

MARK COMFORT LINE

0662531_R02



Read this document before installing the heater

Warning

Incorrect installation, adjustment, alteration, repair or maintenance work may lead to material damage or injury. All work must be carried out by certified, qualified professionals. If the appliance is not positioned in accordance with the instructions, the warranty shall be rendered void. This appliance is not intended for use by children or persons with a physical, sensory or mental handicap, or who lack the required experience or expertise, unless they are supervised or have been instructed in the use of the appliance by somebody who is responsible for their safety. Children must be supervised to ensure that they do not play with the appliance.

1.0 General

1.1 Application

The first step towards a better indoor climate is the use of an air heating system, type Comfort Line. The Comfort Line takes care of the suction, filtering and (heating) blowing out air in the home. This allows all rooms to be heated quickly and comfortably. In contrast to heating with radiators, a Comfort Line will bring your home to the desired temperature quickly and self-regulating. In addition to homes, the Comfort Line can also be used for non-residential construction (shopping centres, offices, school buildings, etc.). The Comfort Line is available in various versions. The Comfort Line is an indirect fired air heater that must be used in combination with a central heating system.

The device is suitable for:

Low Temperature Heating (LTV) < 55° C

District heating

Conventional 90°C - 70°C / 80°C - 60°C.

Significant energy savings are achieved through the use of high efficiency DC fans in the Comfort Line (EC).

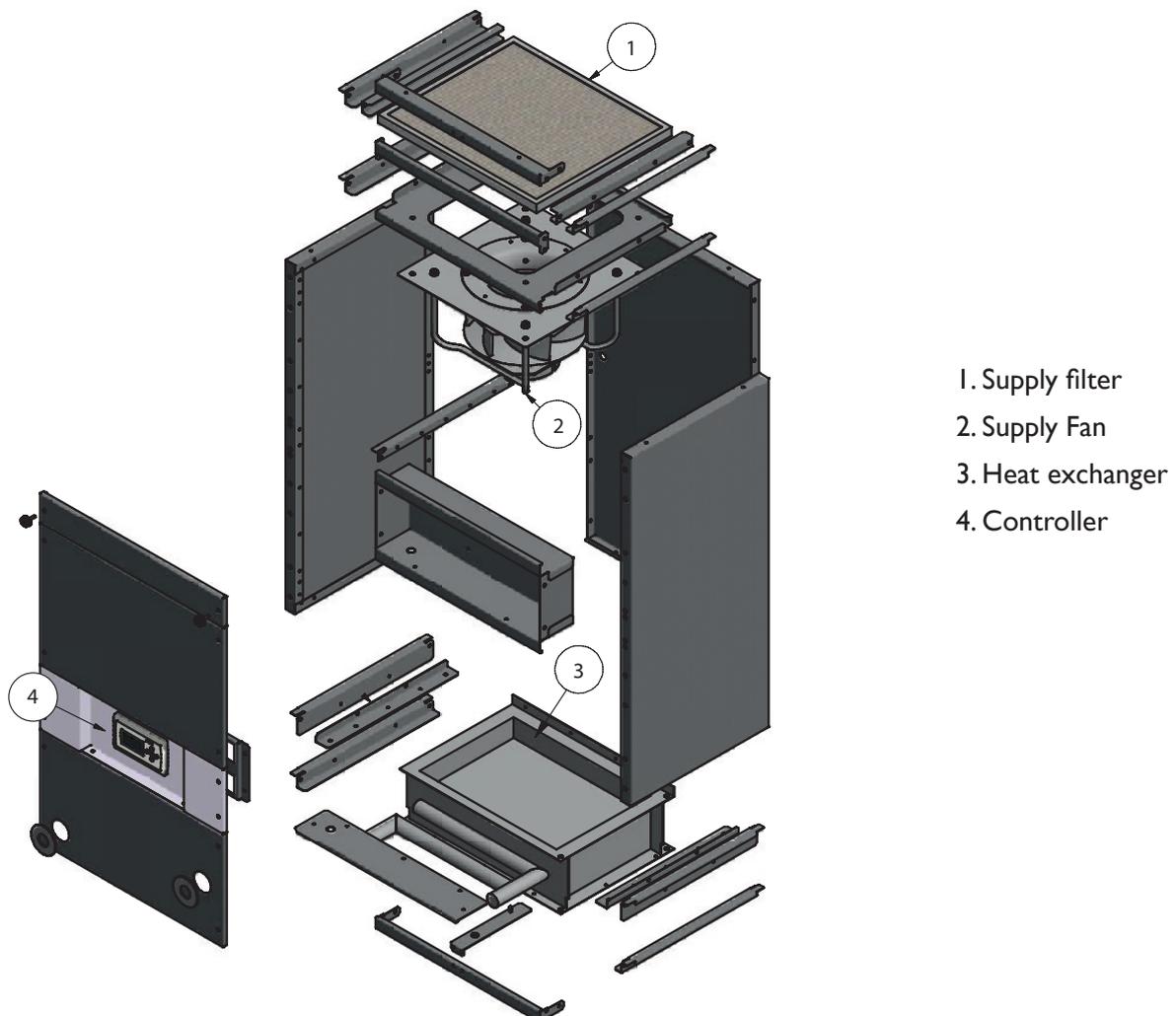
Subject to change

The manufacturer is committed to constantly improving its products and reserves the right to make changes in the specifications without prior notice. The technical details are considered correct but do not form the basis for a contract or warranty. All orders are accepted according to the standard terms of our general sales and delivery conditions (available upon request). The information in this document is subject to change without notice. The most recent version of this manual is always available at www.markclimate.com/downloads.

