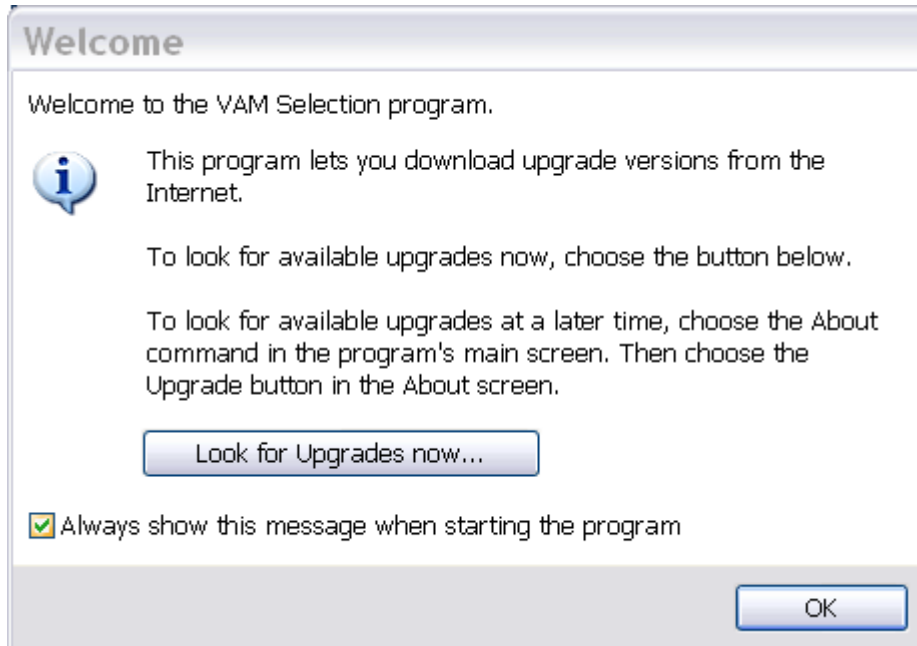


Ventilation Xpress V6.0.0

User Manual

After accepting the disclaimer you come to the :

1. The Welcome Screen



After downloading and running the software on your computer the first time, the above welcoming window will appear.

We offer you the possibility to check our server if no updated version of the software exists. This auto-update functionality will only work providing you did not change the file name of the program.

Possibly you want to deselect this possibility. (Not recommended)

If an update is available you can select the file and download it.

Caution If you are working with translated version of the software only download **your language version!** Downloading a different version will replace the earlier selected language version.

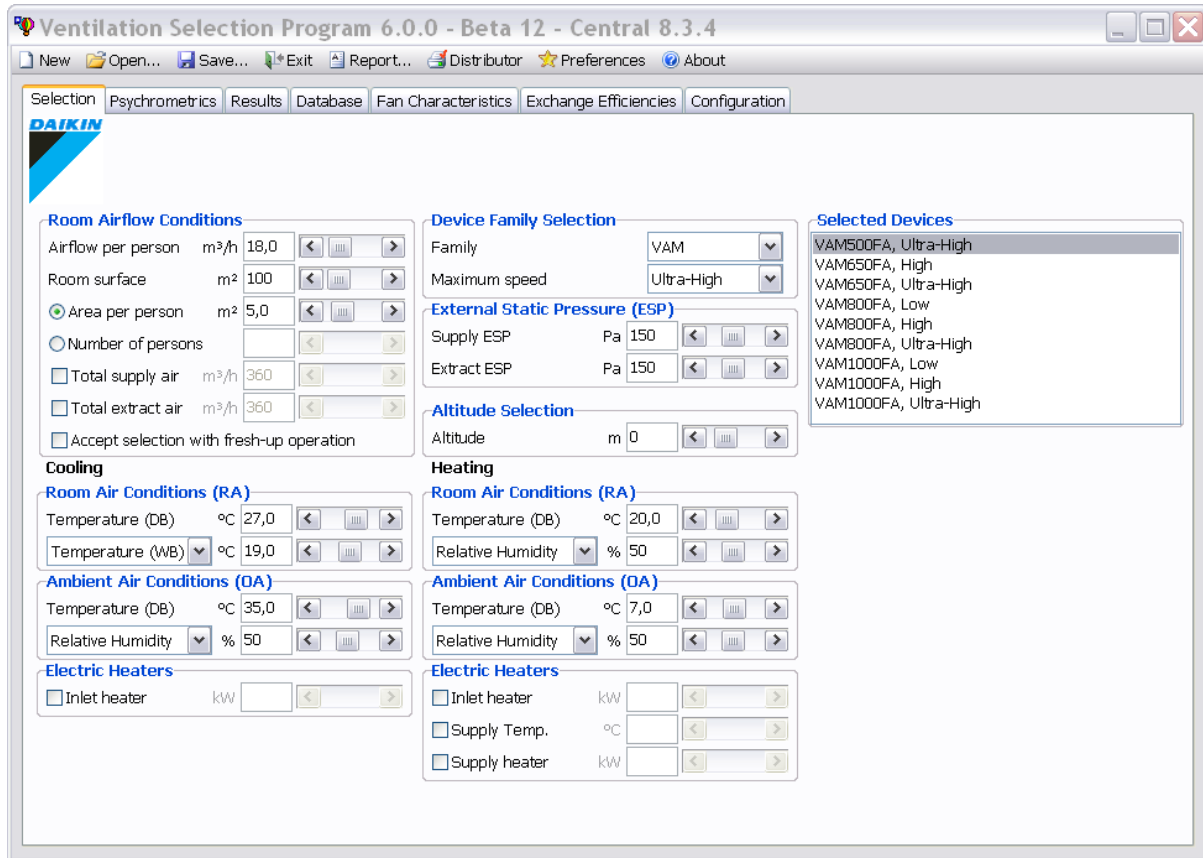
After downloading the update will be installed and the new version of the program will start.

New updates may become available at any time. An update may support new functionalities or may use new product information to optimise your selection.

It is very likely that the software will use information that is not yet available in a printed version.

The Main Screen

1.1. The menu bar

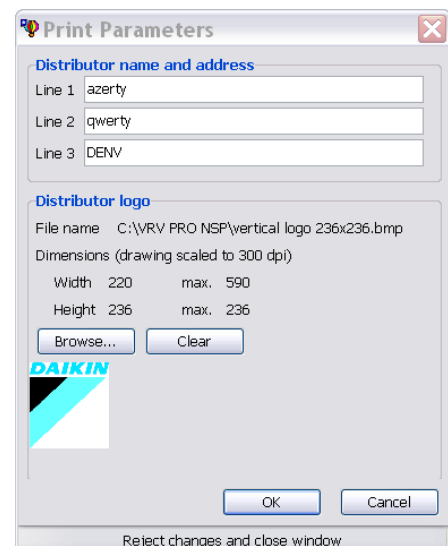


The title bar will indicate the name of this program with its Version and also the Central Data Base for our products.

