PRODUCT DATA

COMFORT 5000 BY NILAN

Ventilation & passive heat recovery

Commercial

Passive
heat recovery

Ventilation
< 5300 m³/h

NILAN®
OUTSTANDING INDOOR CLIMATE

COMFORT 5000

The Comfort 5000 is a ventilation unit suitable for central ventilation of residential buildings, schools, offices and business facilities with a ventilation requirement of up to 5300 m^3/h.

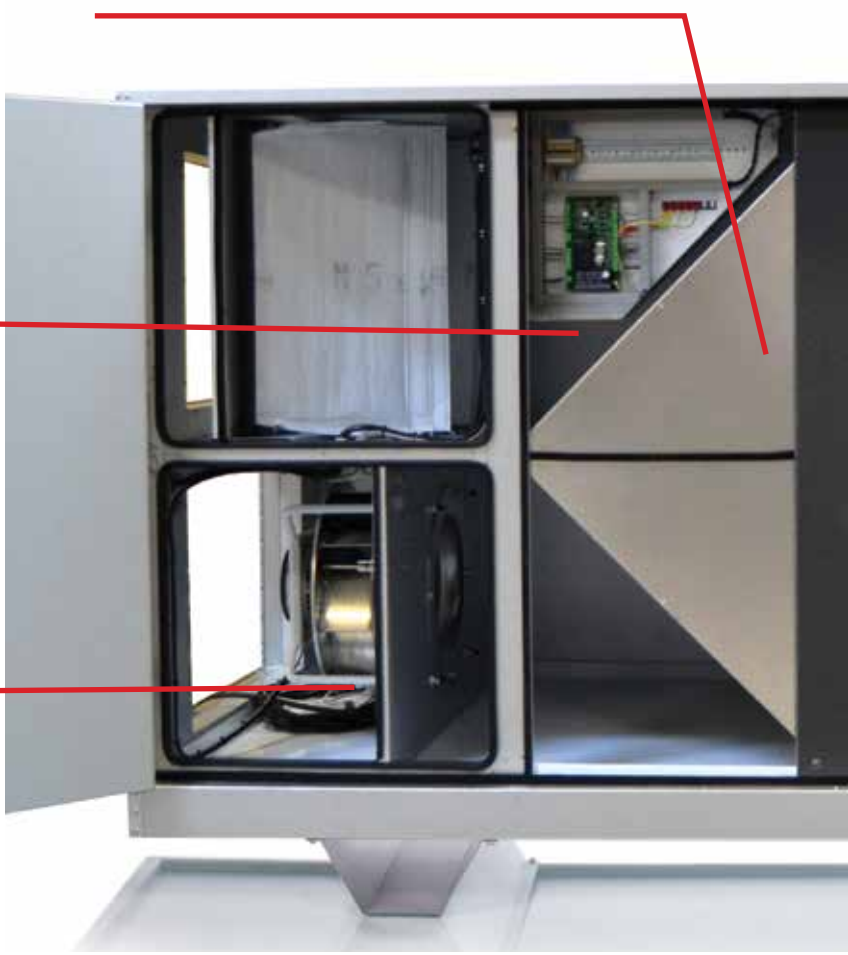
Every component has been carefully selected with a view to unsurpassed quality and each component is tested throughout the entire production process, as are the finished units before leaving the factory. This quality control reflects our high standards, which not only exceed market requirements but also take them several steps further.

Counterflow heat exchanger
Heat recovery is achieved by four counter flow heat exchangers made of highly corrosion resistant marine aluminium. The counterflow heat exchangers have an energy efficiency of more than 80% and prevent odours being transferred from the extracted air to the supply air.

The CTS 602i control allows for cooling recovery

Automatic control
The Comfort 5000 is supplied with an integrated CTS 602i control, which is operated by the enclosed HMI touch panel.

The modern CTS 602i control communicates Modbus RTU RS485. A CTS system using this type of communication can easily be connected to the device.



Plug fans
The two fan sections consist of energy-efficient EC motors with built-in motor controllers operated by a 0-10V signal.

The efficient fan wheels haverear facing impellers and are extremely quiet.

Doors
The large doors allow easy access for the changing the filters, as well as servicing of the unit.

The doors are mounted with loockable safty doorhandles.

Frost protection
An electric heater can be purchased for frost protection. This prevents the formation of ice in the counterflow heat exchanger in the event of long periods of frost.

Bruger APP løsning via gateway LAN/WiFi er installeret på aggregatet

Modulating 100% bypass
An automatic bypass valve directs the fresh air past the heat exchanger when waste heat recovery is not necessary, thus conserving energy.

