Ventilation in balance®

OPERATOR'S MANUAL

Airmaster 100 · 180 · 300 · 500 · 800 · 900 · 1200; CityVent 80

AIRMASTER

HAZARD WARNING SYMBOL

This Manual must be read before using the Airmaster air handling unit. Following this Manual will ensure this product is operated correctly.

This Manual is to be handed on to the unit's owner for safekeeping.

Failure to adhere to instructions marked with a hazard warning symbol involves a risk of personal injury or material damage.

The manufacturer can assume no responsibility for any injury or damage arising as a result of any use that contravenes the instructions in this Manual.

The manufacturer reserves the right to make changes without prior notice.

This Manual is intended for the Airmaster air handling unit as supplied, complete with all equipment.

WARNINGS

Service covers may not be opened without first disconnecting the unit's power supply.

The unit may not be started up until all service covers and grates on duct connections have been installed.

Place of installation and serial numbers (S/N):

Type: _____

Delivery date: _____

Place of installation: _____

S/N of Air handling unit: _____

S/N of Cooling Module: _____

Table of Contents

1. General Information

This Operator's Manual contains all the information required for the control, operation and maintenance of the Airmaster air handling unit supplied.

The recommended range for use of the Airmaster air handling unit is at outdoor temperatures between -18°C and 35°C.

The air handling unit is equipped with inlet and exhaust fans, filters in the inlet and exhaust ducts, countercurrent heat exchangers, a motor-powered main damper on the intake (as well as on the exhaust on certain units) and a compact electronic controller. The unit is designed to be installed in the room that is to be ventilated.

The control panel together with its control box form a compact fully electronic controller designed to control all aspects of the air handling unit's functions and equipment. The unit is provided with an efficient heat recovery system and energy-efficient EC fans.

1.1. Main Functions of the Software

- Regulation of the airflow.
- Control of inlet temperature.
- Automatic bypass operation to ensure constant inlet temperature.
- De-icing function when unit is operating at low outdoor temperatures.
- Control of cooling module operation at high room and outdoor temperatures.
- Monitoring of temperature and airflow.
- Manual start and stop and fully automatic operation via timer.
- Programmed operation via motion (PIR) sensor, carbon dioxide (CO_2) sensor and **B**uilding **M**anagement **S**ystem (BMS).
- Night time cooling to reduce the room temperature during the night.
- Background ventilation as basic ventilation.

N.B.

The Airmaster air handling unit is <u>not</u> suitable for heating a room. This must be done via the heating system installed in the room.

1.2. Main Component Functions

Inlet and exhaust fans:

These fans are the central units that deliver the necessary airflow.

Countercurrent heat exchanger:

The countercurrent heat exchanger ensures highly efficient transfer of the heat from the exhaust air to the fresh air, thereby reducing energy loss.

Bypass (optional):

There is fully automatic control of the bypass damper by the unit's controller. It is used to regulate the inlet temperature. The damper opens if the heating effect of the countercurrent heat exchanger on the fresh air becomes excessive.

Filter:

The exhaust air and fresh air filter protect the heat exchanger from dirt. The fresh air filter cleans the air of dust and particles before it is blown into the room.

As an alternative to the standard filters (F5), pollen filters (F7) can also be used; these are designed to protect those who suffer from an allergy to pollen.

Main damper:

The main damper protects the unit when it is not in operation and prevents draughts coming from it, as well as unwanted infiltration of fresh air with associated heating losses.

Heating surfaces (optional):

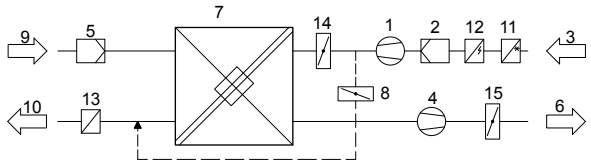
Heating surfaces allow the air handling unit to also be used when outdoor temperatures are very low.

Cooling module (optional):

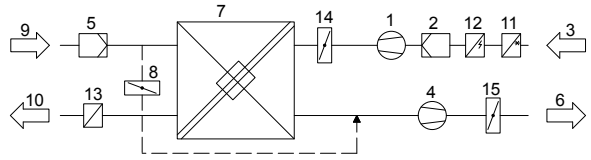
The cooling module reduces the inlet temperature when the outdoor temperature is higher than the desired inlet temperature.

1.3. How It Works

The illustration below shows the basics of how the Airmaster air handling unit works, including the cooling module.



Bypass: Fresh air side



Bypass: Exhaust air side

1. Inlet fan
2. Fresh air filter
3. Fresh air (on the rear or on top)
4. Exhaust fan
5. Exhaust air filter
6. Exhaust air (on the rear or on top)
7. Countercurrent heat exchanger(s)
8. Bypass (optional)
9. Extraction
10. Inlet (on the front)
11. Cooling module (optional)
12. Preheating surface (optional)
13. Comfort heating surface (optional)
14. Main damper
15. Exhaust damper

Air temperatures are monitored both upstream and downstream of the heat exchanger in both the exhaust air and fresh air ducts.

1.4. Control Panels

The Airmaster air handling unit is normally equipped with a control panel and display or a LON module without display (for control via a PC), which is directly connected to the control box.

On the right-hand side of the control panel are four arrows used for the main control of the unit:

^	Menu up/increase value/start unit
v	Menu down/decrease value/start unit
>	Open menu/select menu item / save value
<	Exit menu item/select status menu/ undo

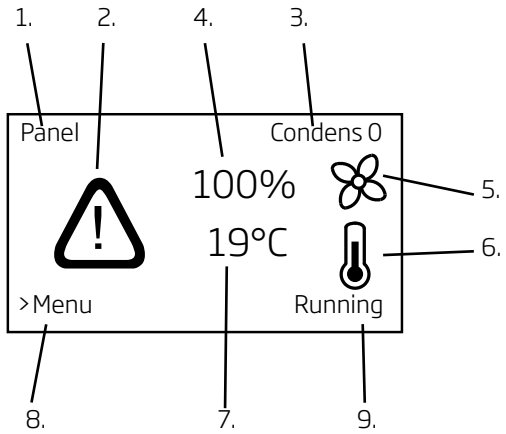
The panel is equipped with two different control menus. There is a very simple user menu for day-to-day operation, and a more advanced service menu for programming the unit.

Where the unit is equipped with a cooling module, there is a controller on the side of the cooling module, under the panel, for adjusting the cooling module's setting and for troubleshooting. Day-to-day operation of the cooling module is however controlled via the control box in the air handling unit.

Set:	Select/save parameter
Up arrow:	Menu up/increase parameter
Down arrow:	Menu down/decrease parameters

1.5. LCD Display

What is the display on the control panel able to show?

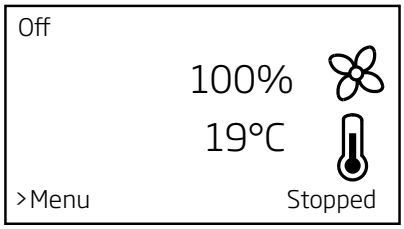


1. Activation – Indicates how the unit has been activated.
   Off (switched off)
   Panel
   CTS (BMS)
   PIR
   CO_2
   0-10V
   External
   Combined
   SERVICE
2. Alarm symbol – Displayed when an alarm is active.
3. Alarm text – Indicates the cause of the alarm and the unit number (0-15 for master/slave system or 0 for single unit).
   Condensate + 0, 1, 2, 3, ... or 15
   Low Temp + 0, 1, 2, 3, ... or 15
4. Current airflow as percentage of maximum value. (40 - 100 %)
5. Fan symbol.
6. Temperature symbol
7. Current temperature (Indicated in 1°C steps)
   Setpoint for inlet temperature
   Measured inlet temperature
   Measured room temperature
8. Reference: Menu is started with the ">" key.
9. Operating status is indicated.
   Stopping
   Stopped
   Starting
   Running
   Bas.vent.
   Night time cooling
   Condensate

Three Examples:

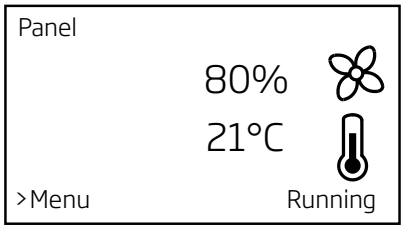
Example 1:

The Airmaster air handling unit has stopped, but is ready for operation. The following information is displayed:



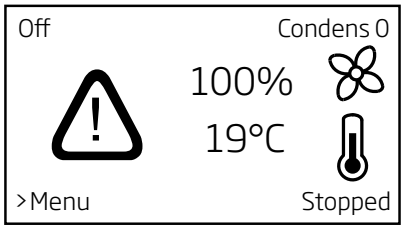
Example 2:

The Airmaster air handling unit is in operation and has been started via the control panel with 80% reduced airflow and a measured room temperature of 21°C. The following operating screen display is obtained:



Example 3:

A "Condensate" alarm has been detected on a single unit. The following information is displayed:



The Airmaster unit cannot be restarted until the cause of the alarm has been removed.

2. Control

The Airmaster air handling unit can be used in many different ways:

- Manual start and stop via the control panel
- Start and stop via external switch
- Automatic operation via timer
- Basic (background) ventilation
- Night time cooling
- Start and stop via motion (PIR) sensor
- Automatic operation and start and stop via CO_2 sensor
- Automatic operation via a **B**uilding **M**anagement **S**ystem (BMS)

This section describes the various basic settings, operating procedures and setting operations, as well as use of the status menus and setting of the cooling module.

The display is backlit. When the control panel is used for control, the backlight goes out.

All control, setting and programming operations described in this section and in section "3. Parameters and programming" apply for both single-unit installations and master/slave systems.

All equipment, be it standard or optional, can be controlled fully automatically by the unit controller, depending on the various processes that are running, the programming in question and current environmental conditions.

The unit is factory pre-programmed to be able to start on the following signals:

- External switch assembly
- PIR sensor
- Control panel (manual and automatic operation via timer)

The unit starts irrespective which of the above options is used to send a start signal. The start parameters can be re-programmed and extended.

For more information, see section "3. Parameters and Programming"

2.1. User Menu - Basic Settings

The controller is pre-programmed at the time of delivery in accordance with the requirements in the customer's order, i.e. all basic parameters relating to equipment, language and the air handling unit's basic configuration have been set. Nevertheless, over time some parameters may need to be adjusted or corrected.

This section describes how the basic settings are to be performed via the user menu of the control panel.

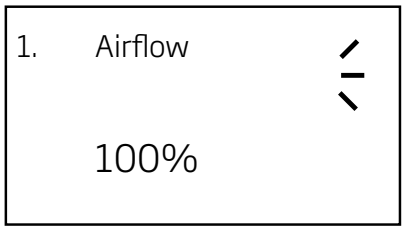
Operating values can be set both prior to and after start-up of the unit. If the unit is switched off, all manual settings revert to their programmed initial values.

N.B. If permanent resetting of operating values is required, these must be programmed in. For more information, see section "3. Parameters and Programming".

The menu items not described in this section are described in section "2.3. User Menu – Programmed Operation"

The menu for basic settings is activated by pressing > on the control panel keypad.

2.1.1. Airflow



The airflow has been pre-programmed to a rate of 100%, but may be reduced right down to 40% (at CityVent 20%) in 1% steps:

- Press > – Menu opens with item "**1. Airflow**"
- Press > – The current set airflow is indicated in bold.
- Press ∨ or ∧ until the desired airflow is shown.
- Press > – The set airflow will be saved. The parameter will no longer be displayed in bold.

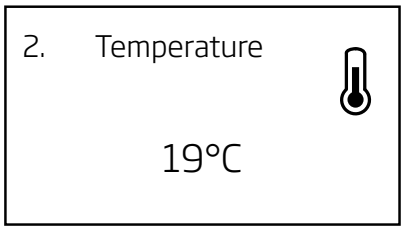
The airflow is now set. Press < to exit the menu or ∨ to scroll to the next menu item.

When the unit has been running with a different airflow it will go back to the pre-programmed airflow when it is next started.

The pre-programmed airflow can be changed to a different default value.

For more information, see section "3.2.1. Airflow – Setpoint".

2.1.2. Temperature



The inlet temperature is a setpoint for the temperature level of the unit. The default setting is 19°C. On units with/without a comfort heating surface, the temperature is set to the desired room temperature as a maximum/2°C below the desired room temperature.

N.B. The Airmaster air handling unit may <u>not</u> be used to heat a room by increasing the inlet temperature. Regulation of room temperature <u>must</u> be performed via the heating system installed in the room.

If the room temperature temporarily exceeds/falls below the desired temperature, the controller of the air handling unit will respond to this via its internal processes. (See "Appendix 1 Processes and Alarms").

The inlet temperature is pre-programmed at 19°C, but it may be adjusted in steps of 1°C as follows:

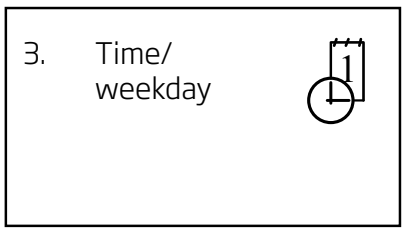
- Press > – Menu opens with item "1. Airflow"
- Press ∨ – Item "**2. Temperature**" appears.
- Press > – The current temperature is indicated in bold.
- Press ∨ or ∧ until the desired temperature is shown.
- Press > – The set temperature will be saved. The parameter will no longer be displayed in bold.

The inlet temperature is now set. Press < to exit the menu or ∨to scroll to the next menu item.

When the unit has been running with a different inlet temperature it will go back to the pre-programmed temperature when it is next started.

The pre-programmed inlet temperature can be changed to a different default value. For more information, see section "3.2.2. Inlet temperature – Setpoint".

2.1.3. Time and Weekday



To programme the time and day for programmed operation, proceed as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨twice – Menu item "3. Time/Weekday" appears.
- Press > – Submenu "**3.1 Day**" appears.
- Press > – The current set day is indicated in bold.
- Press ∨or∧until the current day is shown.
- Press > – The set day will be saved. The parameter will no longer be displayed in bold.

- Press ∨ – Submenu "**3.2 Hour**" appears.
- Press > – The current set hour is indicated in bold.
- Press ∨ or ∧until the current hour is shown.
- Press > – The set hour will be saved. The parameter will no longer be displayed in bold.

- Press ∨ – Submenu "**3.3 Minute**" appears.
- Press > – The current set minute is indicated in bold.
- Press ∨or∧until the current minute is shown.
- Press > – The set minute will be saved. The parameter will no longer be displayed in bold.

The time and day have now been programmed. Press < to exit the menu or ∨ to scroll to the next menu item.