2.0 Technical information

Type	90/70 T10 (ECL)	55/45 T10 (LTV)	Air volume	Current consump- tion	Dimensions	Weight	Electrical connection	Water-side connection	Article number
	kW	kW	m ³ /h	A	hxwxh (mm)	kg	V/F/Hz	Inch (male thread)	
8-12	12,1	6,7	900	0,8	945x570x442	48	230/1/50	1"	5997120/ 5997130
18-24	31,1	17,6	1800	1,5	945x670x612	60	230/1/50	1"	5997121/ 5997131
28	38,1	21,5	2380	2,2	945x670x612	60	230/1/50	1"	5997122/ 5997132
32	51,9	29,4	3740	4,2	945x670x612	62	230/1/50	1"	5997123/ 5997133

3.0 Components



4.0 Installation

4.1 Installation and regulations according to;

- The relevant articles in the Building Decree.
- The safety provisions for low voltage installations, NEN 1010.
- These installation instructions for Comfort Line.

4.2 Installing the Comfort Line

The Comfort Line must be set up in such a way that it is accessible for service and maintenance. The Comfort Line must be placed on a solid and flat horizontal surface, free from vibration. Place the Comfort Line as centrally as possible in relation to the air ducts and central heating installation. The room in question must be frost-free. The heat exchanger must always be connected in counter flow. This is also indicated on the Comfort Line.

4.3 Water connections

When mounting the supply and discharge pipe, the water connections that protrude from the section must be prevented when tightening the compression coupling or threaded coupling. This is to prevent the connections of the exchanger from being twisted and thus leakage.

4.4 Connecting the Comfort Line power supply

The Comfort Line is equipped with a mains plug with protective earth and must be connected to an electrical supply of 230 V ~ 50 Hz including protective earth, fused with 16 A (T) slow-motion (see electrical diagram). If an automatic circuit breaker is used, we recommend a K characteristic.

5.0 Controls & Settings

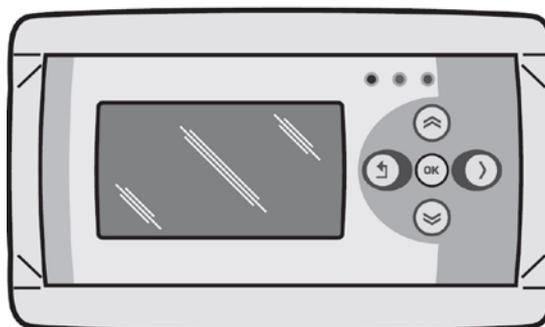
Every Comfort Line is supplied with a controller as standard. This user-friendly and easy-to-operate control ensures perfect and worry-free operation.

Each controller is equipped with a pipe surface temperature sensor. The COMFORT LINE fan speeds up or down depending on the water temperature.

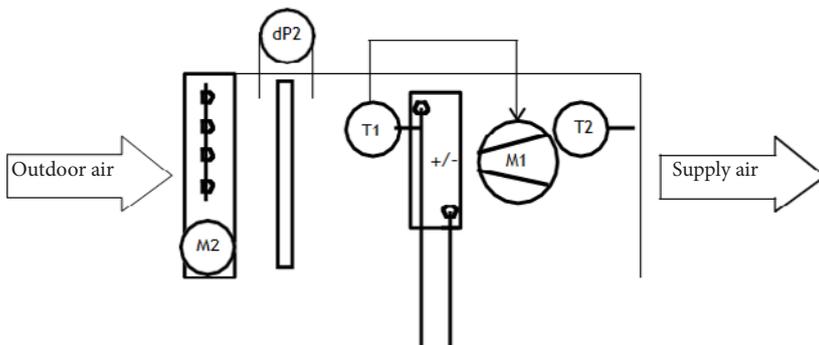
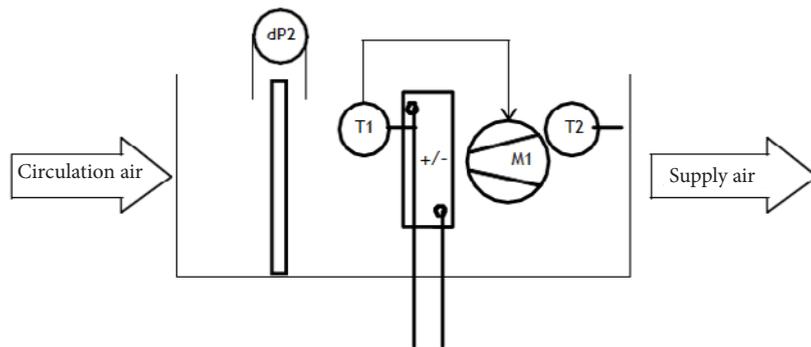
Some features of the controller:

- Full electronic control, you never use more energy than necessary.
- Temperature dependent control

See the following pages for the operation and settings of the controller:



5.1 Flow schemes



Symbolism

- dP2 Filter pollution on a time basis
- T1 Temperature sensor for the temperature dependent ventilation control
- T2 Optional Inlet temperature monitoring
- M1 Fan
- M2 Optional outside air valve

Possibilities

With a ventilation control based on temperature, the air volume is measured by means of the temperature T1 controlled.