Filters
The Comfort 5000 is supplied with bag filters. An ISO ePM10 >60% (M5) filter in the air exhaust and an ISO ePM1 50% (F7) filter for fresh air are supplied as standard.

The CTS 602i control has a built-in pressure controlled filter monitor.

Construction
The Comfort 5000 is housed in a strong frame structure of Aluzinc with 50 mm insulation.

Base
Comfort 5000 is delivered with a robust built-in base. A foundation and vibration absorbers can be ordered as an accessory. This ensures a noiceless installation.

Heating elements
External water or electric heating elements, regulated by the CTS 602i control, can be purchased.

The water-heating element can be built into the unit.

Pressure control
The extraction and/or supply fan can be operated with the aid of a pressure transmitter.

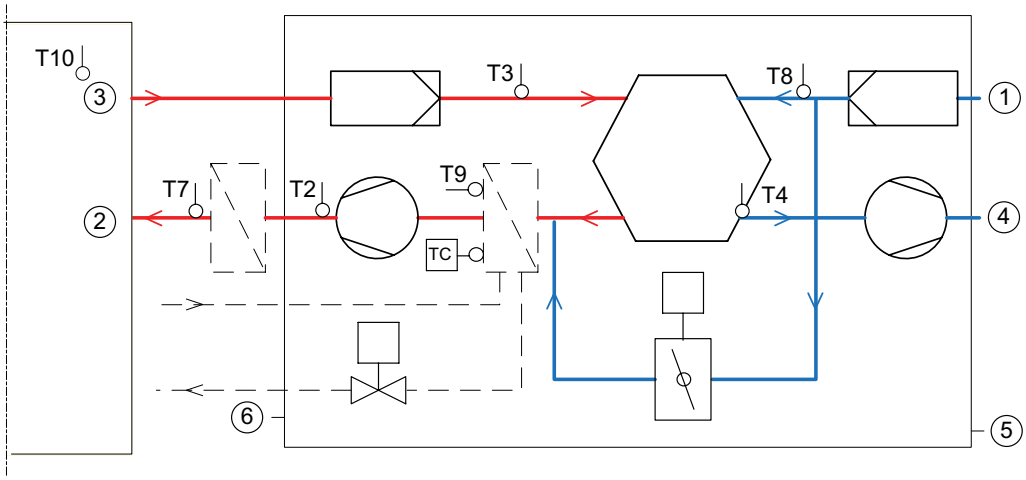
COMFORT 5000

Technical specifications

Dimensions (W x D x H)	2650 x 1250 x 1500 mm
Weight	617 kg
Min. Airvolume	500 m³/h
Max. Airvolume	5300 m³/h
Power consumption	3.9 kW
Power supply	3 x 400V, 50 Hz
Max. phase	3 x 13 A
Standby power	3 W
Plate type casing	Aluzinc steel plate
Heat exchanger type	Aluminium counterflow heat exchanger
Filter class	Standard bagfilters ISO ePM10 >60% (M5) Extract air and ISO ePM1 50% (F7) Fresh air
Duct connections (WxH)	800 x 500 mm
Condensate drain	PVC, Ø 20×1.5 mm
External leakage underpressure (*1)	< 0,9 %
External leakage overpressure (*2)	< 0,9 %
Internal leakage (*3)	< 0,5 %
Tightness class	IP31

*1 At ± 250 Pa and 4000 m³/h according EN 13141-7.
*2 At ± 250 Pa and 4000 m³/h according EN 13141-7.
*3 At ± 100 Pa and 4000 m³/h according EN 13141-7.

Functional diagram



Connections

1: Fresh air
2: Supply air
3: Extract air
4: Discharge air
5: Condensate drain
6: Electric and water heating

Automation

T2/T7: Supply air sensor
T9/TC: Heating element frost protection
T3: Extract air sensor
T4: Discharge air and defrost sensor
T8: Fresh air sensor
T10: Room sensor

