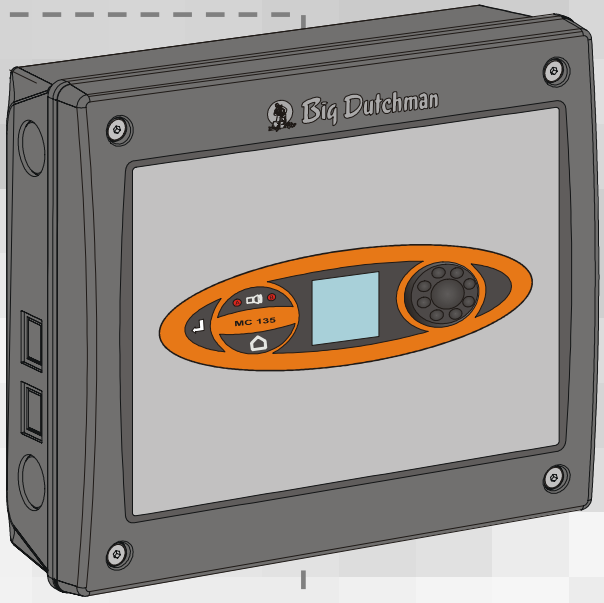
# MC 135CT Climate Computer
# User's Manual

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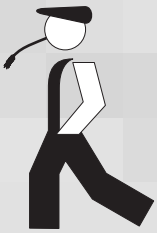


Big Dutchman

## 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 5.2

It was released in June 2007.

## 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 of this manual.**

**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 all mechanically ventilated houses.

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.

## Note

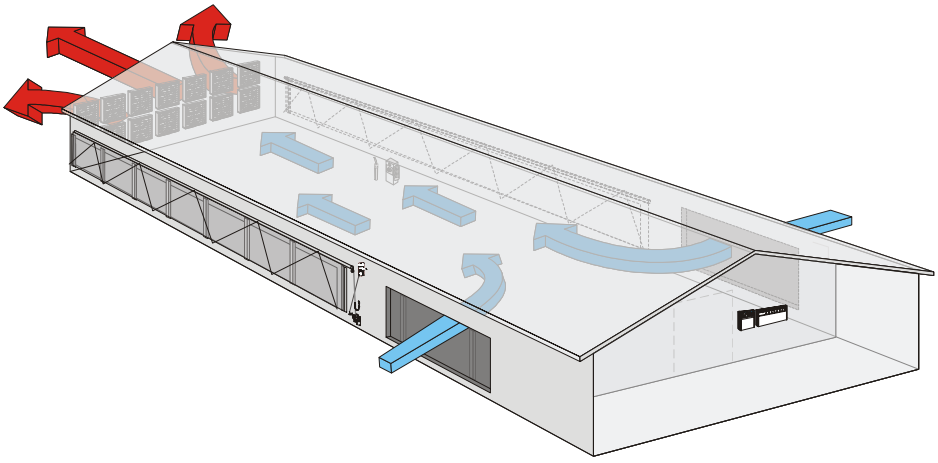
# INTRODUCTION

This user's manual deals with the operation of the MC 135CT Climate 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 MC 135CT Climate Computer.

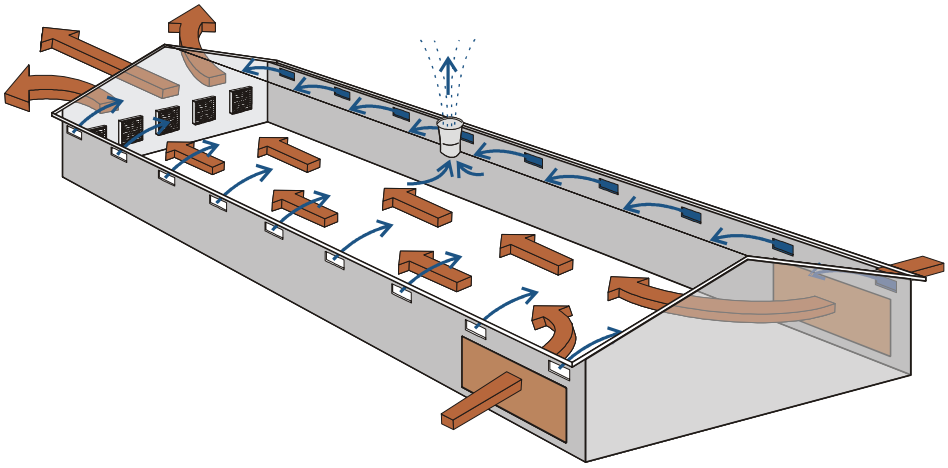
The manual contains a complete description of all the functions of the climate computer and the structure of the manual follows the menu structure of the computer. As the MC 135CT software is modular software, this manual may include sections that are irrelevant to the setup of your computer. If in doubt about the operation, please contact Big Dutchman or your dealer.

MC 135CT is a Combi-Tunnel climate computer for control and monitoring of the climate in a single zone house with heating zone. MC 135CT can control the ventilation both as Tunnel and Combi-Tunnel.