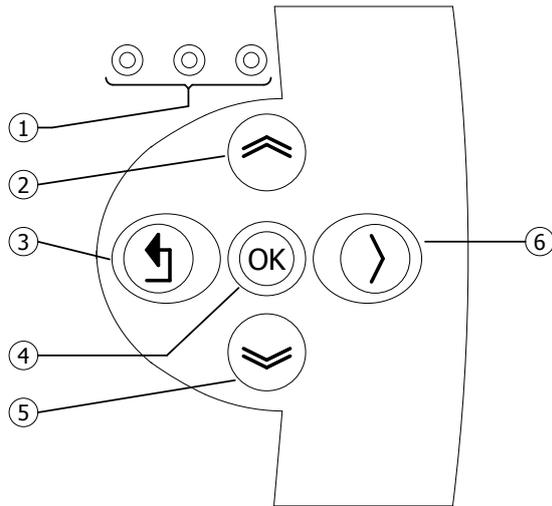
The temperature sensor T1 can be mounted in the following places:

- On the distributor of a heating block,
- Or on the distributor of a cooling block,
- Or immediately after electric heating.
- Or be hung in a room (not in combination with electric heating).

For the sake of clarity, the room temperature control itself is not included in this control.

Various options are possible and these will be further described in this document.

5.2 Control and display



1	<ul style="list-style-type: none"> • LED Red = malfunction • LED orange = Contaminated filter • LED green = in operation
2	<ul style="list-style-type: none"> • Scroll up • Go back to previous page • Increase value/change a setting • Go to next
3	<ul style="list-style-type: none"> • Exit menu page/go back to previous menu • Move cursor to the left in the edit mode • (Press and hold) Exit edit mode without making any changes
4	<ul style="list-style-type: none"> • Go to next level/menu/edit mode (open folder, subfolder, parameter setting) • Opening and confirming the setting/parameter setting. • Confirmation of the change/setting
5	<ul style="list-style-type: none"> • Scroll down • Go to next page • Decrease value / Change a setting • Go to previous
6	<ul style="list-style-type: none"> • Move cursor to right in the edit mode

5.3 Technical data temperature sensor

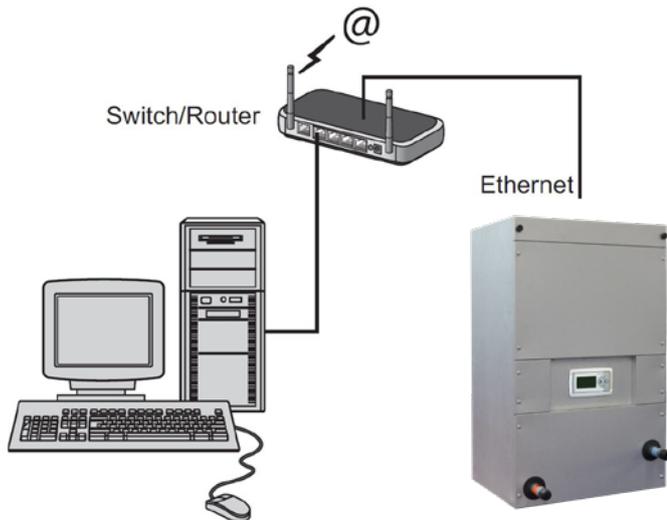
- Type of indication :TTS 10KC3 34
- Article number :06 29 057
- Resistor :NTC 10K 3977

NTC 10K 3977			
°C	kΩ	°C	kΩ
-10	55.329	+50	3.602
-5	42.327	+55	2.986
0	32.650	+60	2.488
+10	19.902	+65	2.083
+15	15.710	+70	1.752
+20	12.491	+80	1.256
+25	10.000	+85	1.071
+30	8.055	+90	0.917
+35	6.532	+95	0.787
+45	4.368	+100	0.679

5.4 Control with the computer

The unit can be controlled by a computer or a laptop.

Connect the PC or laptop using an ethernet connection on the display



After you have made the connection, start your internet browser* and enter the IP address.
(Default address: 192.168.1.100)

When you are connected, a login screen will appear.
Enter the username and password.

Username: USER
Password: 1000

When the login details have been entered correctly, the status/settings tab will appear in your browser.
The desired language can then be selected via the tabs at the top of the screen or the menu can be opened to display and change the time program on the screen.

* The manufacturer recommends Google Chrome or Mozilla Firefox as the internet browser.