Unit data for ecodesign

Trade mark	Nilan
Model	Comfort 5000
Type	Two-way ventilation unit not for residential
Type of drive	Variable speed drive VSD
Type of heat recovery system	Counterflow heat exchanger
Thermal efficiency of heat recovery	80,5%
Reference flow rate (supply air)	0,951 m^3/s
Reference flow rate (extract air)	1,064 m^3/s
Effective electric power input (kW) (supply air)	1,279 kW
Effective electric power input (kW) (extract air)	1,097 kW
SFP_{int}	872 $W/(m^3/s)$
Velocity at design flow rate	0,36 m/s
Nominal external pressure	275 Pa
Internal pressure drop of ventilation components (supply air)	155 Pa
Internal pressure drop of ventilation components (extract air)	228 Pa
Static efficiency of fans (supply air)	67,9 %
Static efficiency of fans (extract air)	67,9 %
Maximum external leakage rate	1,2 % v/400 Pa
Maximum internal leakage rate	0,9 % v/250 Pa
Energy classification of ISO ePM10 >60% (M5) bag filters (extract air)	E
Energy classification of ISO ePM1 50% (F7) bag filters (outdoor air)	C
Visuel filter warning	An alarm on the user panel appears when filters need changing. To maintain the performance and energy efficiency of the unit it is very important to change filters regularly.
Sound power level (LWA)	54 dB(A)

Motor and motor control

Motortype	EC-Engine
Motor class in accordance with IEC 60034-30	IE3 (Premium efficiency)
Voltage input	1 x 230 V
Current overload protection	Built-in
Control signal with third party control system	0 - 10 V DC
Fluid temperature (air)	-20 / +40 °C
Ambient temperature (operating)	-20 / +40 °C

Fan data for ecodesign

Fan data	
Max. total efficiency (A-D)	67.9 %
ECO measurement set-up (A-D)	A
Efficiency level requirements	62N (2015)
ECO efficiency level during optimal operating point	75.3

Motor data (optimal operating point)	
EC-motor	With motor controller
Absorbed power	1.954 kW
Airflow	4863 m^3/h
Total pressure	897 Pa
RPM during optimal operating point	2311

Conditions according with EC327/2011

PLANNING DATA

Nilan units are tested in accordance with the valid standards of accredited independent test institutes.

Capacity

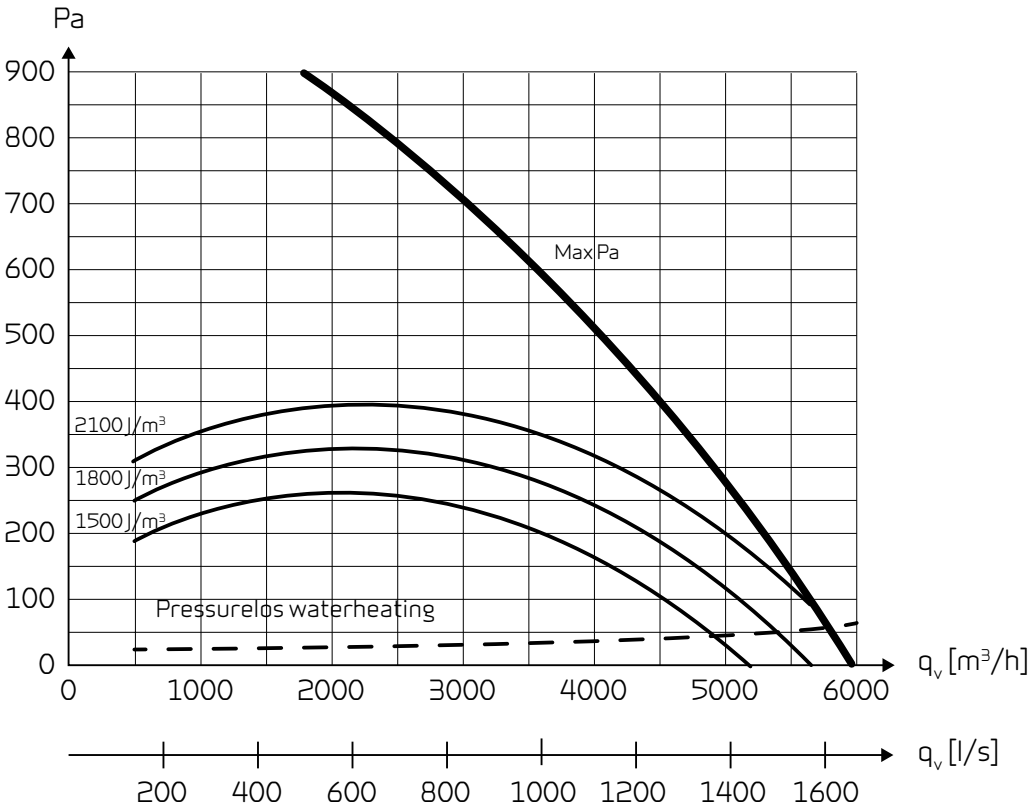
Capacity of standard unit as a function of q_v and $P_{t,ext}$.

