KL-6400 series

CLIMATE COMPUTER FOR PIGS
KL-6401(i), KL-6402(i), KL-6405(i), KL-6410(i)

KL-6401

KL-6410

The KL-6400 series includes the following controllers:

- KL-6401, KL-6401i (1 room)
- KL-6402, KL-6402i (2 rooms)
- KL-6405, KL-6405i (5 rooms)
- KL-6410, KL-6410i (10 rooms)

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Copyright/Disclaimer

1 General introduction

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

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

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

1.1 Symbols and definitions

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

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

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

Pressure cleaning is not allowed.

Collect as separate flows

Important note

Additional information

Example of a concrete application of the functionality described.

Example calculation

Manual control

Tips and advice

Screenshot

Application note

1.2 Customer service

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

2 Safety instructions and warnings

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

2.1 Sound, independent alarm system

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

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

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

2.2 During use

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

⚡ The device must only be opened by authorised personnel.

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

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

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

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

2.3 Disposal

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

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

3 Operation

3.1 Display

screen number + title bar

Column with settings and measurements
Column with calculated and/or corrected settings

scroll up/down
scroll left/right
graphic representation
remote control active

time + date

previous/next control

111 Room ventilation

Temperature setting   20.0°C   20.0°C
Bandwidth   04.0°C   4.0°C
Minimum ventilation   010%   10%
Maximum ventilation   100%   100%

100%

12%
10%

20.0   +4.0

room 1

! Due to the growth curve and/or offsets, the calculated setting may differ from the user-set value.

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

Indication that you can press ◄ ► to retrieve the remaining settings/measurements.

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

Indication that you can press ◄◄ ►► to select the previous/next screen.

ⓘ Due to the growth curve and/or offsets, the setting calculated may differ from the setpoint entered by the user.

3.2 Keyboard
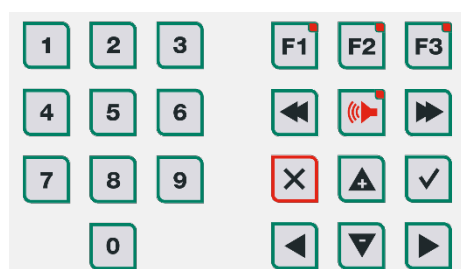
KL-6401
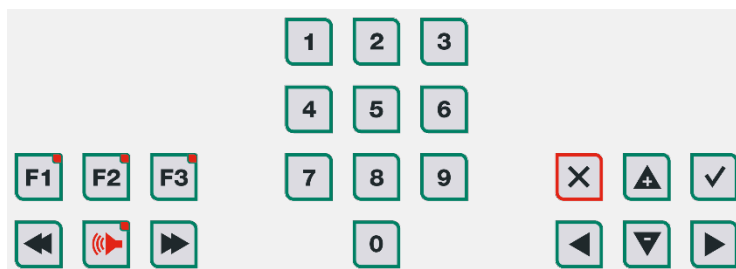
KL-6402, KL-6405 and KL-6410

Each time a button is pressed, the screen lights up for a few seconds. In a dark house, setpoints and measurements are then easily visible.

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

Short keys F2 and F3

F2 Shortcut key for the room status.

F3 Shortcut key for graphic representation. If the LED in the function key is on, the graph short key is active. You can switch off this function by pressing **F3** again. The LED then goes off again.

The graph is updated automatically when you change any details in the window. Since the position of the graph is determined automatically, certain details in the window may no longer be visible.

Selecting rooms

These keys allow you to select rooms with identical screen content.

| ◀◀ room 1 | ▶▶ | or | 001 | 002 | 003 | 004 | 005 | 006 | 007 | 008 | 009 | 010 |

Room	1	2	3	4	5
Air inlet control based on	Temperature	Ventilation	Temperature	Pressure	Ventilation

If the cursor is in room 1 and you press the key ▶▶, the settings and measurements for room 3 will appear. If the cursor is in room 2, the settings and measurements for room 5 will be displayed. If the cursor is in room 4 and you press ▶▶, nothing will happen.

Alarm key

Shortcut key for the alarm screen.

```
Alarm status

Main alarm  on          Test  no
  Off       no

Alarm code  Temperature sensor faulty
Control     sensor 1
Room        room 1      Terminal 00K01



1 Device          2 Central
3 Rooms           4 Communication
```

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

🕐 *Off* = Option for temporarily disabling the alarm (siren). You cannot temporarily disable hardware alarms. The main alarm is switched off for 30 minutes; the LED flashes unevenly. After 30 minutes, the main alarm switches back on automatically. If the cause of the alarm is not remedied, the alarm relay will de-energize again.

Set 🕐 *Off* to *no* to clear the temporary alarm deactivation time.

You can clear all alarms by setting *Reset* to *yes*. First, all alarms are cleared, then all active alarms are re-enabled.

When the alarm relay has de-energized (alarm delay time has elapsed), the alarm cause appears on the screen. You can turn the main alarm on and off. When the main alarm is off, the LED in the alarm button flashes. The LED in the alarm key is on when there is an alarm in any of the rooms and/or central controls. In addition to the alarm cause, the relevant control and the room number are displayed. The terminal number to which the alarm relates is listed behind *Room.*

Rooms

```
3 Alarm status rooms

Room  Alarm    Alarm code
002    on    No alarm
003    on    No alarm
004    on    No alarm
005    on    No alarm
006    on    No alarm
007    on    No alarm
008    on    No alarm
009    on    No alarm
010    on    No alarm
011    on    No alarm
```

Press number key 3 or select *Room 3* with the cursor key, the left screen will appear.

In this window, you can switch the room alarm on and off for each room. Furthermore, you will see the current alarm code of the respective room.

⚠ Remember to turn the alarm back on after troubleshooting.

KL-61 in manual mode

The room ventilation can be set manually by turning the control knob on the KL-61.
The current room status then changes to *Cleaning*.

⚠ The *Manual control, Cleaning, Pre-heating* and *Not in use* states affect the alarm function. Handle these 'modes' with care and use them only when no animals are in the house.

Terminal numbering inputs and outputs

The terminal number consists of a module address (value between 00 and 31), input/output type (capital letter, see table) and a 2-digit sequence number (value between 01 and 99, 00 = input/output not in use). On the screen, the terminal number is preceded by the module address.

Letter	I/O type	Serial no.	Explanation
A	0-10V output	1-99	Analogue output with range 0-10V or 10-0V.
B	Relay output	1-99	Relay contact output (no solid state relays, alarm relays, digital output, etc.)
C	Digital output	1-99	Solid state relays, modulating outputs etc. (24 . . 230Vac / 500mA).
D	Open/close control	1-99	Open/close control with position feedback. For example: heaters and valves with feedback potentiometer.
E	Manual	1-99	KL-61 manual control module for single section cleaning.
F	Controlled triac output	1-99	Regulated triac output with range of 30-230Vac.
G	2-10V output	1-99	Analogue 2-10V output with digital position feedback. For example: modules for controlling EGM-100CA or EGM-250CA.
K	Temperature sensor	1-99	All temperature sensors with 10K NTC resistor (N10B, BV10B etc.).
L	0-10V input	1-99	Analogue input with a measurement range of 0-10V. For connecting e.g. measuring sensors (humidity, pressure, etc.)
M	Digital input	1-99	Measuring fans, counter input, etc.
O	MCA-Sx	1-99	Sensor for wind-compensated air inlet (AW1-xx air inlets + MCA-Sx).

3.3 Navigation keys

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

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

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

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

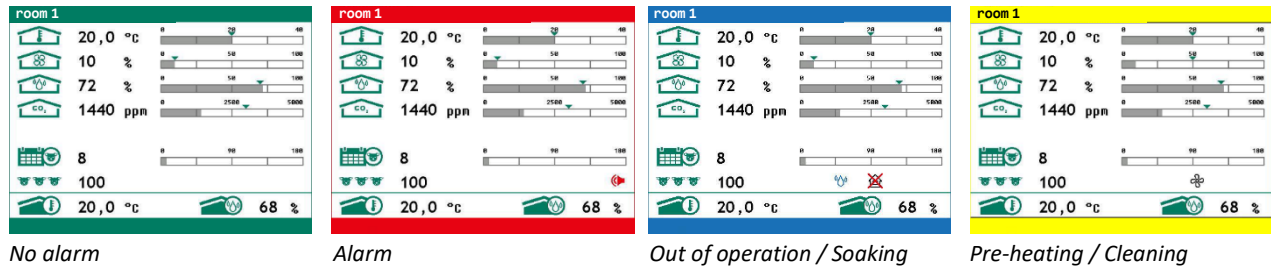## 3.4 Temperature settings

For all controls except room temperature, inlet heating, floor heating, nest heating and central controls, the following applies:

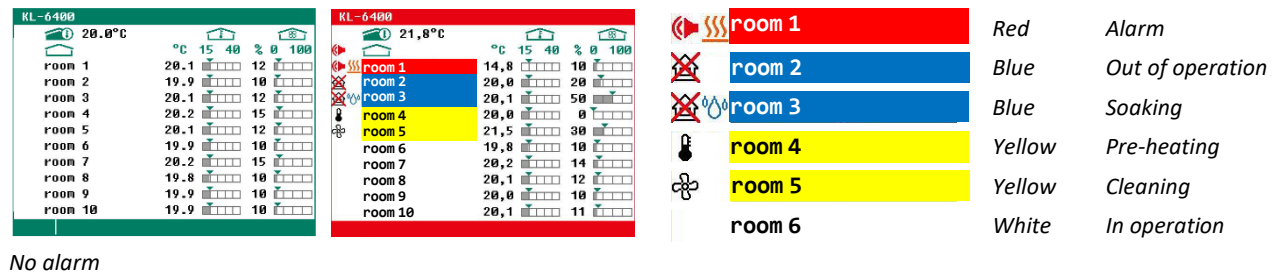Temperature setpoint < 10.0°C→ relative temperature setpoint to room temperature
Temperature setpoint ≥ 10.0°C→ absolute temperature setpoint

4 Overview screen

KL-6401

No alarm   *Alarm*   *Out of operation / Soaking*   *Pre-heating / Cleaning*

KL-640x

No alarm

Symbol	Color	State
room 1	Red	Alarm
room 2	Blue	Out of operation
room 3	Blue	Soaking
room 4	Yellow	Pre-heating
room 5	Yellow	Cleaning
room 6	White	In operation

KL-6401

Symbol	Description
	Room alarm enabled
	Room alarm and/or main alarm disabled
	Alarm in room (alarm delay time not elapsed)
	Room out of operation
	Cleaning room
	Pre-heating room
	Measuring fan switched off
	Cooling on
	Room heating on
	Room heating off
	Soaking active
	Room temperature
	Room ventilation
	RH in house
	CO_2 in house
	NH_3 in house
	Age of animals
	Number of animals in the house
	Outdoor temperature
	Outdoor RH

KL-6402, KL-6405 and KL-6410

Symbol	Description
	Room alarm enabled
	Room alarm disabled
	Alarm in room (alarm delay time not elapsed)
	Room out of operation
	Cleaning room
	Pre-heating room
	Measuring fan switched off
	Cooling on
	Room heating on
	Room heating off
	Soaking active
	Main alarm enabled
	Main alarm disabled
	Room name
	Graphic display temperature
	Graphic display ventilation
	Outdoor temperature

5 Main menu

```
Main menu

1 Rooms
2 Central
3 Sensors
4 Alarm

5 System


Access code          ****
```
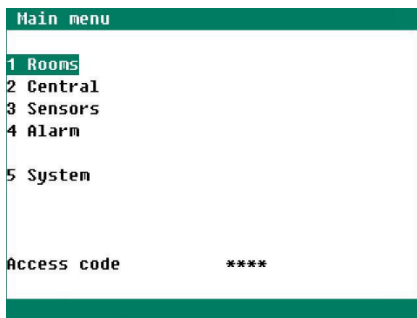
When using an access code, we recommend writing it down and keeping it in a safe place. You cannot change settings without an access code.

