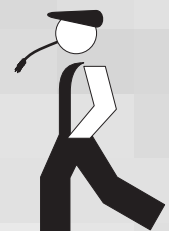


99-97-1965
(V 5.4)

Viper Climate and Production Computer User's Manual • UltiMatic



Program Version

The product described in this manual is computer based, and most functions are realised by software. This manual corresponds to:

- Software Version CPU 5.4

It was released in May, 2006.

Product and Documentation Changes

BIG DUTCHMAN reserve the right to change this document and the product herein described without further notice. In case of doubt, please contact BIG DUTCHMAN.

Latest date of change appears from the back page.

NOTE

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IMPORTANT

NOTES CONCERNING THE ALARM SYSTEM







Where climatic control is used in livestock buildings, breakdowns, malfunctions or faulty settings may cause substantial damage and financial losses. It is therefore most important to install a separate, independent alarm system, which monitors the house concurrently with the climate computer. According to EU-directive No. 91/629/EEC and 91/630/EEC an alarm system must be installed in any house that is mechanically ventilated.



Please note that the product liability clause of BIG DUTCHMAN's general terms and conditions of sale and delivery specifies that an alarm system must be installed.



In case of misoperation or improper use, ventilation systems can result in production loss or cause loss of lives among animals.

BIG DUTCHMAN recommend that ventilation systems should be mounted, operated and serviced only by trained staff and that a separate emergency opening unit and an alarm system be installed as well as maintained and tested at regular intervals, according to BIG DUTCHMAN's terms and conditions of sale and delivery.

1	INTRODUCTION	6
2	USER'S GUIDE	7
2.1	 Get started	7
2.1.1	Keyboard	7
2.1.2	Display and Menus	8
2.1.2.1	Outline Screen.....	8
2.1.2.2	Function Menus.....	10
2.2	Climate Functions in UltiMatic	11
2.2.1	 Temperature	11
2.2.1.1	Inside Temperature.....	12
2.2.1.2	Outside Temperature and Outside Temperature Curve.....	18
2.2.1.3	Heating.....	19
2.2.1.4	Cooling.....	23
2.2.1.5	Night Setback.....	24
2.2.2	 Humidity	27
2.2.2.1	Humidity Control	28
2.2.2.2	Humidification	29
2.2.2.3	Humidity Curve.....	30
2.2.2.4	Humidity Control Principle.....	30
2.2.3	 Ventilation	32
2.2.3.1	Minimum Ventilation.....	33
2.2.3.2	Maximum Ventilation	34
2.2.3.3	Zone Control – Air Intake	35
2.2.3.4	Zone Control – Air Outlet.....	36
2.2.3.5	CO ₂ Minimum Ventilation.....	38
2.2.3.6	Ventilation Status	39
2.2.4	 Tunnel	41
2.2.4.1	Air Speed.....	42
2.2.4.2	Maximum Air Speed	43
2.2.4.3	Setting the Chill Factor	43
2.2.4.4	Outside Temperature Limitation and Current Tunnel Start Temperature	43
2.2.4.5	Connecting or Disconnecting Heat Allowed in Tunnel	44
2.2.4.6	Pad Cooling.....	44
2.2.4.7	Tunnel Status.....	46
2.2.5	 Pressure Control	47

2.2.5.1	Reading the Pressure Demand	47
2.2.5.2	Setting and Reading the Pressure Level.....	48
2.2.6	 Auxiliary Sensors	49
2.2.6.1	Reading the Auxiliary Sensors.....	50
2.2.6.2	Auxiliary Sensor Curve.....	51
2.2.7	 Consumption	52
2.2.7.1	Ventilation Consumption	53
3	INDEX	54

1 INTRODUCTION

This user's manual deals with the operation of the Viper Climate and Production Computer. The user's manual provides the user with the fundamental knowledge about the functions of the computer that is required to ensure optimum use of Viper.

The manual contains a complete description of all the functions of the climate and production computer. Furthermore, the structure of the manual follows the menu structure of the computer. As the Viper software is modular software, this manual will contain sections that are irrelevant to the setup of your computer. If in doubt, please contact BIG DUTCHMAN service or your BIG DUTCHMAN dealer.

The Viper climate and production computer controls the climate according to the control principle UltiMatic.

With Ultimatic, the climate can be regulated both on the basis of P-band regulation and PID regulation. Viper regulates the climate itself, and it is therefore not necessary to adjust the climate settings on a daily basis. In UltiMatic, the climate is controlled on the basis of curves for temperature, heating, humidity, chill – outside temperature, chill – factor, minimum and maximum ventilation.

Viper is a climate and production computer which is capable both of regulating and monitoring the climate and production in poultry houses.

BIG DUTCHMAN would like to congratulate you on your choice of a new
Viper Climate and Production Computer

2 USER'S GUIDE

2.1 Get started

2.1.1 Keyboard

Outline menu key

- read the outline screen
- gain direct access to setting values

Main menu key

- read the values and settings in the function menu
- set function menus

Numeric keyboard

- used to enter values
- the keys 1-4 are used as shortcut keys when the outline screen is displayed

Information key

- gain access to the help menu

  Alarm lamp

Quick flashing → alarm

Slow flashing → acknowledged alarm

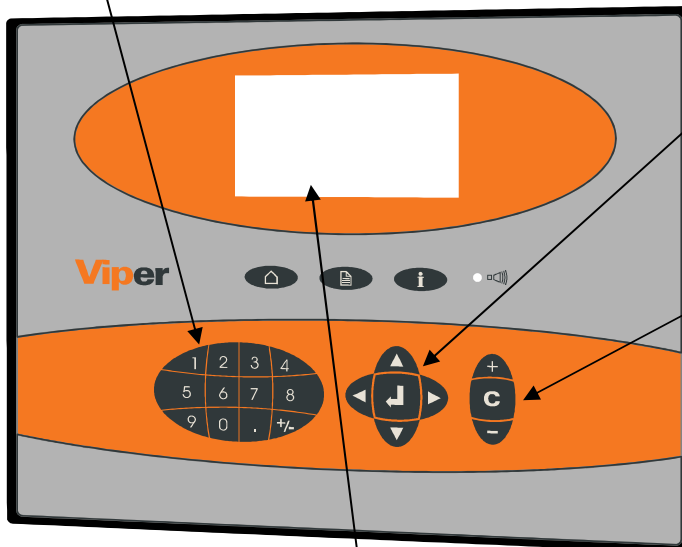
Constant light → non-acknowledged alarm where the error has disappeared

Arrow keys and enter key

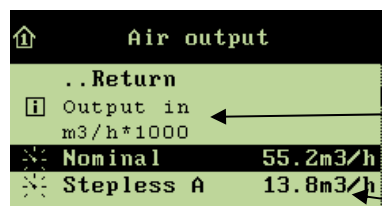
- with the arrow keys, you can move around in the menus
- with the enter key, you can connect or disconnect functions and accept changes

+ , - and C key

- used to change/delete settings



Display




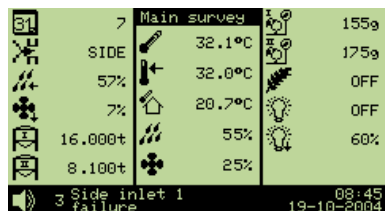
A scroll panel on the right side of the display shows you how long the menu is and where you are in the menu.

Values, which are readings or calculations, are in normal type. The values and functions, which you can change, are highlighted in bold type.

2.1.2 Display and Menus

2.1.2.1 Outline Screen

To gain access to the outline screen that provides you with an overview of the current conditions in the house, press the outline key  once. Here, you can read the values which you will be needing most often in your work.



- The icons indicate which menu item is involved
- The settings can be changed directly from the outline screen when the setting is selected


























Icon	Menu text	Icon	Menu text
	Temperature setpoint		Auxiliary sensor
	Indoor temperature		Negative pressure
	Outside temperature		Effective temperature
	Ventilation		Wind speed
	Minimum ventilation		Day no.
	Alarm		Feed
	Zone		Light
	Side mode		Light dimmer
	Tunnel		Silo
	Humidity		Animal weigher
	Humidity setpoint		Number of animals
	Cooling		Water
	Heating		

Table 1: Icons in the Outline Screen

2.1.2.1.1 Message line

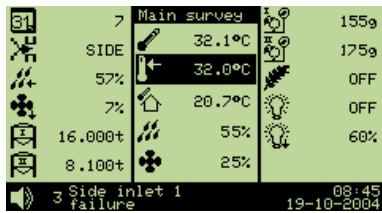
At the bottom, the display shows a message line, which for instance informs about acknowledged alarms and the fact that the computer is set to in-between function in connection with cleaning.

The current time and date are indicated farthest to the right.

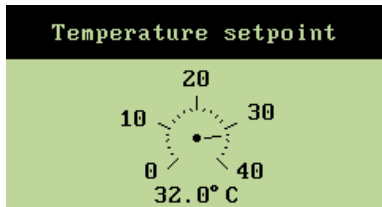
When, in connection with setup or service, the computer is set to manual regulation of the system, Viper will indicate the manual control in the message line.

The display reading returns to the outline screen when the computer has not been operated for ten minutes.

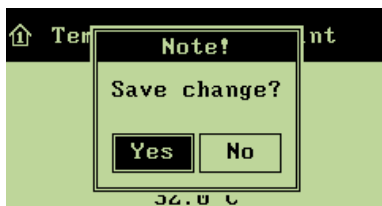
2.1.2.1.2 Changing a Setting via the Outline Screen,



→ select the required setting (e.g. **Temperature setpoint**), and press the rotary button



→ change the setting



→ when **Yes** is highlighted, press to approve and save the change

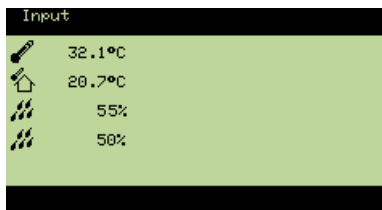
or

→ when **No** is highlighted, press to undo

2.1.2.1.3 Installation Overview via Outline View

The numeric keyboard can help you to get an overview of what has been installed on inputs and outputs as well as which climate and production functions have been installed.

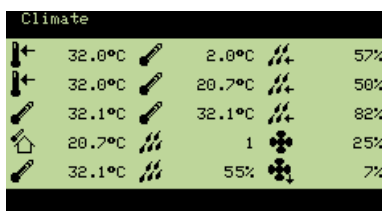
2.1.2.1.3.1 Outline of Inputs



→ press **1** on the numeric keyboard

From this menu, you can read the values of the individual inputs.

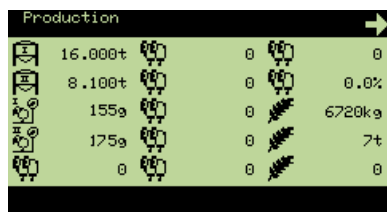
2.1.2.1.3.2 Outline of Climate Functions



→ press **2** on the numeric keyboard

From this menu, you have direct access to change the values set. (e.g. **Temperature setpoint**)

2.1.2.1.3.3 Outline of Production Functions

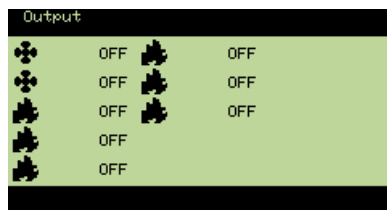


→ press **3** on the numeric keyboard

From this menu, you can read the values of the installed production functions.

In the right corner of the display an arrow indicates if more functions are available than shown in the display.


2.1.2.1.3.4 Outline of Outputs

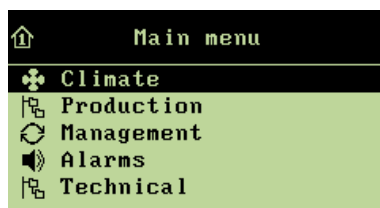


→ press **4** on the numeric keyboard

From this menu, you can read which functions are active/inactive.

2.1.2.2 Function Menus

To gain access to reading and setting the menus, press the  main menu key. The Climate, Production, Management and Alarms menus are for the everyday user while the menus under Technical have to be changed only if changes are made to the actual installation (if necessary, see the *Technical Manual*).



All the Viper functions can be accessed via these menus by selecting the required function (e.g. **Climate**), and pressing the rotary button

(an outline of the functions of the individual menu is provided at the start of each menu section).


