SFP values according to EN 13141-7 are for standard units with ISO ePM10 >60% (M5) filter in extract air, ISO ePM1 70% (F7) filter in fresh air and no heating element

SFP values comprise the unit´s total power comsumption excl. control.

Conversion factor: $\frac{J/m^3}{3600} = W/m^3/h$

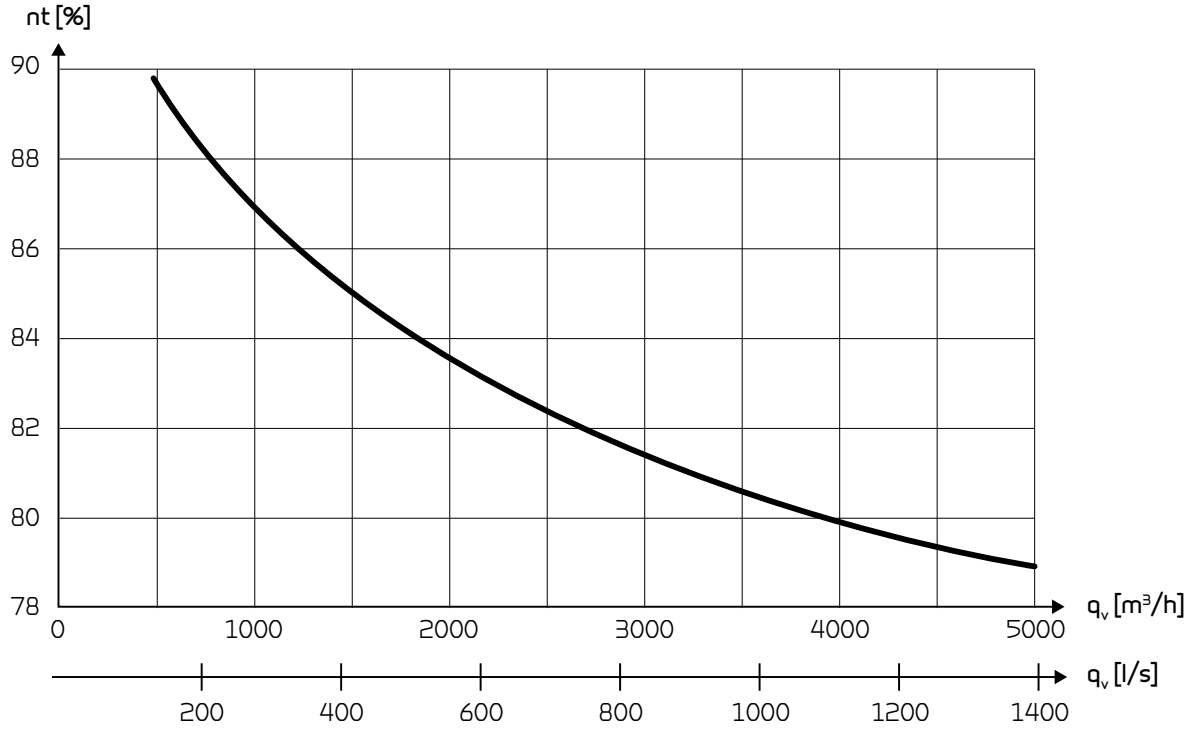
Attention! The SFP values are measured and stated as a total value for both fans.



Temperature efficiency

Temperature efficiency for unit with counterflow heat exchanger according to EN308 (dry).

Temperature efficiency EN308: $\eta_t = (t_{supply\ air}-t_{fresh\ air})/(t_{extract\ air}-t_{fresh\ air})$



Sound data

Sound data for q_V = 4000 m³/h and $P_{t,\ ext}$ = 100 Pa according to EN 9614-2 for surfaces and EN 5136 for ducts.

Sound output level L_{WA} drops with falling air volume and falling back pressure.

Sound output level L_{pA} at a given distance will depend on acoustic conditions in the place of installation.