**Tunnel**



**Combi-Tunnel**



Big Dutchman would like to congratulate you on your choice of a new

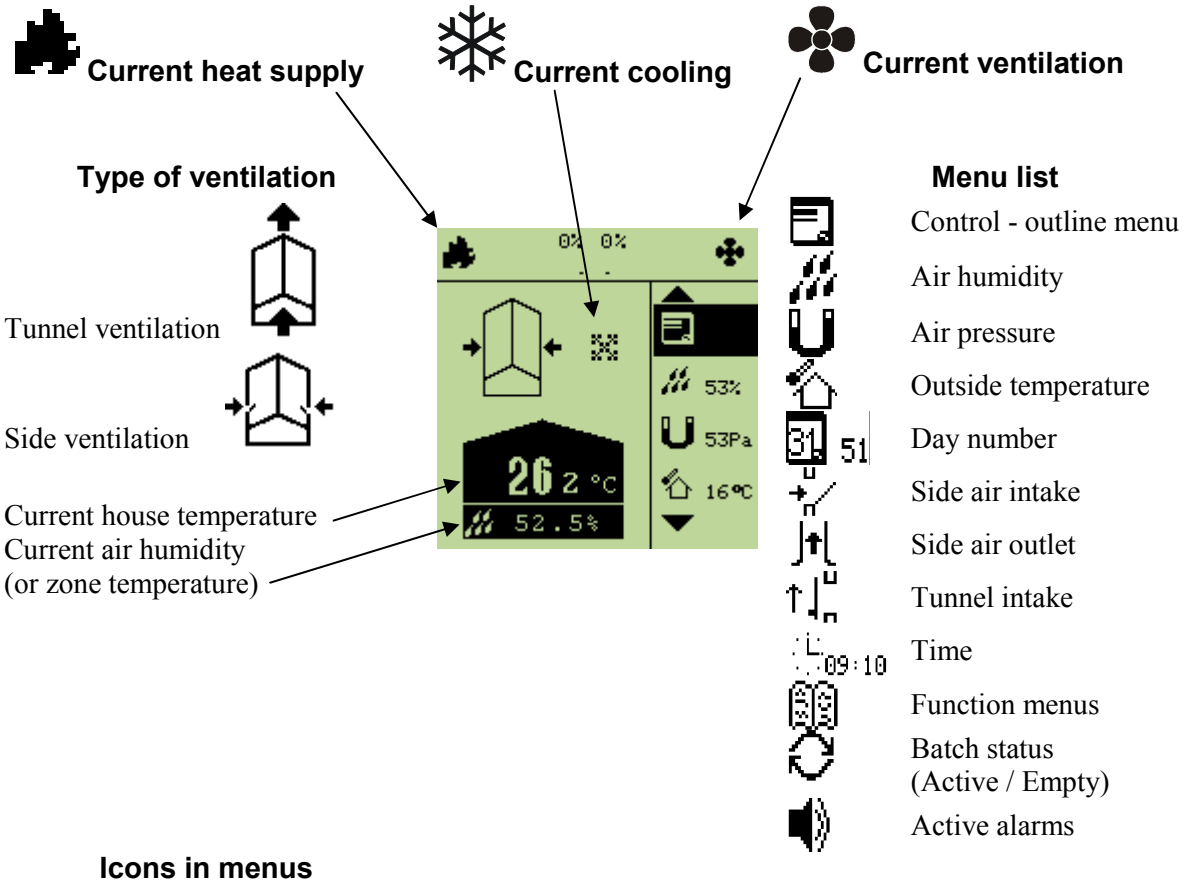
MC 135CT Climate Computer

# USER'S GUIDE

## 1 Get started

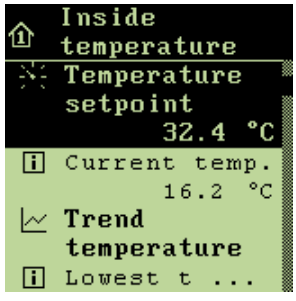
### 1.1 Display and Menus

#### Status view




#### Icons in menus

- Setting
- Reading
- Connect
- Disconnect
- Tunnel
- Options
- Submenus
- Curve setting
- Entry of code/name




#### Operation view

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

The values and functions, which you can change, are highlighted in **bold font**.

Values, which are readings or calculations, are shown in normal font.

## 1.2 Control Panel

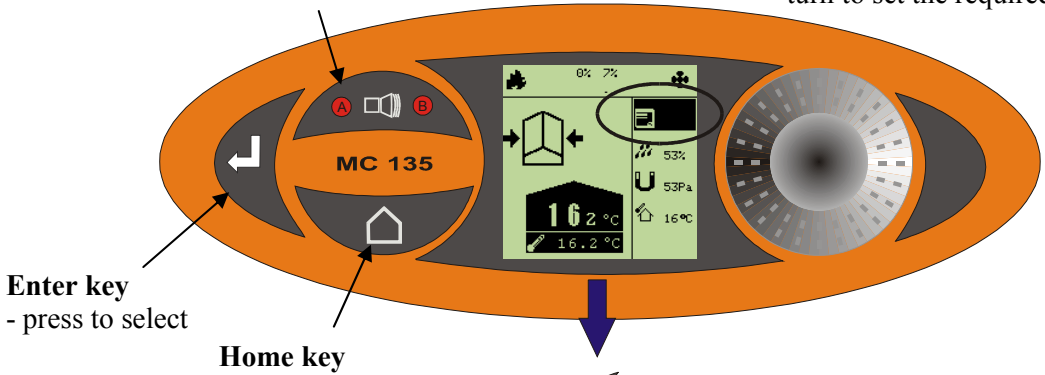
**Alarm lamp**

**Quick flashing**
- alarm

**Slow flashing**
- acknowledged alarm

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

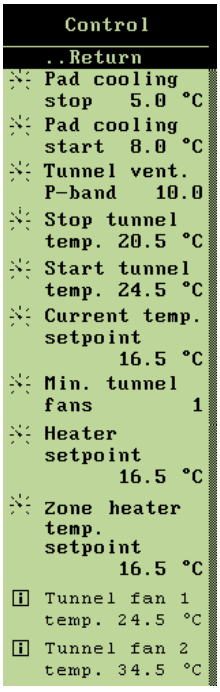
**Adjustment knob**
- turn to the required menu item
- turn to set the required value



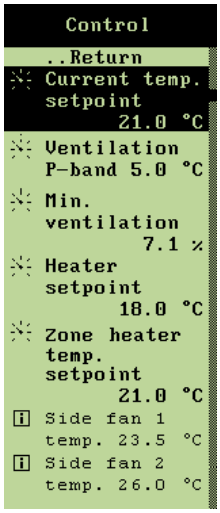

**Enter key**
- press to select

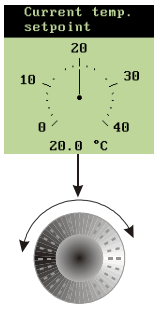
**Home key**
- back to status view

**Tunnel mode**




**Side mode**



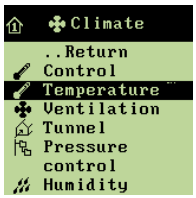
# 2 Climate

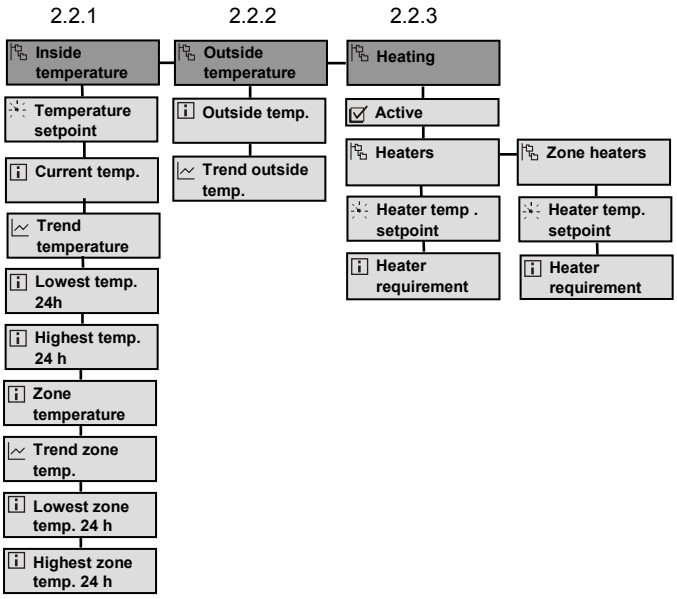

## 2.1 Control


The **Control** menu gives you direct access to the setting of the most used climate settings in the MC 135CT.

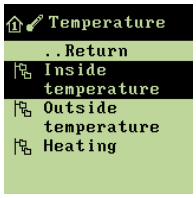
| | |
|---|---|
| Current temp. setpoint | Temperature setpoint, which is the basis of MC 135CT´s adjustment of the inside temperature. |
| Ventilation P-band | The number of degrees by which the temperature is to exceed **Temperature setpoint** before all ventilation is connected (side mode). |
| Min ventilation | Lower limit of ventilation in side mode (see 2.3.1). |
| Heater setpoint | The set lower temperature limit activating heating. |
| Zone heater temp. setpoint | The set lower temperature limit activating zone heat. |
| Side fan temp. | The temperature where the fan starts in side mode. |
| Pad cooling stop | The number of degrees by which the temperature is to fall below **Temperature setpoint** before pad cooling stops (tunnel mode). |
| Pad cooling start | The number of degrees by which the temperature is to exceed **Temperature setpoint** before pad cooling starts (tunnel mode). |
| Tunnel vent. P-band | The number of degrees by which the temperature is to exceed **Start tunnel temperature** before all tunnel ventilation is connected (tunnel mode). |
| Stop tunnel temp. | The inside temperature where tunnel ventilation is to stop (Tunnel mode, however not in connection with pureTunnel). |
| Start tunnel temp. | The inside temperature where tunnel ventilation is to start (Tunnel mode, however not in connection with pureTunnel). |
| Min. tunnel fans | Lower limit of ventilation in tunnel mode (See 2.4). |
| Tunnel fan temp. | The temperature where the fan starts in tunnel mode. |

## 2.2 Temperature




### 2.2.1 Inside Temperature

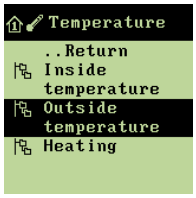



MC 135CT adjusts the inside temperature according to the set temperature. The house is heated by the heat generated by the animals and possibly by a heating system.