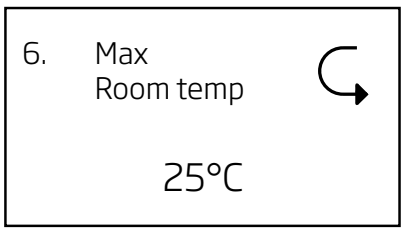
N.B. The time setting must be checked regularly. Change the time to daylight savings time manually.

Please complete in pencil!

Last setting performed on: _____

Name: _____

2.1.4. Maximum Room Temperature



This menu item is hidden by default. The maximum room temperature may also be set via a parameter setting (for this, see section "3.5. Additional Parameters")

The maximum room temperature has been programmed for 25°C. At this temperature the upper limit of the temperature range generally described as a "comfortable temperature" is exceeded.

If the unit detects that this limit is exceeded while it is in operation, the unit's controller initiates a cooling process to reduce the current room temperature as measured. For more information, see "Appendix 1 Processes and Alarms – High Temperature.

This temperature setting does not generally need changing. If, however, you do wish to change the maximum room temperature, proceed as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨ until menu item "**6. Max. room temp**" appears.
- Press > – The current set maximum room temperature is indicated in bold.
- Press ∨ or ∧ until the desired temperature is shown.
- Press > – The set temperature will be saved. The parameter will no longer be displayed in bold.

The maximum room temperature is now permanently set. Press < to exit the menu or ∨ to scroll to the next menu item.

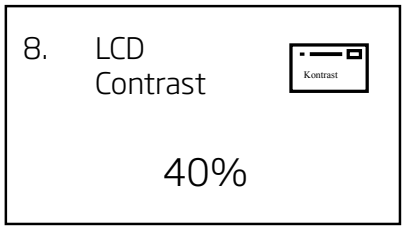
N.B. In order to ensure problem-free operation, it is recommended that you do not program in a maximum room temperature below 23°C.

Please complete in pencil!

Last setting performed to: _____ °C

Name/date: _____

2.1.5. LCD Contrast

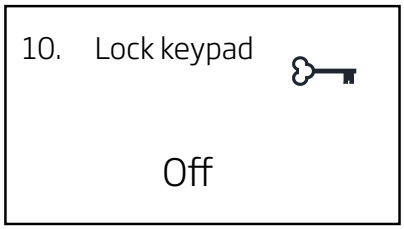


The contrast for the control panel display has been initially set at 40%. If you wish to change the contrast, this is set via the control panel as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨ until menu item "**8. Contrast**" appears.
- Press > – The current set contrast is indicated as a percentage in bold.
- Press ∨or∧until the desired contrast is shown.
- Press > – The set contrast will be saved. The parameter will no longer be displayed in bold.

The contrast is now permanently set. Press < to exit the menu or ∨ to scroll to the next menu item.

2.1.6. Lock Keypad



The control panel keypad may be locked to prevent unauthorised use. The keypad lock is activated as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨ until menu item "**10. Lock keypad**" appears.
- Press > – The text "**Off**" appears in bold.
- Press ∨ or ∧ – The text changes to "**On**".
- Press > – The keypad lock is activated and the display switches to the operating screen display.

A "key" symbol now appears in the bottom left corner of the display.

To deactivate the keypad lock, press the following key combination:

- Press: ∨, ∨, ∧, ∧
- Then press < and > simultaneously and hold down for two seconds

The "key" symbol is deleted and the keypad is unlocked.

2.1.7. Cooling Module

If the Airmaster unit is equipped with a cooling module, there will be a controller under the left-hand side panel of the cooling module for adjusting setting and checking its operation.

Set:	Select/save parameter
Up arrow:	Menu up/increase parameter
Down arrow:	Menu down/decrease parameters

Settings, inspection and repair of the cooling module must be performed by authorised specialist personnel.

The cooling module contains the refrigerant R407c or R134a, both of which represent a hazard to the environment.

LED signals:

Green LED flashing

1. Cooling module starting
2. The Set key has been pressed.

Yellow LED flashing:

1. The cooling module is de-icing

The controller is an EVCO type EVK 253 and has three temperature sensors for the outdoor, evaporator and condenser temperatures, respectively, and these start and stop the compressor.

Sensors:

Pb 1: Outdoor temperature

Pb 2: Evaporator temperature

Pb 3: Condenser temperature

The controller has been preset to display the outdoor temperature Pb 1.

To display other sensor temperatures, proceed as follows:

Press "Down arrow" for two seconds.

Press "Up arrow" or "Down arrow" to toggle between Pb2 and Pb3.

Press "Set" and the value will be indicated on the display for 60 seconds, after which the outdoor temperature Pb1 will again be displayed.

To change "Setpoint", proceed as follows:

Press "Set"; the green LED will flash.

Press "Up arrow" or "Down arrow" until you obtain the desired value.

Press "Set" to save your change.

2.2. Manual Start and Stop

2.2.1. Start and Stop Using the Control Panel

Manual start and stop of the Airmaster air handling unit is possible directly via the control panel. If you want settings suited for manual operation, this may be undertaken prior to or after start-up of the unit via the control panel. For this, see section "2.1. User menu – basic settings".

To **start** the Airmaster air handling unit:

- Press ∧ for four seconds.

The unit will start automatically within 3 minutes with the current preset or pre-programmed parameters.

In the bottom right-hand corner of the control panel display, the text "Starting" appears for approximately two seconds before the text "Running" appears. At the same time, in the top left-hand corner of the display, the text "Panel" appears.

To **stop** the Airmaster air handling unit:

- Press ∨ for four seconds.

The unit will stop within approximately two minutes.

In the bottom right-hand corner of the control panel display, the text "Stopping" first appears for approximately two minutes before the text "Stopped" appears. At the same time, in the top left-hand corner of the display, the text "Off" appears.

Both the start and the stop function can also be used when the unit is running in automatic operation. Here the user can reset the unit from, e.g., basic ventilation or night time cooling to general operation and reset it back to its last operating state.

In the case of automatic operation via the timer, the unit can also be stopped completely. The unit can then either be started manually from the panel, via an external switch, or via the next automatic start signal.

2.2.2. Start and Stop via an External Switch

It may be necessary to switch the unit on or off using an additional external switch, if, for instance, the control panel is not installed in the same room as the air handling unit.

To **start** the unit the switch must be enabled (closed).

To **stop** the unit the switch must be disabled (opened) again.

Both the start and the stop function via an external switch can also be used when the unit is running in automatic operation. Here the user can reset the unit from, e.g. basic ventilation or night time cooling to general operation and reset it back to its last operating state.

In the case of automatic operation via the timer, the unit can also be stopped completely. The unit can then either be started manually from the panel, via the switch, or via the next automatic start signal.

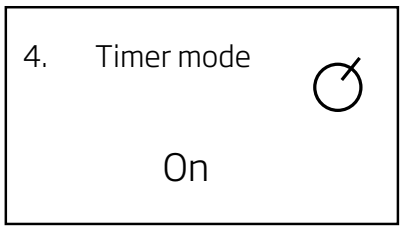
External switches:

- Switch
- Hygrostat
- Thermostat
- etc.

2.3. User Menu - Programmed Operation

This section describes automatic operation via a timer, night time cooling and basic ventilation.

2.3.1. Timer Mode



This function ensures fully automatic operation of the Airmaster air handling unit according to the programmed times.

Automatic operation, which is set via the control panel user menu, starts and stops the air handling unit from the control panel by means of the integrated timer. To use this function, the time and day must be set – for this see also "2.1.3. Time and Day".

To activate and programme the timer, proceed as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨ until menu item "**4. Timer mode**" appears.
- Press > – Menu item "**4.1 On/Off**" appears.
- Press > – The current set state (Off) is indicated in bold.
- Press ∨ or ∧ – The text "On" appears in bold on the display.
- Press > – The change is now saved. The parameter will no longer be displayed in bold. Stay in the menu.

The timer has been factory pre-set to switch on the air handling unit from Monday to Friday at 07.00 and switch it off at 17.00 on each day, once automatic operation is activated.

If the factory setting suits the customer's requirements, press < to exit the menu. Otherwise continue by following the instructions on the next page.

The time may be programmed in a different way, by means of "Events", which can switch the air handling unit on or off. A maximum of 16 events (1-16) are available. Changes are permanently saved.

Press ∨ to select the next menu item

- "**4.2 Event no.**", an event number (1 to 16) is displayed.
- "**4.3 On/Off**", the current event setting ("**On**" or "**Off**") is displayed. To activate an event, "On" must be displayed.
- "**4.4 Event**", the activation state "**Switch on**" or "**Switch off**" is displayed. The "Switch on" state switches on the unit and the "Switch off" state switches it off.
- "**4.5 Day**", the day setting is displayed. (Mon-Fri, Mon, Tue, Wed, Thu, Fri, Sat, Sun; all days or Sat-Sun may be selected.)
- "**4.6 Hour**", the set hour is displayed. Hours may be set from 0 to 23.
- "**4.7 Minute**", the set minute is displayed. Minutes may be set from 0 to 59.

Press > to initiate a change in value and to save a change.

Press ∧ to select the previous menu item.

Press ∧ or ∨ to change parameters.

Press < to exit the menu or to undo a change.

Once the first event (e.g. "1") has been set, press ∧ to scroll up the menu structure to menu item 4.2 so you can select and set the next event (e.g. "2").

N.B. At least one switch-on and one switch-off event must be programmed, otherwise automatic operation via the timer will not prove satisfactory.

Factory-set parameters:

Event 1, On, Switch on, Mon-Fri, 7, 0
Event 2, On, Switch off, Mon-Fri, 17, 0

All other events are switched off. Please complete/cross out in pencil!

Last setting performed to:

Event 1, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 2, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 3, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 4, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 5, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 6, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 7, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 8, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 9, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 10, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 11, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 12, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 13, On/Off, Switch on/Switch off, day: _____, h:____, m:____

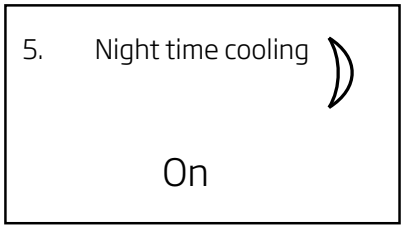
Event 14, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 15, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Event 16, On/Off, Switch on/Switch off, day: _____, h:____, m:____

Name/date: _____

2.3.2. Night Time Cooling



The night time cooling function, which is set via the control panel user menu, provides the option of reducing the room temperature overnight if the temperature has exceeded the nominal values during the day. The function works with a fixed parameter setting (high flow rate and low inlet temperature), which has been optimised to cool down the room's furnishings and structure to limit the room temperature during the day.

If the air handling unit is equipped with a cooling module and a bypass damper, the function uses this equipment to regulate the inlet temperature (IT).

Night time cooling starts and stops the Airmaster air handling unit via the clock integrated in the control panel, once the start conditions 1 and 2 are met. To use this function, the time and day must be set – for this see also "2.1.3. Time and Day".

Start conditions 1:

- The room temperature has exceeded the programmed upper limit

and

- Night time cooling was not active during the previous night.

or

Start conditions 2:

- The room temperature has exceeded the programmed lower limit

and

- Night time cooling was active during the previous night.

To activate night time cooling, proceed as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨ until menu item "5. Night time cooling" appears.
- Press > – Menu item "**5.1 On/Off**" appears.
- Press > – The current set state (Off) is indicated in bold.
- Press ∨ or ∧ – The text "On" appears in bold on the display.
- Press > – The change is now saved. The parameter will no longer be displayed in bold. Stay in the menu.

Night time cooling is now activated and will start according to the factory setting at 00.00 from Monday to Friday and switch off at 06.00 on each of those days, provided the start conditions 1 or 2 are met.

There is a "switch on" and "switch off" event available for programming night time cooling.

If the factory setting suits the customer's requirements, press < to exit the menu. Otherwise continue by following the instructions on the next page.

Factory-set parameters:

Airflow:	100%
Inlet temperature:	16°C
Temperature upper limit:	26°C
Temperature lower limit:	23°C
Switch on, Day:	Mon-Fri
Switch on, Hour:	0
Switch on, Minute:	0
Switch off, Day:	Mon-Fri
Switch off, Hour:	6
Switch off, Minute:	0

Press ∨ to select the next menu item The following menu items are available:

- "**5.2 Event**", an event ("**Switch on**" or "**Switch off**") is displayed.
- "**5.3 Day**", the day setting is displayed. (Mon-Fri, Mon, Tue, Wed, Thu, Fri, Sat, Sun; all days or Sat-Sun may be selected.)
- "**5.4 Hour**", the set hour is displayed. Hours may be set from 0 to 23.
- "**5.5 Minute**", the set minute is displayed. Minutes may be set from 0 to 59.

Press > to initiate a change in value and to save a change.

Press ∧ to select the previous menu item.

Press ∧ or ∨ to change parameters.

Press < to exit the menu or to undo a change.

Once the first event (e.g. "Switch on") has been set, press ∧ to scroll up the menu structure to menu item 5.2 to set the next event (e.g. "Switch off").

N.B. Both a "Switch on" and a "Switch off" event must be set.

Please complete/cross out in pencil!

Current event parameters:

Night time cooling activated: Yes/No

Switch on, Day: _____

Switch on, Hour: _____

Switch on, Minute: _____

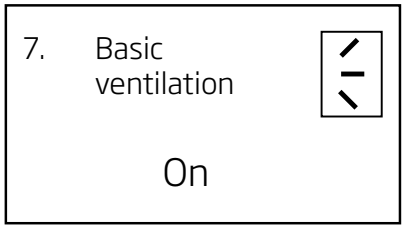
Switch off, Day: _____

Switch off, Hour: _____

Switch off, Minute: _____

Name/date: _____

2.3.3. Basic (Background) Ventilation



The basic ventilation function, which is activated and set via the control panel user menu, ventilates a room using a lower flow rate than is the case with general operation of the air handling unit.

Basic ventilation starts and stops the unit via the integrated clock from the control panel. To use this function, the time and day must be set – for this see also "2.1.3. Time and Day".

A typical use of this function is low-level ventilation over the weekend when nobody is in the room, or low-level ventilation with PIR sensor override in a room that is only used on an irregular basis.

Instructions on how to activate and set this are on the next page.

To activate basic ventilation, proceed as follows:

- Press > – Menu opens with item "1. Airflow"
- Press ∨ until menu item "**7. Basic ventilation**" appears.
- Press > – Menu item "**7.1 On/Off**" appears.
- Press > – The current set state (Off) is indicated in bold.
- Press ∨ or ∧ – The text "On" appears in bold on the display.
- Press > – The change is now saved. The parameter will no longer be displayed in bold. Stay in the menu.

Basic ventilation is now activated and will start according to the factory setting at 06.00 from Monday to Friday and switch off at 18.00 on each of those days.

There is a "switch on" and "switch off" event available for programming basic ventilation.