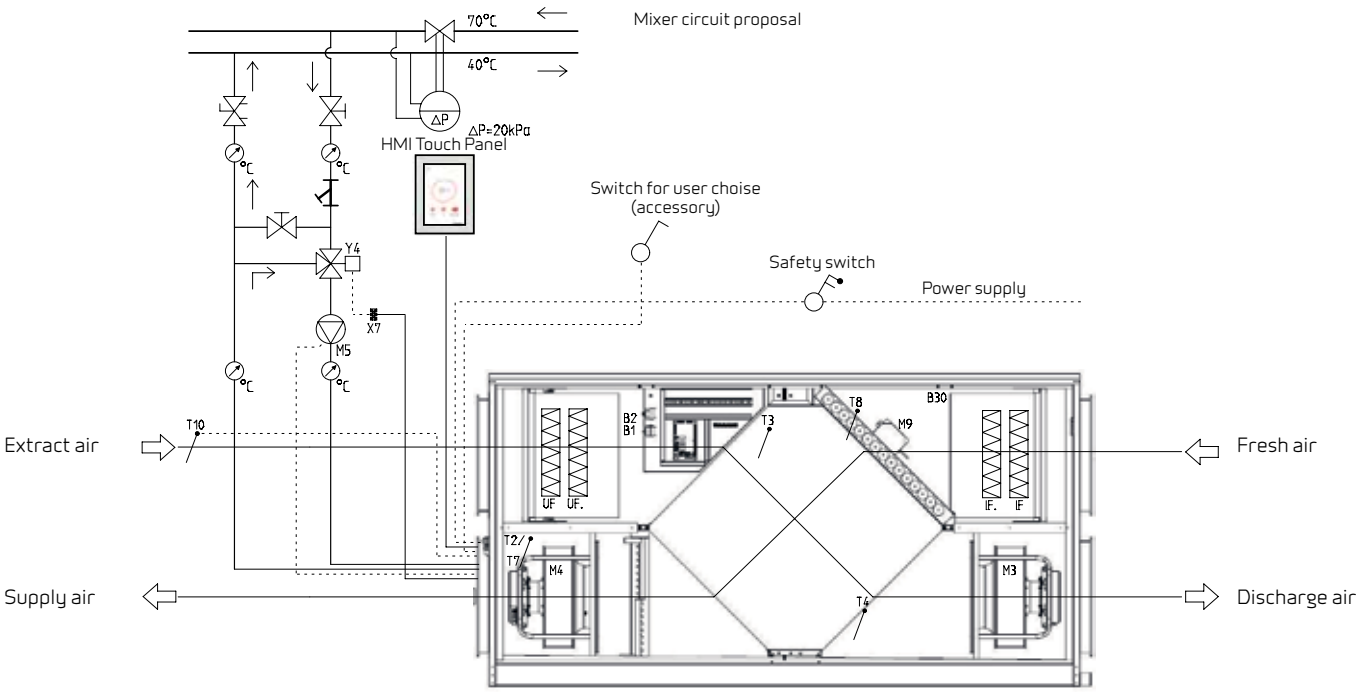
Sound output level (L_{WA})

Octave band Hz	Surface dB(A)	Supply air dB(A)	Extract air dB(A)	Outdoor air dB(A)	Discharge air dB(A)
125	47,7	61,4	48,7	50,4	60,2
250	50,6	70,1	57,5	59,9	68,5
500	44,9	78,3	54,2	56,7	75,7
1.000	43,7	81,5	53,7	56,4	79,8
2.000	35,7	75,6	47,3	48,8	74,1
4.000	30,9	70,4	33,6	35,4	68,0
8.000	23,2	59,6	14,9	14,6	54,3
Total ±2 dB(A)	53,7	84,3	60,8	63,2	82,4

PLANNING DATA

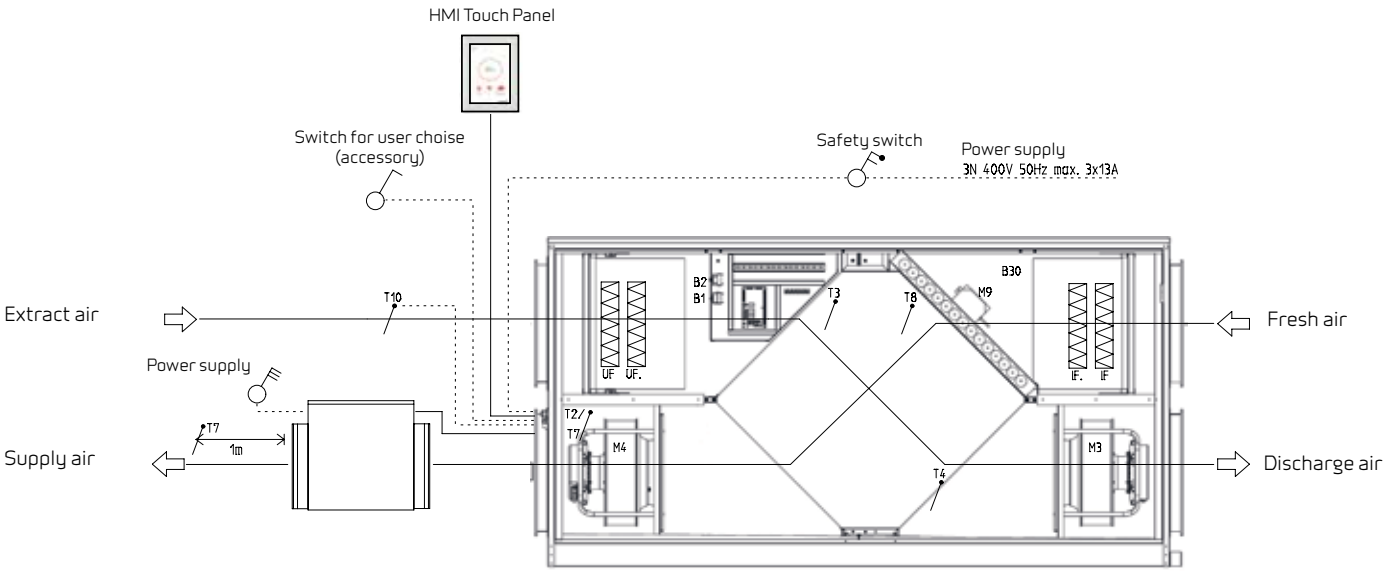
Heating elements (accessory)