Icon	Function	Icon	Function
	Setting		Options
	Reading		More submenus
	Connect		Curve setting
	Disconnect		Entering of code/name

Table 2: Operating icons

2.2 Climate Functions in UltiMatic

2.2.1 Temperature

	1 st level		2 nd level	
	Inside temperature	 Temperature setpoint	22.0 °C	
 Zone 1 offset		1.0 °C		
 Zone 2 offset		1.0 °C		
 Temp. setpoint w. additions		22.0 °C		
 Current temp.		21.8 °C		
 Current tunnel temp.		20.0 °C		
 Heat zone 1-6 temp.		18.0 °C		
 Brooding zone 1-4 temp.		18.0 °C		
 Trend temperature				
 Lowest temp. 24 h		21.2 °C		
 Highest temp. 24 h		22.2 °C		
 Comfort temp.		2.0 °C		
 Extra vent.		2 °C		
Outside temperature	 Outside temperature	20.7 °C		
	 Trend outside temp.			
Heating	<input checked="" type="checkbox"/> Active			
	 Heaters		 Heater 1-6 temp. setpoint	18.0 °C
			 Heater 1-6 demand	0 %
			 Minimum heating	0 %
			 Minimum heating activate	- 5 °C
	 Brooding heaters		 Heater 1-4 temp. setpoint	18.0 °C
			 Heater 1-4 demand	0 %
			 Minimum heating	0 %
			<input checked="" type="checkbox"/> Minimum heating activate	









	1 st level		2 nd level
	Cooling	 Cooling requirement	0 %
 Cooling temp.		2 °C	
 Stop cooling		85 %	
Night setback	 Actual setback	0.0 °C	
	 Night temp.	- 2 °C	
	 Start time	20:00:00	
	 Stop time	07:00:00	

Table 1: Outline of the temperature menu (changeable values are highlighted in bold types)

2.2.1.1 Inside Temperature

Viper controls the inside temperature according to the set temperature. The house is heated by the heat generated by the animals and possibly by a heating system.

When the inside temperature is too high, the Viper computer increases ventilation by supplying more fresh air, and when the temperature is too low, the computer limits ventilation in order to maintain the heat in the house.

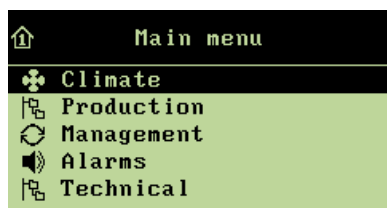
With Viper the house can be divided into three **Grow zones**. Each grow zone is assigned a number of temperature sensors to register the temperature in each zone. According to the age and the size of the animals Viper activates the zones (see the menu **Technical / Setup / Adjustment / Climate / Configuration** in the *Technical manual* regarding setting of number of grow zones).



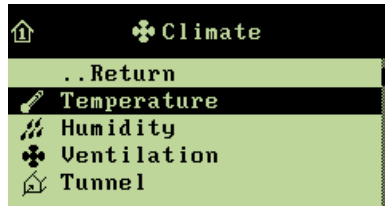
When the individual temperature sensor has been assigned to a zone, it will be active only when the associated zone is active. Thus, the sensors in **Grow zone 2** and **3** are inactive when **Grow zone 2** and **3** are inactive. Viper's temperature indication therefore depends on which grow zone is active.

All menu items ... in the temperature menu **Inside temperature** can be set by

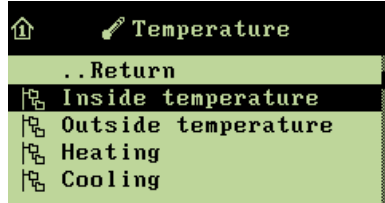
→ pressing the  menu key



→ select **Climate**, and press



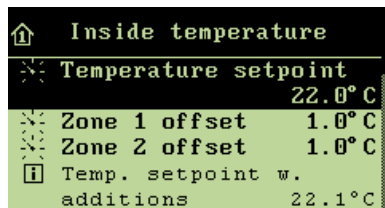
→ select **Temperature**, and press



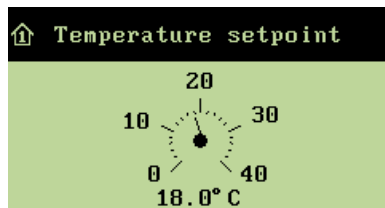
→ select **Inside temperature**, and press

2.2.1.1.1 Setting the Temperature Setpoint

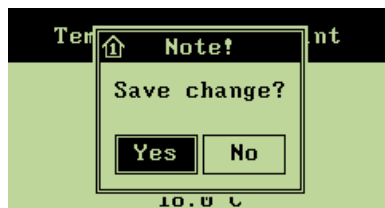
When you want to ... set the temperature, open the **Climate/Temperature/Inside temperature** menu, and



→ select **Temperature setpoint**, and press



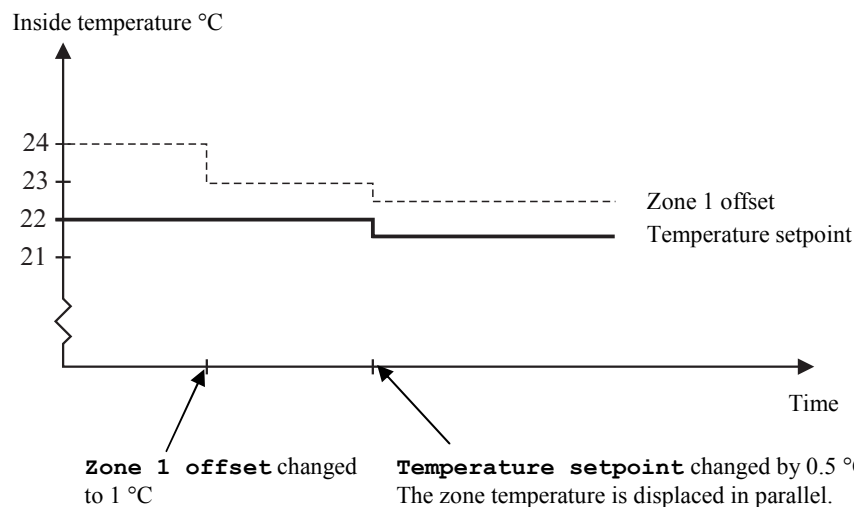
→ set the temperature, and press



→ when **Yes** is highlighted, press to save the change

2.2.1.1.2 Setting the Zone Offset

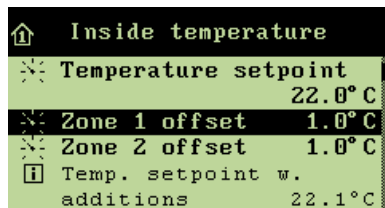
With zone control, you can set a temperature deviation for up to two zones in the house. In **Zone 1/2 offset**, set the required temperature deviation from **Temperature setpoint** for each zone. **Zone 1 offset** is set either as a positive or negative value. Thus, the function works either as an addition or reduction of the set temperature of the house.

Example 1: Zone temperature offset

*You must set **Zone 1 offset** to the number of degrees by which the **Temperature setpoint** is to be adjusted in the zone compared to the house temperature.*

When you want to ... set Zone 1/2 offset

open the **Climate/Temperature/Inside temperature** menu, and



→ select **Zone 1 offset**, and press



→ set the temperature, and when **Yes** is highlighted, press to save the change

Repeat the setting for **Zone 2 offset**.

2.2.1.1.3 Temperature Setpoint with Additions

Temperature setpoint is the basis of the calculations, which Viper makes of the ventilation requirement. If, however, the computer is set up with the functions comfort temperature or humidity control at temperature reduction, the computer will adjust the temperature setpoint by increasing or reducing it a few degrees and calculate the ventilation requirement based on this.

2.2.1.1.4 Tunnel Temperature

Viper continuously calculates the current cooling in the house. **Current tunnel temp.** indicates the temperature, which the animals sense, i.e. the effective temperature.

When you want to ... read the effective temperature, open the **Climate/Temperature/Inside temperature** menu, and

🏠 Inside temperature	
📄 Current temp.	20.7°C
📄 Current tunnel temp.	20.3°C
📄 Heat zone 1 temp.	19.0°C

→ read **Current tunnel temp.**

2.2.1.1.5 Heat Zone Temperature

Viper can control the temperature in up to six heat zones at once. **Heat zone 1 - 6 temp.** indicate the temperature in each heat zone.

When you want to ... read the temperature in a heat zone, open the **Climate/Temperature/Inside temperature** menu, and

🏠 Inside temperature	
📄 Current temp.	20.7°C
📄 Current tunnel temp.	20.3°C
📄 Heat zone 1 temp.	19.0°C

→ read **Heat zone 1 temp.**

2.2.1.1.6 Brooding Zone Temperature

With Viper the house can be divided into three grow zones. **Grow zone 1** can be divided into several smaller zones, brooding zones, where the heat is concentrated around a smaller area in the grow zone. Viper controls the temperature in the brooding zones and heats them by means of heaters.

When you want to ... read the temperature in a brooding zone, open the **Climate/Temperature/Inside temperature** menu, and

🏠 Inside temperature	
📄 Heat zone 6 temp.	19.0°C
📄 Brooding zone 1 temp.	19.0°C
📄 Brooding zone 2 temp.	

→ read **Brooding zone 1 temp.**

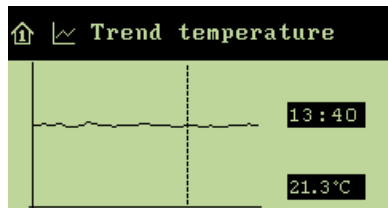
2.2.1.1.7 Temperature Curve

The **Trend temperature** curve provides you with a clear picture of the temperature development in the house during the last 24 hours.

When you want to ... read the temperature development in the house, open the **Climate/Temperature/Inside temperature** menu, and

🏠 Inside temperature	
📄 Trend temperature	
📄 Lowest temp. 24 h	16.2°C
📄 Highest temp. 24 h	20.0°C
📄 Comfort temp.	2.0°C

→ select **Trend temperature**, and press



- press the arrow keys to read the exact time and figure values
- press the enter key to return to the inside temperature menu

2.2.1.1.8 Lowest and Highest 24-hour Temperature

The 24h temperatures indicate the lowest and highest measured temperature within the last 24 hours.

2.2.1.1.9 Comfort Temperature

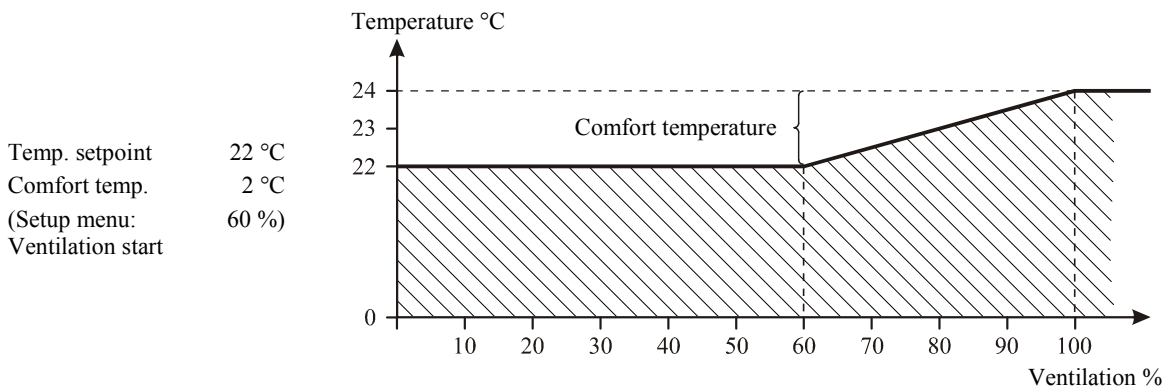
The comfort temperature is a function, which automatically increases the inside temperature to minimize possible draught problems in the house at extreme ventilation.

When Viper increases ventilation on warm days to keep the inside temperature down, the higher air speed in the house will make the air feel colder on the animals. Thus, for example 20 °C in calm weather feels warmer than 20 °C in windy weather.

To counteract the fact that the animals are chilled because of the higher air speed, Viper increases the inside temperature by the set **Comfort temp.** The inside temperature will then increase gradually by this number of degrees before ventilation increases to maximum. This temperature increase counteracts the fact that the animals feel the extreme ventilation as draught.

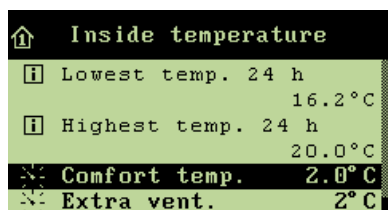
Viper activates the **Comfort temp.** function when the ventilation requirement is higher than the degree of ventilation to which the **Ventilation start** setting has been adjusted at setup.

Example 2: Comfort temperature

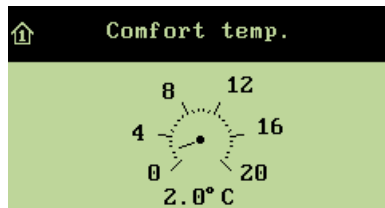


*You must set the **Comfort temp.** to the number of degrees by which the indoor temperature is to increase before the ventilation goes up to maximum.*

When you want to ... set the comfort temperature, open the **Climate/Temperature/Inside temperature** menu, and



- select **Comfort temp.**, and press



→ set a number of degrees, and when **Yes** is highlighted, press to save the change



Draught is a combination of high air speed and low temperature. Problems with draught in the house may therefore be caused by the fact that the indoor temperature has been set too low. Problems with draught can also result from situations with extreme ventilation in warm weather. The animals will go away from the areas in the house where they feel the draught.