If the factory setting suits the customer's requirements, press < to exit the menu. Otherwise continue by following the instructions on the next page.

Factory-set parameters:

Airflow:	40%
Inlet temperature:	Programmed inlet temperature (manual operation) minus 1°C
Switch on, Day:	Mon-Fri
Switch on, Hour:	6
Switch on, Minute:	0
Switch off, Day:	Mon-Fri
Switch off, Hour:	18
Switch off, Minute:	0

Press ∨ to select the next menu item:

- "**7.2 Event**", an event ("Switch on" or "Switch off") is displayed.
- "**7.3 Day**", the day setting is displayed. (Mon-Fri, Mon, Tue, Wed, Thu, Fri, Sat, Sun; all days or Sat-Sun may be selected.)
- "**7.4 Hour**", the set hour is displayed. Hours may be set from 0 to 23.
- "**7.5 Minute**", the set minute is displayed. Minutes may be set from 0 to 59.

Press > to initiate a change in value and to save a change.

Press ∧ to select the previous menu item.

Press ∧ or ∨ to change parameters.

Press < to exit the menu or to undo a change.

Once the first event (e.g. "Switch on") has been set, press ∧ to scroll up the menu structure to menu item 7.2 to set the next event (e.g. "Switch off").

N.B. Both a "Switch on" and a "Switch off" event must be set.

Please complete/cross out in pencil!

Current event parameters:

Basic ventilation activated: Yes/No

Switch on, Day: _____

Switch on, Hour: _____

Switch on, Minute: _____

Switch off, Day: _____

Switch off, Hour: _____

Switch off, Minute: _____

Name/date: _____

2.4. Programmed Operation

This section describes how to start and stop the Airmaster unit via a PIR sensor, starting, stopping and control via a CO_2 sensor, and operation via a BMS system.

Some specific details are described in section "3. Parameters and programming"

2.4.1. Start and Stop via PIR Sensor

The Airmaster air handling unit has been set to start/stop via a signal from a PIR sensor.

In the event of a signal from the PIR sensor resulting from movement in the sensor's range, the unit will start in normal operation with the airflow and inlet temperature that has been programmed in the controller for manual operation.

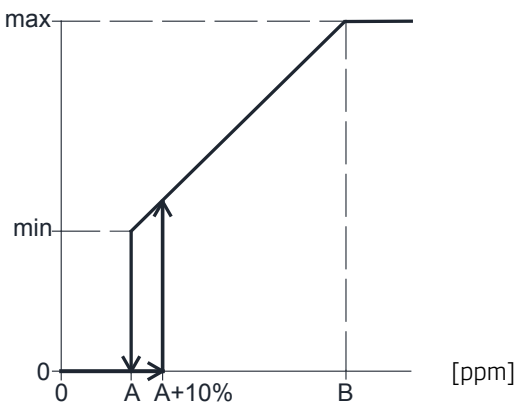
When the signal disappears, the unit will stop after a certain delay has elapsed (factory-set at 30 minutes).

The factory-set parameters may be changed and the PIR sensor can be deactivated. For more information, see section "3. Parameters and Programming".

2.4.2. Start, Stop and Control via CO_2 Sensor

A CO_2 sensor is used to start, stop and control the Airmaster air handling unit in response to the levels of CO_2 in the room.

1. [%]



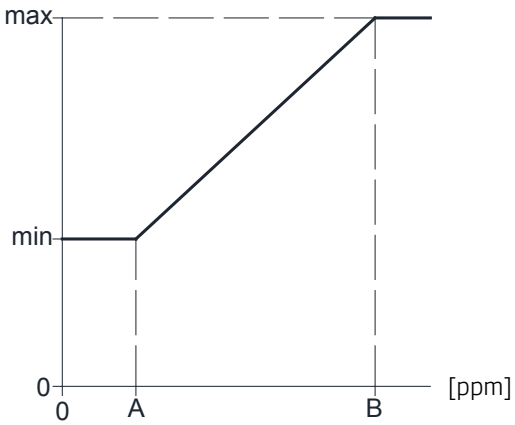
The unit starts with the programmed minimum airflow (min) when the CO_2 level exceeds the programmed lower limit plus 10% (A+10%). Depending on the CO_2 level in the room, the unit then increases the airflow in linear fashion until it reaches the maximum airflow (max) at the upper limit for the CO_2 level (B) and above.

If the CO_2 level drops back below the programmed lower limit (A), the unit will stop within two minutes.

To use this function, the CO_2 sensor must be programmed as a start parameter (see section "3.2.4. CO_2 Sensor – Start Parameter")

See the settings on the next page.

2. [%]



The controller also responds when the unit is, for instance, already running at reduced flow rate as basic ventilation (see section "2.1.1 Airflow" or "3.2.1. Airflow – Setpoint"). In this case, once the CO_2 level exceeds the programmed lower limit (A), the CO_2 sensor's signal overrides the set parameters from the basic ventilation that is already running. From this point on, the CO_2 sensor takes over control of the airflow between (min) and (max), as described under 1.

If the CO_2 level drops back below the programmed lower limit (A), the controller will return to the programmed basic ventilation.

All parameters can be adjusted once the CO_2 sensor is activated in the controller program. For more information, see section "3.2.6. CO_2 sensor – activation".

Factory settings and associated parameters (see also sections "3.2.5. CO_2 Sensor – Operating Range" and "3.5. Service Menu – Additional Parameters"):

A: 500 ppm (Min CO2 PPM)
B: 1000 ppm (Max CO2 PPM)
max: 100% (Max airflow)

Setting the minimum airflow (min):

The airflow is determined by the programmed airflow "Default flow" (see section "3.2.1. Airflow – Setpoint") or the set airflow via the control panel user menu under menu item "1. Airflow" (see section "2.1.1 Airflow").

2.4.3. BMS System

The Airmaster air handling unit can be controlled via a BMS system, which can start and stop the unit and regulate airflow.

The BMS system can be provided with an alarm signal from the air handling unit when the unit detects an internal alarm.

This type of control requires that the unit receive

- a potential-free start and stop signal and
- a 0-10 volt DC signal that can control the airflow.

All signals must be programmed in the BMS system. Please contact your BMS system supplier in this regard.

The BMS system starts the unit via a start signal. The BMS system then controls the airflow.

Once the BMS system's start signal disappears, the unit will stop for approximately two minutes according to the default stop procedure.

The unit can also be started and stopped via a BMS system (see also "Installation Manual – External Connections") and the unit then controlled as described in section "2. Control".

Please cross out in pencil!

Current programming:

BMS system starts and stops the unit /
BMS system controls the unit

Name/date: _____

2.5. Status Menu

The status menu is used to check the unit's operation. The menu shows all the major operating parameters.

To display the menu, press < for four seconds

4.6	4.6	0			Running
IT	**19.2**	**F1**	**50**	**AC**	**OFF**
OT	**15.5**	**F2**	**65**	**MD**	**ON**
RT	**20.6**	**CF**	**0**	**BP**	**0**
ET	**17.6**	**FL**	**1.2**		**19.0**

The following information is displayed at the top:

Software version of controller (4.6), software version of control panel (4.6), unit number (0= single unit), operating status (Running; the following are also possible: Stopping, Stopped, Starting, Bas.vent, Night time cooling, Condensate, Low Temp. or High Temp.) Pressing ∧ or ∨ displays the status of all units (0 = Master, 1-15 = Slave) on Master/Slave systems

To exit the menu, press >.

The 12 parameters:

IT – Inlet temperature (temperature downstream of the heat exchanger and comfort heating surface) in °C

OT – Outdoor temperature (temperature downstream of the preheating surface and upstream of the heat exchanger) in °C

RT – Extraction/Room temperature (temperature upstream of the heat exchanger) in °C

ET – Exhaust temperature (temperature downstream of the heat exchanger) in °C

F1 – Voltage of the inlet fan as a number (0-100 for 0.0 to 10.0 volts)

F2 – Voltage of the exhaust fan as a number (0-100 for 0.0 to 10.0 volts)

CF – CO_2 flow/BMS flow control voltage as a number (0-100 for 0.0 to 10.0 volts)

FL – Air speed in m/s (first number) and the setpoint used by the controller for the inlet temperature in °C (second number)

AC – Cooling module (ON = ready for operation, OFF = not ready for operation)

MD – Main damper (ON = Open, OFF = Closed)

BP – Bypass damper (degree of opening as a percentage, 0-100)

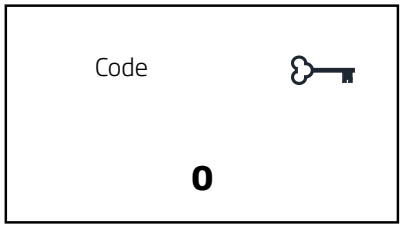
3. Parameters and Programming

If changes are to be made to basic values, setpoints or operating conditions on a permanent basis, these parameters must be programmed using the control panel service menu.

The service menu may also be navigated using the four arrow keys on the control panel. See also section "1.4 Controls".

Any changes in the service menu must be performed by an installation engineer who has experience of programming Airmaster air handling units.

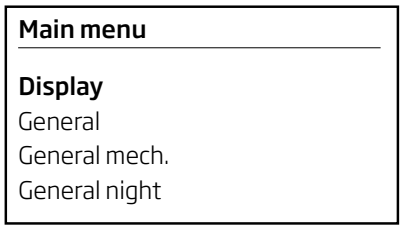
3.1. Service Menu - Activation



- Press > for approximately four seconds.
- The menu item "**Code**" will now appear on the display, with the text "**0**" in bold.
- Press ∧ until the code "22" appears in bold.
- Press > to log into the service menu.
- "**Main menu**" appears in the top line of the display.

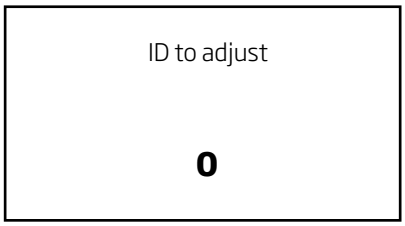
The controller is now ready for changes to be made to default values and for the programming of operating parameters.

The following text now appears at stand alone units on the display:



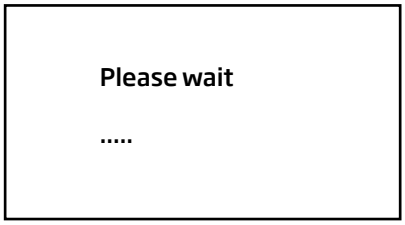
Only Master/Slave sytems:

You need to choose the specific unit which has to be programmed before "Main menu" is activated.



- Press ∧ until the specific unit is shown which needs to be programmed.
- Press > to log into the Service Menu.

- The Display now briefly shows the following message before "Main Menu" is opened.



Please Note:
It is recommended that a list is produced that shows the id 0 to id 15 with all relevant information. We refer to " 3.3.2 Local Master Programming ".

id 0 is Master, id 1 to id 15 is Slave 1 to 15

3.2. Service Menu - Default Values

To change default values on a permanent basis, the service menu must be activated - see "3.1. Service Menu - Activation".

3.2.1. Airflow - Set Point

General	
Flow alarm	0%
Measure flow	2m
Slaves	0
Default flow	100%

If the default airflow for manual operation, automatic operation via a timer, CO_2 sensor control and internal processes is to be limited, the following setting must be performed:

- Activate the service menu.
- Press ∨ until the menu item "**General**" appears in bold.
- Press > - The "General" menu opens.
- Press ∨ until the menu item "**Default flow**" appears in bold.
- Press > - The set airflow in % is indicated in bold.
- Press ∨ or ∧ to change the airflow to the desired value.
- Press > to save the new default value - the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The airflow has now been permanently changed to a new default value. This setting does not affect the airflow for night time cooling or basic ventilation.

However, it is also possible to increase the airflow both prior to and during manual operation and following start-up during programmed operation using the basic setting - see also section "2.1.1. Airflow".

Please complete in pencil!

Last setting performed to: _____%

Name/date: _____

3.2.2. Inlet Temperature - Set Point

General	
Measure flow	2m
Slaves	0
Default flow	100%
Default temp	19°C

If the default inlet temperature for manual operation, automatic operation via a timer, CO_2 sensor control, basic ventilation and internal processes is to be changed, the following setting must be performed:

- Activate the service menu.
- Press ∨ until the menu item "**General**" appears in bold.
- Press > - The "General" menu opens.
- Press ∨ until the menu "**Default temp**" appears in bold.
- Press > - The set inlet temperature is indicated in °C in bold.
- Press ∨ or ∧ to change the temperature.
- Press > to save the new default value - the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The inlet temperature has now been permanently changed to a new default value. This setting does not affect the inlet temperature for night time cooling.

However, it is also possible to increase the inlet temperature both prior to and during manual operation and following start-up during programmed operation using the basic setting - see section "2.1.2. Temperature".

Please complete in pencil!

Last setting performed to: _____ °C

Name/date: _____

3.2.3. PIR Sensor - Delay

General	
Start pri. 3	0-10 V
Start pri. 4	None
Start pri. 5	Panel
PIR delay	30m

- Activate the service menu.
- Press ∨ until the menu item "**General**" appears in bold.
- Press > – The "General" menu opens.
- Press ∨ until the menu item "**PIR delay**" appears in bold.
- Press > – The set delay is indicated in minutes in bold.
- Press ∨ or ∧ to change the time.
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The delay has now been permanently changed to a new default value.

Please complete in pencil!

Last setting performed to: _____ minutes

Name/date: _____

3.2.4. CO_2 Sensor - Start Parameter

General	
Start dep.	Indep
Start pri. 1	Start
Start pri. 2	PIR
Start pri. 3	None

This programming procedure may be used for all start parameters that are associated with the 0-10 volt signal. Start parameters work independently of one another by default. This means, each programmed start parameter can start the air handling unit. If the start parameter has not been set, setting must be performed before a CO_2 sensor may be used:

- Activate the service menu.
- Press ∨ until the menu item "**General**" appears in bold.
- Press > – The "General" menu opens.
- Press ∨ until the menu item "**Start pri.**" appears in bold.
- Press > – Set parameter "**None**" (default value) appears in bold.
- Press ∧ until "**0-10 V**" appears in bold.
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The start parameter for a CO_2 sensor is now activated. If it is to be deactivated again, it must be reset to "None".

Please complete/cross out in pencil!

Start parameter 0-10 V (CO_2 sensor) activated: Yes/No

Name/date: _____

3.2.5. CO_2 Sensor - Operating Range

CO2 Setup	
Min CO2 PPM	500
Max CO2 PPM	1000
S. Min PPM	0
S. Max PPM	2000

- Activate the service menu.
- Press ∨ until the menu item "**CO2 Setup**" appears in bold.
- Press > – The "CO2 Setup" menu opens with the menu item "**Min CO2 PPM**".