Water heating element (for internal fitting)



T2/T7:	Supply air sensor
T9:	Heating element frost protection
T3:	Extract air sensor
T4:	Discharge air and defrost sensor
T8:	Fresh air sensor
T10:	Room sensor

Electrical heating element (duct mounted)



Capacity - Heating element (accessory)

Electrical heating element

The electrical heating element is fitted in the air inlet duct and connected to the CTS 602i control panel and 3 x 400 V supply.

The electrical heating element can supply up to 15 kW or 21 kW of heat.

Water heating element for internal fitting

The water heating element is designed to be built into the system and must be connected to the primary heating supply and the CTS 602i control. The water heating element includes copper pipes and aluminium fins.

Capacities can be seen in the table below.

Capacity water heating element

	Water side			Air side			
Temperature input/output [°C]	Flow [l/h]	Pressure drop [kPa]	Output [kW]	Flow [m³/h]	Temperature before WHE* [°C]	Temperature after WHE* [°C]	Pressure drop over WHE* [Pa]
40/30	415	1.7	4.8	1000	16	30.1	3
	672	4.1	7.8	2000	16	27.4	9
	871	6.5	10.1	3000	16	25.8	18
	1036	9.0	12.0	4000	16	24.8	29
	1178	11.4	13.7	5000	16	24.0	41
60/40	379	1.4	8.7	1000	16	41.6	3
	612	3.3	14.1	2000	16	36.6	9
	792	5.2	18.2	3000	16	33.8	18
	941	7.2	21.7	4000	16	31.9	29
	1070	9.1	24.7	5000	16	30.4	41
70/40	285	0.8	9.8	1000	16	44.8	3
	455	1.9	15.7	2000	16	39.0	9
	586	3.0	20.2	3000	16	35.7	18
	694	4.0	23.9	4000	16	33.5	29
	786	5.1	27.1	5000	16	31.9	41

* Water heating element.

AUTOMATION

CTS602i Control

The Comfort 5000 is controlled using its CTS 602i HMI touch panel, featuring a wide range of functions, e.g., menu-controlled operation, weekly programme settings, filter monitor with timer, fan speed adjustment, summer bypass, post-heating element control, error messages etc.

The CTS 602i comes with factory settings, including a default setting which can be customised to operational requirements to achieve optimum operation and utilisation of the system.

Nilan User APP

A Nilan gateway is fitted as standard on the Comfort 5000, where the user can gain access to the unit via a Nilan User APP. The APP enables the user to access and monitor the current operation, also from the outside of the property.

The APP allows you to adjust the default settings of, for instance, room temperature, fan speed level and the humidity control system.

The APP shows when filter change is next due. This is an important function, and you are automatically notified when filters need changing or an alarm is triggered.

It also provides you with useful trend curves so you can follow the operation of the unit for the previous week with regards to, for instance, room temperature or humidity level.

Using a LAN connector, you connect the gateway to the Modbus of the unit and then to the user's internet router via a LAN or a WiFi connection. This creates a secure cloud connection between the unit and the smartphone.