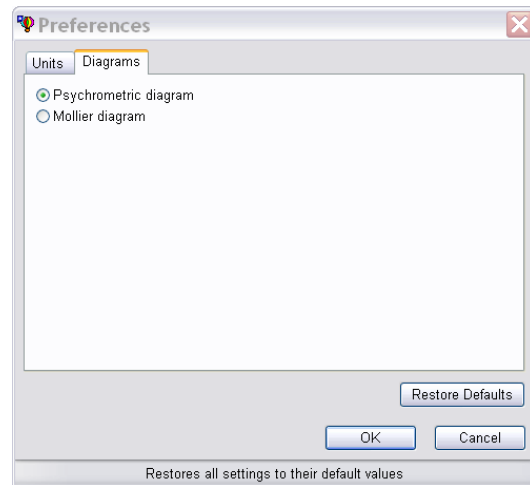
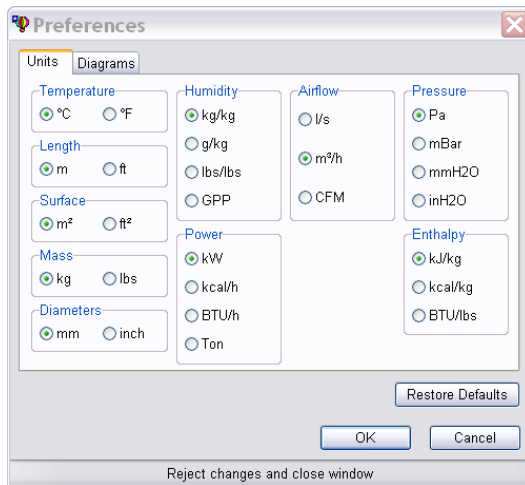
The following usual menu commands are available: **NEW**, **OPEN**, **SAVE**, **EXIT**

Further, **REPORT** will allow you to save your selection in a document with an rtf-extension (Rich Text Formatting) Usually, this kind of file is quite large (typically 463KB). For e-mailing purposes possibly you want to get a more condensed file size. Please save as ".doc"-file. (typically 151KB) (Using .docx will jeopardise the numbering formats (MS-Word bug)

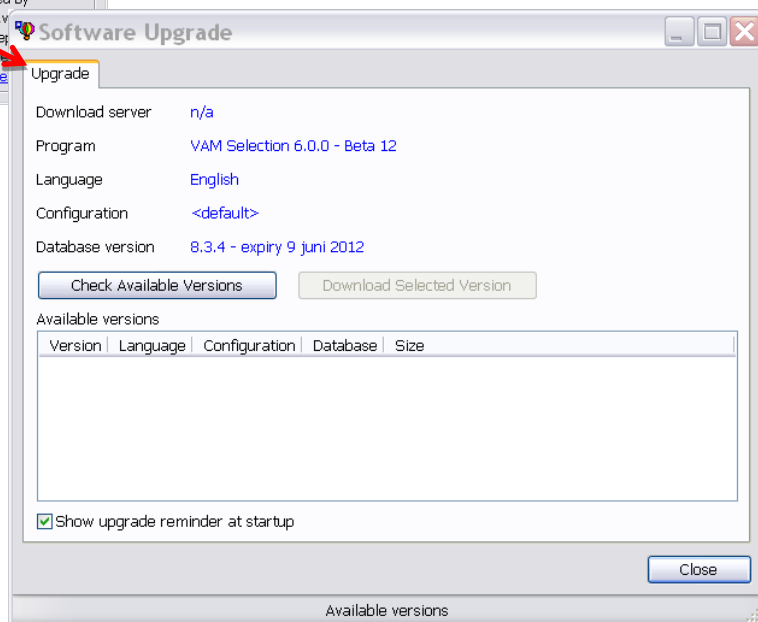
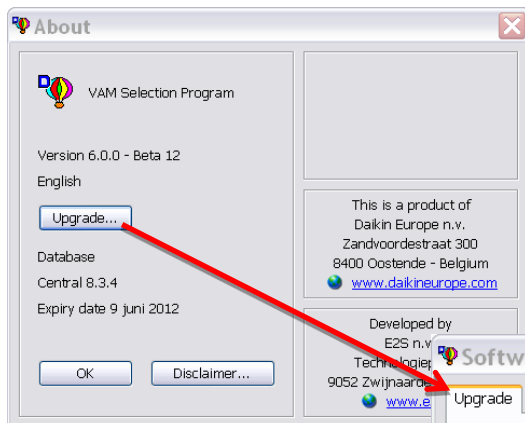
DISTRIBUTOR enables you to add your company details and a bitmap of your company logo that will be included in the report



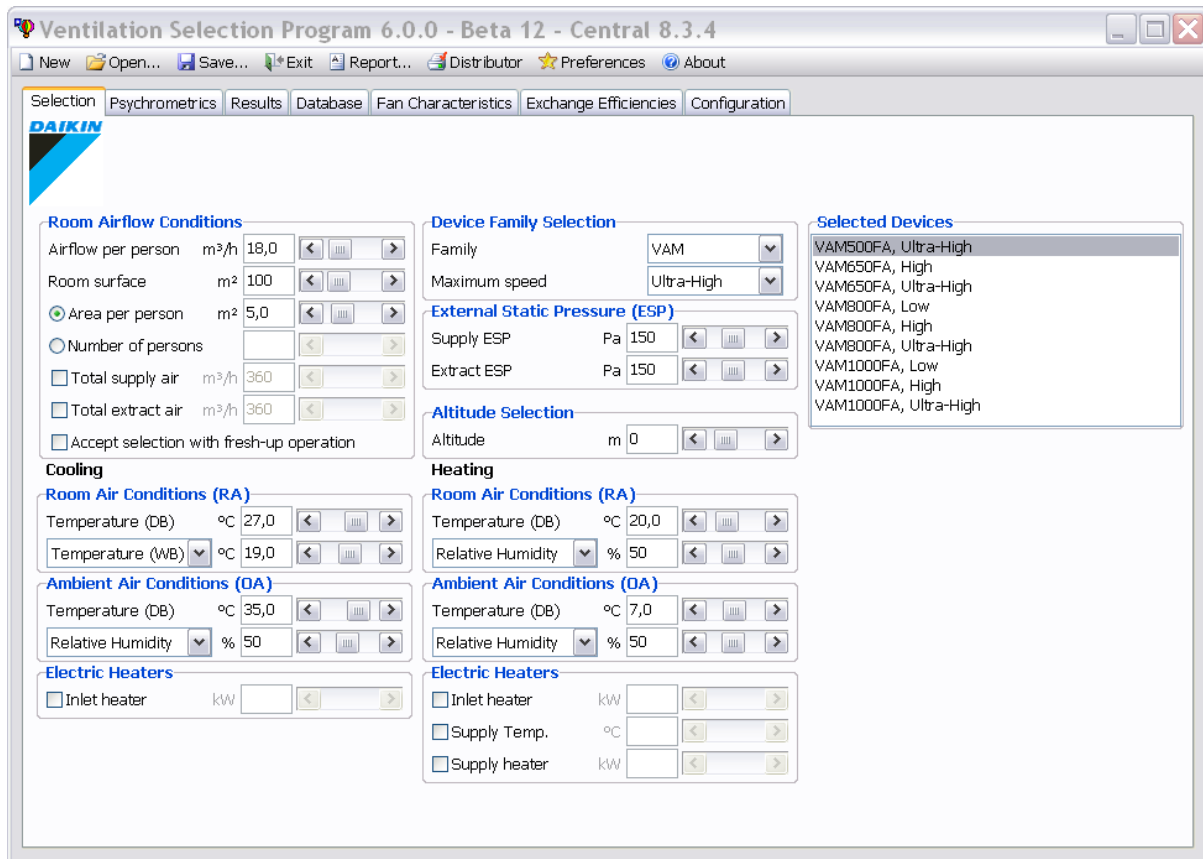
PREFERENCES will enable you to set the units that you usually work with. In the diagrams tab you can possibly select another view to see the properties of the moist air (see further)