Adjust the lower limit:

- Press > – Set parameter (default value: 500 ppm, possible: 0-5000 ppm) appears in bold.

  N.B. The controller's start point for the programmed lower limit is "lower limit plus 10%", whereas the stop point is at the lower limit!

- Press ∧ or ∨ until the desired lower limit is set. (Stepped change of: 50 ppm).
- Press > to save the new default value – the value is no longer displayed in bold.

Adjust the upper limit:

- Press ∨ until the menu item "**Max CO2 PPM**" appears in bold.
- Press > – Set parameter (default value: 1000 ppm, possible: 0-5000 ppm) appears in bold.
- Press ∧ or ∨ until the desired upper limit is set. (Stepped change of: 50 ppm).
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The working range for a CO_2 sensor is now programmed.

Please complete in pencil!

Current CO_2 sensor lower limit: _____

Current CO_2 sensor upper limit: _____

Name/date: _____

3.2.6. CO_2 Sensor - Activation

CO2 Setup	
S. Max PPM	2000
S. Min Volt	0.0 V
S. Max Volt	10.0 V
CO2 Instal.	No

In order to use a CO_2 sensor it must be activated (default state: Active):

- Activate the service menu.
- Press ∨ until the menu item "**CO2 Setup**" appears in bold.
- Press > – The "CO2 Setup" menu opens.
- Press ∨ until the menu item "**CO2 Instal.**" appears in bold.
- Press > – Set parameter "**No**" appears in bold.
- Press ∨ – Now "**Yes**" appears in bold.
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The CO_2 sensor is now activated. If it is to be deactivated again, it must be reset to "No".

Please complete/cross out in pencil!

CO_2 sensor activated: Yes/No

Name/date: _____

3.2.7. Language

General	
Language	EN
Start dep.	Indep
Start pri. 1	Start
Start pri. 2	PIR

The language of the control panel display for displaying indicated items, the status menu and the basic setting menu may be set to English – EN, Danish – DA, Dutch – NL, German – DE, Swedish – SV and French – FR. The service menu on the other hand is always in English.

The language has been factory-set. To change it, proceed as follows:

- Activate the service menu.
- Press ∨ until the menu item "**General**" appears in bold.
- Press > – The "General" menu opens and the menu item "**Language**" appears in bold.
- Press > – The abbreviation for the set language appears in bold.
- Press ∨ or ∧ to change the language.
- Press > to save the language. The language will no longer be displayed in bold.
- Press < to exit the menu in stages.

The language has now been permanently changed to a new default value.

Please complete in pencil!

Language set as: _____

Name/date: _____

3.2.8. Night Time Cooling – Set Points

General mek.	
NC IT	16.0°C
NC flow	100 %
NC High	26.0°C
NC Low	23.0°C

The airflow, inlet temperature, temperature upper and lower limit for night time cooling can be adjusted independently of the other general settings:

- Activate the service menu.
- Press ∨ until the menu item "**General mek.**" appears in bold.
- Press > – The "General mek." menu opens.

Adjust the inlet temperature:

- Press ∨ until the menu item "**NC IT**" appears in bold.
- Press > – The set inlet temperature (default value = 16°C) appears in bold.
- Press ∨ or ∧ to change the temperature in 1°C steps.
- Press > to save the new default value. The value will no longer be displayed in bold.

You can also adjust the airflow "**NC Flow**" (default value = 100 %), the temperature upper limit "**NC High**" (default value = 26°C) and the temperature lower limit "**NC Low**" (default value = 23°C) as described above.

- Press < to exit the menu in stages.

The night time cooling parameters have now been permanently changed to new default values. From now on, night time cooling will start if the new temperature limits are exceeded on the basis of a new flow and a new inlet temperature. For more information, see also section "2.3.2. Night Time Cooling"

Please complete in pencil!

Night time cooling inlet temperature: _____ °C

Night time cooling airflow: _____ %

Night time cooling temperature upper limit: _____ °C

Night time cooling temperature lower limit: _____ °C

Name/date: _____

3.2.9. Basic Ventilation - Set Points

General mek.	
Delay stop	0 m
Grad start1	0 s
BG flow	40%
BG temp diff	1°C

The airflow and temperature difference for the default inlet temperature for basic ventilation can be adjusted independently of the other general settings:

- Activate the service menu.
- Press ∨ until the item "**General mek.**" appears in bold.
- Press > – The "General mek." menu opens.

Adjust the airflow:

- Press ∨ until the menu item "**BG flow**" appears in bold.
- Press > – The set airflow (default value = 40%) appears in bold.
- Press ∨ or ∧ to change the airflow in 5 % steps.
- Press > to save the new default value. The value will no longer be displayed in bold.

You can also adjust the inlet temperature "**BG temp diff**" (default value = 1°C) as described above.

- Press < to exit the menu in stages.

From now on, basic ventilation will start on the basis of a new flow and a new temperature difference. The difference is subtracted from the default inlet temperature. For more information, see also section "2.3.3. Basic Ventilation"

Please complete in pencil!

Basic ventilation airflow: _____ %

Basic ventilation temperature difference: _____ °C

Name/date: _____

3.2.10. BMS - Start Parameter (CTS)

General	
Start dep.	Indep
Start pri. 1	Start
Start pri. 2	PIR
Start pri. 3	None

Start parameters work independently of one another by default. That is to say, each start parameter can start the Airmaster air handling unit. If the start parameter "CTS" has not been set, it must be set prior to using a controller via a BMS system:

- Activate the service menu.
- Press ∨ until the menu "**General**" appears in bold.
- Press > – The "General" menu opens.
- Press ∨ until the menu item "**Start pri.**" appears in bold.
- Press > – Set parameter "**None**" (default value) appears in bold.
- Press ∧ until "**CTS**" appears in bold.
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The start parameter for a BMS system has now been activated. If it is to be deactivated again, it must be reset to "None".

The CO_2 sensor must be deactivated. For more information, see section "3.2.6. CO_2 Sensor – Activation". The controller cannot work with a 0-10 volt signal from the BMS system and the CO_2 sensor. Otherwise a CO_2 sensor is typically controlled by the BMS system.

Please complete/cross out in pencil!

BMS start parameter activated: Yes/No

CO_2 sensor deactivated: Yes/No

Name/date: _____

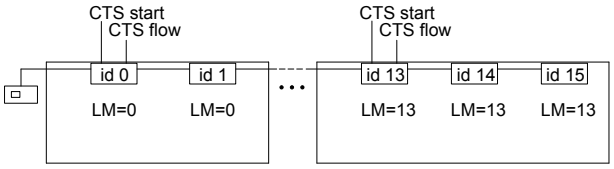
Remember! The BMS system must be programmed with a 0-10 volt signal to control the airflow in the 0-100% range via the 0-10 V input. Contact your BMS system supplier in this regard.

3.3. Master/Slave System

Please Note!
The first time a Master/Slave System is connected to a power supply the control panel shows "Slave error", until the number of slaves are programmed.

Different models with different options can be linked, based on the need for ventilation in each room. The programming of a Master/Slave System is described by using four examples.

Example 1: Start, Stop and Controlling by using BMS (CTS).



LM: Local master

Start parameters may be programmed identically for all units:

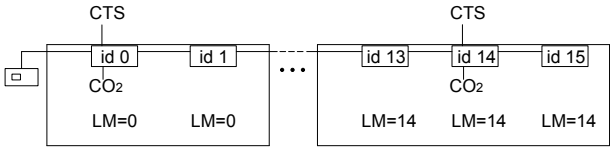
Start pri. 1:	CTS
Start pri. 2:	None or Start
Start pri. 3:	None or PIR
Start pri. 4:	None
Start pri. 5:	Panel

In this example the daily operating hours and air volumes are controlled by BMS. BMS is connected to each "Local master" as "CTS Start" and " CTS Flow"; also consult Installation manual section "External connections" and "Appendix 3; wiring diagrams " and the following sections.

The scheduler of the control panel, e.g. Night Time Cooling, will control all units outside the shared timer on demand. In this case the shared timer of the control panel and the individually programmed parameters in each unit, e.g."NC flow", "NC temp", "NC High" and "NC Low" is used to control each unit.

Please note: The use of a PIR sensor (Start pri. "PIR") or and external start signal (Start pri. "Start") is always possible outside normal operating hours. The "Default flow" and "Default temp" values of the Master (or the set points showed in the display of the control panel in user menu 1 and 2) are used to control the units. We refer to section "2.1.1. Airflow" and section "2.1.2. Temperature".

Example 2: Start and Stop using CTS.



LM: Local master

Start parameters may be programmed identically for all units:

Start pri. 1:	Start
Start pri. 2:	None or PIR
Start pri. 3-4:	None
Start pri. 5:	Panel

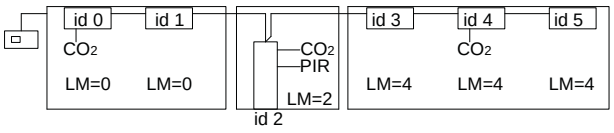
The airflow must be programmed too e.g. 40%. We also refer to section; "3.3.3. Programming of a Master/Slave System".

In this example the daily operation of the unit is started and stopped by BMS. BMS is connected to each "Local master" as "Manual start"; we also refer to Installation manual section "External Connections" and "Appendix 3 Wiring Diagrams" and the following sections. When programmed to start with 40% airflow the CO_2 sensors overrides the set point of the units depending on the CO_2 level in the room. (Demand Controlled)

The scheduler of the control panel, e.g. Night Time Cooling, will control all units outside the shared timer on demand. In this case the shared timer of the control panel and the individually programmed parameters in each unit, e.g."NC flow", "NC temp", "NC High" and "NC Low" is used to control each unit.

Please note: The use of a PIR sensor (Start pri. "PIR") is always possible outside normal operating hours. The "Default flow" and "Default temp" values of the Master (or the set points showed in the display of the control panel in user menu 1 and 2) are used to control the units. We refer to section "2.1.1. Airflow" and section "2.1.2. Temperature". When the units have started, the signal from the CO2 sensors overrides the set point of the airflow.

Example 3: Controlling using the CO_2 level



LM: Local master

In this case the following start parameters are programmed:

id 0-1 and id 3-5:	Start pri. 1-4:	None
	Start pri. 5:	Panel
id 2:	Start pri. 1,3-5:	None
	Start pri. 2:	PIR

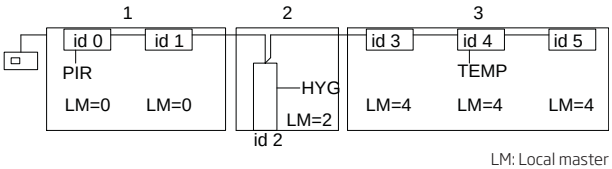
The airflow must be programmed too e.g. 40%. We also refer to section "3.3.3. Programming of a Master/Slave System".

This way operating hours and airflows for id 0-1 and 2-5 are controlled by the control panel. Id 2 only starts on demand by the signal from the PIR sensor, but with the same airflow as id 0-1 and 3-5. When the units have started with an airflow of 40% the CO_2 sensors override the airflow depending of the CO_2 level.

The scheduler in the control panel controls, both Basic Ventilation and Night Time Cooling, all air handling units except id 2 (because Start pri. "panel" was not programmed her) outside normal operating hours defined by local needs (demand controlled). In this case the shared timer of the control panel and the individually programmed parameters in each unit, "NC flow", "NC temp", "NC High" and "NC Low" but also "BG flow" and "BG temp diff" are used to control each unit.

Please note: The use of a PIR sensor (Start pri. "PIR") by id 0-1 and 3-4 or an external start signal (Start pri. "Start") by all units are always possible outside normal operating hours. The "Default flow" and "Default temp" values of the Master (or the set points showed in the display of the control panel in user menu 1 and 2) are used to control the units. We refer to section "2.1.1. Airflow" and section "2.1.2. Temperature". When the units have started the signal from the CO2 sensors overrides the set point of the airflow.

Example 4: Basic ventilation with override of ventilation on demand



LM: Local master

Here the default programmed starting parameters can be used for all units:

Start pri. 1:	Start
Start pri. 2:	PIR
Start pri. 3:	CTS
Start pri. 4:	None
Start pri. 5:	Panel

Basic Ventilation is activated and programmed for each unit if needed, e.g. "BG flow" to 40 % and "BG temp diff" to 0 °C. We refer to section "2.3.3. Basic (Background) Ventilation" or section "3.2.9. Basic Ventilation – Set Points"

Daily operation is started and stopped by using the control panel function "Basic Ventilation ". When the unit is started with an airflow of 40%, the connected sensors will override this air volume using the default value "Default flow" (default value 100 %) or the airflow set in the user menu point 1, depending on the need (Demand controlled)

In this example background ventilation is changed by the following ways:

Room 1 using a PIR-sensor, when movement is registered in the room.

Room 2 using a hygrostat, when the relative humidity exceeds the adjusted set point.

Room 3 using a thermostat, when the temperature exceeds the adjusted set point.

The program Night Time Cooling in the control panel controls all ventilation units outside normal operating hours defined by local needs (demand controlled). In this case the shared timer of the control panel and the individually programmed parameters in each unit "NC flow", "NC temp", "NC High" and "NC Low" are used to control each unit.

3.3.1. Programming of Number of Slaves

General	
PIR delay	30 m
Flow alarm	0 %
Measure flow	2 m
Slaves	0

In master/slave systems, a master and 1 to 15 slave units are declared via dipswitches in the control box (For more information, see also section "Master/Slave Installation" in the Installation Manual).

The system will only properly function once the controller has been programmed with the number of slaves present on the system:

- Activate the service menu.
- Press ∨ until the menu "**General**" appears in bold.
- Press > – The "General" menu opens.
- Press ∨ until the menu item "**Slaves**" appears in bold.
- Press > – The set parameter "**0**" (default value) appears in bold.
- Press ∧ until the correct number of slaves appears in bold.
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The master/slave system has now been fully activated. Where more slaves are added, their number must be corrected in the menu.

Please complete in pencil!

Number of programmed slaves: _____

Name/date: _____

3.3.2. Programmering of Local master (LM)

Local master		
id 0	master	0
id 1	master	0
id 2	master	0
id 3	master	0

In the wired network it is the id 0 the master of the network, that communicates with the control panel. The Master and all of the Slaves are located through "DIP-switches" in each control box in the unit. We refer to the Installation Manual section " Master/Slave installation". Slave 1 to Slave 15 is referred to as id 1 to id 15.

In the programming of all units in a system all units can be a "Local master" (LM) or just follow a "Local master". We refer to the four examples previously mentioned. The system is typically defined in groups as shown in those four examples.

- Press ∨ to enter menu "**Local master**".
- Press > - Menu "Local master" is entered.

By using the four navigation arrows the addressed "Local master" can be connected to each unit.