When the inside temperature is too high, the MC 135CT Climate Computer increases ventilation to supply more fresh air, and when the temperature is too low, the computer limits ventilation to keep the heat in the house.

| | |
|---|---|
| Temperature setpoint | Temperature setpoint, which is the basis of MC 135CT´s adjustment of the inside temperature. |
| Current temp. | Measured inside temperature. |
| Trend temperature | Curve showing the temperature course over the last 24 hours. |
| Lowest temp. 24 h | Lowest measured temperature within the last 24 hours. |
| Highest temp. 24 h | Highest measured temperature within the last 24 hours. |
| Zone temperature | Measured inside temperature in the zone. |
| Trend zone temperature | Curve showing the temperature course over the last 24 hours in the zone. |
| Lowest zone temp 24 h | Lowest measured temperature within the last 24 hours in the zone. |
| Highest zone temp 24 h | Highest measured temperature within the last 24 hours in the zone. |

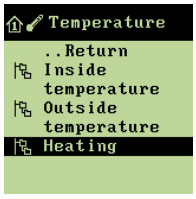
## 2.2.2 Outside Temperature




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

## 2.2.3 Heating

This section is relevant only to houses with heating systems.



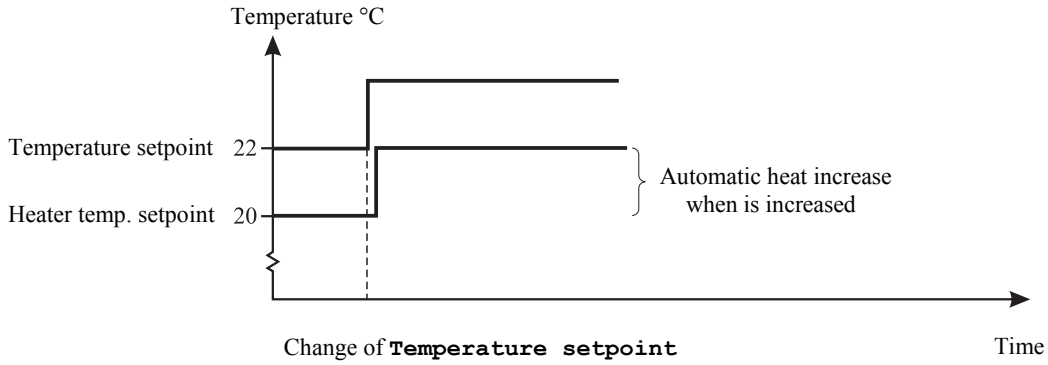

In houses with heating systems, the MC 135CT Climate Computer adjusts the inside temperature according to the set temperature and a lower temperature limit, **Heater temp. setpoint**.

When an extra heat source is installed for zone heating, the MC 135CT can adjust the temperature in this individual zone.

| | |
|---|---|
| Active | Connection or disconnection of heating (see 2.2.3.1). |
| Heater temp. setpoint | Temperature setpoint for heat supply (in the house). |
| Heater | Status of heat supply (ON/OFF) (in the house). |
| Heater temp. setpoint | Temperature setpoint for heat supply (in the zone). |
| Heater | Status of heat supply (ON/OFF) (in the zone). |

Note that when you increase **Temperature setpoint**, **Heater temp. setpoint** will automatically increase correspondingly so that there is still the same number of degrees between the two settings.

***Example 1: Heat supply***




*Set **Heater temp. setpoint** to the lowest temperature allowed in the house.*

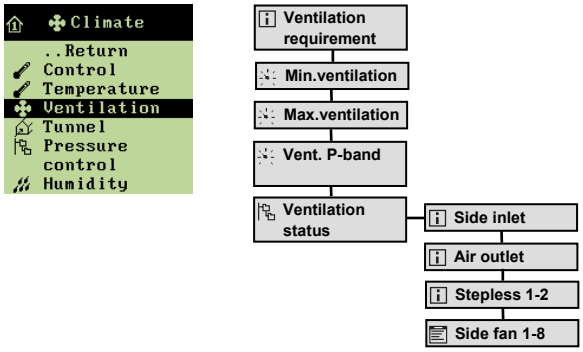
*If you wish to increase **Temperature setpoint** without increasing **Heater temp. setpoint**, you should first adjust **Temperature setpoint** and afterwards reduce **Heater temp. setpoint** by the same number of degrees.*

### 2.2.3.1 Connecting or Disconnecting Heat Supply

When you want to stop the heat supply in the house, disconnect **Active**. MC 135CT will then automatically turn off the heat supply.

If you turn off heat supply manually without disconnecting **Active** on the MC 135CT Climate Computer, adjustment of the ventilation will be inappropriate as the computer will try to base its adjustment on the belief that heating is still available.

## 2.3 Ventilation




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

MC 135CT 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.

| | |
|---|---|
| Ventilation requirement | Current ventilation requirement in side mode. |
| Min. ventilation | Lower limit of ventilation in side mode (see 2.3.1). |
| Max. ventilation | Upper limit of ventilation in side mode (see 2.3.2). |
| Ventilation P-band | The number of degrees by which the temperature is to exceed **Temp. setpoint**, before all ventilation is connected in side mode. |
| Side inlet | Read-out of the flap opening of the air inlets. |
| Air outlet | Read-out of the flap opening of the air outlets. |
| Stepless 1-2 | Read-out of the output of the stepless exhaust units. Stepless 1 performs up to 100 %. Hereafter Stepless 2 is connected. |
| Side fan 1-8 | Status of the fans in side mode (ON/OFF). |

### *2.3.1 Minimum Ventilation*

The minimum ventilation function supplies the exact amount of air to the house, which ensures an acceptable air quality. The function is particularly relevant in periods with cold weather when it is not necessary to ventilate to keep down the inside temperature.

Minimum ventilation can be read as a percentage of the capacity of the ventilation system. The system will never ventilate less than this indicated minimum ventilation.

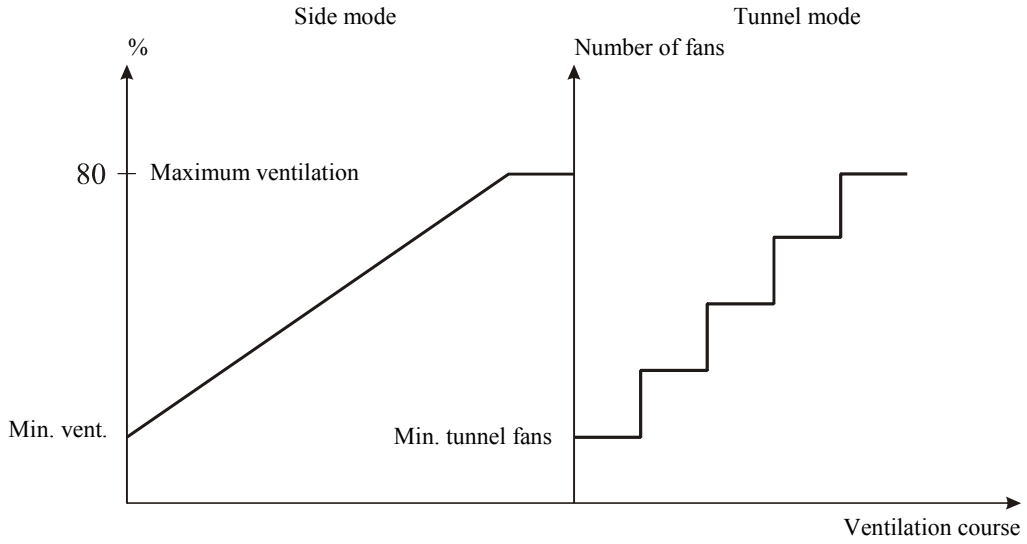
MC 135CT calculates the necessary minimum ventilation according to the animals' need for fresh air. This varies depending on race and weight. You can find the correct figure in the technical literature or ask your consultant if in doubt.