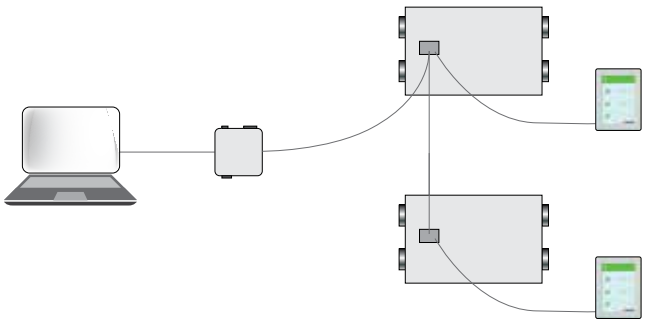
External communication

The CTS 602i control unit communicates by default with Modbus RTU RS485 communication. A CTS system using this form of communication can easily be connected to the unit.

Nilan units have an open Modbus communication, i.e. not only can the unit be monitored, but its operation can also be set in the same way as it can via the operating panel.

The protocol is set up by default for a Modbus RTU 30 address, but can be set to a value between 1 and 247.

A Modbus converter allows you to connect one or more units to a computer to monitor and control the unit.



Functions overview		+ Standard - Accessories
Alarms	Description of errors indicated with alarms. Alarm log displaying the latest 16 alarms.	+
Joint alarm	The CTS602 control system has an output signal that is activated in the case of an alarm. It can be connected to, for example, external automation.	
Filter monitor	Filter alarm with timer that can be set to 30/90/180/360 days.	+
Data display	An overview of the current operation with regards to temperatures, fan speed level etc.	+
Week program	The CTS602 control system has 3 week programs that can be set individually (the default setting is "off").	+
Humidity control system	Enables a higher or lower degree of ventilation at a high/low level of humidity.	-
Air quality	Enables you to adjust the degree of ventilation depending on the CO_2 level in the air.	-
Winter low	You can prevent a low level of humidity in the dwelling by activating low ventilation at low outdoor temperatures.	+
Temperature regulation	Enables you to control the operation of the unit in accordance with the room temperature.	+
Summer/winter mode	You can set the unit to operate in summer or winter mode.	
Language	You can choose from more than 10 languages in the control panel.	+
User levels	The menu in the control panel is divided into 3 user levels: User/Installer/Factory.	+
User selection 1	Enables you to override the operating mode via an external potential free signal.	+
Electrical after-heating element	An electrical after-heating element allows you to control the supply air temperature. In this way the unit can help heat the dwelling.	-
Water after-heating element	A water after-heating element allows you to control the supply air temperature. In this way the unit can help heat the dwelling.	-
Frost protection	In order to protect a potential water after-heating element against frost damage, the unit will stop and display an alarm if the temperature in the water after-heating element becomes too low.	-
Air exchange	Stepless setting of four fan speed levels. The supply air and the extract air can be set individually.	+
De-icing	Based on temperature, this automatic function de-ices the counterflow heat exchanger if ice has formed within it.	+
Room low	Safety function that will cause the ventilation unit to stop if the heating system for the dwelling fails. This will prevent the unit from cooling the dwelling even further.	+
External heating	The ventilation unit can control an external heat supply in accordance with the current room temperature.	+
External fire automation system	You can connect the ventilation unit to an external fire automation system or to a fire thermostat. This will signal to the unit whether to stop or continue operation.	+
Integral fire automation system	The ventilation unit is available with an integral fire automation system that can control fire and smoke dampers.	-
Pressure sustaining regulator	You can install a pressure sustaining regulator on the side of both the extract air and the supply air.	-
Delayed start-up	You can activate a delayed start-up of the fans if you install, for instance, a shut-off damper.	+
Restore settings	You can save the current settings and subsequently restore them if, for instance, the user has altered the settings on the unit. You can also reinstall the default settings.	+
Manual operation	Different functions can be tested manually.	+
Energy saving function	You can activate a power saving function of the operation.	+
Modbus	You can set the Modbus address of the unit. The default setting is 30.	+
Data logging	It is possible to log the operational data of the unit every 1 - 120 min. Alarms are logged when they occur.	+
Control panel	You can choose from 2 different images for the main screen.	+

You can find further information about all the functions in the Software and Installation instructions for the unit.

OPERATION

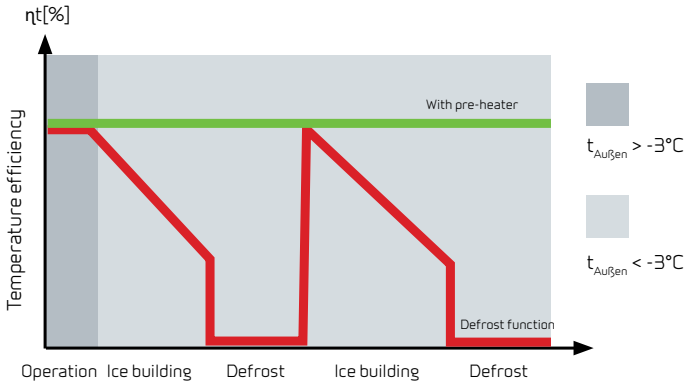
Frost protection

All ventilation units with a counterflow heat exchanger will ice up if the outdoor temperature is below freezing for a prolonged period.