The figure to the right on each line shows which "Local master" the units (id 0-id 15) follows. Example:

id 1	master	1
id 2	master	1

means that the unit id 1 (Slave 1) follows it self as Local master 1 (id 1 or Slave 1) and id 2 (Slave 2) also follows Local master 1 (id 1 or Slave 1). Hence decides id 1 the operations of id 1 and id 2, if e.g. id 1 is equipped with a CO2sensor, while id 2 is not equipped with a sensor.

Please note: We strongly recommend that a system configuration is produced which at least contains the information as follows:

Groups with Local master for id 0 to id 15 (Master to Slave 15), the actual position of each specific unit, sensors connected to each specific unit, and the actual programming of each individual unit. (Please also note this information in the Operators Manual to each unit).

3.3.3. Programmering of a Master/Slave System

- Programming of number of Slaves; we refer to section 3.3.1.
- Programming of Local master (LM); we refer to section 3.3.2.
- Programming of Start priorities and parameters to each unit, if needed; both the obligatory shared parameters and the individually parameters to each unit, see below and section 3.3.

The air flow and inlet temperature is set by the id 0 (Master) and is shared with all units. We refer to sections "2.1.1. Airflow" and " 2.1.2. Temperature". By using sensors to define the airflow, e.g. a CO2 sensor, the sensor signal will override the default value "Default flow ". This requires the default value to be adapted to the demanded start level, e.g. 40%.

Starting parameters and scheduler controlled programs from the control panel shared with all units if the start priority "panel" is active for the individual unit. See section "3.4. Start Conditions".

Start parameters and individual parameters to control specific units must be programmed for all units in the system.

The parameters of the sensors to operate units must be programmed both to the unit on which it has been wired to as well as the unit which has this unit as "Local master".

3.4. Start Conditions

Start conditions are programmed start parameters that start the Airmaster air handling unit when a start signal is active and then stop it when the start signal is no longer present.

Start parameters can be programmed as start parameters that act independently of one another (independent parameters) or start parameters which are dependent on one another in order to take effect (dependent parameters), and are therefore combined.

Any one independent start parameter can start or stop the unit. Combined start parameters can only start the unit if all parameters are active; but in this case, if even just one signal ceases to be present, the unit stops, even though the other parameters are still active.

The following start parameters are available:

None	No parameter programmed.
Start:	Manual start via external switch.
CTS	Start via BMS system.
PIR	Start via motion sensor.
0-10 V	Start via CO_2 sensor or other equipment that has a 0-10 V control signal.
Panel	Start via programmed operation (automatic operation, basic ventilation and night time cooling) and manual start via the ∧ key of the control panel.

The controller can handle up to five different start parameters, both as independent and as combined start conditions.

3.4.1. Independent Start Conditions

The Airmaster air handling unit is programmed by default with four start parameters that act mutually independently:

Start pri. 1: Start

Start pri. 2: PIR

Start pri. 3: CTS

Start pri. 4: None

Start pri. 5: Panel

As independent signals, these have a priority ordering of 1 to 5. This means that the start parameter with priority 1 can override all other start parameters, whereas the one with priority 5 can be overridden by all the others.

If, for instance, the unit is in operation due to a start signal from the control panel, a start signal from the PIR sensor resulting from movement detected in the room can change operation to run in accordance with the operation parameters that belong to the PIR sensor. If the PIR signal disappears, after the time delay associated with the PIR sensor the unit will return to the operating state that it was in prior to the start signal from the PIR sensor.

Changing start parameters is described in sections 3.2.4. for a CO_2 sensor (0-10 V) and 3.2.9. for BMS systems (CTS).

3.4.2. Combined Start Conditions

General	
Start dep.	Indep
Start pri. 1	Start
Start pri. 2	PIR
Start pri. 3	None

In certain situations, it may be desirable for the Airmaster unit to be able to start when all start parameters are met and then for it to stop again when only one signal disappears.

An example would be where the unit is only to start in a room over a given period of time if there are people in the room. In this case, you would want to program the timer with the desired time and install a PIR sensor in the room. You would program PIR and Panel as start parameters.

To change start conditions to obtain combined conditions, proceed as follows:

- Activate the service menu.
- Press ∨ until the menu item "**General**" appears in bold.
- Press > – The "General" menu opens.
- Press ∨ until the menu item "**Start dep.**" appears in bold.
- Press > – The set condition "**Indep**" (default value) appears in bold.
- Press ∧ – the value changes to "**Depen**".
- Press > to save the new default value – the value is no longer displayed in bold.
- Press < to exit the menu in stages.

The Airmaster air handling unit will now start with combined start conditions. All the start parameters programmed under the menu item "General" ranging from "Start pri. 1" to "Start pri. 5" must have an active start signal before the unit will start.

To complete the programming procedure, the necessary start parameters must now be programmed in. To do this, proceed as indicated in sections 3.2.4. for a CO_2 sensor (0-10 V) and 3.2.9. for BMS systems (BMS).

3.5. Service Menu - Additional Parameters

By default, none of the parameters described here are used for daily operation. All the parameters are in the service menu.

3.5.1. Display

- **Min airflow** – General restriction of selection options for minimum inlet airflow.
- **Max airflow** – General restriction of selection options for maximum inlet airflow.
- **Min temp**. – General restriction of selection options for minimum value of the inlet temperature.
- **Max temp**. – General restriction of selection options for maximum value of the inlet temperature.
- **Show temp** – Setting if the display is to show a setpoint for the inlet temperature (Set), the measured inlet temperature (Inlet) or measured room temperature (Room).
- **Hide menu 1-11** – Shows or hides user menu items (Yes = hide, No = show).

3.5.2. General

- **Save def.** – Saves all programmed settings. (Yes = saves by default; No = does not save; back-up function for settings)
- **Restore def.** – Replaces all current settings and programming configurations with the saved settings. (see "Save def.") (Yes = goes back to the last saved settings, No = use current settings)
- **GLOBAL OFF** – Stops the power supply to the fans, e.g. for servicing or repairs to the electrical system for instance. (No = default operation, Yes = stop power supply, the text "SERVICE" appears on the display)

  N.B. This function may only be used by an authorised specialist!

- **AutoRestDef.** - The controller resets all "Default" values during all stopping processes (Yes=Standard) or only after a power cut (No)

3.5.3. General mek.

- **Min volt in, Max volt in, Min volt ex and Max volt ex** – Parameters that may only be used for retrofitting of a cooling module. ***N.B. Settings may only be performed in accordance with the instructions in the relevant retrofitting manual or the manual from the supplier of the unit.***
- **Displacement** – During general operation this restricts the maximum setpoint for the inlet temperature in relation to the current room temperature.

  N.B. This should only be set when installing/ removing comfort heating surfaces.

  Settings:
  Airmaster 900 as displacement model with or without comfort heating surface: -3
  Other units: 0

- **Fixed Displ.** – If it is deemed desirable that the setpoint of the inlet temperature should always track the room temperature, this parameter is changed from "OFF" to "ON". This will mean that the inlet temperature adheres to the room temperature plus "Displacement".

3.5.4. General nat.

Not in use.

3.5.5. Heat/temp.

- **Preheater flow** – Set by default to 90% but can be changed to give internal processes a different start point to switch on the preheating surface.
- **Min inlet** - Limit for activating the alarm for inlet temperature.

  Please note: Parameters may only be changed after consulting the manufacturer of the unit.

- **Min outside** - Limit for activating the alarm for outside temperature.

  Please note: Parameters may only be changed after consulting the manufacturer of the unit.

- **Afterheater** – Parameter that may only be used for retrofitting of a comfort heating surface. (No = no heating surface, Elect = electrical heating surface, water = water heating surface)
- **Virtual PH** – must be at "Green" for "Green mode" and "Comf." for "Comfort mode" on a CityVent 80, Airmaster 100 and 300 with a comfort heating surface installed. Otherwise it must be set to "OFF". (See also "Appendix 1 Processes and Alarms" – "Virtual Preheating".)
- **Preheater** – Parameter that may only be used for retrofitting of a pre heating surface. (No = no heating surface, Elect = electrical heating surface)

3.5.6. Condens

Not in use.

3.5.7. Bypass

- **Installed** - Yes for "installed", No for "not installed".
- **On/off** - On for "in use", Off for "not in use".
- **High RT** – Setting of the setpoint in °C for the upper limit of "High room temperature" for internal processes. If this value is set, the value in the user menu item "Max Room Temp." is also changed and vice-versa. (Standard: 25 °C)
- **Low RT** – Setting of the setpoint in °C for the lower limit of "High room temperature" for internal processes. If "Max Room Temp." is set in the user menu, the value for Low RT is also changed to High RT minus 3 °C. (Standard: 24 °C)
- **RT Timer** – This parameter determines the number of minutes until the controller has to regulate the inlet temperature when it is running internal processes (see "Appendix 1 Processes and Alarms). Changes to settings are not normally needed. It is not recommended that the set default value (30 minutes) be changed without the approval of the unit's supplier.
- **Cool flow** – The setting of the minimum airflow in % during operation of a cooling module. This setting is only used in the event of retrofitting of cooling modules:

No cooling module:	0%
Airmaster 180:	70%
Airmaster 300:	80%
Airmaster 500:	100%
Airmaster 800:	80%

3.5.8. CTS

Not in use.

3.5.9. Loop test

Not in use.

3.5.10. CO2 Setup

The following parameters are set if a CO_2 sensor from another supplier is to be installed, or if the sensor is to be replaced with a new type having different operating limits.

- **S. Min PPM** – Lower limit in ppm for CO_2 measurement of the sensor. (Default: 0, possible: 0 - 5000)
- **S. Max PPM** – Upper limit in ppm for CO_2 measurement of the sensor. (Default: 2000, possible: 0 - 5000)
- **S. Min Volt** – Lower limit in volts for CO_2 sensor output signal. (Default: 0.0V, possible: 0.0-10.0 volts)
- **S. Max Volt** – Upper limit in volts for CO_2 sensor output signal. (Default: 10.0 V, possible: 0.0-10.0 volts)

3.5.11. Main Damper

Not in use.

3.5.12. Local Master

See also section "3.3.3. Programmering of a Master/Slave System".

4. Maintenance

Maintenance is important to ensure optimum performance of the air handling unit and its equipment. The major part of the maintenance in question involves external and internal cleaning and filter replacement.

4.1. External Cleaning

N.B. The Airmaster air handling unit must be switched off before starting any cleaning operations.

In order to remove dirt from the control panel, sensors, cooling module and air handling unit, the equipment can be wiped down with a soft cloth dampened in clean water, or water with a mild cleaning agent (e.g. washing up liquid).

N.B. Aggressive agents (e.g. turpentine) or sharp objects (e.g. a scraper) must not be used to clean the ventilation system's components.

Extraction grilles must have the dirt regularly cleaned from them. For this, it is recommended that the grilles be vacuumed using a soft brush attachment.

Dust in the area between the air handling unit and the ceiling can be easily cleaned off using a hand brush. If there is enough space, the area can also be vacuumed with a soft brush attachment.

4.2. Internal Cleaning

It is recommended that internal cleaning be carried out when a filter is replaced. If dirt enters the air handling unit/cooling module, it can be removed with a vacuum cleaner or swept out of the unit with a soft brush.

REMEMBER! Before the covers of the ventilation or cooling module may be opened, the air handling unit must be switched off and the power supply to the unit disconnected.

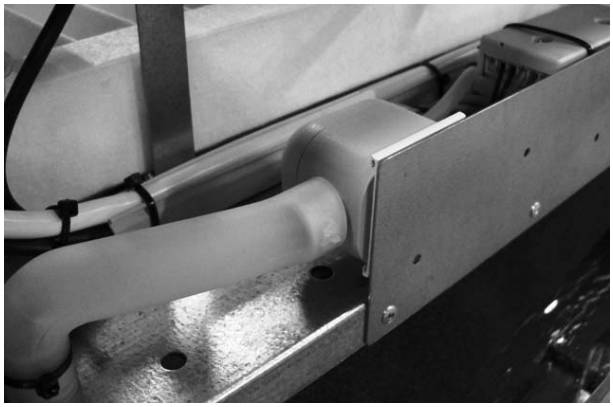
4.3. Condensate Trough and Condensate Pump

Condensate trough:

The condensate trough comes fitted as standard to all Airmaster air handling units and cooling modules. If a drain hose or condensate pump is fitted, the condensate trough must be cleaned annually when the filter is replaced.

The drain plug or drain hose of the condensate trough and the trough itself can be easily removed to clean the drain and the hose. It is recommended the drain be cleaned at the same time as the filter is replaced.

Condensate pump:



The condensate pump is available as an option and is therefore not supplied with all units. If the pump is fitted, its filter and the inlet pipe to the float chamber must be cleaned annually.

Removal of the float chamber is recommended when cleaning the filter.

In the illustration, which is of a Cooling module 500, the pump feed is on the left, the float chamber in the centre and the pump on the right under the filter.

At the Airmaster 1200 the condensate pump is placed behind a service hatch behind the extraction panel.

Please complete/cross out in pencil!

Last service: Condensate trough/condensate pump

Date of last service: _____

Name: _____

4.4. Cooling Module

4.4.1. Safety References

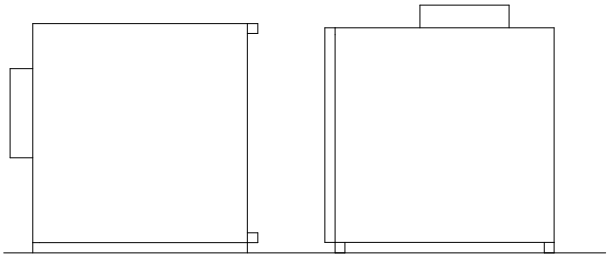
The cooling module is exempted from the Pressure Equipment Directive (PED) under the terms of article 1 para. 3.6.

Maintenance and repairs

Maintenance may be performed by the end user, whereas repairs to the cooling module must be carried out by an authorised specialist.

Transport/storage

The cooling module may only be transported/stored standing on the cover or on fixings for installing the Airmaster air handling unit.



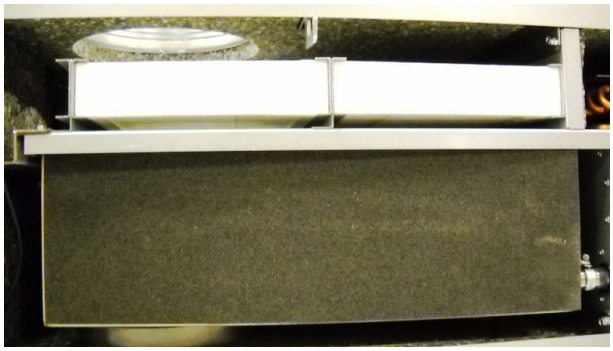
Disposal for scrap

Disposal for scrap must be performed by an authorised specialist. Before scrap disposal, the cooling module must be emptied of refrigerant and oil in accordance with current local regulations and legislation.