ABOUT shows the credentials, the disclaimer that you accepted when you opened the program and also the upgrade button that allows you to check the availability of a more recent version of the program and give you the possibility to download and installing it. Again, make sure to select the proper language version



1.2. The Program Tabs



1.2.1. SELECTION -tab

1.2.1.1. Room Airflow Conditions:

Room Airflow Conditions

Airflow per person	m³/h	18,0	< [] >
Room surface	m²	100	< [] >
☒ Area per person	m²	5,0	< [] >
☐ Number of persons			< [] >
☐ Total supply air	m³/h	360	< [] >
☐ Total extract air	m³/h	360	< [] >

We possibly define the required air flow by setting the required amount per person in m³/h. (if this unit has been chosen in the preferences window).

The room surface can be entered and together with area per person or the number of persons the total amount will be computed.

Another possibility is to enter the previously calculated amounts in m³/h

directly and this both for the supplied and the extracted air.

Cooling

Room Air Conditions (RA)

Temperature (DB) °C 27,0 < [|||||] >

Temperature (WB) °C 19,0 < [|||||] >

Ambient Air Conditions (OA)

Temperature (DB) °C 35,0 < [|||||] >

Relative Humidity % 50 < [|||||] >

Heating

Room Air Conditions (RA)

Temperature (DB) °C 20,0 < [|||||] >

Relative Humidity % 50 < [|||||] >

Ambient Air Conditions (OA)

Temperature (DB) °C 7,0 < [|||||] >

Relative Humidity % 50 < [|||||] >

To set the conditions of the different air conditions that the system will cope with. Note that the air condition can be given either in degree dry bulb and wet bulb or by entering the dry bulb and the relative humidity.

The abbreviations of the various air conditions throughout the different kind of equipment selections are:

OA	Outdoor Air
EA	Exhaust air
RA	Room Air
SA	Supply Air
VI	Ventilation IN
VO	Ventilation OUT
CI	Coil IN
HI	Humidifier IN

1.2.1.3. Electric heaters

Electric Heaters

☐ Inlet heater kW [] < [|||||] >

Electric Heaters

☐ Inlet heater kW [] < [|||||] >

☐ Supply Temp. °C [] < [|||||] >

☐ Supply heater kW [] < [|||||] >

Possibly electric heaters will be require to either enhance comfort or to protect the heat exchanger from being soaked/damaged by condensing moist.

In Heating mode an inlet heater will avoid a condensation of the Extracted Air whilst the supply heater will add a couple of degrees more to obtain a selectable and comfortably higher discharged Supply Air temperature.

1.2.1.4. Device Family Selection

Device Family Selection

Family VAM ▾

Maximum speed Ultra-High ▾

Here you can select what kind of equipment you are looking for:

Ventilation Xpress can help you to choose a Heat Reclaim Ventilation device. The

VAM or VKM (VKM has also a direct expansion coil and an optional humidifier)

Your selection will also be based on the comfort level due to the fan speed and thus also unit sound level. Set the maximum fan speed that is acceptable to be used in your selection.

1.2.1.5. The External Static Pressure

External Static Pressure (ESP)

Supply ESP	Pa	150	<		>
Extract ESP	Pa	150	<		>

The amount of air that will flow through your selected device is depending upon the resistance that is caused by your ducting.

Knowing the required quantities of air for a room/area, the grilles/louvers that will be used, the ducting components and the acceptable air velocities obtained because of the ducting dimensions, the total resistance can be calculated (the VRV Pro selection program will do that for you)

It is very likely that the supply and discharge ESP will be different, resulting into different air volumes that can pressurise a room or put a room in a depression. In Heat Reclaim Ventilation this will also affect the efficiency of the equipment and thereto correction factors will be taken into account.

The values that are entered here are assumed to be the minimum duct resistance. The program will search for a solutions that will be able to overcome this resistance. Solutions that would have lower ducting resistance are neglected, not considered.

1.2.1.6. The Altitude above Sea level

Altitude Selection

Altitude	m	36	<		>
----------	---	----	---	--	---

A very nice tool to see the importance of the altitude is the Daikin Psychrometric Diagram Viewer. There, using the slider

you can see the impact of the altitude to the properties of the air that we use in an Air Conditioning system.