5.5 User menu

5.5.1 Status

Status	
Mode	Climatize
Fan	0 %
Water temp.	40 ° C

- Mode : current operating mode
- Fan : fan speed in percentage
- Watertemperature : current water temperature
- Inlet temperature (optional) : current supply temperature

5.5.2 Fan

Fan	
Mode	Off
Ventilate	030 %
Cool	050 %

- Mode : Select operating mode off
air conditioning or ventilation
- ventilate : fan position during ventilation
- Cool : fan position during cooling (optional)

Filter	
Changed	No
Change in	91 days

5.5.3 Filter

- Changed : Yes (reset the time until filter change)
- Change in : display of the number of days until the filter needs to be replaced

Error	

5.5.4 Error

- If an error occurs, it will be displayed on this screen

5.6 Operation

5.6.1 Off

The off mode is selected by selecting the “off” mode in the “Fan” control menu.

- The fan is off
- Optional outside air damper closes

5.6.2 Climatize

By means of a temperature-dependent ventilation control, the air volume is regulated depending on a measured (water) temperature. The control becomes active during the CLIMATIZE mode.

The climatizing mode is selected by selecting the “klimatize” mode in the “Fan” control menu

The current (water) temperature can be read in the status screen.

5.6.3 Ventilate

The air handling unit is equipped with a continuously adjustable ventilation system.

The ventilation mode is selected by selecting the “ventilation” mode in the “Fan” control menu.

Adjustment of the air volume is possible by entering the speed in percentage at “Ventilation”. Confirm this with the <OK> key.

5.6.4 Dirty filter

The life of a filter depends on many factors. In principle, the dirt filter detection is a notification to the end user to alert them that the filters need to be replaced soon due to the quality of the indoor climate and also lower energy consumption.

The lifespan of a filter depends on:

- The amount of air blown through the filter
- The pollution level of the environment,
- Filter surface (flat, zigzag or bag),
- Filter class.

The software dirty filter works on the basis of an hour counter. As soon as the fan is running, the filter life is shortened.

When the relevant service life is reached, the message “CHANGE FILTER” appears on the display. The air handling unit will continue to function.

We recommend replacing the filters at least once a year.

After replacing the filter, it is possible to reset the message as follows:

- Scroll in the operating menu using the “>” key to the “FILTER” section
- Confirm “REPLACED” with “yes”
- The lifetime has now been reset and the message “REPLACE FILTER” has disappeared.
- The orange LED is off.
- After this, REPLACE will automatically be reset to “No”

5.6.5 Cool (optional)

Cooling mode is selected by an external “cool” contact.

Adjustment of the air volume is possible by entering the speed in percentage at “Cooling”. Confirm this with the <OK> key.

5.6.6 Inlet temperature monitoring (optional)

For air handling units where outside air is drawn in, we recommend applying the supply temperature monitoring system.

The air inlet temperature monitoring prevents too cold air from being blown into the room in question. Provided that the correct temperature is set, damage to any exchanger or any condensation on the outside of the uninsulated ducts is prevented.

It is possible to measure the inlet temperature by means of an optional inlet temperature sensor and extension module.

The inlet temperature is measured with the temperature sensor T2. The temperature sensor is automatically activated as soon as the optional extension module is connected.

The inlet temperature works on the basis of the temperature sensor T2

The supply temperature monitoring becomes active as soon as:
Measured supply temperature (T2) lower is than the set supply temperature.

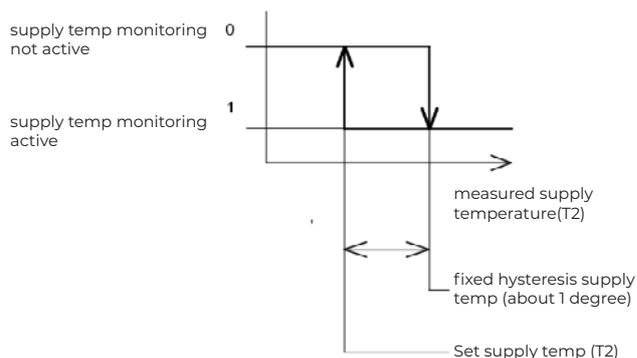
This results in stopping the airflow by:

- Switching of the fan,
- And/or closing any air valve,
- Displaying the message “Inlet temperature too low” on the display. (See also figure 1)

Inlet temperature monitoring is deactivated as soon as:
Measured supply temperature (T2) higher than set supply temperature.

This results in the release of airflow through:

- A release to a fan,
- And/or release to open any air valve,
- Delete the notification “Inlet temperature too low”.



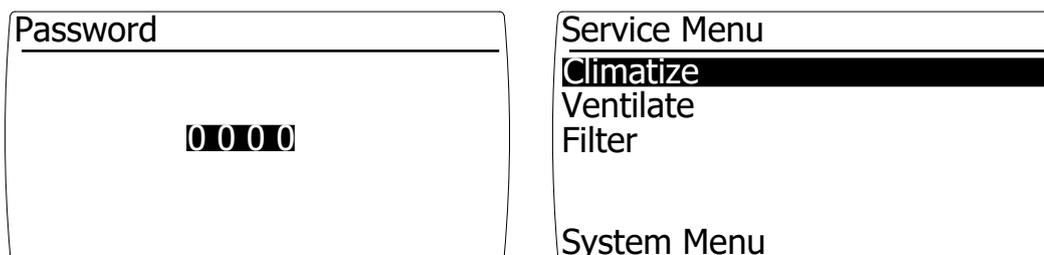
5.6.7 Error

In the event of an error, the display will illuminate the red LED.
The current error message is displayed in the “error” screen.