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

The access code remains active until the overview screen is selected. After that, you need to re-enter it to change a setting.

5.1 Access code

You can set a four-digit access code to prevent unauthorised persons from changing settings. Your installer can set up to six access codes for you.

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

6 Animal sections (rooms)

6.1 Ventilation

```
1 Room

1 Ventilation
2 Heating
3 Miscellaneous
4 Growth curves

5 Overviews

6 Alarm

7 Room status          in use
```

```
11 Ventilation

1 Room ventilation
2 AQC-flap
3 Air mixing fan
4 Bypass flap
5 Air inlet flap 1
6 Air inlet flap 2
7 Wind compensation
```

```
11 Ventilation

1 Room ventilation
2 --------
3 Air mixing fan
4 Bypass flap
5 Air inlet flap 1
6 Air inlet flap 2
7 Wind compensation
```

Room ventilation

Prevent cold air from being drawn in too much and too quickly.
It is important to set the room temperature and bandwidth correctly.

```
111 Room ventilation

Temperature setting    20.0°C    22.1°C
Bandwidth              04.0°C     4.0°C
Minimum ventilation     010%       11%
Maximum ventilation     100%      100%

Current temperature    20.1°C
Current ventilation      15%       15%
Capacity           9,069m³/h
Capacity per animal     91m³/h

1 Options        3 Manual control
2 Compensations
```

```
111 Room ventilation            cleaning

Manual control           050%       50%
Bandwidth              04.0°C      4.0°C
Minimum ventilation     010%        11%
Maximum ventilation     100%       100%

Current temperature    20.1°C
Current ventilation      50%        50%
Capacity          31,250m³/h
Capacity per animal    313m³/h

1 Options        3 Manual control
2 Compensations
```

*Measured ventilation readout when
using a measuring fan*

! Due to offsets, the calculated value may differ from the setpoint.

Temperature setting	The room ventilation control is based on the temperature setpoint. The required house temperature depends on several factors.
Bandwidth	The bandwidth determines the 'sensitivity' of the control. With a small bandwidth, the control reacts quickly to a rise in temperature.
	Bandwidth = 4 to 7 °C, depending on outside temperature
Min/Max ventilation	If you have installed occupancy-based compensation, the minimum and maximum ventilation is adjusted to the number of animals in the room.
Current temperature	Readout of the current room temperature.
Current ventilation	If the room ventilation is controlled using a measuring fan, the measured and calculated ventilation values will be shown in this line. If the room does not have a measuring fan or if the measuring fan is defective, the calculated ventilation will be equal to the measured ventilation. With step control the ventilation level is adjusted every 30 seconds.
Capacity	The calculated ventilation in m³/hour.
Capacity per animal	The calculated ventilation capacity per animal in m³/hour. In this case, the *Occupation rate* option has been activated.

Room ventilation options

```
1111 Options room ventilation

Number of animals        0072
  Maximum                0100
  Fill ratio             72%
Minimum ventilation   8,035m³/h
Maximum ventilation  76,320m³/h
Capacity 1st fan         50%
Start fan 2             050%      on

Proportional            73%
Step control        Step   0
1 Frost protection
                  ◀◀room 1     ▶▶
```

Number of animals	To express the ventilation capacity per animal in m^3/hour, the climate controller needs to know the *Number of animals* in the room.
Maximum:	Enter the maximum number of animals for which the ventilation capacity, under normal conditions, is adequate.
Fill ratio	In a not fully occupied room, less ventilation is needed. If the room is 75% occupied, you can reduce the minimum and maximum ventilation by 25%. The occupancy rate is calculated from the maximum number of animals and current number of animals in the room.

> (i) In a few cases, the animals may have to stay in the room for longer or there may be more animals in the room. In such a situation, you can reduce the maximum number of animals for this room, causing the fill ratio to rise to above 100%. The minimum and maximum ventilation will be increased and you do not need to adjust any other settings.

Min/Max ventilation	Based on the occupancy rate, the minimum and maximum ventilation capacity is calculated. The capacity is displayed in m^3/hour. Above 100%, only the minimum ventilation is adjusted.
Capacity 1st fan, *Start fan 2 and* *2nd fan status*	If the room ventilation consists of two fan groups, the capacity of the first fan is relative to the total capacity (capacity 1st + 2nd fan). The fan capacity is entered by the installer. At *Start 2nd fan* should enter the percentage at which the 2nd fan group is to be switched on. After this setting is displayed the current status of the 2nd fan.

Capacity 1st fan group   4400 m/h^3
Capacity 2nd fan group   5600 m/h^3

$$\textit{Capacity 1}^{st}\textit{ fan group} = \frac{4400}{4400 + 5600} \times 100\% = 44\%$$

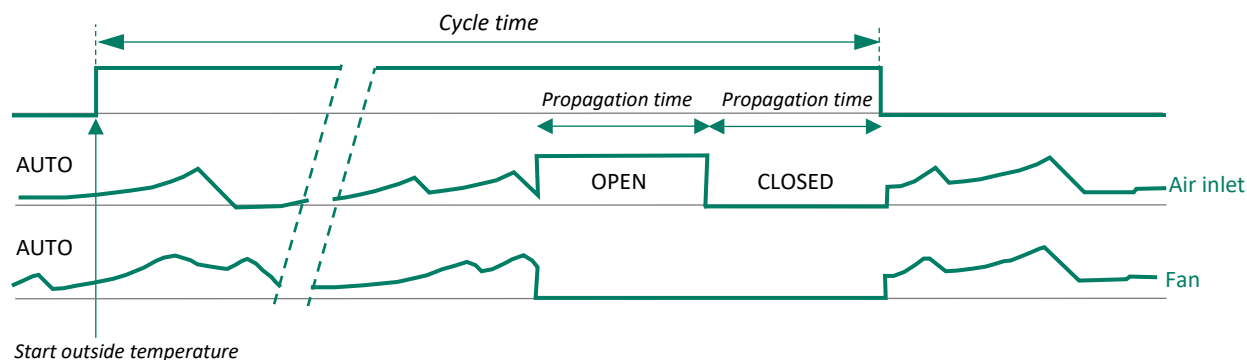|	
Proportional	The <u>current</u> ventilation of the proportionally controlled ventilation group.
Step control	If step control is installed, "Step" will be followed by the step number that is currently active.
1 Frost protection	Frost protection to prevent the air inlet valves from freezing and getting stuck.

Frost protection

```
11111 Frost protection

Frost protection
Start outside temperature   -01.0°C
Cycle time                   60 min
Flaps
  Maximum flap opening        010%
  Propagation time            020s

Outside temperature         19.9°C
Frost protection               off
Cycle time                   0m00s
Flaps                         auto
            ◄◄room 1  ►►
```

```
11111 Frost protection

Frost protection
Start outside temperature   -01.0°C
Cycle time                   05 min
Flaps
  Maximum flap opening        010%
  Propagation time            060s

Outside temperature         -5.9°C
Frost protection            active
Cycle time                   1m22s
Flaps                         open
            ◄◄room 1  ►►
```

```
11111 Frost protection

Frost protection
Start outside temperature   -01.0°C
Cycle time                   05 min
Flaps
  Maximum flap opening        010%
  Propagation time            060s

Outside temperature         -5.9°C
Frost protection            active
Cycle time                   1m56s
Flaps                        close
            ◄◄room 1  ►►
```


Start outside temperature	When the outside temperature drops below the temperature setpoint, frost protection activates.
Cycle time	Cycle time for frost protection. When the outside temperature drops below the temperature setpoint, frost protection activates after the *Cycle time* (2× cycle time of the air inlet) has elapsed. The cycle then starts again. If the outside temperature subsequently rises above the temperature setpoint again, the cycle started will be completed first.
Flaps (air inlets)	*Maximum flap opening:* maximum air inlet open position when frost protection is active.
	Propagation time: maximum air inlet running time. This setting applies to both, opening and closing the air inlet.
Outside temperature	The current outside temperature.
Frost protection	The current status of frost protection: *active* or *off*.
Cycle time	The current cycle time.
Valves	The current valve status: *auto, open* or *closed*.

Offsets

```
1112 Compensations

1 Night setting
2 Room temperature
3 Room ventilation
4 RH-compensation
5 CO2-compensation
6 NH3-compensation
```
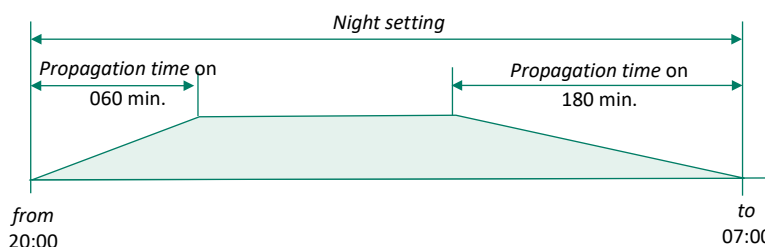
⚠ Multiple offsets can be active at the same time.

Night settings

```
11121 Night setting

Night setting        from 20:00
  Propagation time    on   060 min
Night setting        till 07:00
  Propagation time    off  180 min
Room temperature          +0.0°C
Minimum ventilation       +000%
```


The night settings allow you to create a natural temperature gradient between day and night. You do this by changing the temperature setpoint by a few degrees at night.

Furthermore, you can enter the number of degrees by which the room temperature should be increased/decreased during this night period. Ventilation is linked to the room temperature. It is also adjusted during the night. During the night period, you can increase or decrease the minimum ventilation percentage, if necessary.

With *Propagation time on* and *Propagation time off*, a gradual change of the room temperature and minimum ventilation at the beginning and end of the night period can be created.

Room temperature compensation

```
11122 Compensations room temperature

Start temp. compensation     -2.0°C
Maximum temp. compensation   03.0°C
Reduce temp. compensation    0.2°C/h
Temperature compensation     2.1°C

Inlet temperature            20.1°C
```

The temperature may include:
- room temperature,
- outside temperature or
- air inlet temperature (separate air inlet temperature sensor).

The purpose of this compensation is to prevent rapid temperature decreases in a room. The *Maximum temp. compensation* is used to limit the room temperature corrected by the climate computer. Instead of the room temperature you can also use the air inlet temperature or outside temperature as the basis for temperature compensation.