1.2.1.7. The Selected Devices

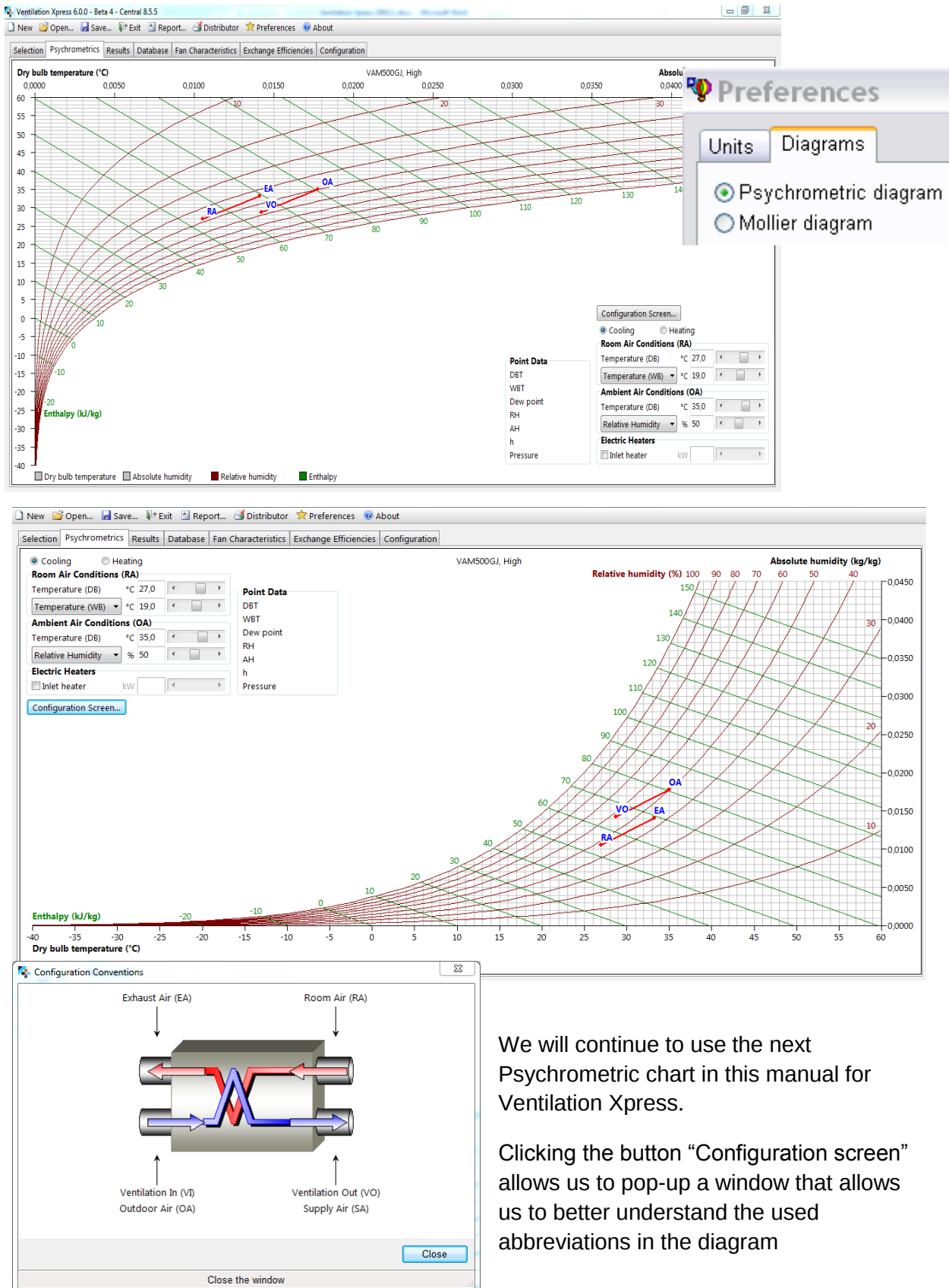
Selected Devices

- VAM500FA, Ultra-High
- VAM650FA, High
- VAM650FA, Ultra-High
- VAM800FA, Low
- VAM800FA, High
- VAM800FA, Ultra-High
- VAM1000FA, Low
- VAM1000FA, High
- VAM1000FA, Ultra-High

NOTE: make sure that you use the tab-key to leave an entry field or to click in another field to accept you changes.

1.2.2.PSYCHROMETRICS -tab

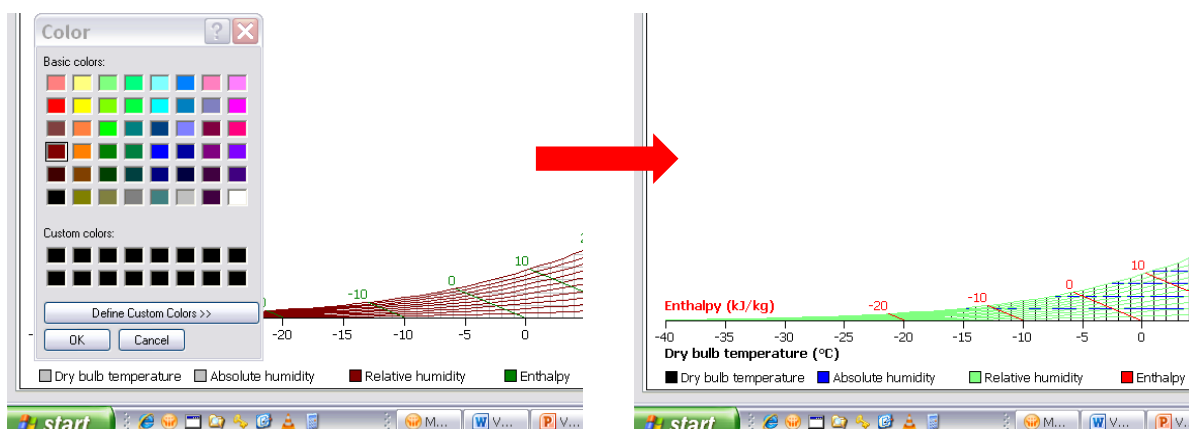
Please note that, if you adjusted the preferences to see the Mollier diagram, you will see the following image:



We will continue to use the next Psychrometric chart in this manual for Ventilation Xpress.

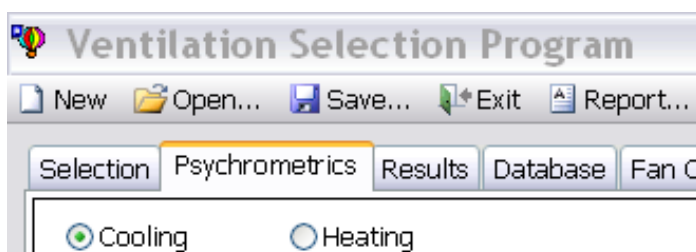
Clicking the button “Configuration screen” allows us to pop-up a window that allows us to better understand the used abbreviations in the diagram

1.2.2.1. Colour legend



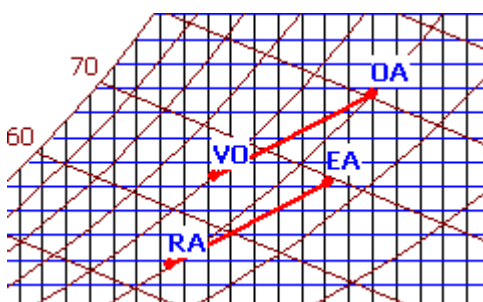
You can easily change the used colours in the diagram by clicking one of the coloured squares in the colour legend. A COLOUR-window will open and there you can select another, better visible colour for the item / lines that you selected. Note that this function is available in any of our selection programs.