4.4.2. Changing the Filter

The fresh air filter should be changed at least twice a year, depending on the amount of dirt in the air.

Filter without support plate:



Filter with support plate:

Filter replacement is performed on all cooling modules in the same way:

- Switch off the air handling unit.
- Disconnect the power supply to the air handling unit.
- Carefully open the cooling module cover.

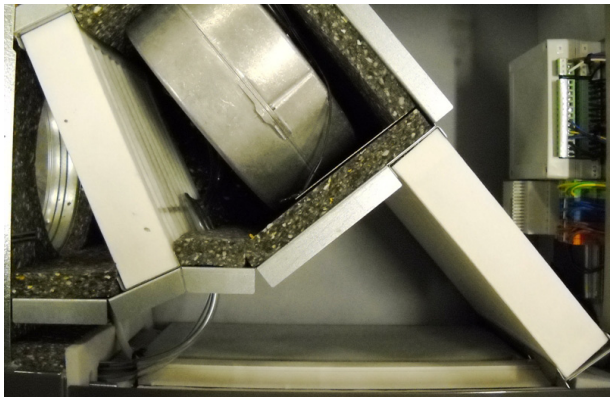
  N.B. The cover is heavy and there may be dirt on it.

- Loosen the support plate (not all models) and withdraw the old filter on the inlet side out of the holder.
- Remove any dirt from inside the cooling module and from the inlet duct.
- Insert a new filter in the direction of flow into the filter holder. (The arrow on the side of new F5/F7 filters shows the direction of flow) and fit the support plate (not all models).
- Close the cover.
- Change the extraction filter on the air handling unit. See section “4.5. Wall-mounted Airmaster Unit”.

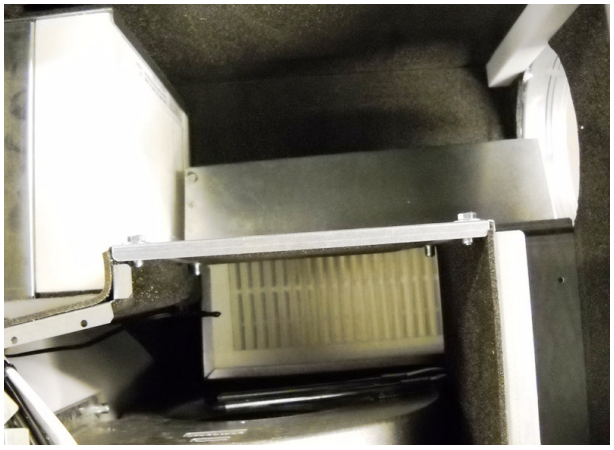
4.5. Wall-mounted Airmaster Unit

All filters in the Airmaster air handling unit should be changed at least twice a year, depending on the amount of dirt in the air.

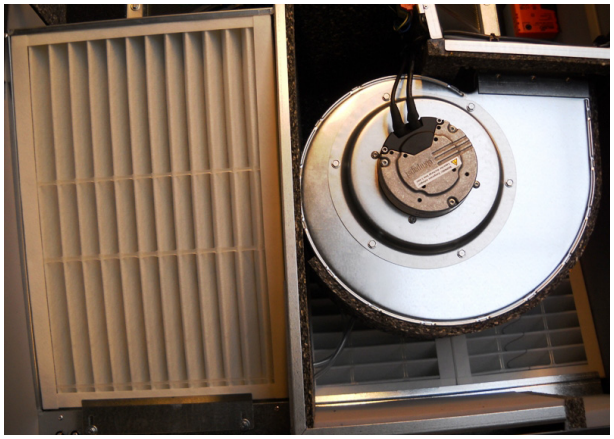
1. Filters without support plate:



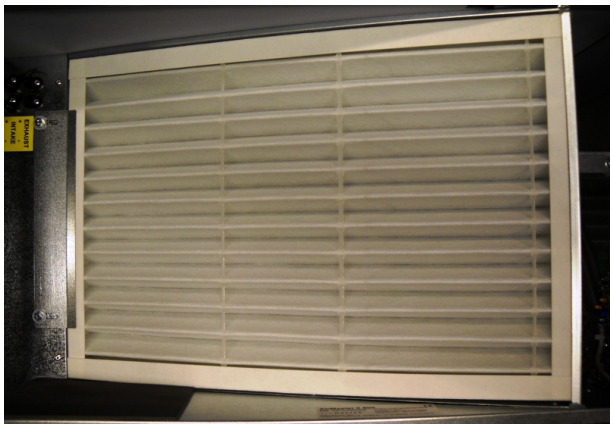
2. Filters without support plate (on the left) and with support plate (in the centre of the illustration):



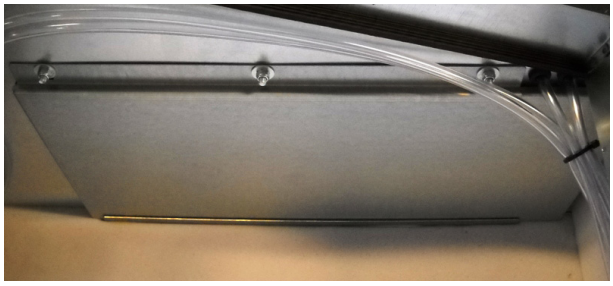
3. Both filters with support plate:



4. Exhaust air filter with support plate:

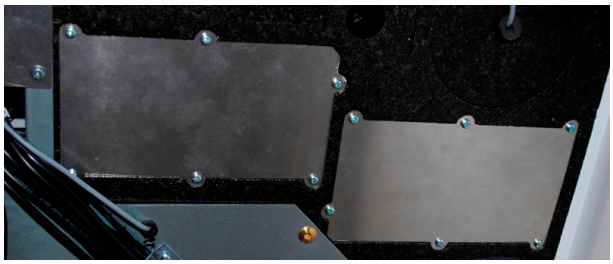


5.The support plate for the fresh air filter is under the exhaust air filter:



On some models the exhaust air filter is fitted using a support plate. Under the filter, a guard is fitted for the fresh air filter. Here the fresh air filter consists of two filter elements.

6. Filter under a metal cover:



Changing the filter:

If the Airmaster air handling unit is equipped with a cooling module, the air handling unit only has one exhaust air filter. In this case the space for the fresh air filter is empty. Otherwise, all units are equipped with both an exhaust air filter in the extraction and one or two fresh air filters upstream of the inlet fan.

Filter replacement is performed on all air handling units in the same way:

- Switch off the air handling unit.
- Disconnect the power supply to the air handling unit.
- Carefully open the air handling unit cover.

  N.B. The cover is heavy and there may be dirt on it.

- Loosen the support plate(s) or plastic covers (not all models) and withdraw the old filters from their holders.
- Remove any dirt from inside the air handling unit.
- Insert new filters in the filter holders. (The arrow on the side of new F5/F7 filters shows the direction of flow) and fit the support plate(s) or plastic covers (not all models).
- Close the cover.
- Switch the power supply back on and start the unit.

Please complete/cross out in pencil!

Last service: Air handling unit/cooling module

Filters: F5/F7

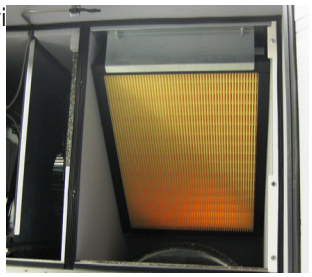
Date of last service: _____

Name: _____

4.6. Floor-mounted Airmaster Unit

Changing the filter:

All filters in the air handling unit should be changed at least twice a year, depending on the amount of dirt in the air.



At the top of the unit, the filter is fitted in a support plate behind a service cover.

2. Fresh air filter behind the side panels. (The filter is equally accessible from the left and right-hand sides)

Undo the top rail (three screws)

Remove all side panels underneath this top rail (lift them up). The filter is fitted behind a support plate

3. Exhaust air filter in the front cover:

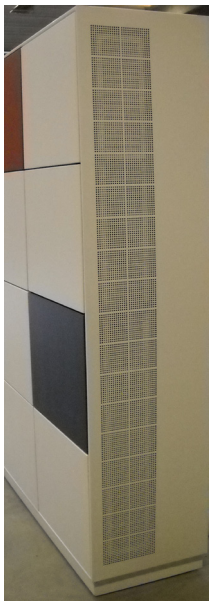
On a Airmaster 900, the exhaust air filter is either fitted at the top (displacement ventilation) or the bottom (mixing ventilation) of the front cover.

To change the filter, proceed as follows:

- Switch off the air handling unit.
- Disconnect the power supply to the air handling unit.
- Open the unit's front cover (Airmaster 900)/ remove side panels and the front panel.
- Remove the filter support plates and withdraw the old filters from their holders.
- Remove any dirt from inside the air handling unit.
- Insert new filters in the filter holders. (The arrow on the side of new F5/F7 filters shows the direction of flow.)
- Fit the support plates and the service cover/ panels.
- Close the cover (Airmaster 900).
- Switch on the power supply and start the unit.

4. Exhaust air filter (two filter elements) behind the front panel (extraction opening).

Undo the two screws at the top of the extraction and remove the panel.



Loosen the support plate.

Please complete in pencil!

Filters: F5/F7

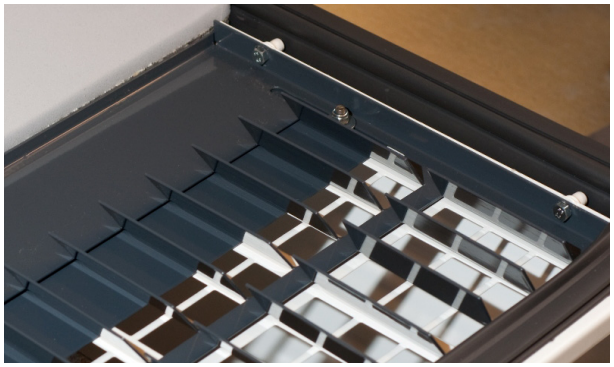
Date of last service: _____

Name: _____

Setting the inlet opening (Airmaster 900 mixing model only):

Inlet opening fully open:

Cover plate half shut:



Cover plate completely shut:

The area of the inlet opening at the top of the front cover can be adjusted by means of a cover plate.

If the bottom part of the inlet opening is fully open, the air is blown in at lowest speed and shortest throw.

If the bottom part of the inlet opening is fully shut, the air is blown in at highest speed and longest throw.

To make a setting, proceed as follows:

- Switch off the air handling unit.
- Disconnect the power supply to the air handling unit.
- Open the front cover of the unit.
- Undo the nuts on both sides of the bottom part of the inlet opening by one turn.
- Adjust the cover plate to suit.
- Retighten the nuts on both sides of the bottom part of the inlet opening.
- Close the cover.
- Switch the power supply back on and start the unit.

Please complete in pencil!

Inlet opening set to: _____

Name/date: _____

4.7. Filter Overview

Standard filters (F5):

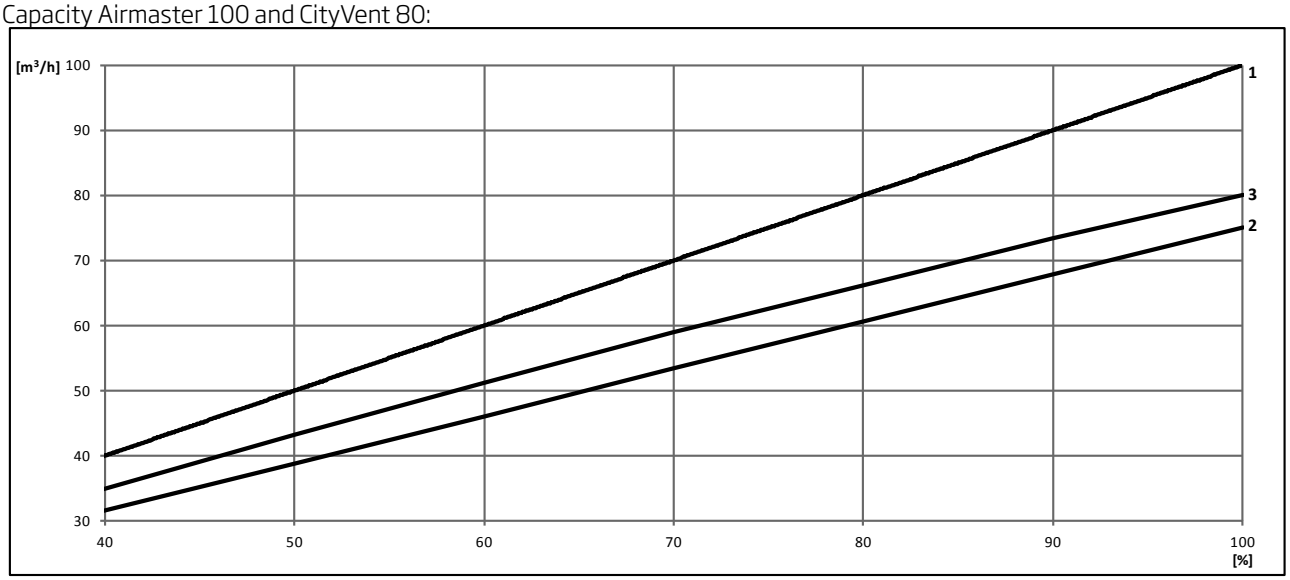
Unit	Location	Dimensions [mm]
100, CV 80	Fresh/exhaust air	206 x 185 x 92
180	Fresh/exhaust air	240 x 160 x 47
180 Cooling module	Fresh air	512 x 284 x 47
300	Fresh air	280 x 220 x 47
300	Exhaust air	280 x 220 x 47
300 Cooling module	Fresh air (two items)	280 x 220 x 47
500 (wall ducts)	Fresh air	380 x 340 x 47
500 (roof ducts)	Fresh air (two items)	190 x 340 x 47
500	Exhaust air	470 x 300 x 47
500 Cooling module	Fresh air	560 x 284 x 47
800 (wall ducts)	Fresh air	408 x 420 x 47
800 (roof ducts)	Fresh air (two items)	408 x 216 x 47
800	Exhaust air	325 x 480 x 47
800 Cooling module	Fresh air	560 x 284 x 47
900	Fresh air	360 x 480 x 96
900	Exhaust air	710 x 350 x 48
1200	Fresh air	790 x 404 x 92
1200	Exhaust air (two items)	820 x 174 x 47

Pollen filters (F7): (AC: Cooling module)