2.2.1.1.10 Extra Ventilation

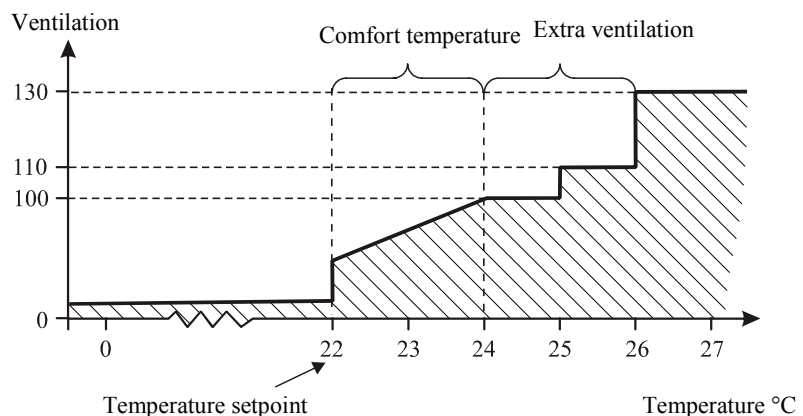
Extra ventilation is a function, which automatically increases the ventilation to cool the animals even at high outside temperatures.

Extra ventilation works by means of the capacity in the ventilation systems, which exceeds the calculated air requirement of the animals. It is not possible to bring the inside temperature down below the outside temperature, but the increased air speed in the house will cool the animals.

The Viper Climate and Production Computer activates the extra ventilation function so that ventilation gradually increases in steps when the inside temperature at maximum ventilation exceeds the **Temperature setpoint** by more than the number of degrees to which **Comfort temp.** has been set.

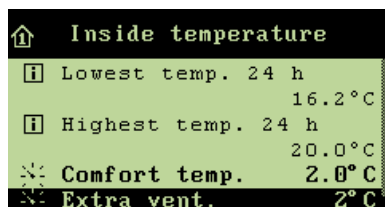
Example 3: Extra ventilation

Temp. setpoint 22 °C
 Comfort temp. 2 °C
 Extra ventilation 2 °C

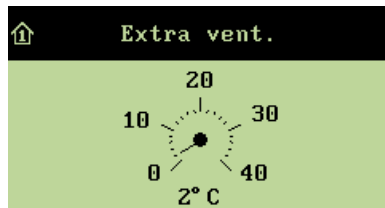


You must set **Extra vent.** to the number of degrees by which the temperature is to increase before all ventilation is connected.

When you want to ... set extra ventilation, open the **Climate/Temperature/Inside temperature** menu, and



→ select **Extra vent.**, and press



→ set a number of degrees, and when **Yes** is highlighted, press to save the change

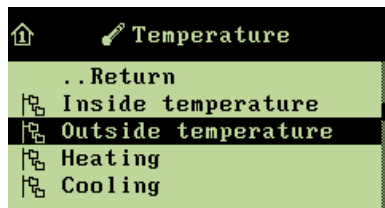


The air speed is of great importance to the animals. The higher the air speed is, the more it cools. When the weather is warm, high air speed feels like a pleasant breeze. When the weather is cold, even low air speed feels like an unpleasant draught.

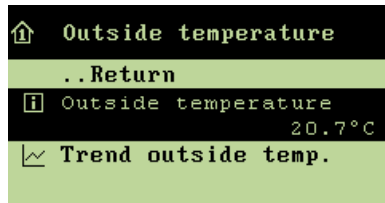
2.2.1.2 Outside Temperature and Outside Temperature Curve

Outside temperature indicates the current temperature outside the house. The **Trend outside temp.** curve indicates the temperature development outside the house during the last 24 hours.

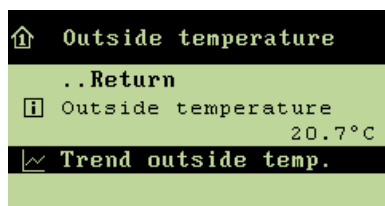
When you want to ... read the temperature or the temperature development outside the house, open the **Climate/Temperature** menu, and



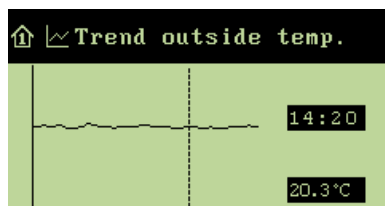
→ select **Outside temperature**, and press



→ read the **Outside temperature** menu item



→ select **Trend outside temp.**, and press



→ press the arrow keys to read the exact time and figure values

→ press the enter key to return to the outside temperature menu

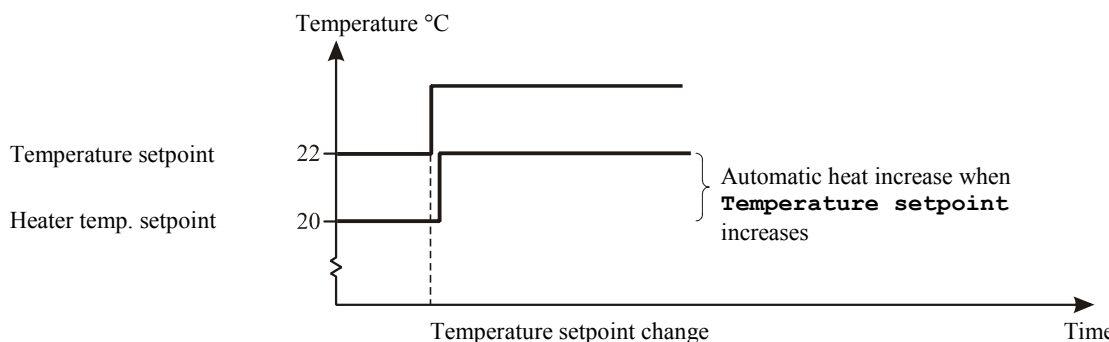
2.2.1.3 Heating

This section is relevant only to houses with heating systems.

In houses with heating systems, the Viper computer adjusts the inside temperature according to the set temperature and a lower temperature limit, for example **Heater 1 temp. setpoint**. Viper will gradually supply more heat when the inside temperature in the heat and brooding zones falls below the **Heater 1 temp. setpoint**.

Note that when you increase the **Temperature setpoint**, the **Heater 1 temp. setpoint** will automatically be increased correspondingly to ensure the same difference in degrees between the two settings.

Example 4: Heating



*If you want to increase **Temperature setpoint** without increasing **Heater 1 temp. setpoint**, you must, after having adjusted **Temperature setpoint**, reduce **Heater 1 temp. setpoint** by the corresponding number of degrees. You must set **Heater 1-6 temp. setpoint** to the lowest temperature allowed at the heater in question.*

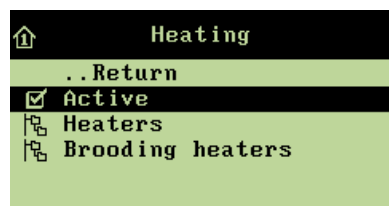
2.2.1.3.1 Connecting or Disconnecting Heating

When you want to stop heating in the house, disconnect **Heating**. Viper will then automatically turn off heating.

If you turn off heating manually without disconnecting **Heating** on the Viper Climate and Production Computer, adjustment of the ventilation will be inappropriate as the computer will try to base its regulation on the belief that heating is still available.

When you disconnect heating in a house with a humidity sensor, Viper will automatically adjust air humidity according to the principle of temperature reduction (see the section on Humidity/Humidity Principles).

When you want to ... connect or disconnect heating, open the **Climate/Temperature/Heating** menu and



→ select **Active**, and press to connect or disconnect

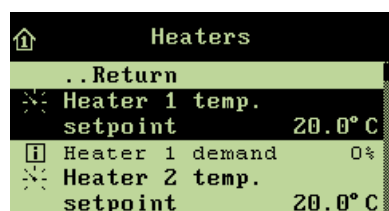
2.2.1.3.2 Heaters

Viper controls the heating level of the house according to the climate conditions in the active grow zone of the house. When only 1/3 and 2/3 of the house are used as grow zone (**Grow zone 1** or **2**), Viper can control both the heaters in the active zones and ensure that they run at minimum in the inactive grow zones. This way, you avoid condensate on the curtains, and the inactive zones are heated faster when they are to be used as grow zones again. You can use up to six **Heaters**.

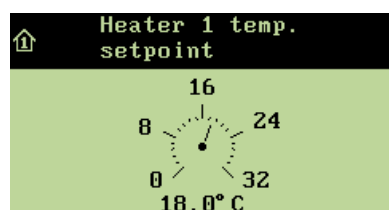
2.2.1.3.2.1 Setting the Heater Temperature and Reading the Heating Demand

In **Heater 1 temp. setpoint**, set the temperature, which is the lowest one allowed at the heater in question. When the inside temperature is lower than this setting, the heater supplies heat. **Heater 1 demand** indicates the heating demand percentage of the grow zone.

When you want to ... set the heater temperature or read the heater demand, open the **Climate/Temperature/Heating/Heaters** menu, and

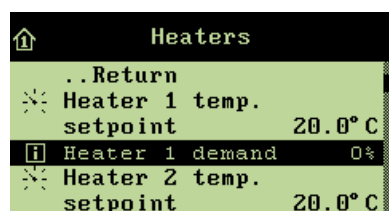


→ select **Heater 1 temp. setpoint**, and press



→ set the temperature, and when **Yes** is highlighted, press to approve the change

Repeat the setting for the installed number of heaters.

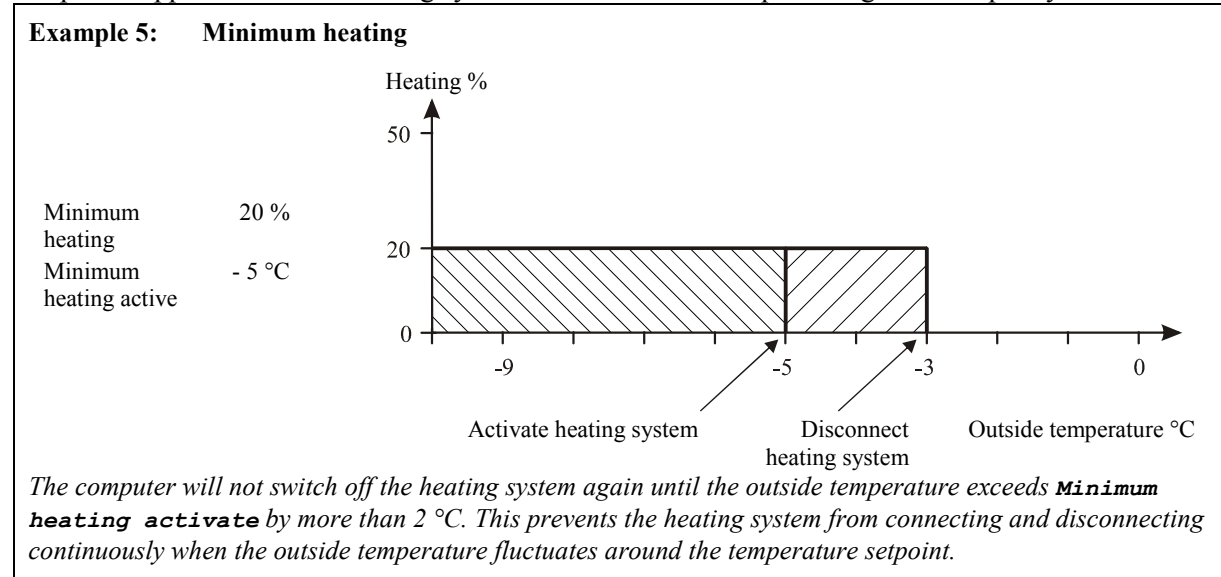


→ read **Heater 1 demand**

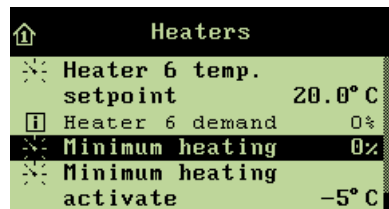
2.2.1.3.2.2 Setting Minimum Heating

Minimum heating is a function, which Viper will activate in cold weather. Minimum heating can, for example, minimize ice formation in the fresh air inlet.

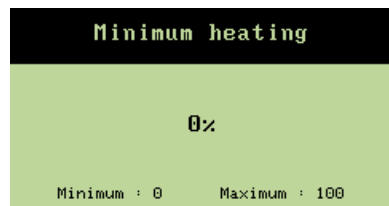
When the outside temperature falls to the temperature setpoint for **Minimum heating**, the Viper computer supplies heat. The heating system will start with a set percentage of its capacity.