1.2.2.2. Cooling and Heating mode



Note that the behaviour in heating mode and cooling mode can be visualised by just one click.

1.2.2.3. Dynamic program



The air volumes will cross in the fibre heat exchanger and both latent and sensible heat will be exchanged.

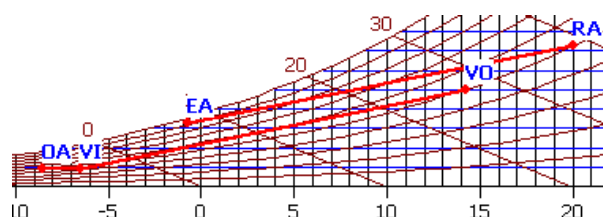
In case of cooling, the room air (RA) becomes the exhaust air (EA) and the flow will exchange capacity with the flow of outdoor air (OA) that will become the ventilation out (VO)

Using the sliders you can see how the system behaves with varying conditions.

Room Air Conditions (RA)	
Temperature (DB) °C	25,4
Temperature (WB) °C	19,0

If you

you will
be kept
the



heater will be required. (horizontal line between OA and VI (ventilation Inlet))

decrease the ambient air condition in the heating mode, remark that the exhaust air has to safely away (max95%RH) from saturation line to avoid condensation in the fibre heat exchanger. Thereto an electric

1.2.2.4. Electric heaters

Electric Heaters

☐ Inlet heater kW

Electric Heaters

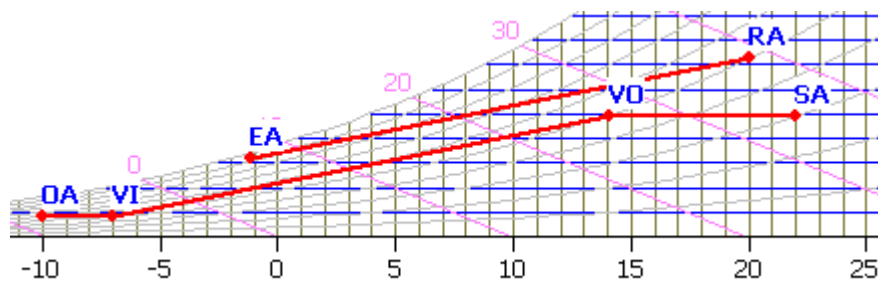
☐ Inlet heater kW 0,269

☐ Supply Temp. °C

☐ Supply heater kW

The section about the electric heaters will be adjusted to the operation mode that you selected.

In very exceptional cases electric heater might be required in cooling mode, whilst in heating mode two kind of electric heaters need to or can be installed. The inlet heater will avoid condensation within the exchanger and the supply heater (only for VAM dev ices) will give additional heat to the air to get to the selectable minimum supply temperature (SA).



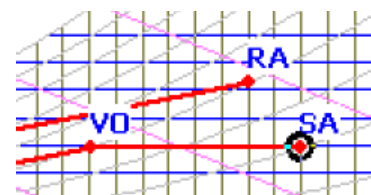
1.2.2.5. Mouse hovering and point select

Point Data

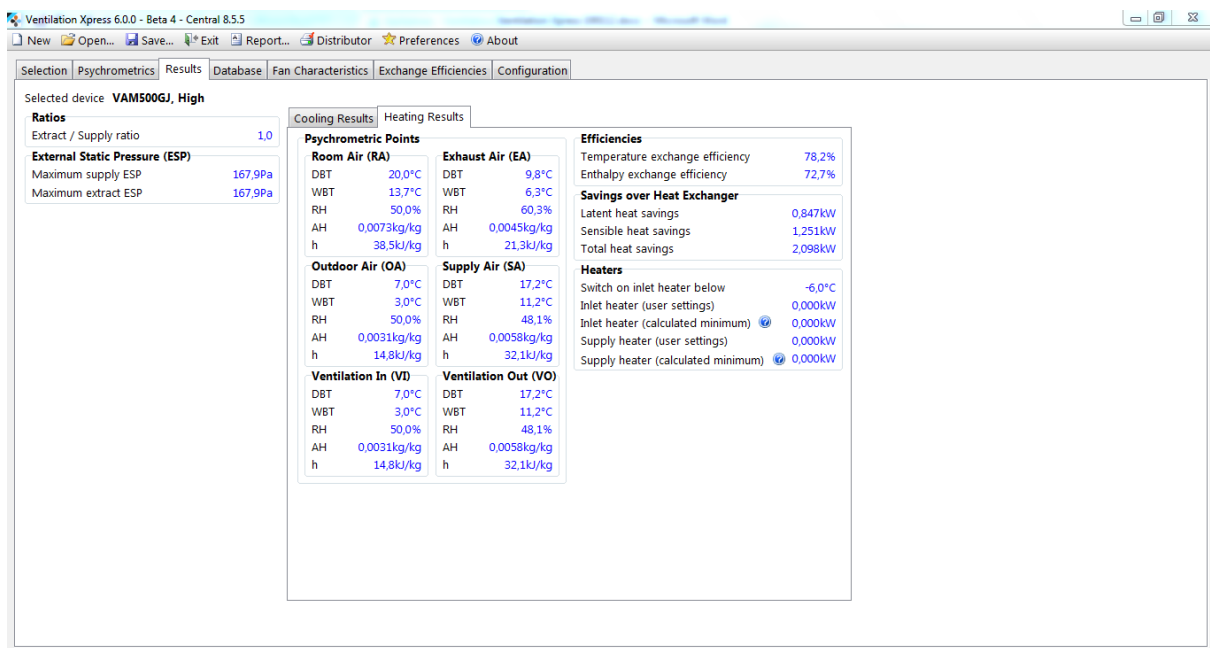
DBT	33,1°C
WBT	17,0°C
Dew point	5,7°C
RH	18,0%
g	0,0056kg/kg
h	47,8kJ/kg
Pressure	101325,0Pa

A mouse hovering over the diagram will give you the psychrometric details on the mouse position.

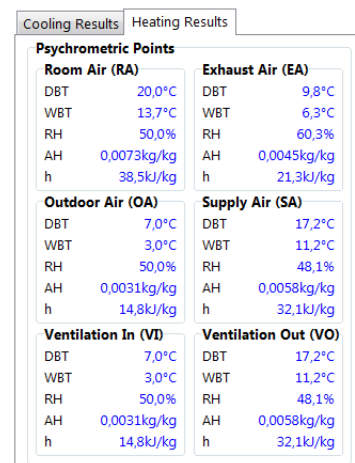
Note that when you get closer to one of the points in the ventilation process, the point will be highlighted and the point data section will reflect the conditions of that particular point



1.2.3.RESULTS –tab



1.2.3.1. The psychrometric points

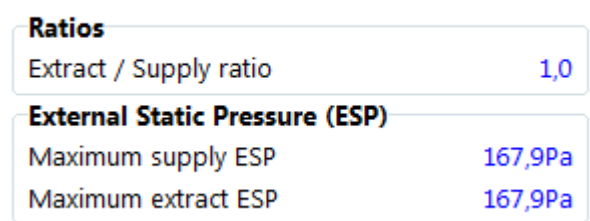


For both operation modes the psychrometric points with their abbreviations are note in this section.