Possible errors

Fan no communication	The controller is not communicating with the fan motor. Check the cable between the motor and the display
Extension module no communication	The controller is not communicating with the optional extension module. Check the cable between the extension module and the display
Water temperature sensor (TI) not connected	<ul style="list-style-type: none">- Check if the water temperature sensor is connected properly- Measure the ohmic value of the sensor with a multimeter. Check whether this corresponds to the value in the table of paragraph 5.3
Inlet temperature sensor (2) not connected	<ul style="list-style-type: none">- Check whether the supply temperature sensor is connected properly- Measure the ohmic value of the sensor with a multimeter. Check whether this corresponds to the value in the table of paragraph 5.3
Fan failure	The fan motor has a malfunction.

5.7 Service menu



By entering password 1000 and confirming this with the [OK] key you enter the service menu [picture right].

Cooling and supply temperature is optional. These menu items become visible when an extension module is connected to the display.

5.7.1 Climatize

Climatize	1/2
Water temperature	
Minimum	040 ° C
Maximum	060 ° C
Fan	
Minimum	000 %
Maximum	100 %

By means of the automatic ventilation control based on (water) temperature and a continuously adjustable ventilation system, the air volume is set by means of a measured (water) temperature.

Influence of the measuring signal in relation to the ventilation control is adjustable.

The measuring range is limited by means of a minimum and maximum (water) temperature and limits the control range of the ventilation system by means of minimum and maximum settings of the fan.

Avoid a measuring range that is too small, because a small irregularity of the measuring signal may have a major influence on the ventilation control, which will cause it to oscillate. Sometimes it is possible to eliminate an irregular measurement signal by increasing the RESPONSE TIME.

Various temperature-dependent ventilation controls are possible:

- Increase in air volume, with an increase in (water) temperature.
- Off and an increase in air volume, when the (water) temperature increases.

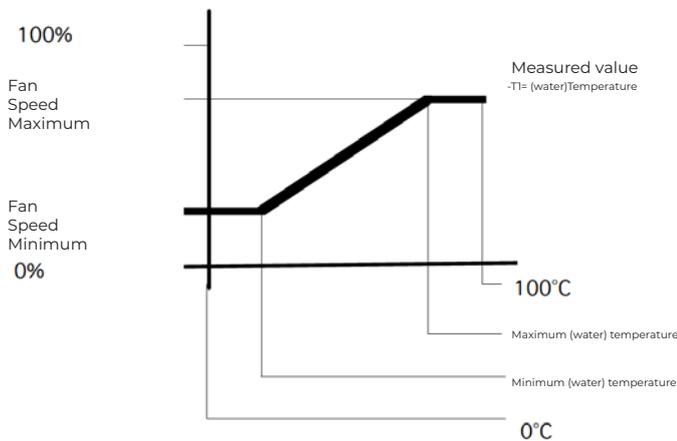
5.7.2 Increase in air volume with increase in (water) temperature

At a (water) temperature lower than the minimum (water) temperature setting, minimal ventilation will take place. The corresponding air volume is set using the Minimum fan speed setting.

With a measurement signal between minimum (water) temperature and maximum (water) temperature, the air volume will be infinitely adjusted.

With a measurement signal higher than the maximum (water) temperature, maximum ventilation will take place. The corresponding air volume is set by means of the maximum fan speed setting. See also figure 1

Figure 1



5.7.3 Off and increase air volume with increase in (water) temperature

At a (water) temperature lower than the minimum (water) temperature setting, ventilation will not take place. For this, minimum fan speed must be set to 0.

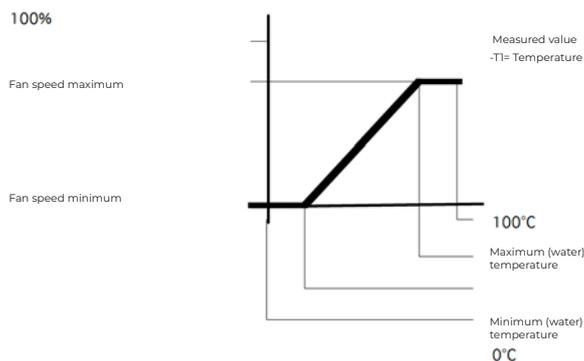
With a measurement signal between minimum (water) temperature and maximum (water) temperature, the air volume will be infinitely adjusted.

At a measurement signal higher than maximum (water) temperature, the ventilation system will run at the maximum set fan speed. See also figure 2.

Figure 2

Figure 2 Graphics

Off and increase air volume with increase of measuring signal



5.7.4 Calibration

Climatise	2/2
Calibration	OK
Post vent.	005 sec.
Response time	000 sec.

With calibration it is possible to calibrate the (water) temperature sensor.
It is possible to calibrate the sensor with -3 to 3K

5.7.5 Post-ventilation time

The post-ventilation time is a post-run time of the fan. Post-ventilation makes it possible to blow any residual heat out of a duct system.