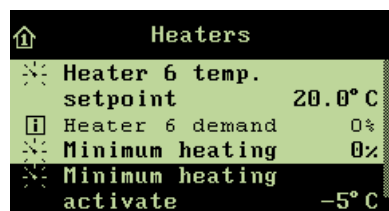
When you want to ... set minimum heating, open the **Climate/Temperature/Heating/Heaters** menu, and



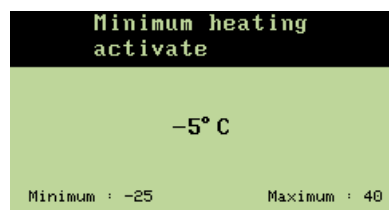
→ select **Minimum heating**, and press



→ set a percentage, and when **Yes** is highlighted, press to save the change



→ select **Minimum heating activate**, and press



→ set a temperature, and when **Yes** is highlighted, press to save the change

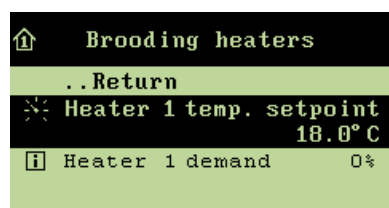
2.2.1.3.3 Brooding Heaters

Viper controls the heating in the brooding zones of the house, independently of the heating level in the rest of the house. As heating is concentrated around the brooding zones, the house temperature outside the zones can be kept down to reduce heating consumption. Viper controls the temperature in the brooding zones and heats them by means of heaters located in each zone. Each heater belongs to a specific brooding zone, and when you activate a brooding zone, you also activate the heater of the zone. You can use up to four **Brooding heaters**.

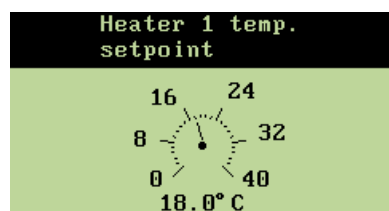
2.2.1.3.3.1 Setting the Brooding Heater Temperature and Reading the Heating Demand

In **Heater 1 temp. setpoint**, set the temperature, which is the lowest one allowed at the heater in question. When the inside temperature is lower than this setting, the heater supplies heat. **Heater 1 demand** indicates the heating demand percentage of the brooding zone.

When you want to ... set the brooding heater temperature or read the heating demand, open the **Climate/Temperature/Heating/Brooding heaters** menu and

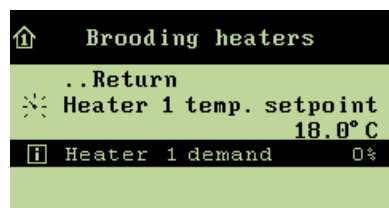


→ select **Heater 1 temp. setpoint**, and press



→ set a temperature, and when **Yes** is highlighted, press to approve the change

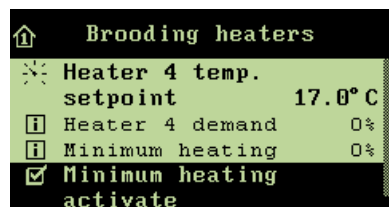
Repeat the setting for the installed number of heaters.



→ read **Heater 1 demand**

2.2.1.3.3.2 Connecting or Disconnecting Minimum Heating

When you want to ... connect or disconnect minimum heating, open the **Climate/Temperature/Heating/Brooding heaters** menu, and



→ select **Minimum heating activate**, and press to connect or disconnect

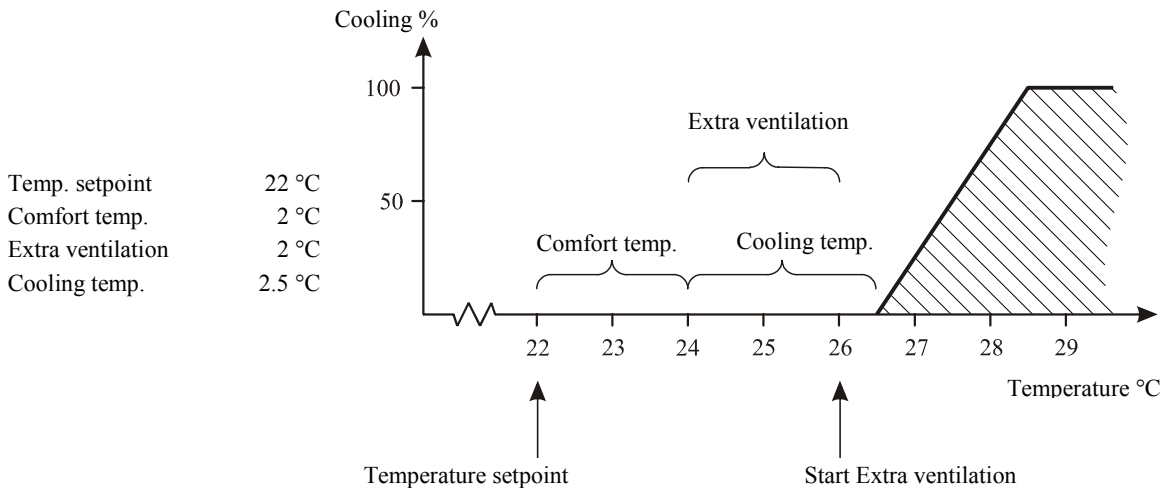
2.2.1.4 Cooling

This section is relevant only to houses with cooling systems.

Cooling is used in houses where ventilation cannot reduce the inside temperature sufficiently. Cooling has the advantage over ventilation in that it can bring the inside temperature down below the outside temperature. On the other hand, cooling will also increase the air humidity in the house.

Viper activates cooling when the inside temperature rises above the **Temperature setpoint** by more than the number of degrees to which **Comfort temp.** and **Cooling** together have been set.

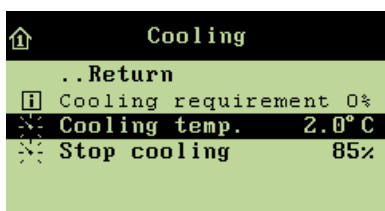
Example 6: Cooling



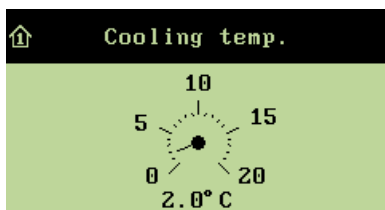
*You must start **Cooling** after **Extra vent.** to avoid increasing the house humidity too much. Therefore, the degree figure that activates **Cooling** must be higher than the degree figure for **Extra vent.***

2.2.1.4.1 Setting Cooling

When you want to ... set cooling, open the **Climate/Temperature/Cooling** menu, and



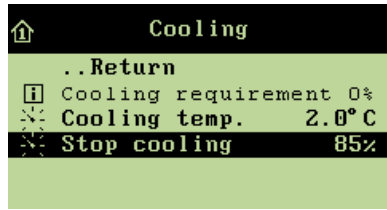
→ select **Cooling temp.**, and press



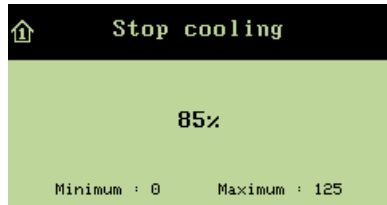
→ set a temperature, and when **Yes** is highlighted, press to save the change

2.2.1.4.2 Setting the Humidity Limit for Cooling

When you want to ... set a humidity limit for cooling, open the **C**limate/**T**emperature/**C**ooling menu, and



→ select **Stop cooling**, and press



→ set a percentage, and when **Yes** is highlighted, press to save the change



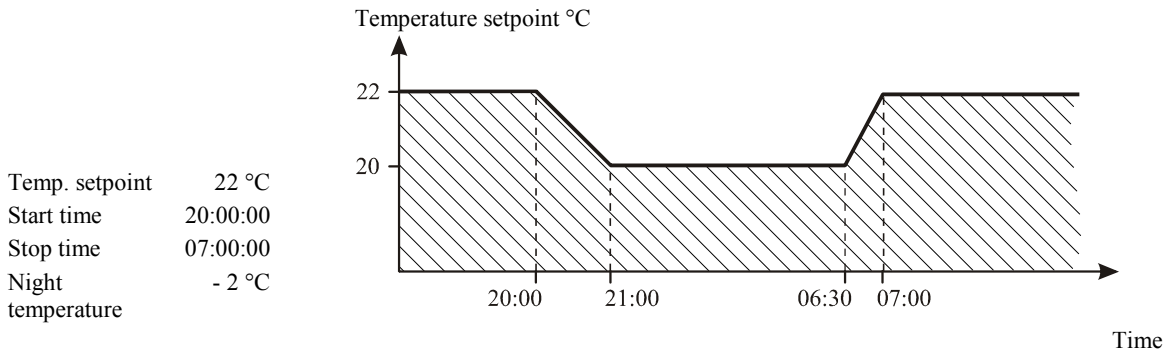
The combination of a high inside temperature and high air humidity can be life threatening to the animals. As cooling makes the house humidity increase, Viper will automatically disconnect cooling when the house humidity exceeds **Stop cooling** (normally 75-85 %).

2.2.1.5 Night Setback

Night setback is designed to lower the inside temperature for at set period every night to support the natural behaviour of the animals. Thus, a lower inside temperature will make the animals experience a normal circadian rhythm. Furthermore, the ventilation level will be relatively higher, thus ensuring a better air quality.

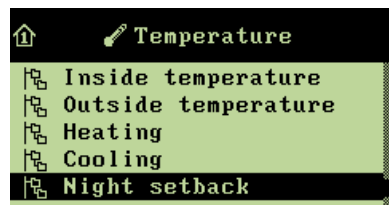
When the function has been activated, you can read the current night setback in the display. The function cannot be activated when the house is set to empty house.

Example 7: Night setback

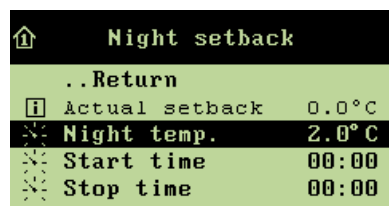


The inside temperature will gradually adapt to the night setback within the period of time the setback has been set to last.

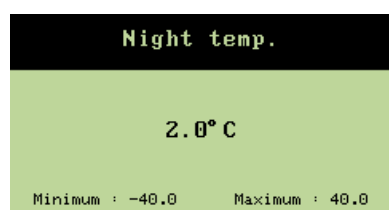
When you want to ... set a temperature for night setback, open the **Climate/Temperature** menu, and



→ select **Night setback**, and press

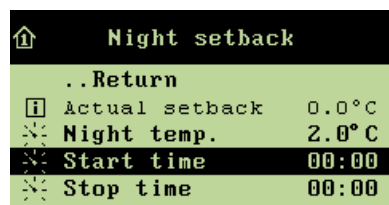


→ select **Night temp.**, and press



→ set a temperature, and when **Yes** is highlighted, press to save the change

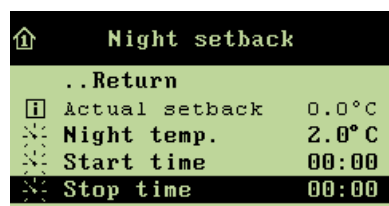
When you want to ... set a period for night setback, open the **Climate/Temperature/Night setback** menu, and



→ select **Start time**, and press



→ set the time, and when **Yes** is highlighted, press to save the change



→ select **Stop time**, and press



→ set the time, and when **Yes** is highlighted, press to save the change

This function is designed for a nightly temperature setback, but can be set to run at any time and to let the temperature rise (by setting the value to a positive figure).



At batch production, the function can be set to lower the temperature automatically during the batch. See the **Management/ Batch curves/ Climate** menu for information about how to set a curve for night setback.

2.2.2 Humidity









	1 st level		2 nd level
	<input checked="" type="checkbox"/>	Active	
	Current humidity	74 % RH	
	Humidity setpoint	75 % RH	
	Humidification setpoint	45 % RH	
	Humidification requirement	0 %	
	Trend humidity		
	Lowest humidity 24 h	72 %	
	Highest humidity 24 h	76 %	

Table 2: Outline of the humidity menu (changeable values are highlighted in bold types)

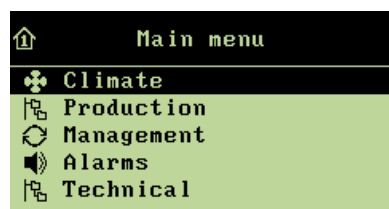
This section is relevant only to houses with humidity sensors.

The Viper Climate and Production Computer adjusts the house air humidity according to the humidity setpoint. Humidity is supplied to the house air partly from animals, feed, drinking water and litter, and partly from the cooling and humidification functions.

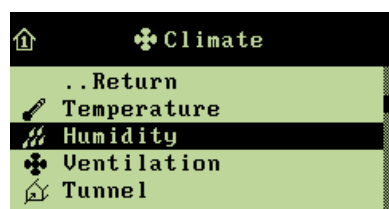
When the air humidity is higher than **Humidity setpoint**, the computer will increase ventilation to reduce the humidity level. When air humidity is lower than the setting, the computer will first reduce ventilation (when allowed by the temperature adjustment) and then activate humidification if the house has a humidification system.