Room ventilation compensation

```
11123 Compensations room ventilation

Bandwidth compensation        -2.5%/°C
 Start outside temperature     20.0°C

Compens. minimum ventilation   1.0%/°C
 Start outside temperature     +15,0°C
                           to -10,0°C

Outside temperature            20,1°C




                    [44]room 1 [▶▶]
```

```
11123 Compensations room ventilation

Bandwidth compensation        -2.5%/°C
 Start inlet temperature       20.0°C

Compens. minimum ventilation   1.0%/°C
 Start inlet temperature       +15,0°C
                           to -10,0°C

Inlet temperature              20,1°C




                    [44]room 1 [▶▶]
```

```
11123 Compensations room ventilation

Compens. minimum ventilation   1.0%/°C
Compens. maximum ventilation   1,0%/°C
 Start outside temperature     +15,0°C
                           to -10,0°C

Outside temperature            20,1°C




                    [44]room 1 [▶▶]
```

Bandwidth compensation and *Compens. maximum ventilation* are mutually exclusive.

Bandwidth compensation Here you can adjust bandwidth based on the current outside/air inlet temperature. For example, when the outside/air inlet temperature exceeds the setpoint.

Compens. maximum ventilation The percentage by which the maximum ventilation is to be corrected per °C outside/air inlet temperature change.

Compens. minimum ventilation The percentage by which the minimum ventilation should be corrected per °C outside/air inlet temperature change.

RV compensation

```
111 Room ventilation

Temperature setting    20.0°C   22.1°C
Bandwidth              04.0°C    4.0°C
Minimum ventilation    010%      11%
Maximum ventilation    100%     100%

Current temperature    20.1°C
Current ventilation    15%       15%
Capacity            9,069m³/h
Capacity per animal    91m³/h

1 Options        3 Manual control
2 Compensations
```

```
11124 RH-compensation

RH-compensation             on
RH-compensation            070%    70%
 Factor                    1.0
 Maximum                 100.0%
Temperature compensation   +05%    75%
 Factor                  0.2°C/%
 Maximum                  2.0°C

Current RH                  82%
RH-compensation            12.0%
Temperature compensation    1.4°C
```

Factor sets the degree of compensation.
The compensation is limited at the top by the *Maximum* setting.

The room temperature setpoint can be compensated on the basis of the RH in the room if the RH rises above the RH setpoint of the *Temperature Compensation (%)* and the *Factor* > 0.

RH compensation = (*Current RH - RH compensation (%)*) × *RH compensation factor.*

Temperature compensation = (*Current RH -Temperature compensation (%)*) × *Temperature compensation factor*.

! If RH compensation, CO_2 compensation and NH_3 compensation are active, ventilation is corrected based on the highest compensation value.

CO_2 compensation

```
11125 CO2-compensation

CO2-compensation            on
CO2-compensation start   1500ppm
 Factor                    1.0
 Maximum                 100.0%

Current CO2              1560ppm
CO2-compensation           0.6%
```

With the *CO_2* compensation factor, you set the degree of compensation.

CO_2 compensation = (*Current CO_2 - CO_2 compensation start*) × *CO_2 compensation factor*

The maximum compensation is limited by the entered *Maximum*.

NH₃ compensation

```
11126 NH3-compensation

NH3-compensation              on
NH3-compensation start    010.0ppm
  Factor                       1.0
  Maximum                    100.0%

Current NH3                 12.0ppm
NH3-compensation             2.0%
```

The *NH₃ compensation factor* allows you to set the degree of compensation.

NH_3 *compensation* = (*Current NH₃ - NH₃ compensation start*) × *NH₃ compensation factor*

The maximum compensation is limited by the entered *Maximum*.

Manual mode

```
1113 Manual control

Manual control
  Not in use              000%
  Cleaning                050%
  Pre-heating             000%
```

In advance, you can set the ventilation rate for *Not in use, Cleaning* and *Pre-heating* (screen 1113 *Manual control*). The relevant settings are adopted as soon as the room enters the *Not in use, Cleaning* or *Pre-heating* state.

If you change the room status to *Cleaning* or *Not in use*, you can manually change the ventilation rate during cleaning in *Manual control* (set and calculated rates are equal). If the KL-61 is in manual mode for the relevant room, the current room status changes to *Cleaning.* The potentiometer position on the KL-61 is adopted as calculated manual control (set and calculated percentage are different).

⚠️ The *Manual control* mode *(Cleaning)* affects the alarm function. Use this mode only when no animals are in the room.

Room ventilation using growth curves

```
111 Room ventilation              🔲

Growth curve temperature  +0.0°C   23.6°C
Bandwidth                 04.0°C    4.0°C
Growth curve minimum        +00%      24%
Growth curve maximum        +00%      96%

Current temperature       20.1°C
Current ventilation          30%      30%
Capacity              18,913m³/h
Capacity per animal       189m³/h

1 Options          3 Manual control
2 Compensations
```

Via growth curves in the climate computer, the climate in the room automatically follows the growth of your animals. Based on the current day number, the current setpoint is extracted from the curve. A growth curve consists of up to seven breakpoints.

The text *Growth curve* represents the climate settings calculated from the curve. To avoid having to continuously adjust the curve settings to the animals' behaviour, you can increase or decrease the calculated curve settings.

Growth curve temperature Here you can increase or decrease the calculated room temperature.

Growth curve minimum Here you can increase or decrease the calculated minimum ventilation.

Growth curve maximum Here you can increase or decrease the calculated maximum ventilation

When the cursor is at *Growth curve temperature, Growth curve minimum* or *Growth curve maximum* and you press the confirmation key, the curve of the settings concerned will appear. You can change the curve settings or deactivate the curve, if desired. Use the cancel key to return to the previous window. If you have deactivated the curve, the text *growth curve* is replaced by the default text. You can then no longer access the relevant curve settings via this window. The curve is disabled.

AQC valve

```
112 AQC-flap

Minimum at ventilation    10%
Maximum at ventilation    055%
Minimum flap opening      030%


Current flap opening      100%
Output fan                 84%
Status 2nd fan             on
```

The AQC valve control is based on the calculated room ventilation. The maximum valve position is 100% and cannot be adjusted.

If you have installed a 2nd fan, the 2nd fan status also appears in the display. In this case, the 2nd fan status determines the position of the AQC valve.

Mixing fan

```
113 Air mixing fan

Air mixing fan            on
Temperature setting    +20.0°C   20.0°C
Bandwidth               05.0°C
Minimum ventilation     000%
Maximum ventilation     100%
Fan stop
  Room temperature      -2.0°C   20.1°C

Current temperature     20.0°C   21.3°C
Current ventilation       on       0%
```

ANote-VContK-N-ENxxxxx

Bypass valve

```
114 Bypass flap

Minimum at ventilation    10%
Maximum at ventilation    055%
Minimum flap opening      030%
Maximum flap opening      100%

Current flap opening       30%
Calculated ventilation      0%
```

ANote-VContK-N-ENxxxxx

Air inlet valve 1 / 2

```
115 Air inlet flap 1

Minimum at ventilation    10%
Maximum at ventilation    055%
Growth curve minimum      23%
Growth curve maximum      92%

Current flap opening      43%
Calculated ventilation    23%

1 Manual control
2 Cascade control
```

```
115 Air inlet flap 1

Temperature setting   +03.0°C  23.0°C
Bandwidth              04.0°C   4.0°C
Minimum flap opening    015%     15%
Maximum flap opening    100%    100%

Current flap opening      51%
Current temperature    24.7°C

1 Manual control
2 Cascade control
```

```
115 Air inlet flap 1

Pressure setting      010Pa    18Pa
Minimum flap opening  015%      15%
Maximum flap opening  100%     100%

Current flap opening  015%
Current pressure       15Pa
Input                 closed

1 Manual control
2 Cascade control
3 Compensation pressure
```

1. Ventilation-based   *2. Temperature-based*   *3. Pressure-based*

1. The air inlet control is based on the calculated room ventilation.
2. The air inlet control is based on the current room temperature.
3. The air inlet control is based on the current pressure in the room.

Once the room ventilation exceeds the calculated setpoint, the temperature-based air inlet opens according to the bandwidth setpoint.

	Room temperature setpoint	18.0°C
	Air inlet temperature setpoint	+3,0°C
	Bandwidth	4,0°C
	Minimum flap (air inlet) opening	15%
	Maximum flap (air inlet) opening	100%

The air inlet remains at its minimum position of 15% until the room temperature rises above 21°C (18°C + 3.0°C).

The air inlet is 100% open when the room temperature is 25°C or higher (18+3+4).

Min/Max flap opening — Changing these values allows you to change the minimum and maximum air inlet position limit.

Current flap opening — The current air inlet position.

Manual

```
1151 Manual control

Manual control
  Not in use         000%
  Cleaning           100%
  Pre-heating        000%
```

In advance, you can set the air inlet position for *Not in use, Cleaning* and *Pre-heating*. The respective settings are adopted as soon as the room enters the *Not in use, Cleaning* or *Pre-heating* modus.

Cascade control

```
1152 Cascade control

Cascade control

Start motor 2        050%
Maximum motor 1      100%

Step                   2
Calculated flap opening
  Output 1            51%
  Output 2            51%
```

Air inlet 1 is opened at 100% first, air inlet 2 remains closed. When air inlet 2 is to co-control, air inlet 1 is closed further to the *Start motor 2* position, at the same time the second air inlet is gradually opened.

Only the percentage of *Start motor 2* can be changed.

Step = 1, the first inlet valve is controlled, the 2^e inlet valve is closed.
Step = 2, both inlet valves are controlled.

Pressure compensation

```
1153 Compensation pressure

Compensation pressure    -0.5Pa/°C
  Start outside temperature  10.0°C

Minimum pressure         005Pa
Maximum pressure         040Pa
```

The pressure can be automatically adjusted according to the current outside temperature. This results in higher negative pressure at low outside temperatures and lower negative pressure at high outside temperatures.

ANote-InletflapK-N-ENxxxxx

Air inlets 1 and 2 using growth curve

```
115 Air inlet flap 1

Minimum at ventilation    10%
Maximum at ventilation    055%
Growth curve minimum         23%
Growth curve maximum         92%

Current flap opening      43%
Calculated ventilation    23%

1 Manual control
2 Cascade control
```

When the cursor is on *Growth curve minimum* or *Growth curve maximum* and the confirmation key is pressed, the corresponding curve with setpoints appears. You can change the curve settings or disable the curve. Use the cancel key to return to the previous window. Having deactivated the curve, the text *Growth curve* changes back to the default text. The relevant curve settings can then no longer be called up via this window.

The text *Growth curve* represents the settings calculated from the curve.