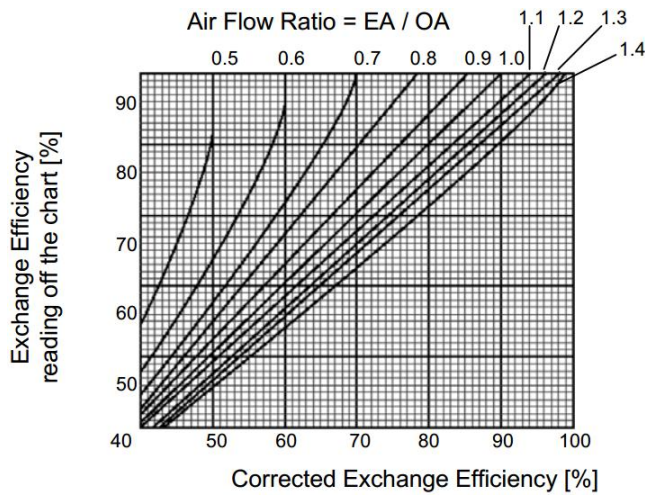
Select the proper tab for the results that you want to consider

1.2.3.2. Extract / supply ratio

Selected device VAM500GJ, High



It is verry likely that the supply air and exhaust air amounts will be different. The difference in airflows that are crossing in the heat exchanger will affect its efficiency. The extend of that influence is enumerated in this ratio.



1.2.3.3. Supply / Nominal ratio

Selected device **VKM50GM, High**

Ratios	
Extract / Supply ratio	1.0
Supply / Nominal ratio	0.7
External Static Pressure (ESP)	
Maximum supply ESP	186,9Pa
Maximum extract ESP	186,9Pa

This correction ratio is required in the selection for a VKM-unit only.

1.2.3.4. The results

Efficiencies	
Temperature exchange efficiency	78,2%
Enthalpy exchange efficiency	58,1%
Savings over Heat Exchanger	
Latent heat savings	0,937kW
Sensible heat savings	0,954kW
Total heat savings	1,891kW
Heaters	
Switch on inlet heater above	48,0°C
Inlet heater (user settings)	0,000kW
Inlet heater (calculated minimum)	0,000kW

In cooling mode the temperature exchange efficiency and the enthalpy exchange efficiency are listed here. In the EXCHANGE EFFICIENCY-tab (see further) you can clearly see that they are depending upon the airflow through the heat exchanger.

As mentioned in 2.2.2.4 in very exceptional cases an electric heater might be required in cooling mode. In this example, we see that the ambient temperature is 48°C

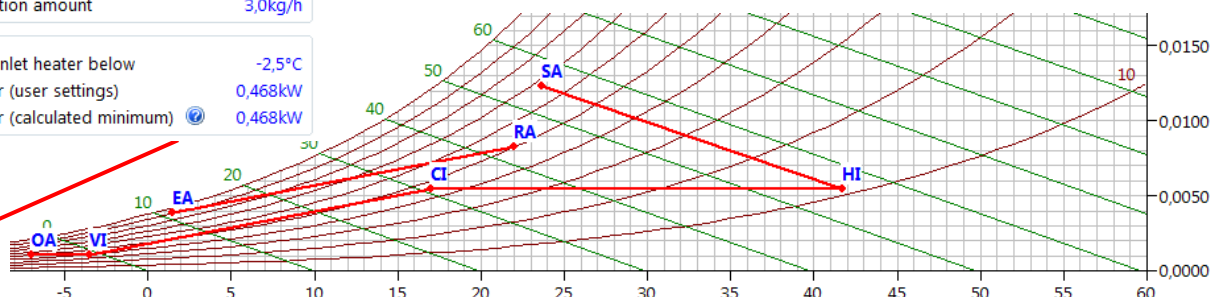
Efficiencies	
Temperature exchange efficiency	78,2%
Enthalpy exchange efficiency	72,7%
Savings over Heat Exchanger	
Latent heat savings	1,434kW
Sensible heat savings	2,646kW
Total heat savings	4,080kW
Heaters	
Switch on inlet heater below	-5,0°C
Inlet heater (user settings)	0,201kW
Inlet heater (calculated minimum)	0,201kW
Supply heater (user settings)	0,000kW
Supply heater (calculated minimum)	0,000kW

In heating mode the efficiencies are also shown.

Additionally the temperature from which the electric heater should be switched on is mentioned. This means that if the ambient air goes down further, the exhaust air would condensated inside of the HEP (High Efficiency Paper) -element and therefore the high limit of 95%RH was set.

Efficiencies	
Temperature exchange efficiency	80,3%
Enthalpy exchange efficiency	72,3%
Savings over Heat Exchanger	
Latent heat savings	3,410kW
Sensible heat savings	3,259kW
Total heat savings	6,670kW
Humidification	
Humidification amount	3,0kg/h
Heaters	
Switch on inlet heater below	-2,5°C
Inlet heater (user settings)	0,468kW
Inlet heater (calculated minimum)	0,468kW

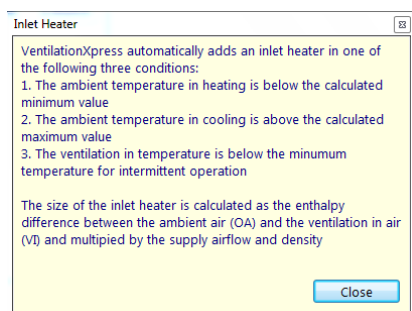
Further, the results also mention the amount of H₂O that will be used in the humidifier of a VKM-unit. The humidifier will only be used in heating mode to counter the decrease in RH when the air is warmed up.



In this example the air is heated from 17°C to 42°C. Because of that we see that the RH goes down from 45.3 to the SA-condition of 10.9%RH... !

Here the program will inform how much moisture is added to the air in order to compensate for this too dry condition. The consequence however will be a decrease in temperature to 23.7°C because of the evaporative cooling.