Unit	Location	Dimensions [mm]
180	Fresh air/exhaust air (not with AC)	240 x 160 x 47
180 Cooling module	Fresh air	512 x 284 x 47
300	Fresh air	280 x 220 x 47
300	Exhaust air (not with AC)	280 x 220 x 47
300 Cooling module	Fresh air (two items)	280 x 220 x 47
500 (wall ducts)	Fresh air	380 x 340 x 47
500 (roof ducts)	Fresh air (two items)	190 x 340 x 47
500	Exhaust air (not with AC)	470 x 300 x 47
500 Cooling module	Fresh air	560 x 284 x 47
800 (wall ducts)	Fresh air	408 x 420 x 47
800 (roof ducts)	Fresh air (two items)	408 x 216 x 47
800	Exhaust air (not with AC)	325 x 480 x 47
800 Cooling module	Fresh air	560 x 284 x 47
900	Fresh air	360 x 480 x 96
900	Exhaust air	710 x 350 x 48
1200	Fresh air	790 x 404 x 92

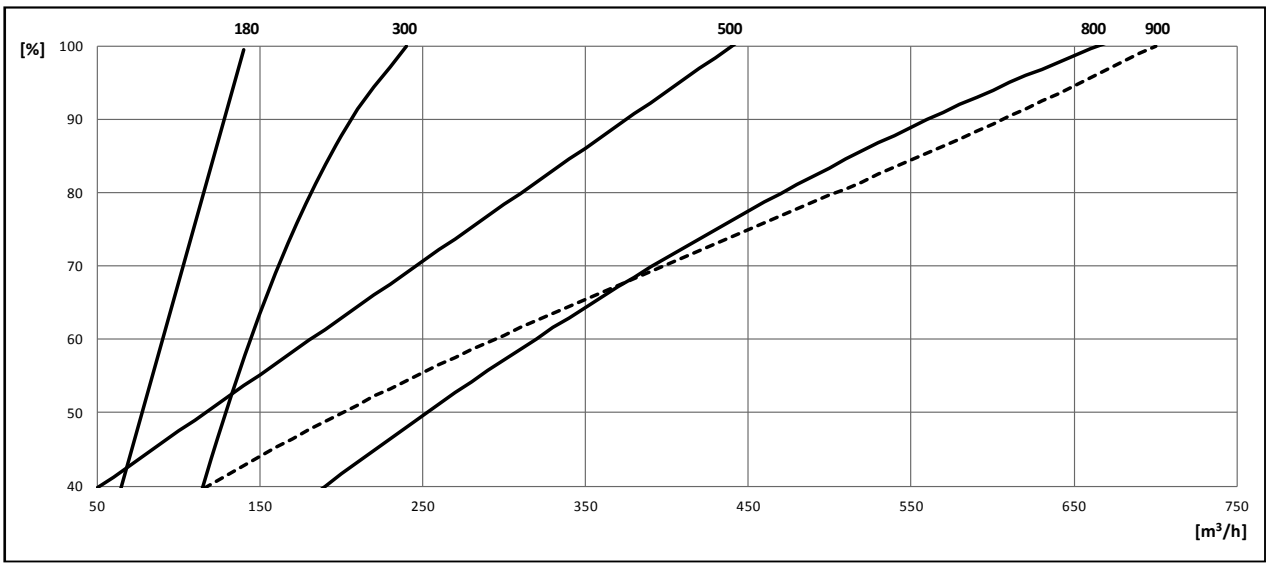
5. Data Relating to Capacity

Capacity Airmaster 100 and CityVent 80:

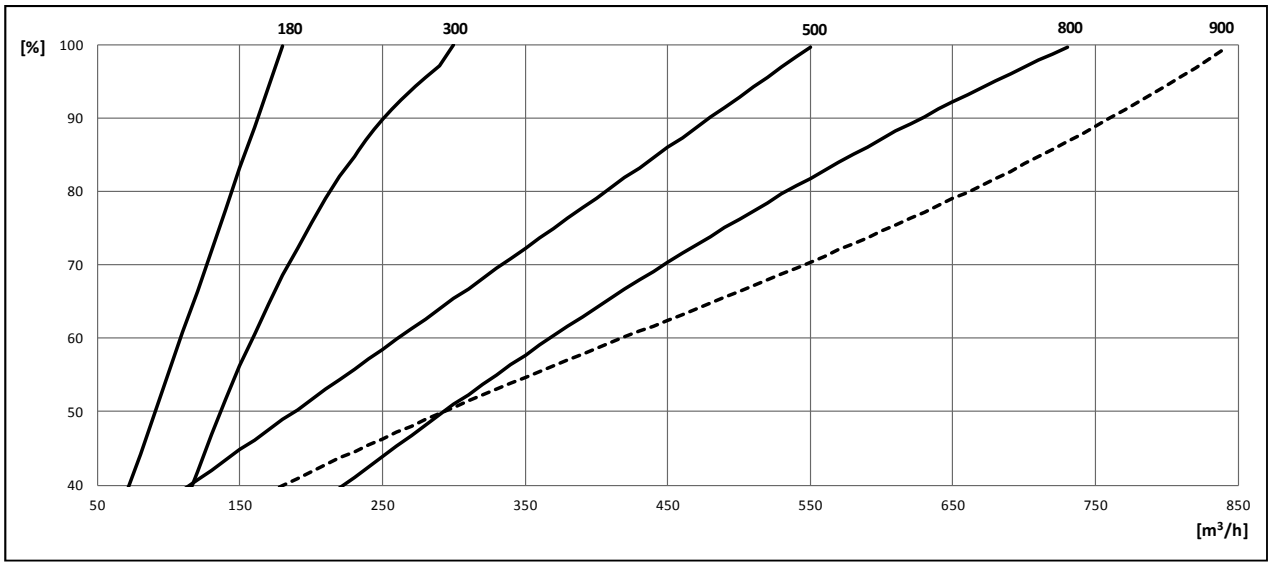


1: AM 100, 35 dB(A); 2: AM 100, 30 dB(A); 3: CV 80

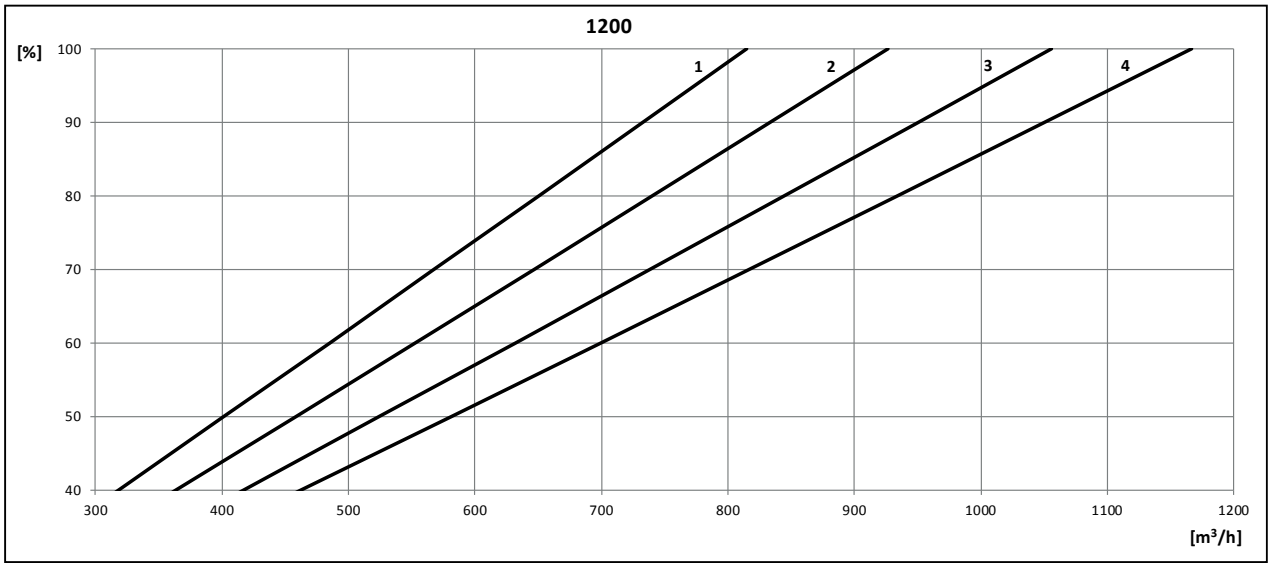
Capacity Airmaster 180 - 900, 30 dB_A:



Capacity Airmaster 180 - 900, 35 dB_A:

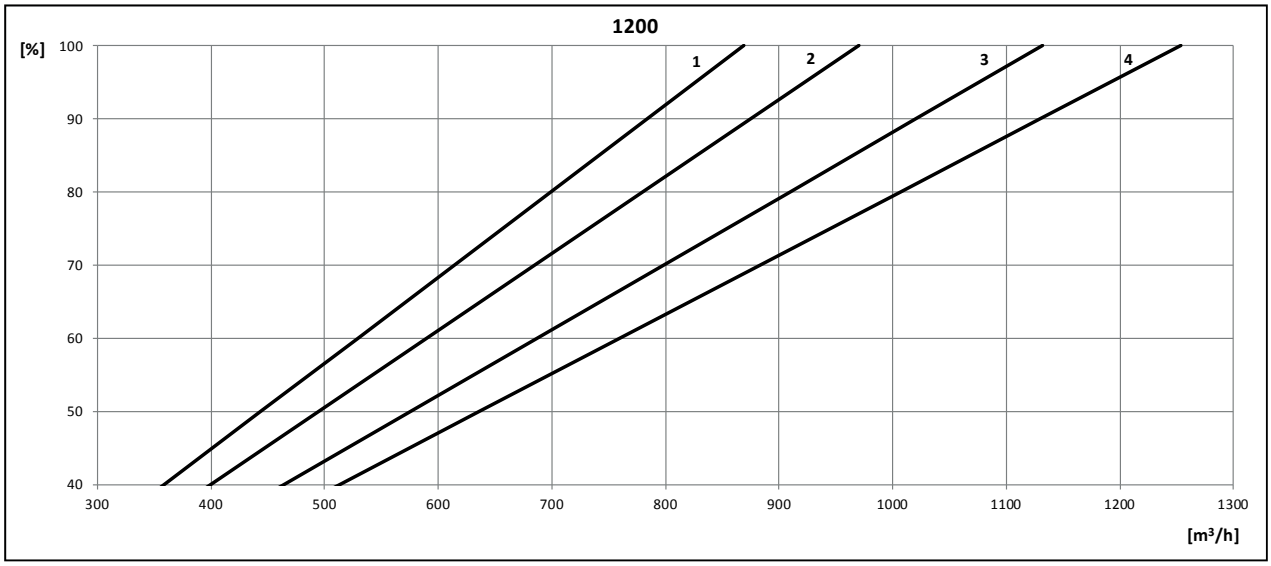


Capacity Airmaster 1200, Roof air duct pipes Ø 315 mm



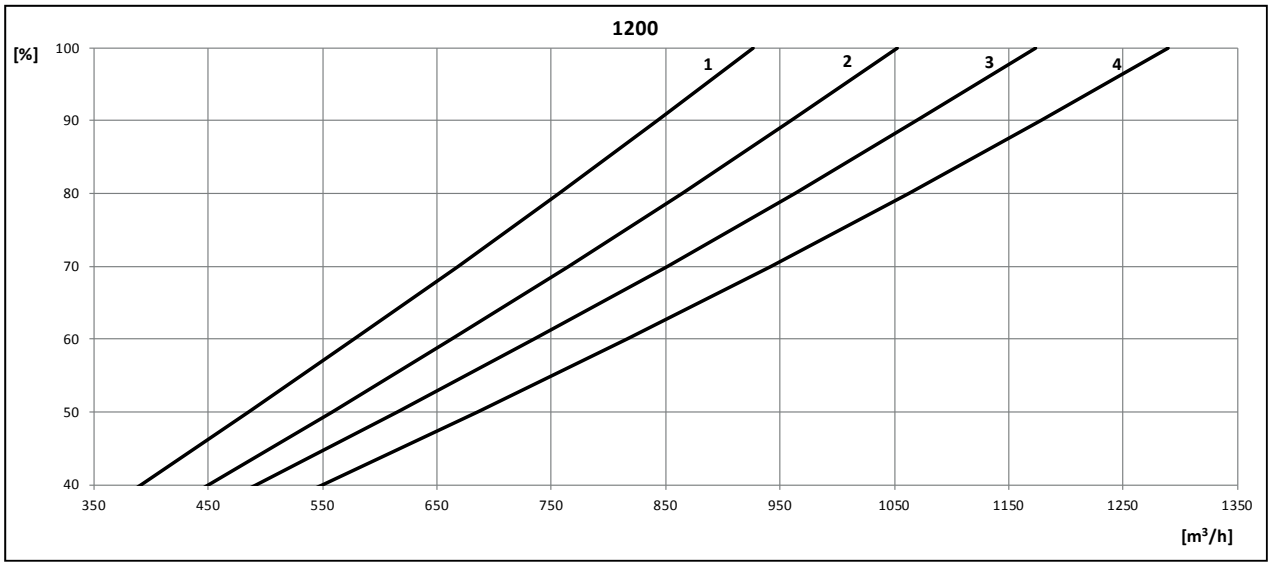
1: Corner, 30 dB(A); 2: Center, 30 dB(A); 3: Corner, 35 dB(A); 4: Center, 35 dB(A)

Capacity Airmaster 1200, Roof air duct pipes Ø 400 mm



1: Corner, 30 dB(A); 2: Center, 30 dB(A); 3: Corner, 35 dB(A); 4: Center, 35 dB(A)

Capacity Airmaster 1200, Wall air duct pipes



1: Corner, 30 dB(A); 2: Center, 30 dB(A); 3: Corner, 35 dB(A); 4: Center, 35 dB(A)

Appendix 1 Processes and Alarms

Processes Airmaster

A process is an internal operating function. The internal functions run automatically and affect both the airflow and air temperature. The processes disable the programmed default parameters, using other ones instead. Processes are displayed in the control panel status menu in the top right-hand corner. To display the menu, press the "<" key for four seconds The illustration below shows the status menu when the unit is in the "Low Temp" process.

4.6	4.6	0		Low Temp	
IT	**16.5**	**F1**	**3.1**	**AC**	**OFF**
OT	**-2.8**	**F2**	**6.7**	**MD**	**ON**
RT	**19.9**	**CF**	**0**	**BP**	**0**
ET	**0.6**	**FL**	**1.2**	**19.0**	

Low Temperature ("Low Temp")

The "Low Temperature" process protects the heat exchanger against ice forming at low outdoor temperatures and maintains the inlet temperature (IT) when the temperature conditions are too low for operation using the default parameters. The process regulates the inlet temperature (IT) and/or the exhaust temperature (ET) on its own, using modified airflows. As a result, the process produces unbalanced ventilation, and this is what prevents the formation of ice in the heat exchanger. The process will run irrespective of whether the unit is equipped with heating surfaces or not. Initially the volumes of fresh air and exhaust air are identical in magnitude.