The post-ventilation starts as soon as the measured value falls below the minimum (water) temperature setting. The blowing out of the residual heat depends, among other things, on the length of the duct system and hence the option to adjust the post ventilation in the menu. The post-ventilation time is adjustable between 0 and 300 seconds.

Advice

Because the setting is mainly determined by the channel system, we can only advise not to set this time too short, but also not too long.

Post-ventilation too short results in;

The fan shuts down after a heat demand. The fan is going to oscillate either is switched on momentarily and momentarily switched off.

Post-ventilation too long results in;

Draft caused by a cold airflow after a heat demand.

5.7.6 Response time

By means of the reaction time it is possible to influence the speed of the relevant regulation. With a short reaction time and a somewhat unstable measurement signal, the fan will run restlessly (oscillation). This is usually experienced as a nuisance (for example sound.)

A slightly longer response time prevents this problem.

The response time depends on many factors. Think of the speed of the sensor itself and the locating of the respective sensor. Of course, air volumes and duct system are also of influence.

The reaction time is adjustable between 0 and 60 seconds. 0 – short response time
60- long response time.

Advice

Because the setting depends on many factors, we recommend setting this time as short as possible set.

Response time too short results in;

The restless running of the fan, resulting in possible noise nuisance.

Response time too long results in;

A very slow ventilation control, which in some situations leads to overheating.

5.7.7 Ventilate

Ventilate	
Fan	
Minimum	000 %
Maximum	100 %

The air handling unit is equipped with a continuously adjustable ventilation system.

The ventilation mode is selected by selecting the “ventilation” modes in the operating menu “Fan”.

By setting the minimum and maximum fan speed during the ventilation mode, the setting range in the user menu is limited by this minimum and maximum value.

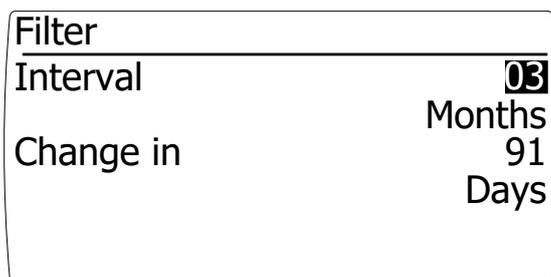
Standard setting:

Minimum fan speed during ventilation 0%

Maximum fan speed during ventilation 100%

Adjustable between 0-100%

5.7.8 Filter

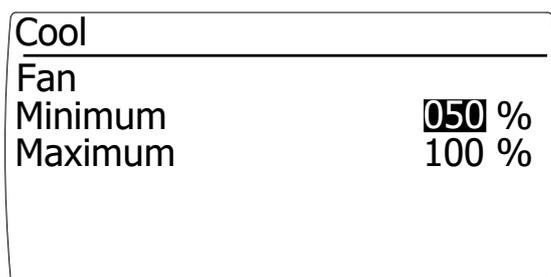


The software dirty filter detection works on the basis of an hour counter that counts when the fan is running. It is possible to set a service life in the service menu. As soon as the hour counter exceeds this standing time, the message “CHANGE FILTER” appears on the display. The orange LED on the display will also light up.

We recommend replacing the filters at least once a year.

By default, the filter replacement interval is set to 3 months. The service life of the filter is adjustable from 1 to 24 months.

5.7.9 Cooling



Depending on whether an optional extension module is connected, this option is visible in the menu.

Cool mode is selected by an external “cool” contact on the extension module.

The air handling unit will run at the set fan speed during cooling.

This mode overrides the current mode (Off, climatize or ventilate)

By setting the minimum and maximum fan speed during the cooling mode, the setting range in the user menu is limited by this minimum and maximum value.

Standard settings

Minimum fan speed during cooling 50%

Maximum fan speed during cooling 100%

Adjustable between 0-100%

5.7.10 Supply temperature (optional)

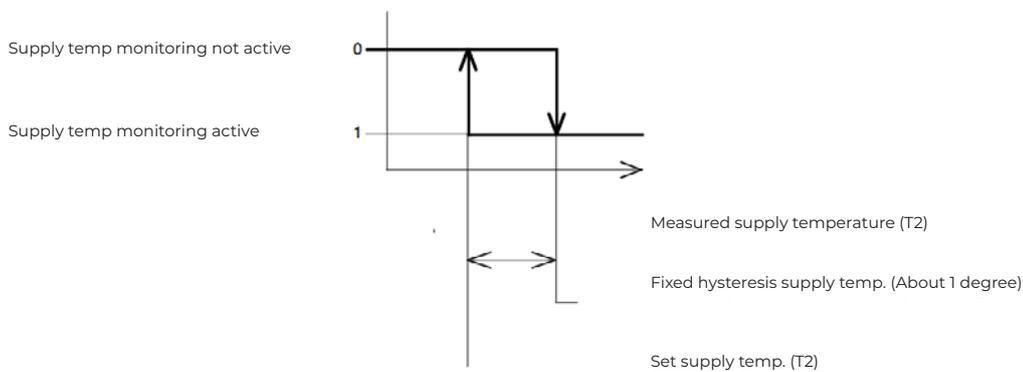
Supply temperature	
Protect	Yes
Temperature	010 ° C
Hysterese	001 K
Calibration	000 K

Depending on whether an optional extension module is connected, this option is visible in the menu.