All menu items ... under the **Humidity** menu can be set by

→ pressing the  menu key



→ select **Climate**, and press



→ select **Humidity**, and press

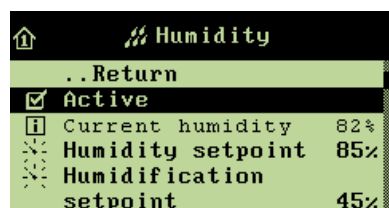


2.2.2.1 Humidity Control

2.2.2.1.1 Connecting or Disconnecting Humidity Control

When humidity control has been disconnected, the Viper computer regulates ventilation according solely to the inside temperature.

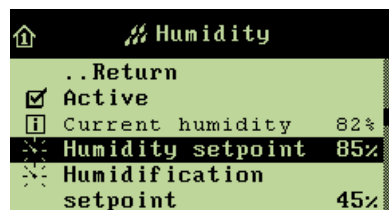
When you want to ... connect or disconnect humidity control, open the **Climate/Humidity** menu, and



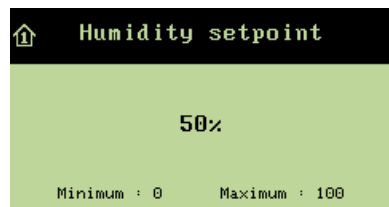
→ select **Active**, and press to connect or disconnect

2.2.2.1.2 Setting the Air Humidity

When you want to ... set air humidity, open the **Climate/Humidity** menu, and



→ select **Humidity setpoint**, and press



→ set a percentage, and when **Yes** is highlighted, press to save the change



It takes some time to change the humidity level in the house. Therefore, when you want to change the humidity setting, you must start by adjusting the **Humidity setpoint** by 2-4 %. Wait 12-24 hours and estimate whether you have obtained the required result. If you are in doubt about the humidity setting, please contact your adviser.

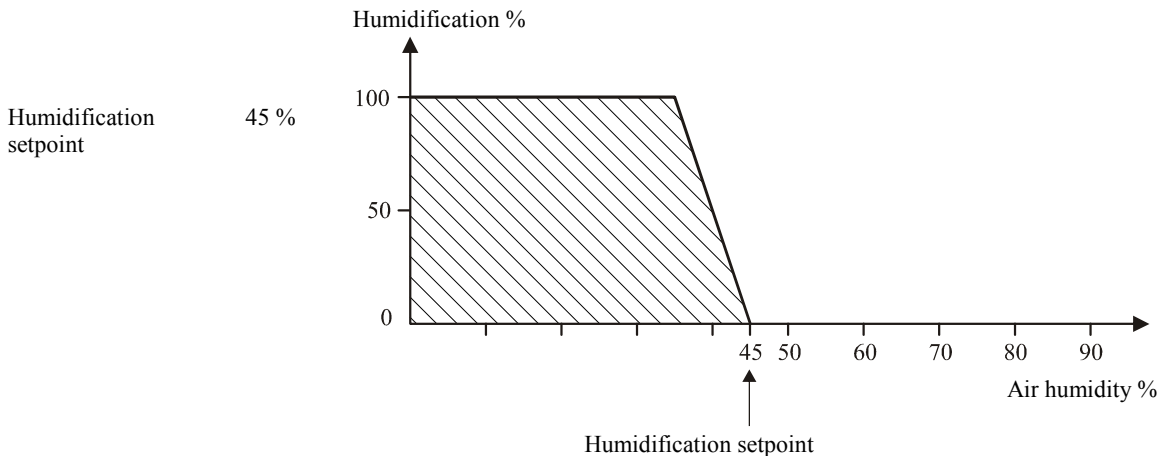
2.2.2.2 Humidification

This section is relevant only to houses with humidification systems.

Humidification increases the air humidity of the house by supplying atomized water to the air. It is important to maintain a certain air humidity, among other things to prevent dehydration of the animals' mucous membranes.

Viper Climate and Production Computer increases humidification as long as the air humidity is below the **Humidification setpoint**.

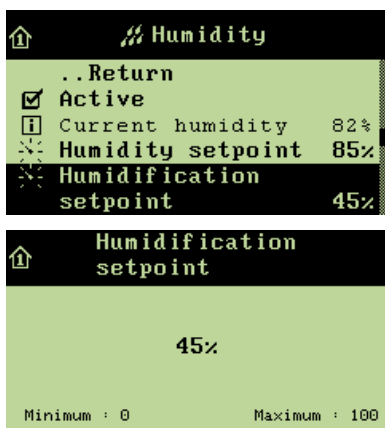
Example 8: Humidification



When the inside temperature is 2 °C below the **Temperature setpoint**, Viper is factory preset to limit humidification. Humidification will be disconnected if the inside temperature is 3 °C below the temperature setpoint. Humidification could otherwise make the inside temperature drop further.

2.2.2.2.1 Setting Humidification

When you want to ... set humidification, open the **Climate/Humidity** menu, and

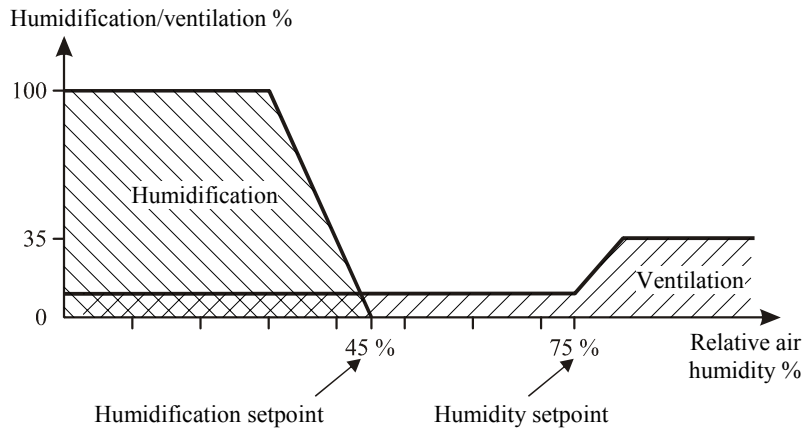


→ select **Humidification setpoint**, and press

→ set a percentage, and when **Yes** is highlighted, press to save the change

Example 9: Humidity and humidification setpoints

Humidity setpoint	75 %
Humidification setpoint	45 %
Minimum ventilation	10 %



There must be a difference of minimum 5 % between the **Humidity setpoint** and the **Humidification setpoint** to prevent the computer from ventilating and humidifying, alternately.

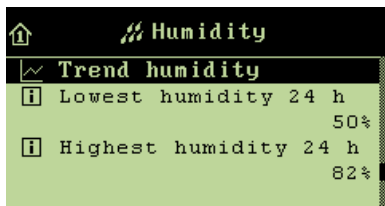


Directly, air humidity is not as important to the animals as air temperature and air speed since influence is required for quite some time before air humidity affects the well-being of the animals. However, the spreading of disease germs and microorganisms is reduced by a dry climate.

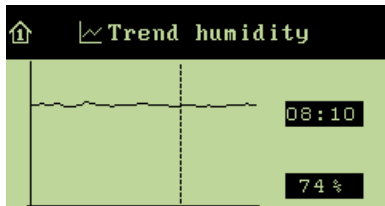
2.2.2.3 Humidity Curve

The **Trend humidity** curve indicates the humidity level in the house during the last 24 hours.

When you want to ... read the humidity development in the house, open the **Climate/Humidity** menu, and



→ select **Trend humidity**, and press



→ press the arrow keys to read the exact time and figure values

→ press the enter key to return to the humidity menu

2.2.2.4 Humidity Control Principle

With the Viper computer, you can adjust house humidity according to the humidity control principle with temperature reduction. In your daily work, you are only to adjust humidity via **Humidity setpoint**.



2.2.2.4.1 Humidity Control with Temperature Reduction

Viper Climate and Production Computer can be set up with the temperature reduction humidity principle when the animals can tolerate a temperature drop at high air humidity. This function limits the use of heating in the house, but it cannot keep the air humidity on the set humidity.

2.2.2.4.1.1 Temperature Reduction with Heating

When the Viper Climate and Production Computer has been set up to control humidity according to the temperature reduction principle, the computer will adjust a too high humidity level by reducing the setting of the inside temperature by a few degrees (**Reduction**).

At a lower temperature setting, Viper will thus increase ventilation and consequently the air change. When this has made the inside temperature fall, ventilation will decrease to minimum ventilation in order to limit the heat loss from ventilation. If this is insufficient to maintain the reduced **Heating temperature**, the computer will gradually supply more heat.

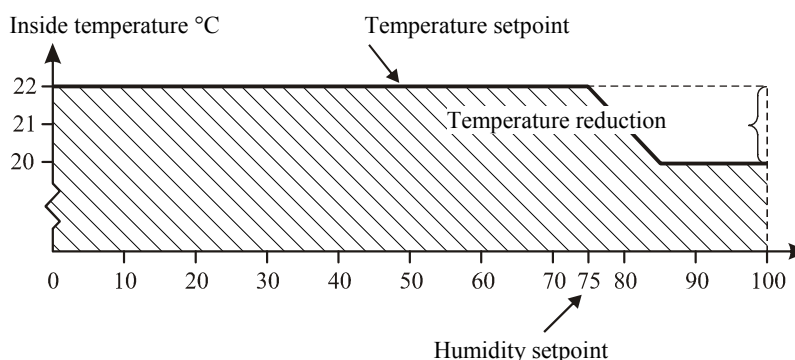
2.2.2.4.1.2 Temperature Reduction without Heating

When you have disconnected heating, Viper will automatically adjust the air humidity according to the temperature reduction principle.

The humidity control process is the same as for heating until the point where ventilation is reduced to minimum ventilation. Without heating, the inside temperature could continue to fall below the **Heating temperature**.

Example 10: Humidity control with temperature reduction

Temp. setpoint 22 °C
Humidity setpoint 75 %
(Setup menu: 2 °C)
Reduction



The Viper computer will lower the temperature setpoint by 1 °C each time the air humidity exceeds the humidity setpoint by 5 %.



Humidity control counteracts poor air quality and may also contribute to ensuring good litter. If the air and litter is good, the humidity setting may be increased, thus ensuring heat savings. Conversely, poor air and litter requires a lower humidity setting.

2.2.3 Ventilation

























	1 st level	2 nd level
	Ventilation requirement 49 %	
	Min. ventilation 9.3 %	
	Min. vent./animal 0.15 m³/h	
	Min. ventilation 9.3 %	
	Max. ventilation 300 %	
	Zone inlets	 Max. deviation 1.0 °C
		 Max. change 20 %
	2-zone outlets	 Ventilation Z1 27.2 %
		 Ventilation Z2 27.2 %
		 Max. deviation 3.0 °C
		 Max. change 30 %
	CO₂ min. ventilation	<input checked="" type="checkbox"/> Active
		 CO ₂ 2000 ppm
		 CO ₂ minimum ventilation 20.0 %
		 CO₂ setpoint 3000 ppm
	Ventilation status	 Side inlet 1-6 49 %
		 Air outlet 1/2 80 %
		 Stepless 1/2 70 %
		 Side stage fan 1-16 OFF
		 MultiStep 1-8 OFF

Table 3: Outline of the ventilation menu (changeable values are highlighted in bold types)

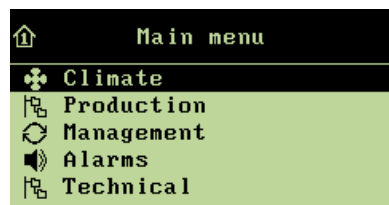
The house ventilation consists of an air intake and an air outlet. Apart from supplying fresh air to the house, the ventilation is to remove humidity and excess heat, if any.

Viper continuously adjusts the ventilation according to a calculation of the current ventilation requirement. Thus, the computer will increase or limit ventilation according to whether the inside temperature and air humidity are too high or too low.

When you want to adjust ventilation, the question is primarily which limits you want to set for how much or how little the ventilation is to run.

All menu items ... in the **ventilation** menu can be set by

→ pressing the  menu key



→ select **Climate**, and press



→ select **Ventilation**, and press

2.2.3.1 Minimum Ventilation

The minimum ventilation function supplies exactly the amount of air required in the house to ensure an acceptable air quality. The function is particularly relevant during periods of cold weather when it is not necessary to ventilate in order to reduce the inside temperature.

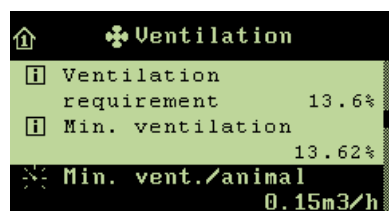
Viper calculates the necessary minimum ventilation based on the animals' requirement for fresh air. You can read the minimum ventilation either as a percentage of the ventilation system capacity or as m³/h per animal. The system will never ventilate less than the indicated minimum ventilation.