The process is started if:

1. The inlet temperature (IT) drops 2°C below the inlet temperature currently set **or**
2. The exhaust temperature (ET) drops below 1°C.

First the process reduces the airflow of fresh air to a minimum of 50% of the airflow set via the control panel. However, this will not be below the technical minimum airflow. This means that more heat can be transferred from the exhaust air to the cold fresh air at the latter's reduced level.

If the airflow of the fresh air cannot be further reduced, the airflow of the exhaust air is increased to a maximum of twice the level of the airflow set. However, this will not be higher than the programmed maximum airflow (corresponding to the maximum fan voltage programmed in the controller). The result is that there is an increase in the amount of heat supplied to the heat exchanger.

The process reduces the volume of the exhaust airflow and then increases the volume of the fresh airflow back to its normal level once

1. The inlet temperature (IT) rises to 1°C below the inlet temperature currently set

   and

2. The exhaust temperature (ET) rises above 2°C.

The process comes to an end again once both the airflow of the exhaust air and that of the fresh air are back to their set values.

Preheating ("Preheat")

The "Preheat" process ensures that the unit operates at low temperatures if the unit has an electrical preheating surface. The preheating surface warms up the cold fresh air before it arrives at the heat exchanger.

The preheating surface is switched off once

1. The bypass damper (BP) is closed

   and

2. The fresh air has a measured lowest speed (FL) of 0.2 m/s

   and

3. The exhaust temperature (ET) is a maximum of 4°C

   and

4. The internal process "Low Temp" has reduced the volume of the fresh airflow to 90% of the value set via the control panel.

Condition 4. can be programmed to other values (see section "3.5. Additional parameters"). If the value is increased, the process can activate the preheating surface earlier, but the energy consumption is also increased as a result. If it is set to 100%, condition 4. is no longer applicable.

Virtual Preheating ("Virtual Preheat")

Like the "Preheat" process, "Virtual Preheat" also ensures the unit operates at low temperatures, but it can only be used by units that have a comfort heating surface that has a high capacity (Air handling unit CV 80, 100 and 300). On units without this comfort heating surface the function is set to "OFF" (see section "3.5. Additional parameters"). The function is started once the exhaust temperature (ET) drops below 1°C.

The function can operate in two different states, "Comfort mode" as the default mode and "Green mode" as the option.

Comfort mode:

The bypass damper opens gradually, guiding fresh air around the heat exchanger directly to the comfort heating surface, which heats the air to the inlet temperature (IT). This results in the exhaust temperature rising and the heat exchanger being protected against the formation of ice.

If the capacity of the comfort heating surface is utilised to its maximum, the unit will begin to operate in unbalanced ventilation, as described for the "Low Temperature" process.

The priority on this setting is to maintain balanced ventilation for as long as possible.

Green mode:

This setting runs as the opposite of "Comfort mode". The function starts by creating unbalanced ventilation, and then, if this is not enough, begins to regulate the bypass damper as described in "Comfort mode".

The priority on this setting is to use as little energy as possible.

High Temperature ("High Temp")

The "High Temperature" process automatically reduces the inlet temperature (IT) or the room temperature (RT) to a limited degree, if these exceed their values as currently set.

Inlet temperature (IT):

The process gradually opens the bypass damper (depending on the measured inlet temperature (IT), if the measured inlet temperature (IT) exceeds the inlet temperature (IT) set via the control panel.

Regulation of the inlet temperature (IT) is activated when

1. The bypass damper is ready for operation

   and

2. The inlet temperature (IT) rises 2°C above the set value ("Default Temp")

   and

3. The intake temperature (OT) is higher than 0°C.

When the bypass damper opens, some of the fresh air is guided around the heat exchanger directly to the inlet grate. The result is a reduction in heating of the fresh air.

Room temperature (RT):

The process automatically reduces the room temperature (RT) to a limited degree so that it reaches an acceptable level, via the bypass damper, once the programmed upper room temperature limit "High RT" (default value: 25°C) is exceeded.

The process regulates the "setpoints" for the inlet temperature (IT) and/or airflow based on the programmed values. The airflow is set to 100% if the measured inlet temperature is at least 5°C colder than the measured room temperature.

The process is active until the room temperature (RT) drops below the programmed lower room temperature limit ("Low RT"), which is set by default at 1°C below the programmed upper room temperature limit.

Regulation of the room temperature (RT) is activated when

1. The measured room temperature (RT) exceeds the programmed upper room temperature limit ("Max. room temp" or "High temp")

   and

2. The intake temperature (OT) is higher than 0°C.

If the air handling unit is equipped with a cooling module, this is started automatically once the bypass damper is fully open.

The bypass damper is still used for regulating the inlet temperature (IT).

The cooling module and the process are stopped again once the bypass damper has been shut for five minutes.

Condensate ("Condens")

The "Condens" process automatically removes condensate from the unit once the condensate float of the air handling unit signals an excess of condensate in the trough.

The process stops the inlet fan and sets the exhaust fan to maximum (100%) flow rate to remove the water from the trough. The process runs for 20 minutes and is then repeated up to three times if the water has not been removed. This means that the process can be active for up to 80 minutes.

If the signal from the float is still active after 80 minutes, a condensate alarm is output and the unit stops until the condensate has been removed manually from the condensate trough. If the signal is inactive after 20, 40, 60 or 80 minutes, the exhaust air continues to run at 100% and the fresh air is regulated to 50% for 10 minutes before the process stops completely and the unit returns to normal operation.

Alarms Airmaster

An alarm is triggered if the air handling unit cannot run without risk of damage. In the case of an alarm, a warning triangle appears on the left of the control panel display, with the alarm text and unit number being indicated in the top right-hand corner (see also section "1.5. LCD Display").

In order to protect the unit, in the event of an alarm the air handling unit will stop, or it will not be possible to start it. The cause of the alarm must be removed before the unit can restart. The unit's alarm output will be activated for as long as the alarm is registered as present. The following alarms are possible:

Condensate

The "Condens" alarm is triggered if the unit cannot remove the condensate on its own by means of the "Condens" process. The alarm protects the unit against any water egress. The alarm is reset automatically once the float is no longer outputting a signal.

On units without a condensate drain:

1. The condensate function cannot remove condensate due to the temperature and humidity conditions. Remove the condensate manually from the trough.
2. If the alarm occurs repeatedly it will be necessary to install a condensate drain.

On units with a condensate drain:

1. The drain/condensate drain hose is blocked. Clean the drain/condensate drain hose.
2. The siphon trap has been incorrectly installed. The installation should be corrected by an authorised specialist.
3. The filter of the condensate pump (if fitted) in the float chamber inlet pipe is blocked. Clean the inlet pipe, float chamber and filter.
4. Condensate pump (if fitted) is faulty. Call for SERVICE.
5. Remove the condensate manually.

Low Temperature

The "Low Temp" alarm protects the unit when low temperatures make it likely that the unit will be damaged due to ice forming in the heat exchanger.

The alarm is triggered if at least one of the following conditions is met:

1. The inlet temperature (IT) is below 10°C **or**
2. The exhaust temperature (ET) is below -2°C

The alarm is reset and the unit may be brought back into service once all of the following conditions are met:

1. The inlet temperature (IT) is at least 10°C **and**
2. The exhaust temperature (ET) is at least -2°C

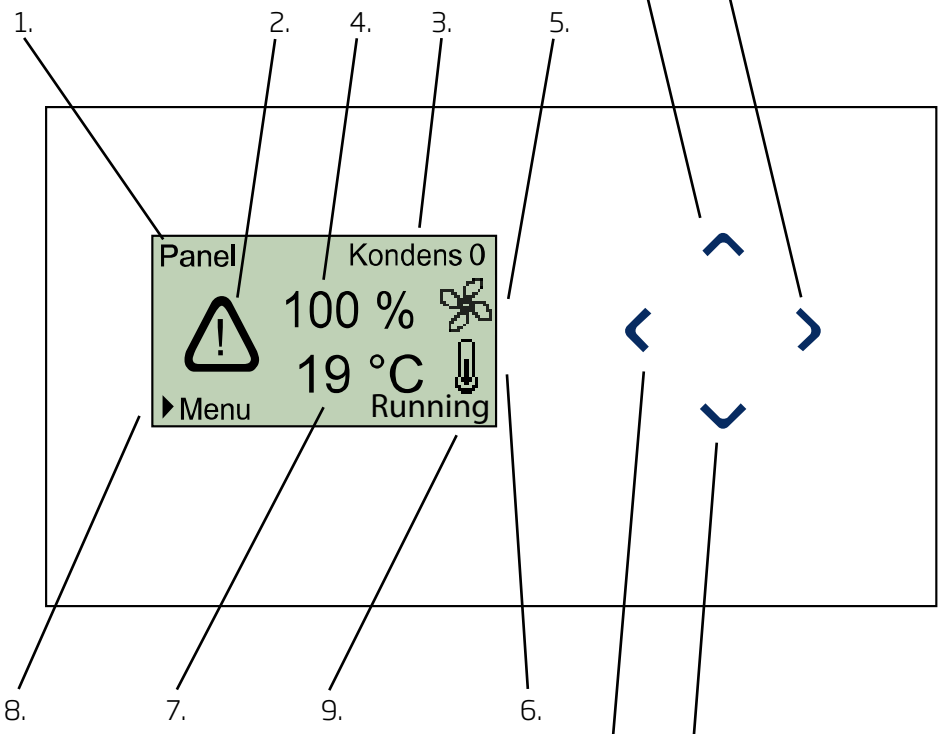
The unit will automatically attempt to start up once an hour where the "Low Temp" alarm has been off for five minutes, provided there is still an active start signal.

Quick Guide Airmaster

AIR MASTER

Start the Unit	**-**	**Press for four seconds**
Menu up	-	Press once
Increase value	-	Press once

User Menu (launch)	**-**	**Press once**
(See user menu on the rear or in the Operator's Manual)		
Open menu item	-	Press once
Save change	-	Press once



For displays 1. to 9.:

See on rear

Stop the Unit	**-**	**Press for four seconds**
Menu up	-	Press once
Reduce value	-	Press once

Status Menu (Launch)	**-**	**Press for four seconds**
(See status menu in the Operator's Manual)		
Exit menu item	-	Press once
Undo	-	Press once

Display

1. Activation – Indicates how the unit has been activated.
   Off (switched off),
   Panel,
   BMS,
   PIR,
   CO_2,
   0-10V,
   External,
   Combined or
   SERVICE
2. Alarm symbol – Displayed only when an alarm is active.
3. Alarm text – Indicates the cause of the alarm and the unit number (0-15 for master/slave system, 0 for single unit) only in conjunction with the alarm symbol.
   Condens + 0, 1, 2, 3, ... or 15,
   Low Temp + 0, 1, 2, 3, ... or 15
4. Current airflow as a percentage. (40 - 100 %)
5. Blower symbol.
6. Temperature symbol
7. Current temperature (Indicated in 1°C steps)
   Setpoint for inlet temperature (fixed value),
   Measured inlet temperature (variable value)
   or
   Measured room temperature (variable value)
8. Reference: User menu is started with the ">" key.
9. Operating status is indicated.
   Stopped,
   Stopping,
   Starting,
   Running,
   Bas.vent.,
   Night time cooling or
   Condens

User Menu

1. Airflow.

   Setting of the desired airflow between 40 and 100%.

2. Temperature.

   The inlet temperature is a setpoint for the temperature level of the unit. The default setting is 19°C. On units with/without a comfort heating surface, the temperature is set to the desired room temperature as a maximum/2°C below the desired room temperature.

   N.B. The Airmaster air handling unit may <u>not</u> be used to heat a room by increasing the inlet temperature. Regulation of room temperature <u>must</u> be performed via the heating system installed in the room.

3. Time/weekday

   Setting of the time and day for programmed operation.

4. Automatic operation to 7. Basic ventilation

   See the Operator's Manual.

8. Contrast

   Setting of the contrast on the control panel display between 0 and 100%.

10. Lock keypad

    Activation of the keypad lock to prevent unauthorised use.

    (See the Operator's Manual for details on how to open the keypad lock)

Appendix 3 Error (fault) Descriptions

Cooling Module

If a fault is detected on the cooling module, a fault code will appear on its control panel. The following faults are possible:

COH: Overheated condenser

Compressor still running. The fault may be due to too little airflow.

1. Check the airflow setting in the user menu "1. Airflow" (see also section "2.1.1. Airflow") – set airflow to 100%.
2. Exhaust filter blocked – change filter.

CSd: Compressor disabled.
The compressor has stopped. The condenser has been overheating for a long time.

1. Check the items under fault COH.
2. Check whether the alarm turns off after the current to the unit has been switched off.

Pr1, **Pr2** and **Pr3**: There is a fault with temperature sensors Pb1, Pb2 and Pb3.

1. Call for SERVICE.
2. In the case of fault code Pb3, the cooling module must be taken out of service, as fault codes COH and CSd cannot be displayed. This can damage the compressor.

Airmaster Unit

Nothing appears on the control panel display.

1. The power supply has been disconnected.
   Switch on the power supply.
2. The control panel is faulty.
   CALL FOR SERVICE.

The control panel display is black.

1. The contrast is set in the user menu to 100%.
   Press >, press ∨ eight times and ∨ once, press >, press ∨ or ∧ until the display appears again as normal.
2. The control panel is faulty.
   CALL FOR SERVICE.

The following text appears on the control panel display:

```
SW Version   4.6
EN Communication
error – see manual
DE Komm. Fehler –
siehe Anleitung
```

1. The data connection from the control panel to the unit is down.
   Call for SERVICE.

The "Low Temp" alarm is triggered irrespective of the temperature:

1. The exhaust fan is not running.
   Call for SERVICE.

The inlet temperature cannot be maintained:

1. Filters are blocked.
   Change filters.
2. The inlet temperature is set wrong
   Control setpoint.

EC Declaration of Conformity

Manufacturer	Airmaster A/S Industrivej 59 DK-9600 Aars Denmark
	herewith declare that the following product
Product	CityVent 80, Airmaster 100, Airmaster 180, Airmaster 300, Airmaster 500, Airmaster 800, Airmaster 900, Airmaster 1200, Airmaster 180 with cooling modul, Airmaster 300 with cooling modul, Airmaster 500 with cooling modul, Airmaster 800 with cooling modul
	is in conformity with provisions of the following EC directives
Directives	The Machinery Directive 2006/42/EC Low Voltage Directive 2006/95/EC EMC Directive 2004/108/EC
Reservation	This declaration is not valid if modifications are made to the product without approval by Airmaster A/S.
Place	Aars
Date	2012-03-10
Signature	 Lars Vestergaard CEO

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