With the supply temperature setting, a so-called limit value or the minimum permitted supply temperature set.

If the measured supply temperature falls below the set value, the supply temperature monitoring becomes active.

Figure 1



Protect

If monitoring is set to “Yes”, this function becomes functional.

Temperature

If the measured supply temperature falls below the set value, the inlet temperature monitoring becomes active.

Standard setting 10K

Adjustable between 0-15K

Hysterese

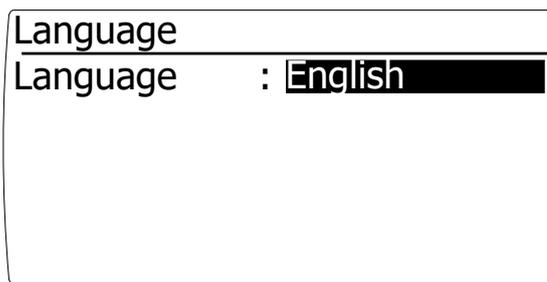
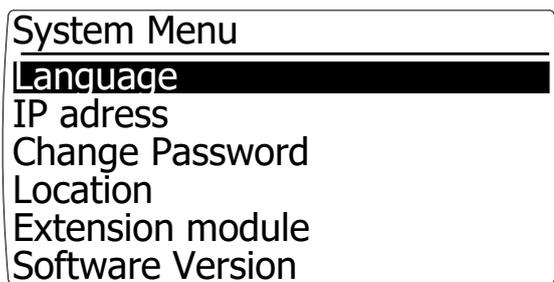
Hysteresis for switching on the air handling unit.

If the measured supply temperature exceeds the minimum supply temperature plus the hysteresis, then turns the unit back on automatically

Standard setting 1K

Adjustable between 1-4K

5.8 System menu



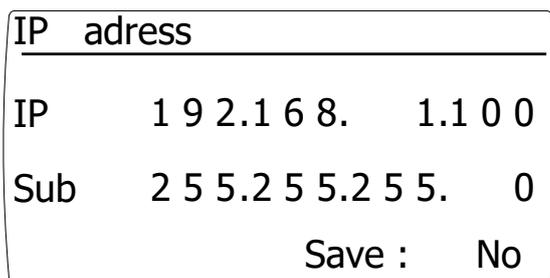
Language

The text screens are available in various languages that can be selected using the language selection. A selection can be made between the following languages;

- DUTCH,
- FRENCH,
- ENGLISH,
- GERMAN.

Standard setting dutch

5.8.1 IP-adres



Entering the IP address in a web browser takes you to the controller's web page. The controller can only be provided with a static IP address

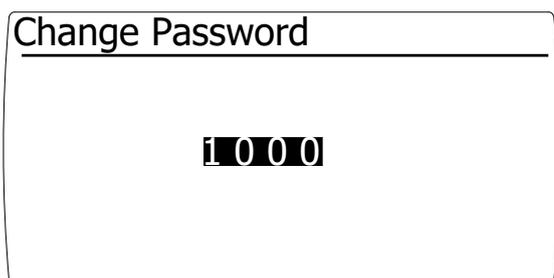
Standard settings:

IP address 192.168.1.100

Sub net mask 255.255.255.0

After changing the IP address, it can be saved. After saving, the controller reboots to activate the new IP address.

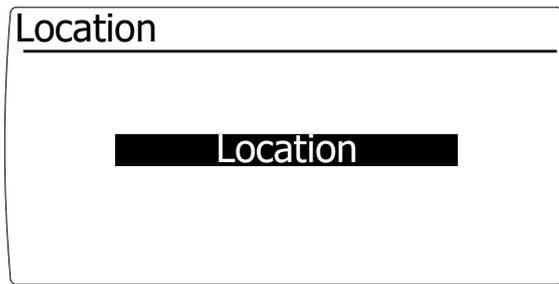
5.8.2 Change password



Here the default password for access to the service menu can be changed.

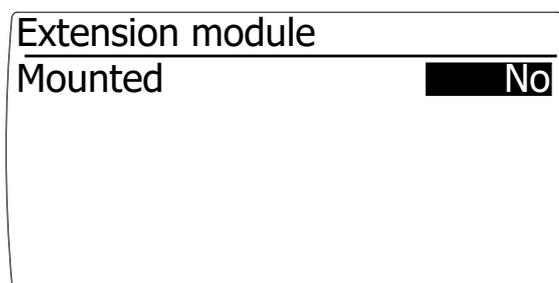
Standard setting 1000

5.8.3 Location



Here the controller can be provided with a unique name so that it is recognizable when used remotely.