Curve setting lower than 10.0°C→ air inlet control is based on room temperature
Curve setting equal to or higher than 10.0°C→ air inlet control is based on absolute curve settings

Wind compensation

```
117 Wind compensation

AeroComp                  auto
Gusty factor              00
Minimum flap opening      002%
Maximum flap opening      005%
AeroComp
Current flap opening      5%
Current pressure          23Pa
Current gusty             2
Current pressure room     23Pa
1 MCA sensor        3 Manual control
2 ----------------
```

📄 *ANote-WindCompK-N-ENxxxxx*

6.2   Heating

```
12 Heating

1 Room heating
2 Inlet heating
3 Floor heating
4 Nest heating
```

Room heating

```
121 Room heating

Room heating              on
Temperature setting    -1.0°C    19.0°C
Bandwidth              02.0°C
Maximum heating        100%

Current temperature    20.0°C
Current heating        off       -0%



1 -------------
```
Proportional heating

```
121 Room heating

Room heating              on
Temperature setting    -1.0°C    19.0°C

Current temperature    20.0°C
Current heating        off



1 Running hours
```
On/off heating

```
1211 Running hours room heating

Today                     0:00
Thursday                  0:00
Wednesday                 0:00
Tuesday                   0:00
Monday                    0:00
Sunday                    0:00
Saturday                  0:00
Friday                    0:00

Total                     0 hours

Clear running hours       no
```

If a house is ventilated unnecessarily, it will also need unnecessary heating. Ensure that the minimum ventilation setting is not too high and that the difference between the room temperature and the temperature at which the heating is switched on is sufficient.

Temperature setting   The temperature at which the room heating control is relative to the room temperature (see page 9). Here you enter the temperature difference relative to the room temperature.

Bandwidth   The bandwidth determines the 'sensitivity' of the heating. Within the bandwidth, the heating is controlled from minimum to maximum. With a small bandwidth, the heater reacts quickly to a drop or rise in temperature. This is not good for the climate in the pig house. The house temperature would fluctuate too much.

Maximum heating   This setting limits the maximum setpoint of the proportional heating to a maximum percentage.

Current temperature   You can assign up to four temperature sensors to the heating control. The current temperature is the average of these temperature sensors. Faulty sensors do not participate in the calculation of this average. The heating control is then based on the remaining temperature sensors.

Current heating   The current heating status: *on* or *off*. This line shows also the calculated current status/heating capacity of the proportional heating. If 0% is calculated for the current heating, the drive signal generated will be 0V instead of the minimum voltage setting. This line is only shown with 0-10V controlled heating.

Growth curve   When the cursor is on *Growth curve temperature* and you press the confirmation key, the heating curve of the room appears. You can change the curve settings or disable the curve. Use the cancel key to return to the previous window. If you have deactivated the curve, the text *Growth curve* changes back to the default text. You can then no longer call up the relevant curve settings via this window.

Running hours

Using an on/off heater, you can request the heater's running hours. You will then see the running hours for today, for the past 7 days and the total number of running hours.

If you set *Clear running hours* to *yes*, the heating operating hours in the selected room will be cleared.

Inlet heater

```
122 Inlet heating                      

Inlet heating            on
Temperature setting      12.0°C   12.0°C
Bandwidth                02.0°C
Maximum heating          100%

Current temperature      12.0°C
Current heating          on        0%



1 Running hours
```

Floor heating

```
123 Floor heating                      

Floor heating            on
Temperature setting      40.0°C   40.0°C
Bandwidth                05.0°C
Maximum heating          100%

Current temperature      40.0°C
Current heating          off       -0%



1 Running hours     2 Options
```

Nest heating

```
124 Nest heating                       

Nest heating             on
Temperature setting      24.0°C   24.0°C
Bandwidth                08.0°C
Minimum heating          000%
Maximum heating          100%

Current temperature      24.0°C
Current heating          off       -0%


1 Running hours
```

ANote-Heating-N-ENxxxxx

6.3 Miscellaneous

```
13 Miscellaneous

1 Cooling
2 Humidification
3 CO2
4 NH3
5 Timer
6 Water counter

7 Temperature monitoring
8 Sensors
```

Cooling (on/off)

```
131 Cooling

Cooling                  on
Temperature setting  +30.0°C    30.0°C
Bandwidth             04.0°C
Minimum cooling        000%      0%
Maximum cooling        100%    100%
Maximum RH             100%
Current RH              82%
Current temperature   20.2°C
Current cooling         off      -0%

1 Options
```
Proportional cooling

```
131 Cooling

Cooling                  on
Temperature setting  +30.0°C    30.0°C



Maximum RH             100%
Current RH              82%
Current temperature   20.1°C
Current cooling         off

1 Options          2 Running hours
```
On/off cooling

The cooling configuration is done in the same way as room heating. To prevent the room humidity from becoming too high during cooling, the cooling control can be switched off based on RH.

When the humidity rises above the setpoint + hysteresis, the cooling switches off. If the RH falls below the preset value, the cooling will be switched on again. Default setting for hysteresis is 2%.

Options

```
1311 Options cooling

Compens. maximum ventilation
  Room ventilation     +00%





1 Soaking
```

Soaking

```
13111 Soaking

Soaking                 off
Start time            08:00
Stop time             20:00
Cycle time on         00:00
Cycle time off        00:00

Current status          off

Time                  11:43
```

Compens. maximum ventilation   If cooling is currently on, you can relatively reduce the maximum room ventilation by the percentage entered at *Compens. maximum ventilation: Room ventilation*. In this way, you can increase the cooling effect.

If the room status is set to *Not in use* or *Cleaning,* you can use the soak function. The cooling is then completely switched off (100%) for the *Cycle-time-on* time. As soon as the room status changes, *Soaking is set* to *off*. This prevents soaking from starting immediately after decommissioning the room.

📄 *ANote-Cooling-N-ENxxxxx*

RH and Humidification

```
132 RH
Current RH            82%
```

```
132 Humidification
Humidification      [on]
RH setting          080%


Current RH           82%
Current status       off
```

When the humidity falls below the setpoint, the humidification switches on. If the RH rises above the setpoint + hysteresis again, the humidification switches off again. Default setting for hysteresis is 2%.

CO₂ and NH₃

```
133 CO2
Momentele CO2       1740ppm
```

```
134 NH3
Momentele NH3       14,0ppm
```

Timer

```
135 Timer
Timer               [on]
Current status        on

Number of periods     01
Per.  Begin     End
 1    08:00  -  20:00
```

```
135 Timer
Timer               [on]
Current status        on    80%

Number of points      04
Point    Begin    ⌐    %
 1       05:00   :04  020
 2       05:04   :16  080
 3       19:50   :20  010
 4       20:30   :00  000
```
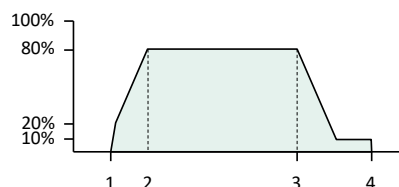
Timer

Maximum 24 periods.
Minimum switch-on time: 1 minute.

Light timer

With a lighting control, you can gradually turn on and off lighting and create ideal day and night conditions (dawn switching).

05:00:00	The light turns on. Light intensity is controlled to 20% in 4 minutes (⌐ :04).
05:04 am	The light intensity is controlled to 80% in 16 minutes (⌐ :16).
19:50 pm	The light intensity is controlled to 10% in 20 minutes (⌐ :20).
20:10 pm	The 20-minute after-fire time starts.
20:30 pm	The light switches off.

The installer can change the name of the *Timer* to, for example, *Light timer*.

Water counter

```
136 Water counter

Today              0,000,000 l
Thursday                   0 l
Wednesday                  0 l
Tuesday                    0 l
Monday                     0 l
Sunday                     0 l
Saturday                   0 l
Friday                     0 l

Total                      0 l

Clear counter             no
```
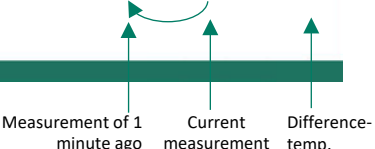
You can change the value of *Today*. By setting *Clear counter* to *yes*, you clear all counter readings, including the *Total* reading.

Thermo-differential

```
137 Thermo-differential

Thermo-differential
Relative alarm limit    +4.0°C/m
Absolute alarm limit    58.0°C

Sensor 1       20.1°C   20.1°C  +0.0°C/m
Sensor 2        0.0°C   20.0°C  +0.0°C/m
Sensor 3        0.0°C   20.1°C  +0.0°C/m
Sensor 4        0.0°C   20.0°C  +0.0°C/m
```

Measurement of 1 minute ago | Current measurement | Difference-temp.

Your installer activates thermo-differential control.

For each sensor, the current reading is compared with that of the previous minute. If the temperature rise in that minute is equal to or greater than the entered *relative alarm limit,* an alarm is triggered. If the measurement falls within the limits, the previous measurement is made equal to the current measurement. A new measurement then starts. Also, if the measured temperature of the sensor rises above the absolute limit, alarm is given. The Thermo-differential alarm only occurs when there is a positive difference.

Sensors

```
138 Sensors

1 Sensor 1        20.0°C
2 Sensor 2        20.0°C
3 Sensor 3        20.2°C
4 Sensor 4        20.0°C
```
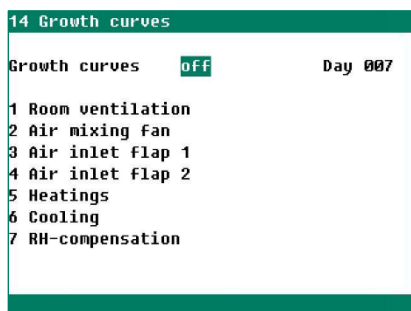
```
1381 Overview sensor 1

Current temperature      20.1°C

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

When you select a sensor, a table of last week's minimum and maximum sensor temperatures appears. You will also see the times when these minima and maxima were reached.
Your installer can change the sensor names (max. 15 characters).

6.4 Growth curves

```
14 Growth curves

Growth curves      off         Day 007

1 Room ventilation
2 Air mixing fan
3 Air inlet flap 1
4 Air inlet flap 2
5 Heatings
6 Cooling
7 RH-compensation
```

Depending on the number of animals in the room and the animal weight, you determine the climate settings and set them using a curve. Over time, the desired temperature gradually decreases and ventilation gradually increases. If you deliver a few animals from a section, you should adjust the occupancy rate. This prevents unnecessary heating costs when the minimum ventilation is too high or the room temperature too low.

Several curves are available to gradually decrease the target values. A curve can consist of a maximum of 7 breakpoints.

Growth curves on/off   This setting allows you to turn all curves on and off simultaneously.

- Also for growth curves, settings below 10.0°C are relative to the house temperature setpoint.
- Within the growth curve, do not switch from relative to absolute settings.
  All relative setpoints are lower than 10.0°C or absolute setpoints are equal to or higher than 10.0°C.
- The day numbers in the growth curve should be consecutive (see example below).
- If the day number of the first breakpoint is greater than 1, the value of the first breakpoint applies up to the preset day number.
- If the curve is active and you want to change a setting, you can change the setpoint concerned by changing the curve.
- For gradual progression, these settings are calculated hourly from the growth curve.
- The room temperature offset is cleared as soon as you change the day number.