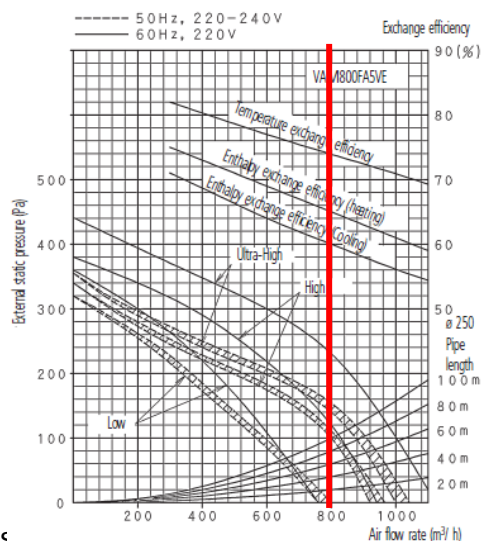
1.2.3.5. Question mark



When using the program, it is not always obvious what value to enter or what the consequences a particular input can have.

Whenever you see the “blue question mark” more information is available

1.2.3.6. Efficiencies



The efficiencies are mentioned in the results view.

A vertical line in the fan performance characteristic through the desired air volume will enable us to read the temperature exchange efficiency and the enthalpy exchange efficiencies for cooling and for heating

Efficiencies

Temperature exchange efficiency	80,3%
Enthalpy exchange efficiency	72,3%

1.2.4.DATABASE -tab

Ventilation Selection Program 6.0.0 - Beta 13 - Central 8.4.1 (exercise manual ventilation xpress.vam)

New Open... Save... Exit Report... Distributor Preferences About

Selection Psychrometrics Results Database Fan Characteristics Exchange Efficiencies Configuration

Selected VAM: VKM506, High

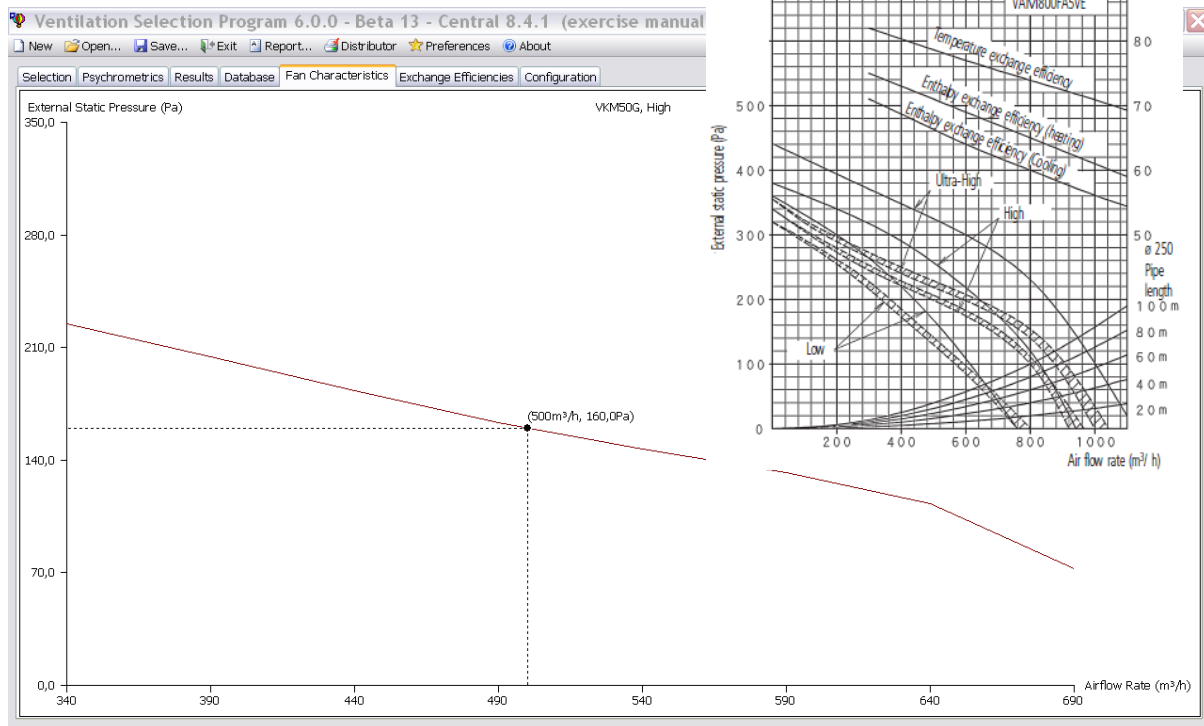
Mechanical Data		Electrical Data	
Height	387mm	Power supply	V1
Width	1764mm	Frequency	50Hz
Depth	832mm	Phases	1
Weight	96,0kg	Voltage	230V
Speed Related Data		Voltage range	220V - 240V
Sound Level	36	Minimum Volts	198V
Current	2,5	Maximum Volts	264V
Wattage	0,49	Min. Circuit Amps	4,3A
Ambient Operation Range		Max. Fuse Amps	15,0A
Minimum Temperature	-15,0°C	Duct Data	
Maximum Temperature	40,0°C	Duct Diameter	200mm
Maximum Relative Humidity	80,0%	Heat Exchanger Operation Range	
Room Operation Range		Minimum Temperature	0,0°C
Minimum Temperature	0,0°C	Maximum Temperature	40,0°C
Maximum Temperature	40,0°C	Maximum Relative Humidity	80,0%
Maximum Relative Humidity	80,0%	Nominal Data	
Exhaust Operation Range		Nominal humidity	
Maximum Relative Humidity	95,0%	Nominal airflow	500m³/h

Available Options

Item	Description	Type
BRC1A62	Remote controller	
BRC301B61	Remote controller	
BRP4A50		
KAF241GS0M		
KAF242GS0M		
K-DIGI 200R		