5.8.4 Extension module

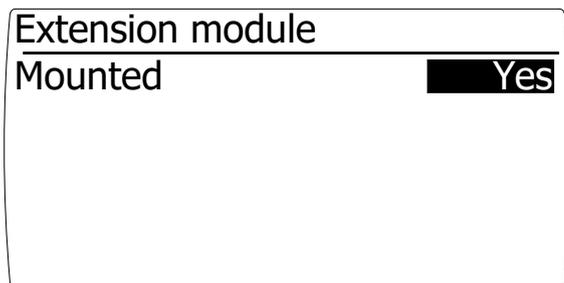


The extension module is automatically detected. If an extension module is connected once, it is checked whether it is connected.

If communication between the display and extension module is lost, this is indicated by a fault.

In the menu it can be set that the module is not mounted.

5.8.5 Optional Extension Module Capabilities



Optional Extension Module Capabilities

The extension module is equipped with the following functions:

Inputs

- o Supply temperature sensor
The minimum supply temperature function is activated
- o contact cooling
As soon as this contact is made, the air handling unit switches to cooling mode

Outputs

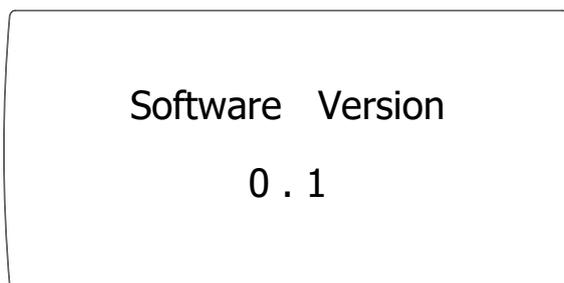
- o Potential free contact fault
This can be used for;
- o Signal exchange with an eventual building management system.

- o Potential free contact fan in operation
This can be used for;
- o Servo control of an outside air damper;
- o Release of a gas valve in a catering facility (as soon as the extractor is running, the stove may be switched on),
- o Signal exchange with an eventual building management system

The extension module is automatically recognized after rebooting the air handling unit.

After installing the extension module, the functions for cooling and supply temperature become visible in the system menu.

5.8.6 Software version



The controller software version is displayed here.

5.9 Factory settings

Menu structure		Composition	Resident settings	Installer settings	Optional	Factory settings	Unit / possibilities
Menu	Status	Mode					Actual mode Off, climatize, ventilate or cooling
		Fan					Actual fan speed (%)
		Water temperature					Actual water temperature (°C)
		Supply temperature			x		Actual Supply temperature (°C)
	Fan	Mode	+	+		Climatize	Off, climatize or ventilate
		Ventilate	+	+		30	0-100%
		Cooling	+	+	x	50	50-100%
	Filter	Change dirty filter	+	+		no	No/yes
		Replace in				91	Days
	Error	Error message				No	Error message
Service menu accessible for the installer							
Menu	Climatize	Minimal water temperature	-	*		40	0-100 °C
		Maximum water temperature	-	*		60	0-100°C
		Minimal fan (air) capacity	-	*		0	0-100 %
		Maximum fan (air) capacity	-	*		100	0-100 %
		Calibrate water temperature	-	*		0	-3K ... +3K
		Post ventilation time	-	*		5	0-300 sec
		Reaction time	-	*		0	0-60 sec
	Ventilate	Minimal fan (air) capacity	-	*		0	0-100 %
		Maximum fan (air) capacity	-	*		100	0-100 %
	Filter	Filter life	-	*		3	1-24 months
	Cooling	Minimal fan (air) capacity	-	*	x	50	0-100 %
		Maximum fan (air) capacity	-	*	x	100	0-100 %
	Supply temperature	Protect	-	*	x	Yes	Yes/no
		Supply temperature	-	*	x	10	0-15 °C
		Hysteresis supply temperature	-	*	x	1	1-4 K
		Calibration supply temperature	-	*	x	0	-3K ... +3K
System menu	Language	Choose your language	-	*		Dutch	Dutch, French, English, German
	IP adress	IP adress	-	*		192.168.1.100	
		Subnet mask	-	*		255.255.255.0	
	Change password	Password	-	*		1000	
	Location	Location	-	*		Location	
	Extension module	Extension module mounted	-	*		Yes	Yes/no extension module is automatically detected
	Software version	Software version	-	-		Software version	
<p>+ Means accessible to,</p> <p>- Means NOT accessible to,</p> <p>* Means final settings made by the installer.</p> <p>x Features are only available with an optional extension module.</p>							

6.0 Electrical diagram

For the electrical diagram see the device

7.0 Malfunctions and maintenance

7.1 Malfunctions and causes

Malfunctions	Possible cause
Unit does not start	Check that the power supply is present and correctly connected. Check that the ground is connected correctly.
Unit does not provide enough heat	Laminar flow through heat exchanger, incorrect water flow rate. Too high external air resistance. Check whether the heating battery is connected in counter-current.

7.2 Maintenance

Maintenance must be carried out by a recognized installation company.

7.3 Filters

We recommend replacing the filters at least twice a year.

7.4 Overall Inspection Unit

To ensure trouble-free operation, the unit should be fully inspected. Points of attention include: pollution (dust) of the components, leak tightness, damage and overall functioning of the installation.

7.5 Service and parts

For service and maintenance, we refer you to the installer. In the event of unforeseen circumstances, please contact Mark.

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