```
1411 Growth curve room temperature

Growth curve temperature        on
Copy curve from room           000
Number of points                 5

Point      Day (1)    Temp.
  1         004       26.0°C
  2         028       24.0°C
  3         077       05.0°C
  4         140       19.0°C
  5         100       19.0°C

                 ◄◄room 1      ►►
```

! Not allowed

Inserting or removing breakpoint or period

1. Press the [Enter] key (edit mode)
2. Press and hold function key F1, then 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)

3. The number of breakpoints/periods is automatically adjusted.

Room ventilation

```
141 Growth curves room ventilation

1 Room temperature
2 Minimum ventilation
3 Maximum ventilation
4 Animal weight

5 Overview
```

Room temperature

```
1411 Growth curve room temperature

Growth curve temperature         on
Copy curve from room            000
Number of points                  4

Point        Day (7)     Temp.
  1          004         26.0°C
  2          028         24.0°C
  3          077         22.0°C
  4          140         19.0°C
```

Minimum ventilation

```
1412 Growth curve room ventilation

Growth curve minimum             on
Copy curve from room            000
Number of points                  4

Point        Day (7)     Min.
  1          004         010%
  2          028         015%
  3          077         022%
  4          140         028%
```

Maximum ventilation

```
1413 Growth curve room ventilation

Growth curve maximum             on
Copy curve from room            000
Number of points                  4

Point        Day (7)     Max.
  1          004         070%
  2          028         080%
  3          077         090%
  4          140         100%
```

Animal weight

```
1414 Growth curve animal weight

Growth curve weight              on
Copy curve from room            000
Number of points                  5

Point        Day (7)     Weight
  1          007         007kg
  2          021         011kg
  3          028         015kg
  4          035         018kg
  5          042         020kg
```

Overview

```
1415 Overview growth curves
```

Day (7)	1	29	57	85	113	141
Weight	7	15	20	20	20	20
Temp.	26.0	24.0	22.8	21.6	20.3	19.0
Min.vent.	10	15	19	23	25	28
Max.vent.	70	80	86	91	96	100

Growth curve temperature When changing the room temperature curve, keep in mind, that room temperature-related curves may be present.

Copy curve from room If the climate controller is the master, connected in a communication loop, you can copy a room curve to the current room. Copying can take several minutes. This depends on the number of rooms in the communication loop. If copying succeeds, the curve settings are automatically adjusted, except for the on/off status. If copying fails, the text *Copy failed* appears. You can only copy the growth curves of climate controllers of the KL-6400 series.

The animal weight growth curve is currently used for overview purposes only.

Mixing fan

```
142 Growth curve air mixing fan

Growth curve temperature         on
Copy curve from room            000
Number of points                  4

Point        Day (7)     Temp.
  1          004         +26.0°C
  2          028         +24.0°C
  3          077         +21.0°C
  4          140         +19.0°C
```

Air inlets 1 and 2

Temperature

```
1431 Growth curve air inlet flap 1

Growth curve temperature        on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Temp.
 1         004         +01.0°C
 2         028         +01.0°C
 3         077         +01.0°C
 4         140         +01.0°C
```

Minimum air inlet opening

```
1432 Growth curve air inlet flap 1

Growth curve minimum            on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Min.
 1         004         010%
 2         028         015%
 3         077         022%
 4         140         028%
```

Maximum air inlet opening

```
1433 Growth curve air inlet flap 1

Growth curve maximum            on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Max.
 1         004         070%
 2         028         080%
 3         077         090%
 4         140         100%
```

Menu item *1 Temperature* appears only for an inlet that controls on a temperature basis.

Heating

Heating

```
145 Growth curves heatings

1 Room heating
2 Inlet heating
3 Floor heating
4 Nest heating
```

Room heating

```
1451 Growth curve room heating

Growth curve temperature        on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Temp.
 1         004         -1.0°C
 2         028         -1.4°C
 3         077         -2.6°C
 4         140         -3.0°C
```

Inlet heater

```
1452 Growth curve inlet heating

Growth curve temperature        on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Temp.
 1         004         12.0°C
 2         028         14.0°C
 3         077         15.0°C
 4         140         16.0°C
```

Floor heating

```
1453 Growth curve floor heating

Growth curve temperature        on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Temp.
 1         004         40.0°C
 2         028         37.5°C
 3         077         35.5°C
 4         140         34.0°C
```

Nest heating

```
1454 Growth curve nest heating

Growth curve temperature        on
Copy curve from room           000
Number of points                 4

Point      Day (7)     Temp.
 1         004         24.0°C
 2         028         23.0°C
 3         077         21.5°C
 4         140         18.0°C
```

Room heating   The room heating settings are relative to the calculated room temperature.

Cooling

Temperature

```
1461 Growth curve cooling          ⊡

Growth curve temperature      on
Copy curve from room          000
Number of points                4

Point      Day (7)     Temp.
  1          004       +30.0°C
  2          028       +28.0°C
  3          077       +25.0°C
  4          140       +23.0°C
```

Minimum cooling

```
1462 Growth curve cooling          ⊡

Growth curve minimum          on
Copy curve from room          000
Number of points                4

Point      Day (7)     Min.
  1          004        010%
  2          028        015%
  3          077        022%
  4          140        028%
```

Maximum cooling

```
1463 Growth curve cooling          ⊡

Growth curve maximum          on
Copy curve from room          000
Number of points                4

Point      Day (7)     Max.
  1          004        070%
  2          028        080%
  3          077        090%
  4          140        100%
```

Only with a 0-10V controlled cooling, you can set the minimum and maximum positions.

RV compensation

```
147 Growth curve RH-compensation   ⊡

Growth curve RH               on
Copy curve from room          000
Number of points                4

Point      Day (7)      RH
  1          004        070%
  2          028        068%
  3          077        063%
  4          140        055%
```

RH compensation, see page 13

6.5 Overviews

```
15 Overviews

1 Room temperature
2 Sensors

3 Growth curves




Reset min/max temp.        no
```

Room temperature

```
151 Overview room temperature

Room temperature        20.0°C

Day        Min.°C Time  Max.°C  Time
Today       20.0  10:42  22.4  10:37
Thursday    20.1   0:00  20.1   0:00
Wednesday   20.1   0:00  20.1   0:00
Tuesday     20.1   0:00  20.1   0:00
Monday      20.1   0:00  20.1   0:00
Sunday      20.1   0:00  20.1   0:00
Saturday    20.1   0:00  20.1   0:00
Friday      20.0   9:53  21.3   0:00
```

Via *Reset min/max temp.* you can clear *today*'s min/max readings in all temperature views.

Sensors

```
152 Sensors

1 Sensor 1              20.0°C
2 Sensor 2              20.0°C
3 Sensor 3              20.2°C
4 Sensor 4              20.0°C
```

```
1521 Overview Sensor 1

Current temperature     20.0°C

Day        Min.°C Time  Max.°C  Time
Today       20.0  10:42  22.4  10:37
Thursday    20.1   0:00  20.1   0:00
Wednesday   20.1   0:00  20.1   0:00
Tuesday     20.1   0:00  20.1   0:00
Monday      20.1   0:00  20.1   0:00
Sunday      20.1   0:00  20.1   0:00
Saturday    20.1   0:00  20.1   0:00
Friday      20.1   0:00  20.1  15:26
```

Overview sensor 1 A table with the minimum and maximum temperatures of the past week, of the temperature selected, will be shown. The table also states the times when the minimum and maximum temperatures occurred on the various days.
-99.9°C = temperature sensor failure; ????°C = invalid temperature.

Growth curves

```
153 Overview growth curves

Day (7)        1   29   57   85  113  141
Weight         7   15   20   20   20   20
Temp.       26.0 24.0 22.8 21.6 20.3 19.0
Min.vent.     10   15   19   23   25   28
Max.vent.     70   80   86   91   96  100
```

See also screen 1415, page 23.

6.6 Alarm

```
16 Room alarm

Room alarm                    on

1 Room temperature            on
2 Room ventilation            on        on
3 Air mixing fan              on
4 Flaps
5 Inlet heating               on
6 Floor heating               on
7 Nest heating                on
8 Miscellaneous
```

You can switch the alarms of the controls on or off and set or change the corresponding alarm limits in the individual screens of the controls.

At *Room alarm*, you can turn the alarm of the selected room on or off.

! If you switch off a heating or cooling system, the alarm is not switched off. You can deactivate the alarm of a heating or cooling system only by:
- disable the scheme's alarm or
- disable the main alarm.

Room temperature

```
161 Alarm room temperature

Alarm temperature            on
Minimum alarm limit    -05.0°C   18.0°C
Maximum alarm limit     05.0°C   28.0°C
Absolute alarm limit    35.0°C

Outside temperature     -5.9°C
Temperature setting     23.0°C
Current temperature     20.0°C

Alarm code  No alarm
```

Here you can set the alarm limits for the room temperature. When temperature compensation is active, you can adjust the maximum alarm limit by changing the temperature setpoint. If you are using an outside sensor, the maximum alarm limit can be adjusted based on the current outdoor temperature.

Alarm code
Depending on the type of sensor, the alarm status can be any of the texts listed in the table above.

Room ventilation

```
162 Alarm room ventilation

Alarm ventilation         [on]      ( on )─── 2nd measuring fan

Minimum alarm limit         43%
Maximum alarm limit        101%

Calculated ventilation      72%
Current ventilation         69%      69%

Alarm 1      No alarm
Alarm 2      No alarm
```

Here you can switch off the measuring fan(s). Furthermore, you see the calculated alarm limits of the measuring fans. The calculations displayed refer to the controlled fan group, not to the overall room ventilation. Therefore, the values displayed may differ from the readings in other windows.

A measuring fan that is switched off no longer influences the output signal and the ventilation group alarm detection.

Measuring fan 1 = on	The output signal depends on the difference between the calculated ventilation and the measured ventilation.
Measuring fan 1 = off	The calculated ventilation defines the output signal.
Measuring fan 2 = on	The output signal depends on the difference between the calculated ventilation and the measured ventilation.
Measuring fan 2 = off	*measuring fan 1 = on* <u>and</u> *Calculated ventilation* exceeds *Start percentage of fan 2* → Output of fan 2 follows output of fan 1. *measuring fans 1 + 2 = off* → calculated ventilation determines output control.

Mixing fan

```
163 Alarm air mixing fan

Alarm temperature        [on]
Minimum alarm limit     -05.0°C    15.0°C
Maximum alarm limit      05.0°C    25.0°C
Absolute alarm limit     35.0°C

Outside temperature      -5.9°C
Temperature setting      20.0°C
Current temperature      20.0°C

Alarm code   No alarm
```

Air inlets

```
164 Flaps

1 Air inlet flap 1        on
2 Air inlet flap 2        on
3 Wind compensation       on
```

Air inlet 1

```
1641 Alarm air inlet flap 1

Alarm temperature        [on]
Minimum alarm limit     -05.0°C    21.0°C
Maximum alarm limit      05.0°C    31.0°C
Absolute alarm limit     35.0°C

Outside temperature      -5.9°C
Temperature setting      26.0°C
Current temperature      24.2°C

Alarm code   No alarm
```

Air inlet 2

```
1642 Alarm air inlet flap 2

Alarm temperature        [on]
Minimum alarm limit     -05.0°C    19.0°C
Maximum alarm limit      05.0°C    29.0°C
Absolute alarm limit     35.0°C

Outside temperature      -5.9°C
Temperature setting      24.0°C
Current temperature      20.0°C

Alarm code   No alarm
```

Wind compensation

```
1643 Alarm wind compensation

Alarm                         on
AeroComp                      on
Minimum alarm limit         -10%
Maximum alarm limit         +10%