### 2.3.2 Maximum Ventilation

In side mode, the maximum ventilation function sets a limit to how large a part of the capacity of the ventilation system (in percentage) the computer can activate.

For instance, this function can prevent small animals from being exposed to heavier ventilation than they can stand.

***Example 2: Ventilation course***




*When the ventilation requirement in side mode exceeds the set* **`Maximum ventilation`**, *MC 135CT will switch to tunnel mode.*

### 2.3.3 Ventilation Status

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

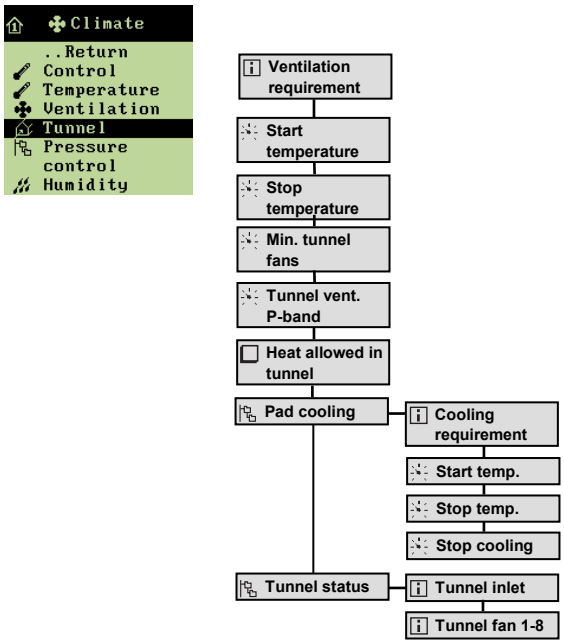
The ventilation system connects the stepless exhaust unit first. When the ventilation requirement exceeds the capacity of the stepless exhaust unit, a group of the other exhaust units are connected and the stepless exhaust unit decreases its output simultaneously. Thus, the computer obtains a stepless change-over from one ventilation level to the next. All exhaust units in the house bear a sign showing if it is a stepless or an ON/OFF exhaust unit.

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. This is particularly relevant in connection with fault finding.

For Side inlet and Air outlet, the percentages indicate how much the flaps have opened. For Stepless, they indicate the output of the stepless exhaust units.

## 2.4 Tunnel

This section is relevant only to houses with tunnel ventilation.




Tunnel ventilation is used at high temperatures and when the air intake through wall inlets and curtains is insufficient to keep the animals chilled.

Air is taken in through a pad cooling system located at one end of the house. Recirculating water keeps the pads moist. Gable fans draw fresh air through the moist pads and the air absorbs water vapour from the pads. Air is vented out through several gable fans at the other end of the house. This makes the air move quickly in a lengthwise direction in the house.

The gable fans provide a high air velocity, which makes the measured temperature feel colder, and with the effect of the pad cooling, the house temperature can be reduced.

**Ventilation requirement**

The current ventilation requirement in tunnel mode.

**Start temperature**

The inside temperature where the Tunnel ventilation is to start (this function is not active when MC 135CT is set up to work in pure Tunnel mode).

**Stop temperature**

The inside temperature where the Tunnel ventilation is to stop (this function is not active when MC 135CT is set up to work in pure Tunnel mode).

**Min. tunnel fans (/demand)**

Lower limit for number of active fans in Tunnel mode.

When Tunnel only is installed as stepless air outlet, the setting corresponds to a percentage of the outlet capacity (**`Min. Tunnel demand`**).

**Tunnel vent. P-band**

The number of degrees by which the temperature is to exceed **`Start temperature`** before tunnel ventilation is fully connected.

**Heat allowed in tunnel**

Connection or disconnection of heating in tunnel mode.

**Cooling requirement**

Status of pad cooling (ON/OFF).

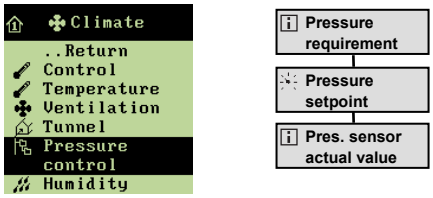
**Start temperature**

The number of degrees by which the temperature is to exceed **`Temperature setpoint`** before pad cooling starts.

| | |
|---|---|
| Stop temperature | The number of degrees which the temperature is to be higher than **Temperature setpoint** before pad cooling stops. |
| Humidity limit | Upper limit of the air humidity, which stops the pad cooling. |
| Tunnel inlet | Percentage showing how much the flaps have opened in tunnel mode |
| Tunnel fan 1-8 | Status of tunnel fan (ON/OFF) |

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

## 2.5 Pressure Control

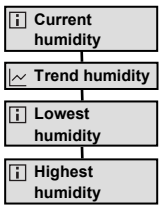



This section is relevant only to houses with pressure sensor.

By means of a pressure sensor, the MC 135CT computer can control the pressure level in the house. On the basis of the sensor measurements, MC 135CT controls the opening of the flaps and in this way it maintains the required pressure level in the house, **Pressure setpoint**.

| | |
|---|---|
| Pressure demand | An indication by percentage of how much the flaps must be open to maintain **Pressure setpoint** |
| Pressure setpoint | The pressure level, which MC 135CT is to maintain in the house |
| Pres. sensor actual value | The actual pressure level in the house |

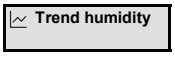
## 2.6 Humidity


This section is relevant only to houses with humidity sensor.

Humidity is supplied to the house air partly from the animals, feed, drinking water and litter, and partly from the cooling function.


Read-out of the current air humidity.



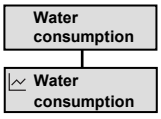

Read-out of the humidity level in the house over the last 24 hours.

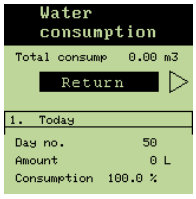

The lowest air humidity in the house over the last 24 hours.


The highest air humidity in the house over the last 24 hours.

# 3 Water

This section is relevant only to houses where pad water meter is installed.

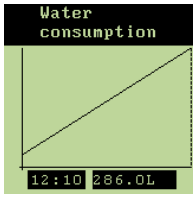




MC 135CT sums up the water consumption in litres to provide an overall view.

In order to expose sudden changes, the water consumption is also summed up in per cent.

Under normal conditions, the percentages will rise by a few per cent per day as the age of the animals progresses.

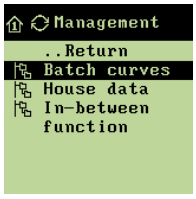


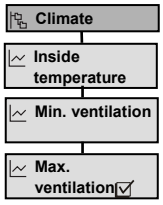

The curve gives you an idea of the water consumption during the last 24 hours.

# 4 Management


## 4.1 Batch Curves

This section is relevant only to houses with batch production.