2.2.3.1.1 Setting the Minimum Ventilation per Animal

The animals' requirement for fresh air varies, depending on breed and weight. You must state the requirement as cubic metre air per hour (m³/h) per animal. You can find the correct figure in the technical literature or ask your adviser if in doubt.

Please note that the correct number of animals must be set in the **Management** menu.

When you want to ... set minimum ventilation per animal, open the **Climate/Ventilation** menu, and



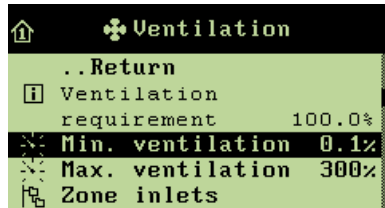
→ select **Min. vent./animal**, and press



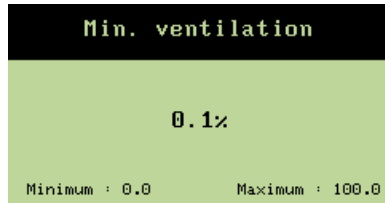
→ set a value, and when **Yes** is highlighted, press to save the change

2.2.3.1.2 Setting the Minimum Ventilation

When you want to ... set minimum ventilation as a percentage of the ventilation system capacity open the **Climate/Ventilation** menu, and



→ select **Min. ventilation**, and press



→ set a value, and when **Yes** is highlighted, press to save the change

2.2.3.2 Maximum Ventilation

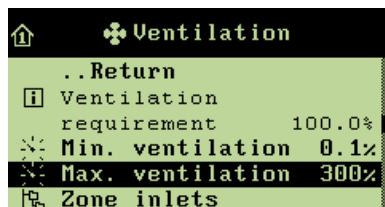
The maximum ventilation function sets a limit to how much of the ventilation system capacity (in per cent) the computer can activate. 100 % ventilation corresponds to the animals' calculated requirement, while ventilation utilising the total capacity of the system may reach, for example 160 % (see also the section regarding extra ventilation).

The function can be relevant to use during very high outside temperatures where ventilation utilising the total system capacity would make the inside temperature exceed the required setting. The function can also prevent, for example, small animals from being exposed to excessive ventilation.

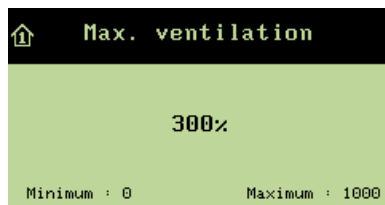
When you want to ignore the function, you must set **Max. ventilation** to 300 % (factory setting). This way, you make sure that no limit has actually been set for how much of the ventilation system capacity that can be used.

2.2.3.2.1 Setting the Maximum Ventilation

When you want to ... set maximum ventilation, open the **Climate/Ventilation** menu, and



→ select **Max. ventilation**, and press



→ set a value, and when **Yes** is highlighted, press to save the change



The ventilation is mainly to remove the water vapour, which comes from animals and manure, among other things. At the same time, the ventilation removes heat. However, this heat loss is necessary to be able to reduce the air humidity.

2.2.3.3 Zone Control – Air Intake

This section is relevant only to houses with zone controlled air intake.

Viper can control the air intake in up to six zones. Side inlets outside the active grow zone will be closed. With zone control, the zone air intake can be regulated independently of the general house air intake.

2.2.3.3.1 Setting Maximum Deviation

When Viper registers temperature deviations from the set temperature, **Temperature setpoint**, the computer regulates the position of the zone air intake.

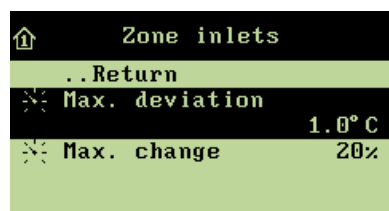
In the **Max. deviation** menu, set the temperature deviation required before the zone air intake is regulated to its maximum deviation, which is a deviation from the position of the general air intake of the house (see **Max. change**). Viper activates the **Max. change** function when temperature deviations are equal to or higher than the number of degrees set in **Max. deviation**.

At temperature deviations lower than the number of degrees set in **Max. deviation**, the zone inlet position is regulated too. Viper calculates the regulation of the air intake based on your settings in **Max. deviation**.

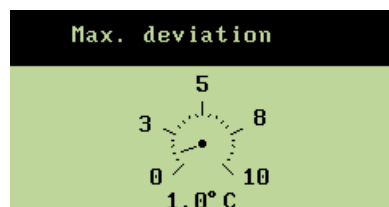
Example 11: Zone air intake position

<i>Set Max. deviation:</i>	<i>1.0 °C</i>
<i>Set Max. change:</i>	<i>20 %</i>
<i>Temperature deviation:</i>	<i>0.5 °C</i>
<i>Deviation of zone air intake position:</i>	<i>10 %</i>

When you want to ... set maximum deviation, open the **Climate/Ventilation/Zone inlets** menu, and



→ select **Max. deviation**, and press

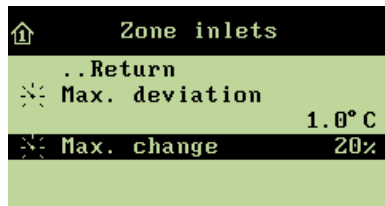


→ set a value, and when **Yes** is highlighted, press to save the change

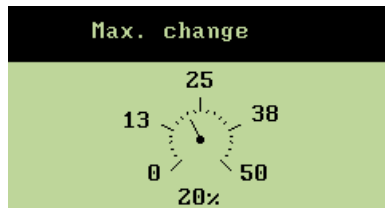
2.2.3.3.2 Setting Maximum Change

In the **Max. change** menu, you are to set a limit for how much the zone intake position is allowed to deviate from the position of the general house air intake.

When you want to ... set maximum change open the **Climate/Ventilation/Zone inlets** menu, and



→ select **Max. change**, and press



→ set a value, and when **Yes** is highlighted, press to save the change

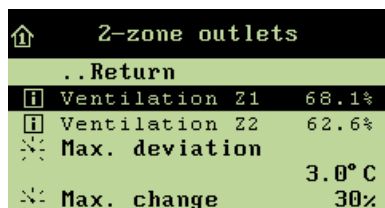
2.2.3.4 Zone Control – Air Outlet

This section is relevant only to houses with the MultiStep system.

Viper can control air outlet with the MultiStep system in two zones with one stepless exhaust unit and four ON/OFF exhaust units in each zone.

2.2.3.4.1 Reading the Ventilation Requirement

When you want to ... read the ventilation requirement of a zone open the **Climate/Ventilation/2-zone outlets** menu, and



→ read the required menu item

2.2.3.4.2 Setting Maximum Deviation

When Viper registers temperature deviations from the set temperature of the zones, the computer regulates the position of the zone air outlet.

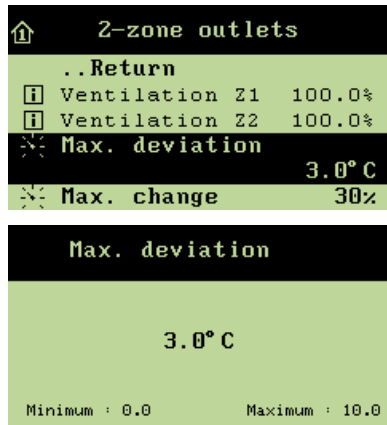
In the **Max. deviation** menu, set the temperature deviation required before the zone air outlet is regulated to its maximum deviation, which is a deviation from the position of the general air outlet of the house (see **Max. change**). Viper activates the **Max. change** function when temperature deviations are equal to or higher than the number of degrees set in **Max. deviation**.

At temperature deviations lower than the number of degrees set in **Max. deviation**, the zone outlet position is regulated too. Viper calculates the regulation of the air outlet based on your settings in **Max. deviation**.

Example 12: Zone air outlet position

<i>Set Max. deviation:</i>	<i>3.0 °C</i>
<i>Set Max. change:</i>	<i>30 %</i>
<i>Temperature deviation:</i>	<i>1.5 °C</i>
<i>Deviation of zone air outlet position:</i>	<i>15 %</i>

When you want to ... set maximum deviation
open the **Climate/Ventilation/2-zone outlets** menu, and



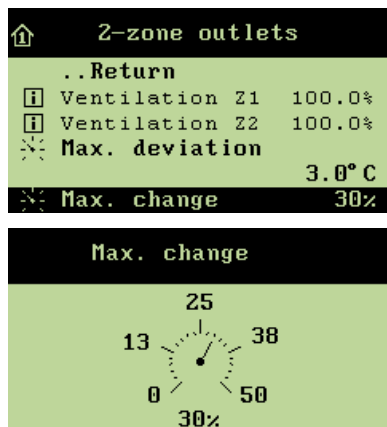
→ select **Max. deviation**, and press

→ set a value, and when **Yes** is highlighted, press to save the change

2.2.3.4.3 Setting Maximum Change

In the **Max. change** menu, you are to set a limit for how much the zone outlet position is allowed to deviate from the position of the general house air outlet.

When you want to ... set maximum change
open the **Climate/Ventilation/2-zone outlets** menu, and



→ select **Max. change**, and press

→ set a value, and when **Yes** is highlighted, press to save the change

2.2.3.5 CO₂ Minimum Ventilation

The **CO₂ minimum ventilation** is active when minimum ventilation is active. Viper's CO₂ function either increases or limits the minimum ventilation and the current ventilation level, depending on the CO₂ content of the house air, i.e. whether or not it is higher or lower than the **CO₂ setpoint**.

When the ventilation level of the house is higher than **Min. ventilation**, the CO₂ function is in principle disconnected, but if the CO₂ content of the house air exceeds the **CO₂ setpoint**, the CO₂ function increases the ventilation.

Minimum ventilation is reduced, if the CO₂ level is below the **CO₂ setpoint**.

In order to prevent a defective CO₂ sensor from causing a ventilation level which is far to low or high, Viper disconnects the CO₂ function and activates **Min. ventilation** when the CO₂ values from the sensor are either too high or too low in relation to what is realistic. Viper also disconnects the CO₂ function if the temperature in the house cannot be maintained due to malfunctioning heaters.

2.2.3.5.1 Connecting or Disconnecting Minimum Ventilation

When you want to ... connect or disconnect CO₂ minimum ventilation, open the **Climate/Ventilation/CO₂ min. ventilation** menu, and

🏠	CO2 min. ventilation
.. Return	
<input checked="" type="checkbox"/>	Active
<input type="checkbox"/>	CO2 3000ppm
<input type="checkbox"/>	CO2 minimum ventilation 30.00%
<input type="checkbox"/>	CO2 setpoint 2000ppm

→ select **Active**, and press to connect or disconnect

2.2.3.5.2 CO₂ and CO₂ Minimum Ventilation

In the **CO₂** menu, you can see the content of CO₂ in the house air. The **CO₂ minimum ventilation** menu indicates how large a percentage of the system capacity that is used to maintain the **CO₂ setpoint**.

When you want to ... read CO₂ and CO₂ minimum ventilation, open the **Climate/Ventilation/CO₂ min. ventilation** menu, and

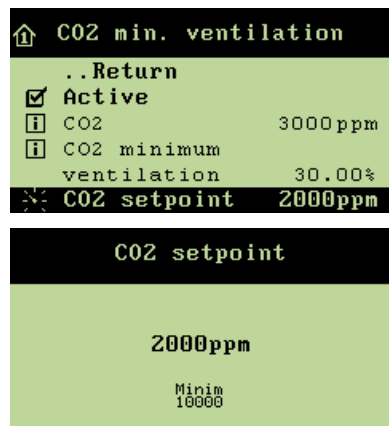
🏠	CO2 min. ventilation
.. Return	
<input checked="" type="checkbox"/>	Active
<input type="checkbox"/>	CO2 3000ppm
<input type="checkbox"/>	CO2 minimum ventilation 30.00%
<input type="checkbox"/>	CO2 setpoint 2000ppm

→ read the required menu item

2.2.3.5.3 Setting the CO₂ Setpoint

In **CO₂ Setpoint**, set the maximum CO₂ level allowed in the house. Viper will make sure to ventilate so that the CO₂ content of the house air does not exceed the **CO₂ setpoint**.

When you want to ... set the **CO₂ setpoint**, open the **Climate/Ventilation/CO₂ min. ventilation** menu, and



→ select **CO₂ setpoint**, and press

→ set a value, and when **yes** is highlighted, press to save the change

2.2.3.6 Ventilation Status

2.2.3.6.1 Stepless and MultiStep Position

The air outlet in the house consists partly of one or more stepless exhaust units, and partly of groups of ON/OFF exhaust units. The stepless exhaust unit is variable as the computer can adjust the motor performance and flap opening of the fan while the fans in the other exhaust units are either on or off.