AeroComp
Current flap opening          5%
Calculated position           5%

Status       No alarm

Alarm code   No alarm
1 Pressure alarm
```

Press

```
16431 Pressure alarm

Pressure alarm                on

Minimum alarm limit        002Pa
Maximum alarm limit        040Pa

Pressure room               23Pa


Status       No alarm
```

Inlet heater

```
165 Alarm inlet heating

Alarm temperature             on
Minimum alarm limit      -05.0°C    7.0°C
Maximum alarm limit       05.0°C   25.0°C
Absolute alarm limit      35.0°C

Outside temperature       20.0°C
Temperature setting       12.0°C
Current temperature       12.0°C

Alarm code   No alarm
```

Floor heating

```
166 Alarm floor heating

Alarm temperature             on
Minimum alarm limit      -10.0°C   30.0°C
Maximum alarm limit       10.0°C   50.0°C


Temperature setting       40.0°C
Current temperature       40.0°C

Alarm code   No alarm
```

Nest heating

```
167 Alarm nest heating

Alarm temperature             on
Minimum alarm limit      -05.0°C   19.0°C
Maximum alarm limit       05.0°C   29.0°C


Temperature setting       24.0°C
Current temperature       20.2°C

Alarm code   No alarm
```

Miscellaneous

```
168 Room alarm

Alarm inlet temperature      on      19.8°C

1 Cooling                    on
2 RH                         on
3 CO2                        on
4 NH3                        on
5 Temperature monitoring     on
```

Alarm inlet temperature If the room's temperature compensation is based on the air inlet temperature with its own temperature sensor, you can switch the air inlet temperature alarm *on* and *off* here. The current air inlet temperature is shown next to the alarm status.

Cooling

```
1681 Alarm cooling

Alarm temperature             on
Maximum alarm limit       05.0°C   35.0°C
Absolute alarm limit      35.0°C

Current temperature       20.2°C

Alarm code   No alarm
```

RH

```
1682 Alarm RH

Alarm RH                     on
Minimum alarm limit         020%
Maximum alarm limit         100%

Current RH                   82%

Alarm code   No alarm
```

CO₂

```
1683 Alarm CO2

Alarm CO2                    on
Minimum alarm limit       0000ppm
Maximum alarm limit       5000ppm

Current CO2               1740ppm

Alarm code   No alarm
```

NH₃

```
1684 Alarm NH3

Alarm NH3                    on
Minimum alarm limit       000.0ppm
Maximum alarm limit       030.0ppm

Current NH3                14.0ppm

Alarm code   No alarm
```

Thermo-differential alarm

```
1685 Alarm thermo-differential

Alarm temperature            on
Relative alarm limit     +4.0°C/m
Absolute alarm limit      58.0°C

Sensor 1         No alarm
Sensor 2         No alarm
Sensor 3         No alarm
Sensor 4         No alarm

Alarm code   No alarm
```

Switching off the thermo-differential alarm clears the current temperature measurement, after which the alarm is switched on again automatically. See also page 21.

⚠ Installation errors such as *Output already assigned, Incorrect output type, Input already assigned* etc. should be resolved before commissioning.

⚠ Remember to turn the alarm ON again after you have switched it off, for example, to clear a fault. Preferably use the function🕒 **off** (temporarily disable alarm) to solve a malfunction.

6.7 Communication alert

Communication alarm may occur at a main station when the main station has not received data from a device from the same RS485 data communication loop.

6.8 Climate alarm codes

Alarm code	Description
Alarm unknown (xxx)	An unknown and non-documented alarm code has occurred. Note down the number that is displayed and contact your supplier.
CO_2 sensor defective	Measurement CO_2 sensor is outside the preset limits.
CO_2 too high	Measured CO_2 concentration is higher than the calculated maximum alarm limit.
CO_2 too low	Measured CO_2 concentration is lower than the calculated minimum alarm limit.
Invalid value	Invalid value (0). Enter a valid value (see AQC table).
NH_3 sensor faulty	Measurement NH_3 sensor is outside set limits.
NH_3 too high	Measured NH_3 concentration is higher than the calculated maximum alarm limit.
NH_3 too low	Measured NH_3 concentration is lower than the calculated minimum alarm limit.
Outside sensor faulty	Outside temperature measured by sensor is lower than -50.0°C or higher than +50.0°C.
Pressure sensor faulty	Measurement pressure sensor is outside the preset limits.
Pressure too high	Measured pressure is higher than the calculated maximum alarm limit
Pressure too low	Measured pressure is lower than the calculated minimum alarm limit
RH too high	Measured RH is higher than the calculated maximum alarm limit
RH too low	Measured RH is lower than the calculated minimum alarm limit
Sensor faulty	Measurement sensor (temperature etc.) is outside the preset limits.
Temperature too high	Measured temperature is higher than the calculated maximum alarm limit.
Temperature too low	Measured temperature is lower than the calculated minimum alarm limit.
Temp. sensor faulty	Temperature measured by sensor is lower than -50.0°C or higher than +100.0°C.
Thermo-differential sensor x	The temperature difference between the last two measurements exceeds the max allowed difference or the temperature measured by the sensor is higher than the absolute limit. See page 21.
Ventilation 0%	The measuring fan is stationary.
Ventilation too high [1]	The ventilation measured is higher than the calculated maximum alarm limit.
Ventilation too low [1]	The ventilation measured is lower than the calculated minimum alarm limit.

[1] If it concerns an air inlet control, first check that the air inlet is not running in manual mode.

6.9 Installation alarm codes

Alarm code	Description
Configuration changed	Module configuration (type) changed. Read module number again.
Control voltage too low/high	The control voltage for the MCA module is too low or too high.
Delta position too small	Too small physical difference between the open and closed positions of the air inlet.
Delta voltage too small	Too small voltage difference between the air open and closed positions of the air inlet.
Inlet not programmed	The air inlet selected for wind compensation has not been installed.
Input already assigned	Input is assigned to two or more controls.
Invalid input	The input number does not exist on the module.
Invalid output	The output number does not exist on the module.
MCA sensor absent	The selected MCA sensor is not present.
Module not found	The set module number at the terminal does not exist.
Module not responding	Module address not found, check settings on module.
Module reset alarm	Module keeps resetting due to a fault. Check module.
Motor overload	The motor has been running for too long.
Motor temp. outside limits	The motor temperature is too high.
No communication address	Device address climate controller missing.
No input assigned	No input terminal number has been entered
No output assigned	No output terminal number has been entered
No outside sensor	Control installed that requires an outdoor sensor but no outdoor sensor is installed
No room data	A central control installed on the climate controller did not receive data from the external controller to control the central controller (e.g. wrong central controller number etc.).
Output already assigned	Output is assigned to two or more controls.
Pressure outside limits	Value measured by the MCA pressure sensor is outside the preset limits.
Pressure sensor not calibrated	The pressure sensors of the MCA module have not been calibrated.
Room x without AQC	The room with the displayed number does not have a valve with measuring fan while the central ventilation is set to *room with AQC.*
Unknown terminal type	The type of terminal does not exist.
Valve not present	The air inlet selected for wind compensation does not exist.
Valve position too high	The current valve position is higher than calculated maximum alarm limit.
Valve position too low	The current valve position is lower than calculated minimum alarm limit.
Wind comp. not programmed	The MCA wind compensation module has not been programmed.
Wrong input type	The input type entered does not match the input type the control can handle.
Wrong output type	The set output type does not meet the type of output the control can handle.
Wrong terminal setting	Wrong assignment. The function assigned to the terminal is not supported by the module.

7 Room status

Current status: *Your installer can set a separate access code for the status screen.*	Cleaning ❄	Pre-heating 🌡	Not in use ✕
Mixing fan	off	manual	off
Room ventilation	manual	off	
Ventilation alarm	off	off	
Throttle valve / Diaphragm damper	automatic	off	
Bypass valve	off	off	
Air inlet based on temperature	manual	off	
Air inlets based on ventilation or pressure	automatic	off	
Wind compensation valves	automatic	open	
Cooling	off	off	
CO_2, NH_3 and RH	off	off	
Humidification	off	off	
Temperature monitoring (differential alarm)	remains unchanged	remains unchanged	
Timer	off	off	
Day number growth curves	remains unchanged	remains unchanged	

Not in use
or
Cleaning
- Inlet heating (without frost protection) and nest heating are switched off.
- Room heating, inlet heating (with frost protection) and underfloor heating switch to frost protection.
- The lower alarm limit calculated equals the frost protection (5.0°C) for the:
   - room heating
- The lower alarm limit calculated equals the frost protection (5.0°C) minus the lower limit setting for the:
  - inlet heating (with frost protection)
  - underfloor heating
- An alarm is generated if the temperature of the control rises to beyond the calculated alarm limit for the following temperature measurements:
  - room temperature
  - inlet temperature (for inlet heating with frost protection)
  - floor temperature

Pre-heating
- All heating systems are controlled, except the inlet heating which continues to be switched off.
- The inlet heating (with frost protection) switches over to frost protection.
- The lower alarm limit calculated equals the frost protection (5.0°C) for the:
   - room heating
- The lower alarm limit calculated equals the frost protection (5.0°C) minus the lower limit setting for the:
  - inlet heating (with frost protection)
  - underfloor heating
  - nest heating.
- An alarm is generated if the temperature of the control rises to beyond the calculated alarm limit for the following temperature measurements:
  - room temperature
  - inlet heating (with inlet heating with frost protection)
  - underfloor heating
  - nest heating

In use The room control is based on the settings entered.

! The nest heating does not have frost protection. Of course, the following applies to all controls: if installed.

Manual control KL-61

Using the rotary knob on the KL-61, you can set the room ventilation manually. The current room status then changes to *Cleaning*.

⚠️ The *Manual control*, Cleaning, Pre-heating and *Not in use* modes influence the alarm operation; only use these states if there are no animals in the room. We advise you to use these modes with due care.

8 Central

```
2 Central

1 Central vent. 1
2 Central heat. 1
3 Central flap
4 Temperature 1
5 Heat exchanger
6 Centr.cooling 1
7 Timer 1
8 Thermo-differential

9 Alarm
```

```
2 Central

1 Central exhaust
2 Central heating
3 Central flap
4 Temperature control
5 Heat exchanger
6 Central cooling
7 Central timer
8 Thermo-differential

9 Alarm
```

KL-6401   *KL-6402, KL-6405 and KL-6410*

8.1 Central exhaust

Central exhaust using measuring fans in the room (AQC valve) or ECOVENT

```
211 Central vent. 1

Minimum ventilation      005%
Maximum ventilation      100%
Current ventilation      005%      5%
Correction ventilation   +0.0%  in  35s

Average ventilation       11%
Optimal flap opening      67%
Maximum flap opening      0%
   Room              room 1

1 Options        2 Pressure
```

```
2111 Options: Central vent. 1

Restart measuring fans
   Rooms               off
Minimum ventilation     5,250m³/h
Maximum ventilation   105,000m³/h
                              Max.
Start fan 2              050%   1: 50%
Start fan 3              066%   2: 66%

Proportional             23%
Proportional           Step  1
Step control 1         Step  0
```