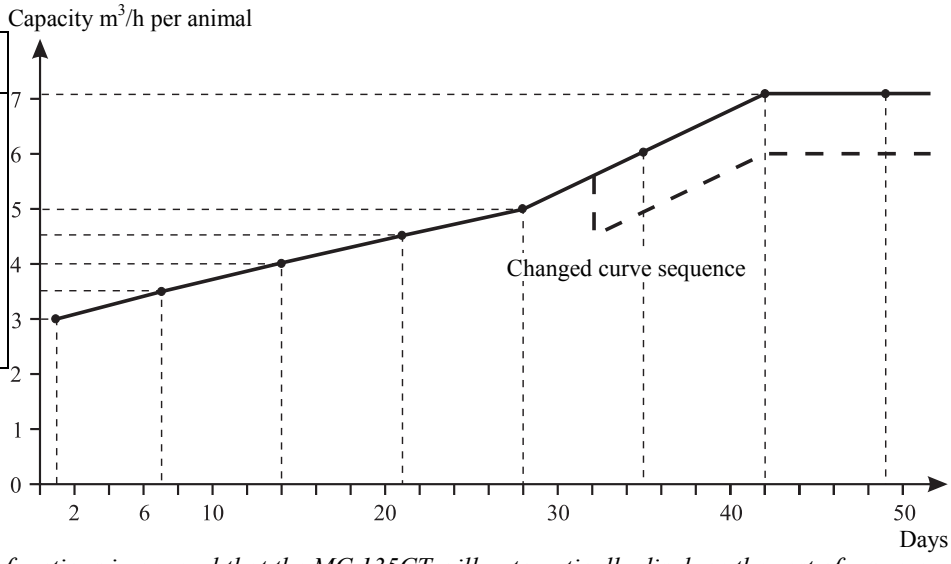

MC 135CT can automatically adjust temperature and ventilation settings according to the age of the animals.

### 4.1.1 Setting Curves

Select day numbers for each of the eight curve points, which cover the whole batch course. For each curve point you should first set a day number and then the required value of the function. In this way, you set up a curve development, which will make the MC 135CT currently adapt conditions in the house to the changes of the animals' requirements.

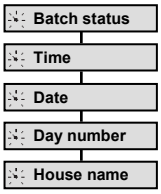
***Example 3: Minimum ventilation***

| Day | Vent. | Change day 32 |
|---|---|---|
| 1 | 3.0 | - |
| 7 | 3.5 | - |
| 14 | 4.0 | - |
| 21 | 4.5 | - |
| 28 | 5.0 | - |
| 35 | 6.0 | 5.5 |
| 42 | 7.1 | 6.0 |
| 49 | 7.1 | 6.0 |




*It applies to the curve functions in general that the MC 135CT will automatically displace the rest of a curve sequence in parallel when you change the curve settings during a batch.*

## 4.2 House Data


| | |
|---|---|
| Batch status | Batch status decides after which settings the house is to run (see 4.2.1). |
| Time | Setting of actual time (see 4.2.2). |
| Date | Setting of actual date. |
| Day number | Day number counts one up every 24 hours after the house was set to active house. |
| House name | Entry of house name. |

### *4.2.1 Batch status: Active House/Empty House*

Set batch status to **`Active house`** the day before stocking the animals so that the computer has time to adapt the climate to the animals' requirements. Hereafter, the day number switches to day 0 and the computer runs according to the automatic settings for temperature, humidity and ventilation.

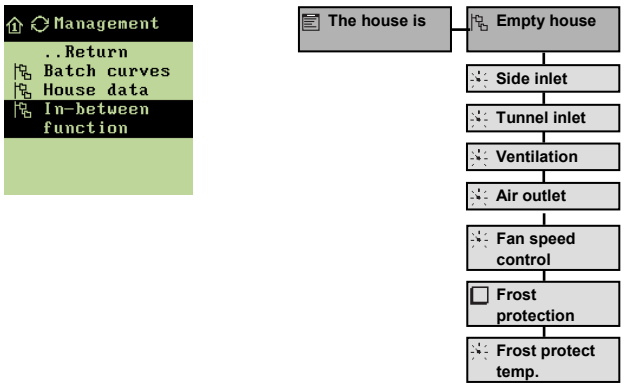
Set batch status to **`Empty house`** after depopulating the house. At empty house, the MC 135CT will disconnect the climate control and control according to the settings of the in-between functions empty house and frost protection. This function protects the animals in case the wrong house is set to **`Empty house`**.

On the other hand, if you want the system to close when batch status is empty house, you should reset the settings of the in-between function empty house. In batch status, MC 135CT will also reset all changes of curves, which you may have made in the previous batch course.

### *4.2.2 Time*

Correct setting of the clock is important, both as regards several control functions and as regards the registration of alarms. The clock will not be disconnected in case of a power failure.

## 4.3 In-between Function




The in-between functions are partly designed for facilitating your cleaning activities when the house is depopulated, partly to ensure the air change and temperature in the empty house.

MC 135CT Climate Computer can only activate the in-between functions when **`Batch status`** is set to **`Empty house`** (in the house data menu under management).

In batch status **`Empty house`**, the computer will disconnect all automatic temperature adjustments and run according to the settings in the empty house function. Thus, the computer will be in empty house mode until you activate one of the other in-between functions, and it will return to empty house mode when the functions are finished.

### *4.3.1 Washing*

While you carry out the manual washing of the house, ventilation must run to keep up the air change.

### *4.3.2 Drying*

Drying is a combination of ventilation and heat supply. The more heat is supplied to the house, the faster it dries.

### *4.3.3 Empty House*

The **`Empty house`** settings maintain the air change in the house by letting the ventilation run at a fixed percentage (50 %) of the system capacity.

This function also enables you to frost protect the house.

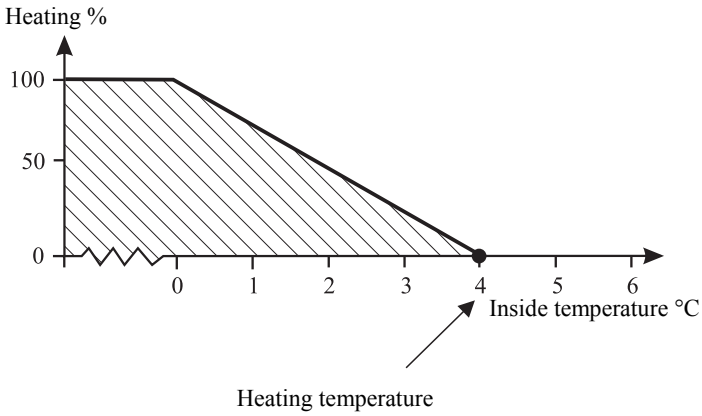
#### 4.3.3.1 Frost Protection

Frost protection ensures that the inside temperature does not drop below the temperature setpoint for frost protection when batch status is empty house during a prolonged period. (See the **`Management`**/**`House data`** menu).

At batch production, the function can also maintain an inside temperature of e.g. 20 °C between two batches. Note that ventilation must be off and the heating system must be on.