Mechanical data	Electrical data
Height	Min. Circuit Amps
Width	
Depth	

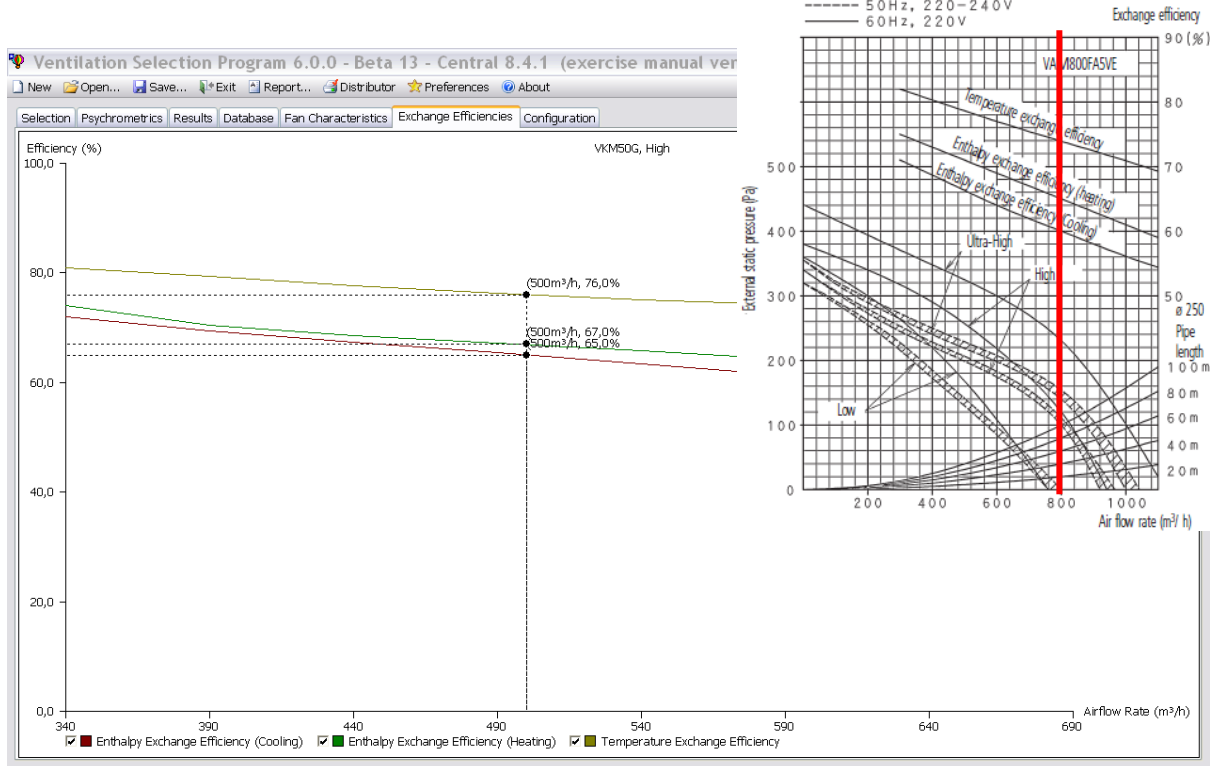
1.2.5.FAN CHARACTERISTICS –tab



The fan characteristics-tab will show the selected, voltage depending, fan speed curve and the airflow that is obtained for a particular ESP of the ducting system that are indicated in the crosshairs.

More information in the databook.

1.2.6.EXCHANGE EFFICIENCIES –tab0



The exchange efficiencies tab shows the upper part of the fan characteristics chart with again crosshairs that will show the efficiency that is obtained for a certain air flow through the heat exchanger.

The vertical crosshair will show starting from the lower line, the enthalpy exchange efficiency in Cooling the second line will be the efficiency in Heating and the upper line will show the Temperature Exchange Efficiency. Note that the upper part of Y-axis legend changed from ESP to % efficiency.

1.2.7.THE CONFIGURATION -tab

The configuration tab will show you how the equipment that you selected can be summarised.

Additionally to the pop-up window that was available in the psychrometrics-tab, here the practical limits for the air properties are also shown

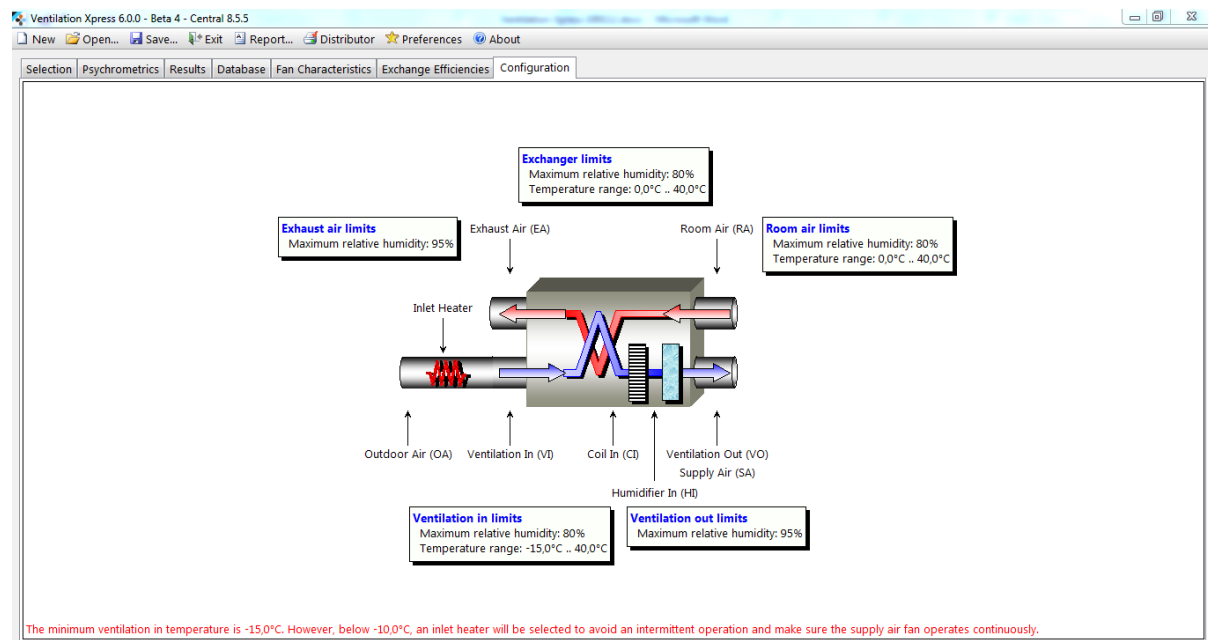


Table of Contents

1.	The Welcome Screen	2
2.	The Main Screen	3
2.1.	The menu bar	3
2.2.	The Program Tabs	5
2.2.1.	SELECTION -tab	5
2.2.1.1.	Room Airflow Conditions:	5
2.2.1.2.	Operation modes	5
2.2.1.3.	Electric heaters	6
2.2.1.4.	Device Family Selection	6
2.2.1.5.	The External Static Pressure	7
2.2.1.6.	The Altitude above Sea level	7
2.2.1.7.	The Selected Devices	7
2.2.2.	PSYCHROMETRICS -tab	8
2.2.2.1.	Colour legend	9
2.2.2.2.	Cooling and Heating mode	9
2.2.2.3.	Dynamic program	9
2.2.2.4.	Electric heaters	10
2.2.2.5.	Mouse hovering and point select	10
2.2.3.	RESULTS -tab	11
2.2.3.1.	The psychrometric points	11
2.2.3.2.	Extract / supply ratio	11
2.2.3.3.	Supply / Nominal ratio	12
2.2.3.4.	The results	12
2.2.3.5.	The question mark	13
2.2.3.6.	Efficiencies	13
2.2.4.	DATABASE -tab	14
2.2.5.	FAN CHARACTERISTICS -tab	15
2.2.6.	EXCHANGE EFFICIENCIES -tab	16
2.2.7.	THE CONFIGURATION -tab	17