```
2112 Pressure: Central vent. 1

Pressure setting         025Pa

Current pressure         25Pa
Current status           on
```

* If the central exhaust system is equipped with a measuring fan, the last column shows the measured ventilation.

If the central exhaust control is based on pressure, menu option 2 appears at the bottom of the screen. In addition to the pressure setpoint and current pressure, the current status of the pressure control is also displayed.

Central exhaust without the use of measuring fans in the room

```
211 Central vent. 1

Minimum ventilation      005%  at   05%
Maximum ventilation      100%  at  100%
Current ventilation      011%        11%
Correction ventilation   +0.0%  in   95s

Average ventilation       11%




1 Options        2 Pressure
```

```
2111 Options: Central vent. 1

Minimum ventilation     5,250m³/h
Maximum ventilation   105,000m³/h
                              Max.
Start fan 2              050%   1: 50%
Start fan 3              066%   2: 66%

Proportional             46%
Proportional           Step  1
Step control 1         Step  0
```

```
2112 Pressure: Central vent. 1

Pressure setting         025Pa

Current pressure         25Pa
Current status           on
```

📄 *ANote-CentVent-N-ENxxxxx*

8.2 Central heating

```
221 Central heat. 1
                      CH    Outside
Minimum temperature  40.0°C  15.0°C
Maximum temperature  90.0°C -10.0°C
Stop temperature             30.0°C
Minimum heat demand  05.0°C
                              Pump
Current status         on      on
Current temperature  18.2°C  20.0°C
Calculated temperature 29.6°C
Maximum heat demand  29.6°C
  Room              room 1
1 Running hours
```

```
2211 Running hours: Central heat. 1
Today                     0:00
Thursday                  0:00
Wednesday                 0:00
Tuesday                   0:00
Monday                    0:00
Sunday                    0:00
Saturday                  0:00
Friday                    0:00

Total                  0 hours

Clear running hours      no
```

ANote-Heating-N-ENxxxxx

8.3 Central air inlet

```
231 Inlet flap 1
Temperature setting   10.0°C
Bandwidth             04.0°C
Minimum flap opening   000%
Maximum flap opening   100%

Current flap opening   100%
Current temperature   24.2°C

1 Cascade control
```

```
2311 Cascade control
Cascade control

Start motor 2          050%
Maximum motor 1        100%

Step                     2
Calculated flap opening
  Output 1             100%
  Output 2             100%
```

ANote-InletflapK-N-ENxxxxx

Wind compensation

```
233 Wind compensation 1
AeroComp              auto
Gusty factor           00
Minimum flap opening  002%
Maximum flap opening  100%

AeroComp
Current flap opening  100%
Current pressure      15Pa
Current gusty          4

Current pressure central  15Pa

1 MCA sensor     2 ----------------
```

```
2331 Miscellaneous

Current temperature     19.8°C
Current temp.heated     20.0°C
Diff. pressure          15Pa
Current gusty            4
```

Wind compensation via *AeroComp* and *AeroWing*

```
233 Wind compensation 1
AeroWing             auto
Minimum flap opening 002%
Maximum flap opening 100%
AeroWing
Current flap opening  9%
Pressure setting    010Pa  10Pa
Current pressure     15Pa
Current gusty         4

1 ----------   2 Options pressure
```

```
2332 Options pressure
Minimum pressure     005Pa
Maximum pressure     040Pa

Gusty correction pressure
  Curve                on
  Factor
  Correction          0Pa

Reduce wind compensation  0.5Pa
```

```
23320 Gusty correction pressure
Point    Gusty    Correction
1        004      000Pa
2        025      005Pa
3        050      010Pa
4        100      020Pa
```

Wind compensation using *AeroWing*

ANote-WindCompK-N-ENxxxxx

8.4 Temperature control

```
241 Temperature 1

Heating                  on
Temperature setting   20.0°C



Current temperature   20.0°C
Current heating         on
```

```
241 Temperature 1

Heating                  on
Temperature setting   20.0°C
Bandwidth             08.0°C
Minimum heating         000%
Maximum heating         100%


Current temperature   20.0°C
Current heating         on      0%
```

ANote-Heating-N-ENxxxxx

ANote-Cooling-N-ENxxxxx

Temperature control can consist of heating or cooling. An on/off heating/cooling has no *Bandwidth*, *Minimum* and *Maximum* heating settings.

8.5 Heat exchanger

```
25 Heat exchanger

1 Bypass flap
2 Intake fan
3 Rinse timer
```

ANote-HeatExcK-N-ENxxxxx

```
251 Bypass flap

Temperature setting   18.0°C
Bandwidth             04.0°C
Minimum flap opening    000%
Maximum flap opening    100%


Current temperature   20.2°C
Current flap opening     0%
Intake flap           open
```

```
252 Intake fan

Minimum at ventilation   05%
Maximum at ventilation  100%
Minimum ventilation     005%
Maximum ventilation     100%


Average ventilation      11%
Current ventilation      0%
Intake flap           open
```

```
253 Rinse timer

Rinse timer              on
Start time            08:00
Stop time              8:01
Pulse                00m10s
Pause                00m00s

Current status          off
  Output                  0

Time                  13:05
```

8.6 Central cooling

```
261 Centr.cooling 1

Centr.cooling 1          on
Temperature setting   30.0°C



                    Outside
Maximum RH           100%   100%
Current RH            53%    76%
Current temperature  20.1°C
Current cooling       off

1 -------      2 Running hours
```

```
261 Centr.cooling 1

Centr.cooling 1          on
Temperature setting   30.0°C
Bandwidth             04.0°C
Minimum cooling         000%
Maximum cooling         100%

                    Outside
Maximum RH           100%   100%
Current RH            84%    76%
Current temperature  20.1°C
Current cooling       off    -0%

1 Options
```

ANote-Cooling-N-ENxxxxx

The central cooling functions identically to standard cooling. If modulating cooling is used, menu option 1 appears, whereas menu option 2 appears in case of an on/off cooling.

An on/off cooling has no *Bandwidth*, *Minimum* and *Maximum* cooling settings.

8.7 Central timer

```
271 Timer 1
Timer 1                   on
Current status            on

Number of periods         01
Per.  Begin    End
 1    08:00 -  20:00
```

```
271 Timer 1
Timer 1                   on
Current status            off

Start time            08:00
Stop time             20:00
Cycle time on         02:00
Cycle time off        01:00
```
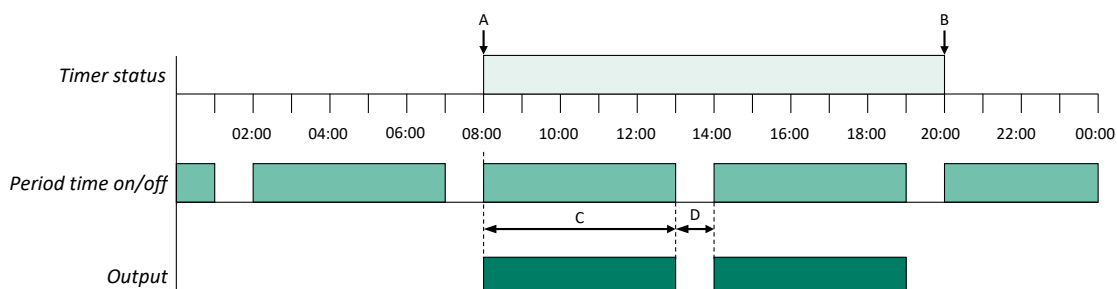
📄 *ANote-Timers-N-ENxxxxx*

The on/off timer functions in the same way as a standard timer.

Timer with adjustable cycle times.

A	*Start time*	Start time of on/off periods
B	*Stop time*	Stop time of on/off periods
C	*Period on*	Length of time that the output is active.
D	*Period off*	Length of time the output is inactive.

At 08:00 (A), the timer turns on. After five hours (C), the output switches off for one hour (D). It then switches on again for five hours (C) before staying off for one hour (D). This is a recurring process. At 20:00 (B), the timer turns off. The next day, the timer will switch on again at 08:00 (A). The process always stops after the total time (B-A) has elapsed, even if the period time C is not yet over.

! The start time of the 1st cycle always coincides with the start time (A). If you enter 00:00 for C and D (cycle time), the timer functions as a standard time switch: at time A the process switches on and at time B the process switches off.

8.8 Alarm

```
29 Central alarm

Central alarm           on

1 Central vent. 1       on
2 Central heat. 1       on
3 Central flap
4 Temperature 1         on
5 Heat exchanger
6 Centr.cooling 1       on
7 Thermo-differential   on
8 External alarm
```

```
29 Central alarm

Central alarm           on

1 Central exhaust
2 Central heating
3 Central flap
4 Temperature control
5 Heat exchanger
6 Central cooling
7 Thermo-differential     on
8 External alarm
```

In this window, you can enable or disable the alarm status of the central controls.

KL-6401

KL-6402, KL-6405 and KL-6410

Central exhaust

```
2911 Alarm: Central vent. 1

Alarm                     on

Minimum alarm limit        2%
Maximum alarm limit       20%

Calculated ventilation    10%
Current ventilation       14%

Fan        No alarm
Alarm code No alarm
```

```
2911 Alarm: Central vent. 1

Alarm                     on




Alarm code  No alarm
```

```
2911 Alarm: Central vent. 1

Alarm                     on




Alarm code  No alarm
1 Pressure
```

With measuring fan   *Without measuring fan*   *Pressure*

Central heating

```
2921 Alarm: Central heat. 1

Alarm                     on




Alarm code  No alarm
```

Central inlet flap

```
2931 Alarm: Inlet flap 1

Alarm temperature         on
Minimum alarm limit   -05.0°C    5.0°C
Maximum alarm limit    05.0°C   26.8°C
Absolute alarm limit   35.0°C

Outside temperature    21.8°C
Temperature setting    10.0°C
Current temperature    20.0°C

Alarm code  No alarm
```

```
2931 Alarm: Inlet flap 1

Alarm                     on




Alarm code  No alarm
```

```
2931 Alarm: Inlet flap 1

Pressure alarm            on
Minimum alarm limit     000Pa
Maximum alarm limit     100Pa

Current pressure         24Pa



Alarm code  No alarm
```

Temperature   *Ventilation*   *Pressure*

Wind compensation

```
2933 Alarm: Wind compens. 1

Alarm                     on
AeroComp                  on
Minimum alarm limit      -10%
Maximum alarm limit      +10%

AeroComp
Current flap opening       4%
Calculated position        4%

Status      No alarm

Alarm code  No alarm
1 --------------
```

```
2933 Alarm: Wind compens. 1

Alarm                     on
AeroComp                  on
Minimum alarm limit      -10%
Maximum alarm limit      +10%

AeroComp
Current flap opening       8%
Calculated position        8%

Status      No alarm

Alarm code  No alarm
1 Pressure alarm
```

```
29331 Pressure alarm

Pressure alarm            on

Minimum alarm limit     002Pa
Maximum alarm limit     040Pa

Pressure central          9Pa
```

Without central pressure   *With central pressure*

Temperature control

```
294 Alarm temperature control
1 Temperature 1           on
2 Temperature 2           on
```