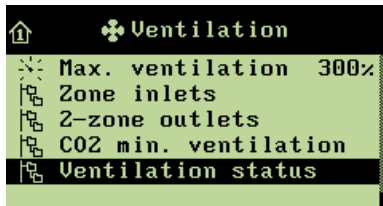
The ventilation system starts by connecting the stepless exhaust unit. When the ventilation requirement exceeds the capacity of the stepless exhaust unit, a group of the other exhaust units are connected while the output of the stepless exhaust unit is reduced. This way, the computer ensures stepless transition from one ventilation level to the next. If the ventilation requirement is further increased, the stepless exhaust unit will again run up to its maximum until it reduces its output when the next group of ON/OFF exhaust units is connected.

All exhaust units in the house are marked to indicate whether it is a stepless or an ON/OFF exhaust unit. Thus, the latter are numbered according to which MultiStep they belong. This way, it is possible to recognize the individual exhaust units and compare their actual output with the status that you can read in the **Ventilation** menu. This is particularly relevant in connection with fault finding.

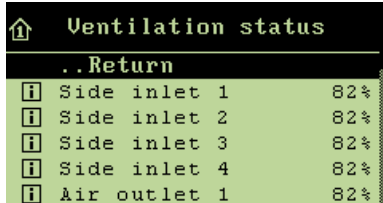
2.2.3.6.2 Flap Opening

The flap opening is a percentage indication of how much the flaps of both the air intake and the air outlet are open. If you are in doubt about the actual ventilation output, you can compare the reading of the ventilation status in the ventilation menu with the output that you can actually observe in the house. Thus, the percentage indications are particularly relevant in connection with fault finding.

When you want to ... read the ventilation status, open the **Climate/Ventilation** menu, and



→ select **Ventilation status**, and press



→ read the required menu item

2.2.4 Tunnel




















	1 st level	2 nd level
	 Current air speed 0.0 m/s	
	 Min. air speed 0.6 m/s	
	 Max. air speed 3.0 m/s	
	 Current chill factor 2.5	
	 Outside temp. limit 21 °C	
	 Current tunnel start temp. 0.0 °C	
	 Current tunnel stop temp. lim. 0.0 °C	
	<input type="checkbox"/> Heat allowed in tunnel	
	 Pad cooling	 Cool demand 0 %
		 Pad temperature 28.0 °C
		 Start speed 1.50 m/s
		 Stop speed 1.20 m/s
		 Cool temperature 2.0 °C
		 Humidity limit 85 %
	 Tunnel status	 Tunnel inlet 1-2 0 %
		 Tunnel stage fan 1-16 OFF
		 Tunnel MultiStep 1-8 OFF

Table 4: Outline of the tunnel menu (changeable values are highlighted in bold types)

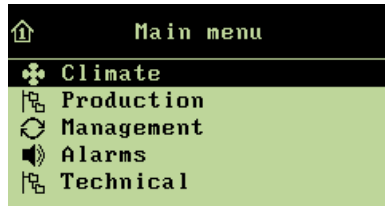
This section is relevant only to houses with tunnel ventilation.

Tunnel ventilation is used at high temperatures and when the air intake through wall outlets and curtains is insufficient to keep the animals chilled. For tunnel ventilation, air is taken in through a pad cooling system located at one end of the house. Air is vented out through several gable fans at the other end of the house, which makes the air move in a lengthwise direction in the house. The gable fans ensure high air speed in the house and with the effect of the pad cooling the temperature in the house is reduced. Pads are kept moist through recirculation of water, and the gable fans automatically draw fresh air through the moist pads and absorb water vapour from them.

The high air speed at tunnel ventilation makes the measured temperature feel colder, making it more comfortable for the animals.

All menu items ... in the **Tunnel** menu can be read and set by

→ pressing the  menu key



→ select **Climate**, and press



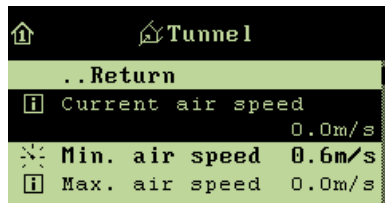
→ select **Tunnel**, and press

2.2.4.1 Air Speed

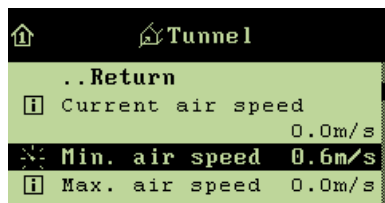
Viper continuously calculates the current air speed in the house; you can read the speed in the **Current air speed** menu.

In **Min. air speed**, set the lowest air speed, which can be accepted in tunnel mode. If the speed is too low, the temperature difference between the two ends of the house will be too high. Therefore, there is a lower limit for the air speed in tunnel mode.

When you want to ... read the current air speed or set the minimum air speed, open the **Climate/Tunnel** menu, and



→ read the **Current air speed**



→ select **Min. air speed**, and press

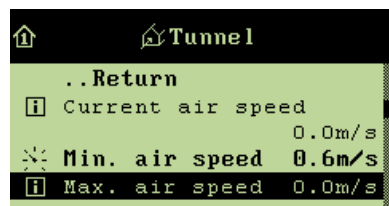


→ set the air speed, and when **Yes** is highlighted, press to approve the change

2.2.4.2 Maximum Air Speed

The Viper computer calculates the maximum air speed, which can be achieved in tunnel mode.

When you want to ... read the maximum air speed, open the **Climate/Tunnel** menu, and



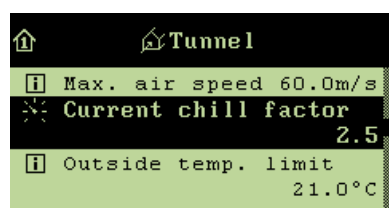
→ read **Max. air speed**

2.2.4.3 Setting the Chill Factor

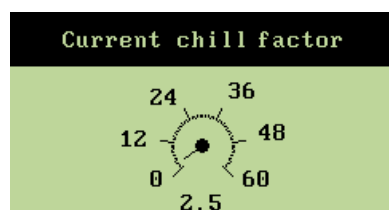
Under **Current chill factor**, indicate the degree of chill, which the animals will feel at an air speed of 1 m/s on the current day number.

The chill factor depends on the age and breed of the animals; the younger the animals are, the colder they feel the temperature at a given air speed. For full-grown animals, chilling at an air speed of 1.5 m/s will, for example feel like: $1.5 \text{ m/s} \times \text{chill factor } 3 = 4.5 \text{ }^\circ\text{C}$. For day-old chickens, chilling will feel like: $1.5 \text{ m/s} \times \text{chill factor } 8 = 12 \text{ }^\circ\text{C}$.

When you want to ... set the current chill factor, open the **Climate/Tunnel** menu, and



→ select **Correction chill factor**, and press



→ set a factor, and when **Yes** is highlighted, press to save the change

2.2.4.4 Outside Temperature Limitation and Current Tunnel Start Temperature

The Viper computer calculates which outside temperature is required before tunnel ventilation can be activated. The outside temperature must be equal to or higher than the **Outside temp. limit**.

In **Current tunnel start temp.**, you can see at which inside temperature tunnel ventilation is activated.

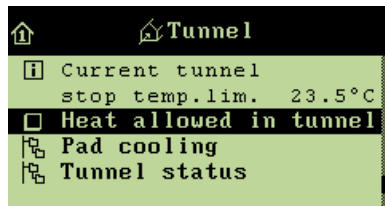
The computer also calculates which inside temperature is required before tunnel ventilation can be stopped. The inside temperature must be equal to or lower than the **Current tunnel stop temp. lim.**

Tunnel ventilation cannot be activated until both the outside and inside temperatures are sufficiently high.

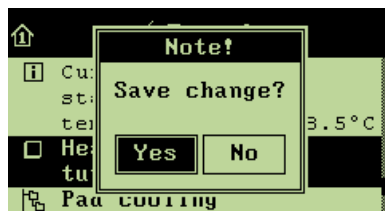
2.2.4.5 Connecting or Disconnecting Heat Allowed in Tunnel

When heating is required in houses ventilated by means of tunnel ventilation only, you can connect the **Heat allowed in tunnel** function.

When you want to ... connect or disconnect **Heat allowed in tunnel**, open the **Climate/Tunnel** menu, and



→ select **Heat allowed in tunnel**, and press



→ when **Yes** is highlighted, press to approve the change

2.2.4.6 Pad Cooling

2.2.4.6.1 Cool Demand and Pad Temperature

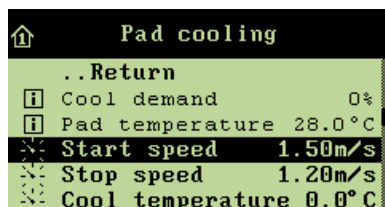
Cool demand indicates the current cooling demand in tunnel ventilation. **Cool demand** is a value calculated between 0 and 100 %.

Pad temperature indicates the current temperature on the inside of the moist pads.

2.2.4.6.2 Setting the Air Speed at Start and Stop of Cooling

In the **Start speed** menu, set the air speed required before pad cooling is to start. In **Stop speed**, indicate the air speed required before pad cooling is to stop.

When you want to ... set the start and stop speed, open the **Climate/Tunnel/Pad cooling** menu, and



→ select **Start speed**, and press



→ set the air speed, and when **Yes** is highlighted, press to save the change

Repeat the setting for **Stop speed**.

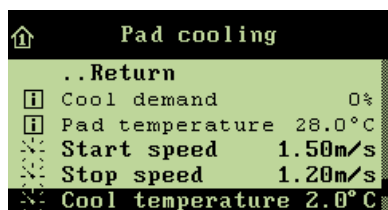
2.2.4.6.3 Setting the Cooling Temperature

In the **Cool temperature** menu, you can set an additional number of degrees by which the inside temperature is to increase before pad cooling is activated. The additional number of degrees set in **Cool Temperature** will be added to the **Temperature setpoint + (Start speed x Chill factor)**.

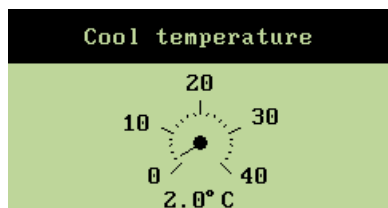
Example 13: Start of pad cooling

<i>Temperature setpoint:</i>	23 °C
<i>Start speed:</i>	3.0 m/s
<i>Chill factor:</i>	2.5
<i>Cool temperature:</i>	2 °C
<i>Calculation:</i>	$23 + (3.0 \times 2.5) + 2$
<i>Start of pad cooling:</i>	32.5 °C

When you want to ... set **Cool temperature**, open the **Climate/Tunnel/Pad cooling** menu, and



→ select **Cool temperature**, and press

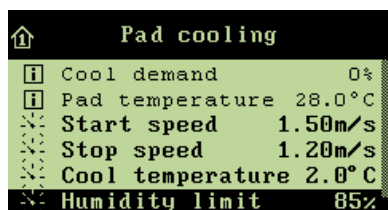


→ set a temperature, and when **Yes** is highlighted, press to save the change

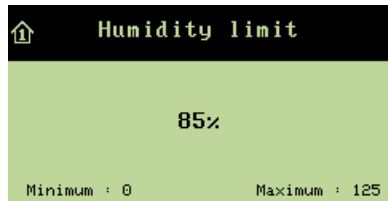
2.2.4.6.4 Setting Stop Cooling - Humidity Limit

When the house humidity is equal to or higher than the setting for **Humidity limit**, Viper stops the pad cooling.

When you want to ... set **Humidity limit**, open the **Climate/Tunnel/Pad cooling** menu, and



→ select **Humidity limit**, and press



→ set a value, and when **Yes** is highlighted, press to save the change

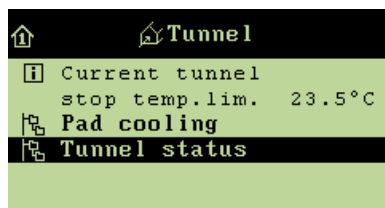


The combination of a high house temperature and high air humidity can be life threatening to the animals. Pad cooling should, therefore, be disconnected when the air humidity is very high as cooling will increase the air humidity further.

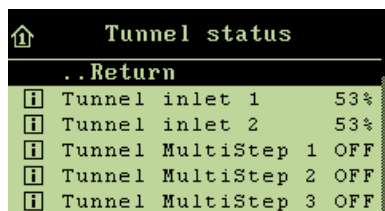
2.2.4.7 Tunnel Status

Tunnel ventilation consists partly of one or two stepless air intakes, and partly of a number of ON/OFF exhaust units. The flap opening is a percentage indication of how much the air intake is open (**Tunnel inlet 1 / 2**). At **Tunnel stage fan** or **Tunnel MultiStep**, the exhaust units are either on or off (**ON/OFF**).