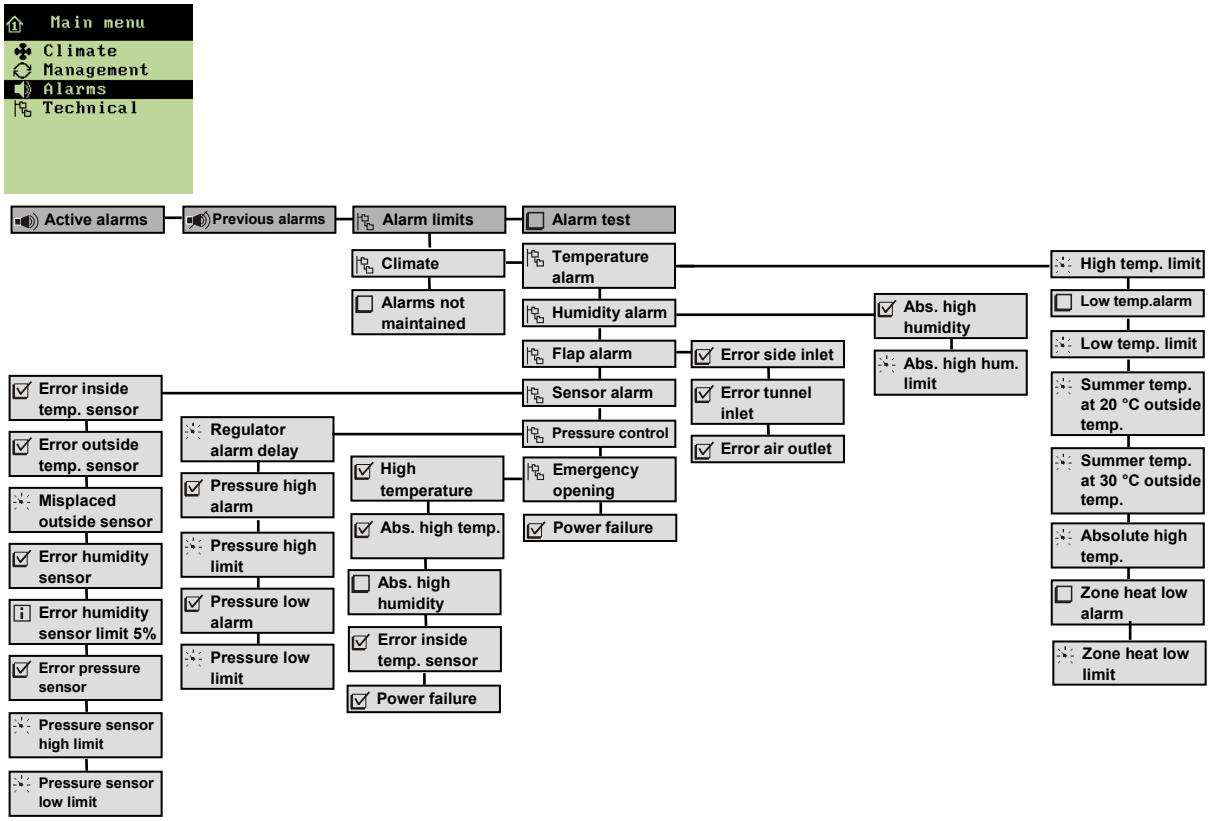
***Example 4: Frost protection***

| | |
|---|---|
| Temperature setpoint (may vary between 0 and 40 °C) | 4 °C |
| Heating temperature | 4 °C |




*When batch status is empty house (**Management/House data**), and **Frost protection** is on, the computer will copy the temperature settings of frost protection to **Temperature setpoint** and **Heating temperature**.*

# 5 Alarms




**Active alarms** — MC 135CT registers the type of alarm and time of its emergence (see 5.1).

**Previous alarms** — MC 135CT saves up to 20 active and previous alarms (see 5.2).

**Alarm limits** — Menu for alarm setting.

| | |
|---|---|
| High temp. limit | Alarm when the inside temperature exceeds **Temperature setpoint** by the set number of degrees. The function is always connected. |
| Low temp. alarm | Connection and disconnection of **Low temp. alarm**. |
| Low temp. limit | Alarm when the inside temperature is the set number of degrees below **Temperature setpoint**. |
| Summer temp. at 20 °C outside | Alarm with a varying alarm limit according to the outside temperature (see 5.3.2.1). |
| Summer temp. at 30 °C outside | Alarm with a varying alarm limit according to the outside temperature (see 5.3.2.1). |
| Absolute high temperature | Alarm when the inside temperature exceeds the setting. |
| Zone heat low alarm | Connection and disconnection of alarm for zone heat. |
| Zone heat low limit | Alarm when the temperature in the zone exceeds **Temperature setpoint** by the set number of degrees. |
| Abs. high humidity | Connection and disconnection of humidity alarm. |
| Abs. high humidity limit | Alarm when the air humidity exceeds the setting. |
| Error side inlet | Connection and disconnection of alarm when the actual flap opening of the air inlet or air outlet deviates from the setting that the computer calculates as being correct. |
| Error tunnel inlet | Same as above. |
| Error air outlet | Same as above. |
| Error inside temp. sensor | Alarm for technical sensor error. Always active (see 5.3.2.2). |
| Error outside temp. sensor | Connection and disconnection of alarm for technical sensor error. |
| Misplaced outside sensor | Alarm for misplaced sensor. |
| Error humidity sensor | Connection and disconnection of alarm for technical sensor error. |
| Error humidity sensor limit 5% | Read-out of factory setting of humidity sensor. |
| Error pressure regulator sensor | Connection and disconnection of alarm for wrong pressure (decentralised exhaustion). |
| Pressure sensor high limit | Alarm when the pressure exceeds **Pressure setpoint** by the set number of Pa. |
| Pressure sensor low limit | Alarm when the pressure falls below **Pressure setpoint** by the set number of Pa. |
| Regulator alarm delay | Delay of alarm from pressure sensor (see 5.3.2.2). |
| Pressure high alarm | Connection and disconnection of alarm for too high pressure. |
| Pressure high limit | Alarm when the pressure in the house exceeds the setting. |
| Pressure low alarm | Connection and disconnection of alarm for too low pressure. |
| Pressure low limit | Alarm when the pressure in the house falls below the setting. |

| | |
|---|---|
| ☑ High temperature | Alarm that activates emergency opening (see 5.3.2.3). |
| ☑ Abs. high temperature | Alarm that activates emergency opening. |
| ☐ Abs. high humidity | Connection or disconnection of alarm that activates emergency opening. |
| ☑ Error inside temp. sensor | Alarm that activates emergency opening. |
| ☑ Power failure | Alarm that activates emergency opening. |
| ☑ Power failure | Alarm in case of power failure. |
| ☐ Alarms not maintained | Connection or disconnection of **`Alarms not maintained`** (alarm signal continues). |

## 5.1 Active Alarms

When an alarm emerges, a particular alarm window appears in the display showing the type of alarm.

The computer will also activate an alarm signal, which you can choose to maintain. Thus, the signal will continue, also when the condition that triggered the alarm has stopped. You must actively disconnect the alarm signal by acknowledging the alarm (pressing the enter key).

### *5.1.1 Stopping an Alarm Signal*

The alarm window in the display disappears, and the alarm signal stops when you acknowledge the alarm by pressing the enter key.

## 5.2 Previous Alarms

MC 135CT Climate Computer registers alarms with the information of when they emerged and when they disappeared. It often happens that several alarms follow each other because one defective function also affects other functions.

For instance, a flap alarm can be followed by a temperature alarm as the computer cannot adjust the temperature correctly with a defective flap. Thus, the previous alarms give you the possibility of following an alarm course back in time to detect the error that caused the alarms.

When the 21st alarm emerges, the computer deletes the oldest alarm from its memory.

## 5.3 Alarm Limits

MC 135CT Climate Computer contains a number of alarms, which the computer will activate if a technical error occurs or the alarm limits are exceeded. A few of the alarms are always connected, e.g. the alarm for power failure. You can connect and disconnect the other alarms (☑ / ☐) and for some alarms you can also set the alarm limits.