```
2941 Alarm: Temperature 1
Alarm temperature         on
Minimum alarm limit    -10.0°C   10.0°C
Maximum alarm limit     10.0°C   31.8°C
Absolute alarm limit    35.0°C

Outside temperature     21.8°C
Temperature setting     20.0°C
Current temperature     20.0°C

Alarm code  No alarm
```

```
2942 Alarm: Temperature 2
Alarm temperature         on
Minimum alarm limit    -10.0°C   10.0°C
Maximum alarm limit     10.0°C   31.8°C
Absolute alarm limit    35.0°C

Outside temperature     21.8°C
Temperature setting     20.0°C
Current temperature     20.0°C

Alarm code  No alarm
```

Heat exchanger

```
295 Alarm heat exchanger
1 Bypass flap             on
2 Intake fan              on
```

```
2951 Alarm: Bypass flap
Alarm temperature         on
Minimum alarm limit    -10.0°C    8.0°C
Maximum alarm limit     10.0°C   31.8°C
Absolute alarm limit    35.0°C

Outside temperature     21.8°C
Temperature setting     18.0°C
Current temperature     20.0°C

Alarm code  No alarm
```

```
2952 Alarm: Intake fan
Alarm                     on




Alarm code  No alarm
```

Average ventilation

```
2952 Alarm: Intake fan
Pressure alarm            on
Minimum alarm limit     000Pa
Maximum alarm limit     100Pa

Current pressure         41Pa

Alarm code  No alarm
```

Pressure

Central cooling

```
2961 Alarm: Centr.cooling 1
Alarm temperature         on
Maximum alarm limit     05.0°C   35.0°C
Absolute alarm limit    35.0°C

Outside temperature     21.8°C
Temperature setting     30.0°C
Current temperature     20.0°C

Alarm code  No alarm
```

```
29611 Alarm: Central RH 1
Alarm RH                  on
Minimum alarm limit     020%
Maximum alarm limit     100%

Current RH               82%

Alarm code  No alarm
```

The *Central RH 1* option is omitted if no RH sensor is installed for central cooling.

Thermo-differential

```
297 Alarm thermo-differential

Alarm temperature          on
Relative alarm limit      +4.0°C/m
Absolute alarm limit      58.0°C

Sensor 1           No alarm
Sensor 2           No alarm
Sensor 3           No alarm
Sensor 4           No alarm

Alarm code   No alarm
```

External alarms

```
298 External alarm

1 Extern.alarm 1          on
2 Extern.alarm 2          on
3 Extern.alarm 3          on
4 Extern.alarm 4          on
5 Extern.alarm 5          on
6 Extern.alarm 6          on
7 Extern.alarm 7          on
8 Extern.alarm 8          on
9 Extern.alarm 9          on
10 Extern.alarm 10        on
```
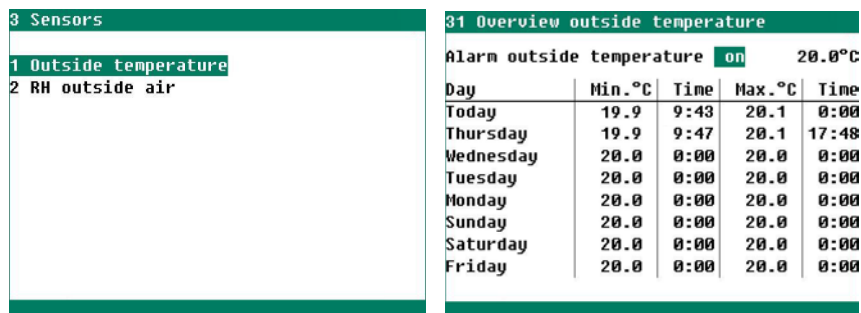
```
2981 Extern.alarm 1

Alarm                      on



Input                 closed




Alarm status    No alarm
```

9 Sensors

```
 Main menu

1 Rooms
2 Central
3 Sensors
4 Alarm

5 System



Access code        ****
```

9.1 Outside temperature alarm

```
3 Sensors


1 Outside temperature
2 RH outside air
```

```
31 Overview outside temperature

Alarm outside temperature  on     20.0°C

Day          Min.°C  Time  Max.°C  Time
Today         19.9   9:43   20.1   0:00
Thursday      19.9   9:47   20.1  17:48
Wednesday     20.0   0:00   20.0   0:00
Tuesday       20.0   0:00   20.0   0:00
Monday        20.0   0:00   20.0   0:00
Sunday        20.0   0:00   20.0   0:00
Saturday      20.0   0:00   20.0   0:00
Friday        20.0   0:00   20.0   0:00
```

When you select menu item 1 *Outside temperature*, a table appears on the screen showing the minimum and maximum outside temperatures for the past week. You will also see the times when these minimums and maximums were measured. If the climate controller has its own outside sensor, you can switch the outside temperature alarm on and off here.

-99.9°C   = Outside temperature sensor defective
?????°C   = Invalid outside temperature

9.2 RH outside air

```
32 RH outside air

Alarm RH                  on

Current RH                76%

Alarm code   No alarm
```
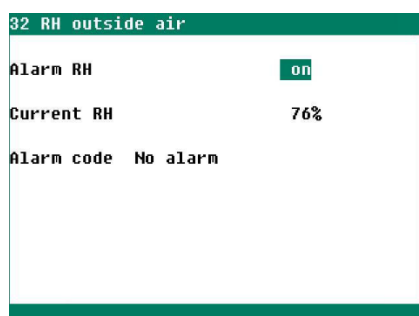
10 Alarm

```
 Main menu                          4 Alarm

1 Rooms                             1 Alarm status
2 Central
3 Sensors                           2 Alarm status device
4 Alarm                             3 Alarm status central
                                    4 Alarm status rooms
5 System
                                    5 Latest alarms device
                                    6 Latest alarms central
                                    7 Latest alarms room
Access code         ****
```

10.1 Alarm status

```
 41 Alarm status

Main alarm  on          Test  no
   Off       no          Reset no
Alarm code  No alarm




1 Device          2 Central
3 Rooms           4 Communication
```

For more information see page 4

10.2 Alarm status of device, rooms and central control

```
 42 Alarm status device      43 Alarm status central      44 Alarm status rooms

Alarm code  No alarm          Alarm code  No alarm          Room  Alarm   Alarm code
                                                            001    on    No alarm
                                                            002    on    No alarm
                                                            003    on    No alarm
                                                            004    on    No alarm
                                                            005    on    No alarm
                                                            006    on    No alarm
                                                            007    on    No alarm
                                                            008    on    No alarm
                                                            009    on    No alarm
                                                            010    on    No alarm
```
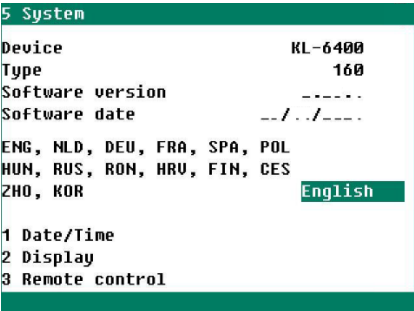
10.3 Latest alarms device, central and room

```
 45 Latest alarms device      46 Latest alarms central      47 Latest alarms room

Alarm 0    __. ____ ___.    ..:..  Alarm 0    __. ____ ___.    ..:..  Alarm 0    __. ____ ___.    ..:..
Alarm code _____ ____.____ Alarm code _____ ____.____ Alarm code _____ ___ ___
Control    _____ _____      Control    _____ _____      Control    ____ _____ __

Alarm 1    __. ____ ___.    ..:..  Alarm 1    __. ____ ___.    ..:..  Alarm 1    __. ____ ___.    ..:..
Alarm code _____ ____.____ Alarm code _____ ____.____ Alarm code _____ ___ ___
Control    _____ _____      Control    _____ _____      Control    ____ _____ __

Alarm 2    __. ____ ___.    ..:..  Alarm 2    __. ____ ___.    ..:..  Alarm 2    __. ____ ___.    ..:..
Alarm code _____ ____.____ Alarm code _____ ____.____ Alarm code _____ ___ ____ _____
Control    _____ _____      Control    _____ _____      Control    _____
```

Alarm 0   The cause of the most recent alarm with the time until when the corresponding alarm was active. With the cursor key down arrow, you reach the data of alarms 3 to 5.

11 System

11.1 General system settings

```
5 System

Device                   KL-6400
Type                         160
Software version         --.--.-
Software date         --/../___.

ENG, NLD, DEU, FRA, SPA, POL
HUN, RUS, RON, HRV, FIN, CES
ZHO, KOR                 English

1 Date/Time
2 Display
3 Remote control
```

Device   The name of the device, i.e. *KL-6400*.
Type   The type number of the device, i.e. *160 = KL-6400.*
Software version   The version number of the software in the KL-6400.
Software date   The date of the software in the KL-6400.

ENG, NLD ...   Enter here the language of the screen texts. You can also press and hold
   function key F1 and use the keys ◄ ► to select your language.

11.2 Date/Time   ## 11.3 Display   ## 11.4 Remote control

```
51 Date/Time          52 Display                    53 Remote control

Time        ..:..h    Fahrenheit            no       Disclaimer
Year          ---.                                   Manufacturer accepts no responsibility
Month          --     Brightness                     for damage when using Remote Control.
Day            --       on            100%           You need to provide a secure
                        off           015%           LAN environment shielded from the
                        On-time       300s           internet through a firewall.

                      Cursor left        yes          Remote control            yes
                                                      User                      ---.
                      Room numbers in status bar no   Access code               ----
                                                      IP address           ...-. ...-.-. --
```

Fahrenheit   By default, temperatures are displayed in °C. If *Fahrenheit* is set to *yes*,
                      temperatures will appear in °F.
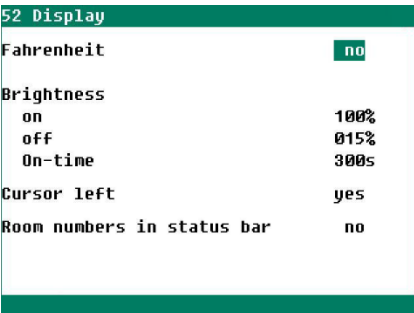
Brightness   The brightness of the backlight:
                      on   Brightness setting during operation mode.
                      off   Brightness setting during sleep mode
                      On-time Number of seconds the backlight remains on after the last key press.
                                0 = Backlight does not switch off

Cursor left   *yes* = move cursor to far left when editing
                      No = move cursor to far right when editing
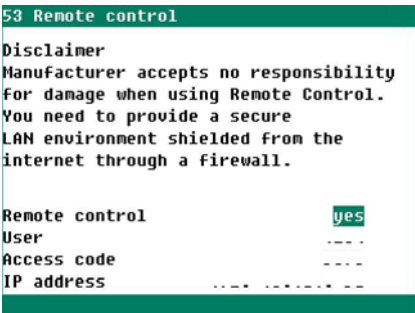
Room numbers in status bar Room numbers are in the status bar :
                      yes 001 002 003 004 005 006 007 008 009 010
                      no   ◄◄ room 1 ►►

                      ◄◄ ►► = select room with identical screen content

📄   *ANote-Remote-N-ENxxxxx*

12 Maintenance and check-up

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

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