When you want to ... read the **Tunnel status**, open the **Climate/Tunnel** menu, and



→ select **Tunnel status**, and press



→ read the required menu item

2.2.5 U Pressure Control





	1 st level		2 nd level
		Pressure demand	0 %
	Pressure setpoint	20 Pa	
	Pressure regulator actual value	20 Pa	

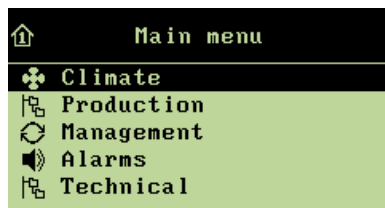
Table 5: Outline of the pressure control menu (changeable values are highlighted in bold types)

This section is relevant only to houses with pressure sensors.

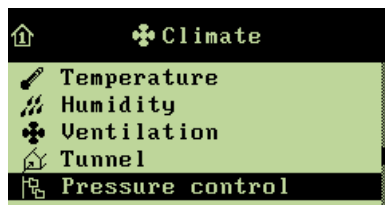
By means of a pressure sensor, the Viper computer can control the pressure level in the house. On the basis of the sensor measurements, Viper controls the opening of the flaps; this way, it maintains the required pressure level in the house (**Pressure setpoint**).

All menu items ... in the **Pressure control** menu can be set and read by

→ pressing the  menu key



→ select **Climate**, and press

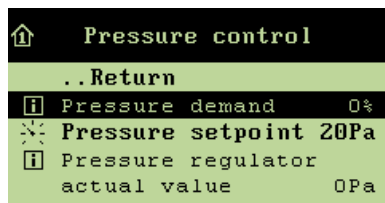


→ select **Pressure control**, and press

2.2.5.1 Reading the Pressure Demand

The **Pressure demand** menu item is a percentage indication of how much the flaps in the active grow zone are to be open to maintain the **Pressure setpoint**.

When you want to ... read the pressure demand, open the **Climate/Pressure control** menu, and

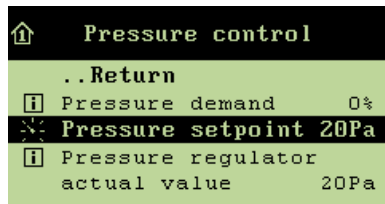


→ read the menu item

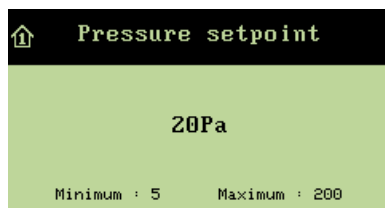
2.2.5.2 Setting and Reading the Pressure Level

In the **Pressure setpoint** menu, indicate the pressure level which Viper is to maintain. You can read the current pressure level in the house under the menu item **Pressure regulator actual value**.

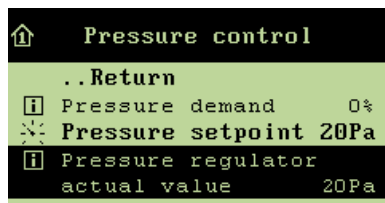
When you want to ... set the pressure or read the pressure level, open the **Climate/Pressure control** menu, and



→ select **Pressure setpoint**, and press



→ set a value, and when **Yes** is highlighted, press to save the change



→ read the menu item

2.2.6 Auxiliary Sensors



















































	1 st level	2 nd level																																																
	 Aux. sensor 1-4	<table border="0"> <tr> <td></td> <td>CO₂ sensor</td> <td>3000 ppm</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>Press. sensor</td> <td>20 pa</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>NH₃ sensor</td> <td>0 ppm</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>O₂ sensor</td> <td>0 ppm</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>Temperature sensor</td> <td>22.0 °C</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>Humidity sensor</td> <td>74.0 %</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>Air speed sensor</td> <td>1.5 m/s</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> <tr> <td></td> <td>Wind direction sensor</td> <td>0</td> </tr> <tr> <td></td> <td colspan="2">Trend aux. sensor 1-4</td> </tr> </table>		CO ₂ sensor	3000 ppm		Trend aux. sensor 1-4			Press. sensor	20 pa		Trend aux. sensor 1-4			NH ₃ sensor	0 ppm		Trend aux. sensor 1-4			O ₂ sensor	0 ppm		Trend aux. sensor 1-4			Temperature sensor	22.0 °C		Trend aux. sensor 1-4			Humidity sensor	74.0 %		Trend aux. sensor 1-4			Air speed sensor	1.5 m/s		Trend aux. sensor 1-4			Wind direction sensor	0		Trend aux. sensor 1-4	
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	Trend aux. sensor 1-4																																																	
	Wind direction sensor	0																																																
	Trend aux. sensor 1-4																																																	

Table 6: Outline of the auxiliary sensors menu

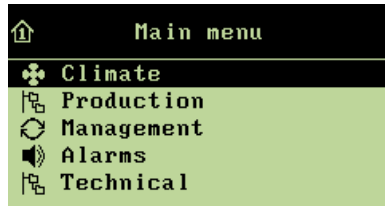
This section is relevant only to houses with auxiliary sensors.

Viper regulates the ventilation in the house on the basis of the registrations it receives from the installed auxiliary sensors. The **Aux. sensors** menu gives you a quick overview of Viper's registrations from the auxiliary sensors.

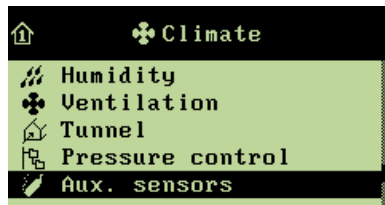
Depending on the content of CO₂, NH₃, O₂ and humidity in the house air, as well as the pressure and temperature, Viper will either increase or limit ventilation in the house. Furthermore, you can connect air speed and wind direction sensors that allow you to measure the wind direction and air speed outside the house. Viper can be connected to up to four auxiliary sensors; the **Aux. sensors** menu display depends on which types of auxiliary sensors you install.

All menu items ... in the **Aux. sensors** menu can be read by

→ pressing the  menu key



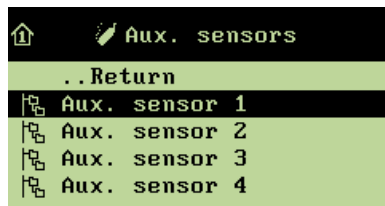
→ select **Climate**, and press



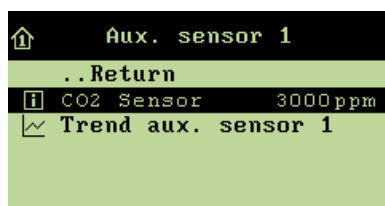
→ select **Aux. sensors**, and press

2.2.6.1 Reading the Auxiliary Sensors

When you want to ... read the current value of an auxiliary sensor; open the **Climate/Aux. sensors** menu, and



→ select **Aux. sensor 1**, and press



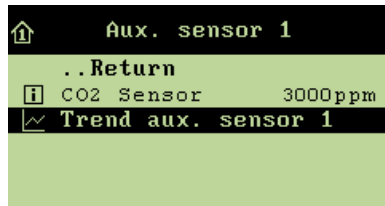
→ read the sensor registration

Repeat the reading for the installed number of sensors.

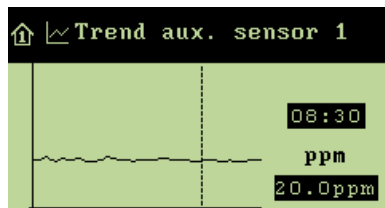
2.2.6.2 Auxiliary Sensor Curve

The auxiliary sensor trend curve indicates the registrations from the auxiliary sensor during the last 24 hours.

When you want to ... read the trend curve,
open the **Climate/Aux. sensors/Aux. sensor 1**, and



→ select **Trend aux. sensor 1**, and press



→ press the arrow keys to read the exact time and figure values

→ press the enter key to return to the **Aux. sensor 1** menu

Repeat the reading for the installed number of sensors.

2.2.7 Consumption







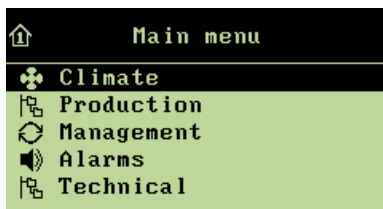
	1 st level		2 nd level	
	Ventilation consumption		This 4-hour period	78 %
		Previous 4-hour period	88 %	
		These 24 hours	110 %	
		Previous 24 hours	107 %	
		Total this batch	35.3 H	

Table 7: Outline of the consumption menu

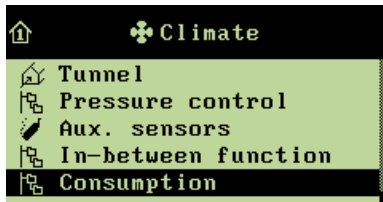
Viper Climate and Production Computer enables you to follow the development of the ventilation consumption. You can read both the current consumption and the consumption in relation to previous consumption indications.

All menu items ... in the **Consumption** menu can be read by

→ pressing the  menu key



→ select **Climate**, and press



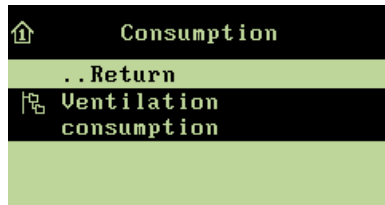
→ select **Consumption**, and press

2.2.7.1 Ventilation Consumption

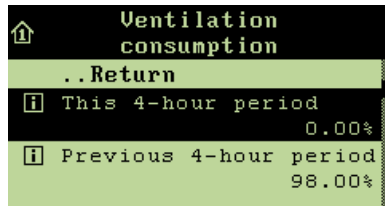
Ventilation consumption is calculated as the average output for the previous four hours and for the previous 24 hours. This output is converted into an average figure for the number of hours with 100 % ventilation during the entire batch process.

The short periodic calculations enable you to analyse deviations in the ventilation process at an earlier stage; this is particularly useful in connection with fault finding.

When you want to ... read the ventilation consumption, open the **Climate/Consumption** menu, and



→ select **Ventilation consumption**, and press



→ read the various statements

3 INDEX

A

actual setback	12
air outlet.....	32
air speed.....	16;17;18;30;41;42;43;44;49
air speed sensor	49
arrow keys	16;18;30;51
auxiliary sensor.....	49;50;51

B

batch curves.....	26
brooding heater temperature	22
brooding heaters	11;22
brooding zone.....	11;15;19;22
brooding zone temperature	15

C

chill factor	43;45
CO ₂ minimum ventilation.....	32;38;39
CO ₂ sensor.....	38;49
CO ₂ setpoint	32;38;39
comfort temperature	11;14;16;17;23
consumption	52;53
cool demand	41;44
cool temperature	41;45
cooling requirement.....	12
cooling temperature	12;23
current air speed	41;42
current chill factor	41;43
current humidity	27
current temperature.....	11;18;44
current tunnel start temperature	41;43
current tunnel temperature.....	11;14;15

D

day number	43
------------------	----

E

empty house.....	24
enter key	16;18;30;51
extra ventilation	11;17;23;34

F

flap opening.....	39
-------------------	----

G

grow zone	12;15;20;35;47
-----------------	----------------

grow zone 1	15;20
grow zone 2	12

H

heat allowed in tunnel.....	41;44
heat zone	11;15
heat zone temperature.....	15
heater demand	20;22
heater temperature	20
heater temperature setpoint.....	19;20;22
heaters	11;15;20;21;22;38
heating.....	11;19;20;21;22
humidification setpoint.....	27;29;30
humidity	27;28;30
humidity control	31
humidity control with temperature reduction	31
humidity limit.....	24;45
humidity sensor	19;27
humidity setpoint.....	27;28;30;31

I

inside temperature	12;13;19;20;22;23;24;29;31;33;34
--------------------------	----------------------------------

M

maximum air speed	41;43
maximum ventilation.....	6;17;32;34
minimum air speed	41;42
minimum heating.....	11;21;22
minimum heating activate	11;21;22
minimum ventilation	30;31;32;33;34;38
minimum ventilation per animal	33
MultiStep.....	32;36;39

N

NH ₃ sensor	49
night setback.....	12;24;25
night temperature.....	12;24;25
number of animals.....	33

O

O ₂ sensor	49
outside temperature	11;18;21
outside temperature limit.....	41;43

P

pad.....	41;44;45;46
pad cooling.....	41;44;45;46
pad temperature	41;44
pressure control	47;48



pressure demand	47
pressure level	48
pressure regulator actual value	47;48
pressure setpoint	47;48

S

side inlet	32;35
side stage fan	32
start speed	41;44;45
stepless	32;39
stop cooling	12;24
stop speed	41;44

T

temperature reduction with heating	31
temperature reduction without heating	31
temperature sensor	12;49
temperature setpoint	11;13;14;19;21;35
trend humidity	27;30
trend outside temperature	11;18
trend temperature	11;15

tunnel	41;42;43;44;46
tunnel inlet	41;46
tunnel MultiStep	41;46
tunnel stage fan	41;46
tunnel status	41;46

U

UltiMatic	1;6;11
-----------------	--------

V

ventilation requirement	14;16;32;36;39
ventilation start	16
ventilation status	32;40

W

wind direction sensor	49
-----------------------------	----