It is always the user's responsibility that all alarm settings are correct.

### 5.3.1 Alarms not Maintained

Maintenance of alarms means that the alarm signal will continue until you acknowledge the alarm by pressing the enter key. This also applies even if the situation that triggered the alarm has stopped. You can connect and disconnect the function.

### 5.3.2 Climate

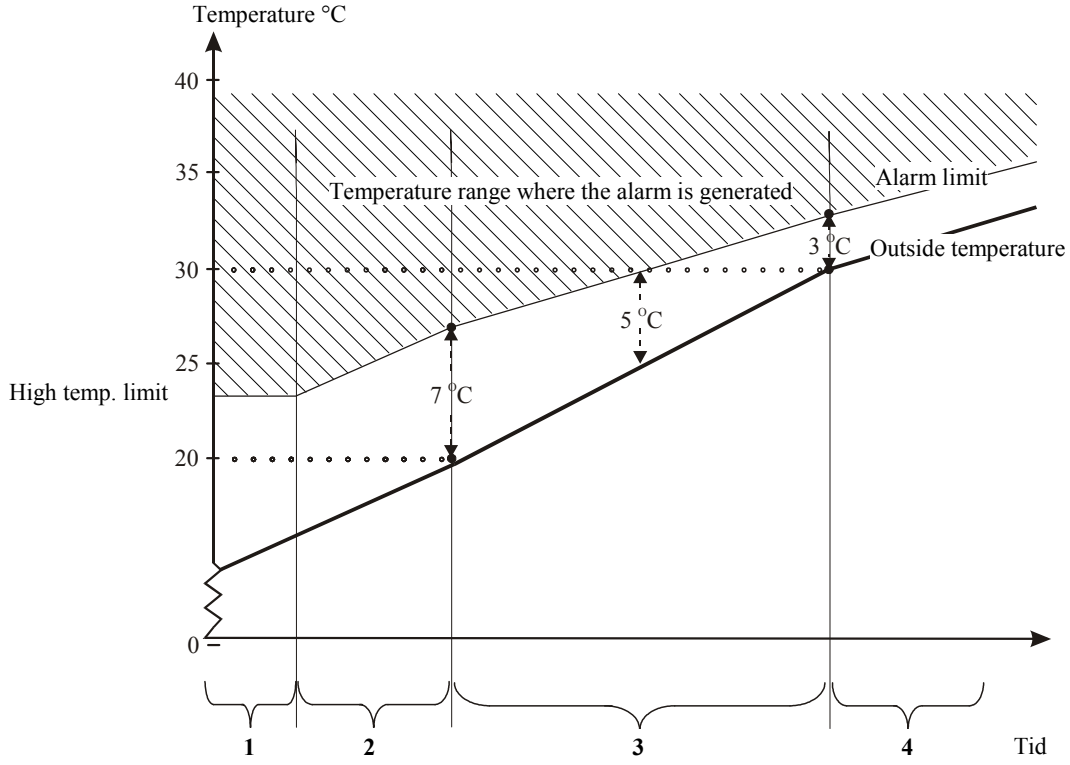
#### 5.3.2.1 Temperature Alarms

##### 5.3.2.1.1 Summer Temperature at 20 °C and 30 °C Outside

When the outside temperature increases, the alarm limit will also increase. Thus, it will postpone the time when the high temperature alarm is activated.

MC 135CT Climate Computer only activates the alarm if the inside temperature also exceeds the high temperature alarm.

***Example 5: Summer temperature at 20 °C and 30 °C outside***

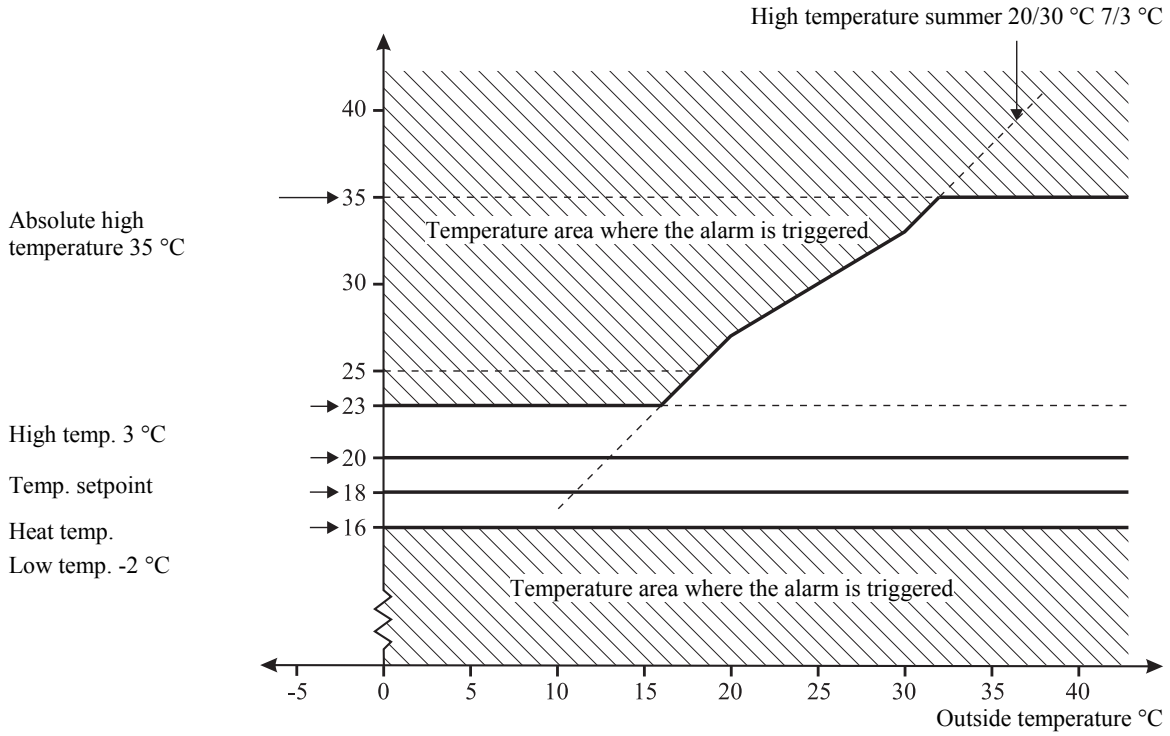



1. *The alarm limit does not drop below the High temperature limit.*
2. *Below 20 °C outside, the alarm limit +7 °C is staggered in relation to the outside temperature.*
3. *Between 20° C and 30 °C outside, a gradual transition from 7 °C to 3 °C takes place. At an outside temperature of e.g. 25 °C, the inside temperature must thus be 5 °C higher (exceed 30 °C) before the alarm is generated.*
4. *Above 30 °C outside, the alarm limit is staggered +3 °C in relation to the outside temperature.*

#### 5.3.2.1.2 Alarm for Absolute High Temperature

The alarm for absolute high temperature is triggered by an actual temperature, e.g. 32 °C. Thus, it will not vary like the alarm for high temperature according to the setting of **`Temperature setpoint`**, and it cannot be postponed by a high temperature at 20/30 °C either.

***Example 6:*** ***All temperature alarms***




### 5.3.2.2 Sensor Alarms

#### 5.3.2.2.1 Alarm for Error in Inside Temperature Sensor

MC 135CT Climate Computer activates an alarm if the inside temperature sensor is short-circuited or disconnected. Without this sensor, MC 135CT cannot control the inside temperature, and apart from the alarm, the error will also activate an emergency control of the ventilation system, which will open 50 %. The alarm for error in an inside temperature sensor is always active.

