brightness during the screen-off period.

On-time Number of seconds the backlight stays on since the last key press. 0 seconds = backlight does not turn off.

Cursor left **yes** When editing, the cursor is placed on the far left digit.

no When editing, the cursor is placed on the far right digit.