#### 5.3.2.2.2 Misplaced Outside Sensor

The alarm states if the sensor is exposed to solar heating and therefore shows a wrong outside temperature. MC 135CT activates an alarm when the inside temperature measured by the computer is the number of degrees below the outside temperature at which the function is set (e.g. 5 °C).

#### 5.3.2.2.3 Alarm for Error in Humidity Sensor

MC 135CT Climate Computer activates an alarm when the humidity sensor is disconnected or the air humidity is lower than humidity setpoint. The alarm limit is factory preset at such a low level (5 %) that the alarm is only triggered by actual sensor errors. You can connect and disconnect the function.

#### 5.3.2.2.4 Alarm for Error in Pressure Sensor (Common Exhaustion)

MC 135CT Climate Computer activates an alarm when the pressure in the exhaustion duct drops below or exceeds the settings of **`Pressure sensor Low/High limit`**. You can connect and disconnect the function.

#### 5.3.2.2.5 Delay of Sensor Alarm

With the **`Regulator alarm delay`** you can postpone the alarm signal so that the alarm is not triggered by transient changes of the pressure level in the house, e.g. when a door is opened.

### 5.3.2.3 Emergency Opening

Emergency opening is a standard function in the MC 135CT Climate Computer. As long as there is power, the computer will open the ventilation system 100 % in case of a relevant alarm - even if it is cold outside.

The emergency opening can be activated by five types of alarms.

| Emergency opening | Activated by | |
|---|---|---|
| | High temperature | Always activate |
| | Absolute high temperature | Always activate |
| | Error in inside temperature sensor | Always activate |
| | Power failure | Always activate |
| | Absolute high humidity | Connect or disconnect |

**Table 1: Activation of emergency opening**

It may be an advantage to disconnect absolute high humidity in houses that are placed in areas with very high outside air humidity and in situations when a technical sensor error emerges.

## 5.4 Alarm Test

Regular alarm tests help ensuring that the alarms actually work when needed. Therefore you should test the alarms every week. The test should be made in all houses in turn.

When you want to ... test the alarms


→ turn until **`Alarm test`** is highlighted, and press to start testing


→ check if the alarm lamps flash

→ check if the alarm system alarms as intended

→ press to finish the alarm test

### 5.4.1 Survey of Alarm Functions

| Alarm type | | When the alarm is triggered, it activates… |
|---|---|---|
| **Temperature alarm** | High temperature | Alarm signal<br>Emergency opening |
| | Summer temperature at 20 °C and 30 °C | Alarm signal<br>Emergency opening |
| | Low temperature | Alarm signal |
| | Absolute high temperature | Alarm signal<br>Emergency opening |
| **Humidity alarm** | Absolute high humidity | Alarm signal<br>Emergency opening ON/OFF |
| **Flap alarm** | Error air outlet | Alarm signal |
| | Error air inlet | Alarm signal |
| **Sensor alarm** | Error inside temperature sensor | Alarm signal<br>Ventilation system runs 50 %<br>Emergency opening |
| | Error outside temperature sensor | Alarm signal |
| | Misplaced outside sensor | Alarm signal |
| | Error humidity sensor | Alarm signal |
| | Error pressure regulator sensor | Alarm signal |
| **Power failure** | | Alarm signal<br>Emergency opening |

**Table 2: Survey of alarm functions**

# 6 Safety

## 6.1 Access Code to Access Levels

You can limit the access to operation of the MC 135CT Climate Computer by means of access codes.

The functions of the climate computer are on three different access levels, which can be activated individually. On each level, there is access to reading and setting all settings and values, while access to changing settings requires the entry of an access code.

Therefore, you must, when setting up the computer, choose which of the three levels are to be active and thus code protected against unauthorized changes.

When you want to change a setting in a protected access level, the computer requires the entry of an access code.

When you want to … enter an access code,


→ turn until the first digit of your access code is highlighted, and press
An asterisk (*) in the black box indicates that you have selected the first digit

→ repeat for the last three digits

→ turn clockwise until the digit string disappears, and press when OK appears to approve

See the *Technical Manual* concerning selection and change of access code.

### 6.1.1 Functions on Access Level 1

| Main menu | Submenu | Access level 1 |
|---|---|---|
| **Control** | | Current temp. setpoint |
| | | Min. ventilation |
| | | Start tunnel temp. |
| | | Stop tunnel temp. |
| | | Min. tunnel fans |
| | | Pad cooling start |
| | | Pad cooling stop |
| | | Ventilation P-band |
| | | Tunnel vent. P-band |
| **Temperature** | **Inside temperature** | Temperature setpoint |
| | **Heating** | Heater temp. setpoint (room) |
| | | Heater temp. setpoint (zone) |
| **Ventilation** | | Ventilation P-band |
| **Tunnel** | | Min. tunnel fans |
| | | Tunnel vent. P-band |

### 6.1.2 Functions on Access Level 2

| Main menu | Submenu | Access level 2 |
|---|---|---|
| **Temperature** | **Heating** | Active |
| | | Stop time |
| **Ventilation** | | Min. ventilation |
| | | Max. ventilation |
| **Tunnel** | | Start temp. |
| | | Stop temp. |
| | | Humidity limit |
| **Management** | **Batch curves** | Inside temperature |
| | | Min. ventilation |
| | | Max. ventilation |
| | **House data** | Batch status |
| | | Time |
| | | Date |
| | | Day no. |
| | | House name |
| **In-between function** | **The house is** | Washing |
| | | Drying |
| | **Empty house** | Side inlet |
| | | Tunnel inlet |
| | | Ventilation |
| | | Air outlet |
| | | Fan speed controller |
| | | Frost protection |
| | | Frost protection temperature |
| **Alarms** | **Temperature alarm** | Alarms not maintained |
| | | High temperature limit |
| | | Low temperature alarm |
| | | Low temperature limit |
| | | Summer temp. at 20 °C outside |
| | | Summer temp. at 30 °C outside |
| | | Zone heat low alarm |
| | | Zone heat low limit |
| | **Humidity alarm** | Abs. high humidity limit |
| | **Flap alarm** | Error side inlet |
| | | Error tunnel inlet |
| | | Error air outlet |
| | **Sensor alarm** | Error outside temperature sensor |
| | | Misplaced outside sensor |
| | | Error humidity sensor |
| | | Pressure sensor Low limit |
| | | Pressure sensor High limit |
| | **Pressure control** | Regulator alarm delay |
| | | Pressure high alarm |
| | | Pressure high limit |
| | | Pressure low alarm |
| | | Pressure low limit |
| | **Emergency opening** | Absolute high humidity |

### 6.1.3 Functions on Access Level 3

| Main menu | Submenu | Access level 3 |
|---|---|---|
| **Alarms** | **Humidity alarm** | Abs. high temperature |

All functions in the technical menus **`Setup`**, **`User setup`** and **`Service`** are on access level 3.

# MAINTENANCE INSTRUCTIONS

MC 135CT Climate Computer requires no maintenance to function correctly.

You should test the alarm system every week.

## 7 Cleaning

Clean the MC 135CT with a damp cloth without using solvents. Do not expose the computer to water or cleaning with a high-pressure cleaner.

Like all types of electronics, it prolongs the life of the MC 135CT to be continuously connected to power as this keeps it dry and free from possible condensation.

## 8 Removal for Recycling/Disposal

Big Dutchman´s products which are suited for recycling are marked with a pictogram showing a refuse bin that is crossed out. See the picture.

It will be possible for customers to deliver Big Dutchman products to local collection sites/recycling stations according to local instructions. The recycling station will then send the products to an approved plant for recycling and reuse.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