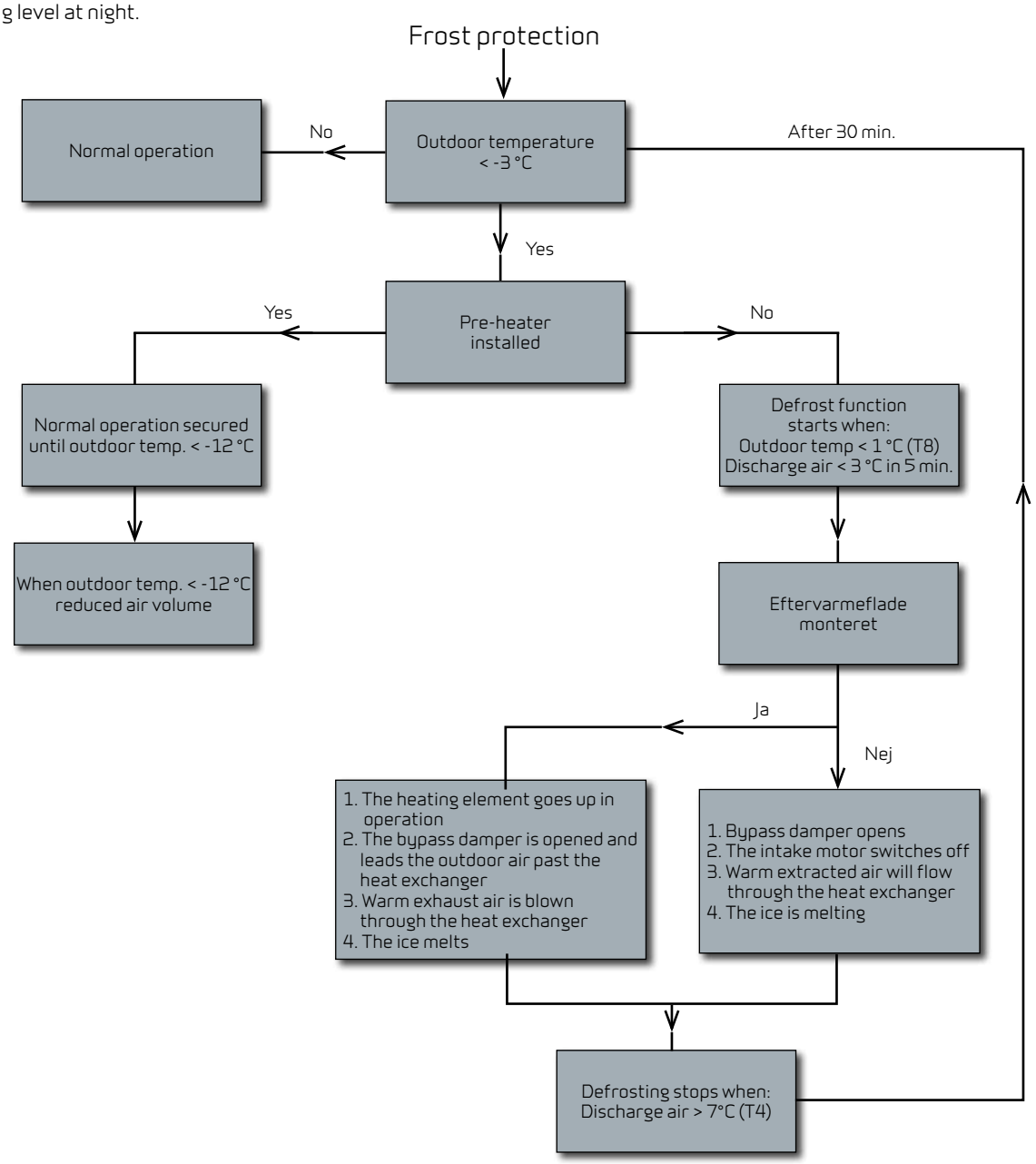
The extracted air condenses when it is cooled down during heat recovery. The high temperature efficiency will slowly turn the condensate to ice, which will block up the counterflow heat exchanger unless action is taken to remedy this.

Consideration must be given to whether the unit's operation can be protected during a lengthy period of frost or whether it is acceptable to decrease its operation.

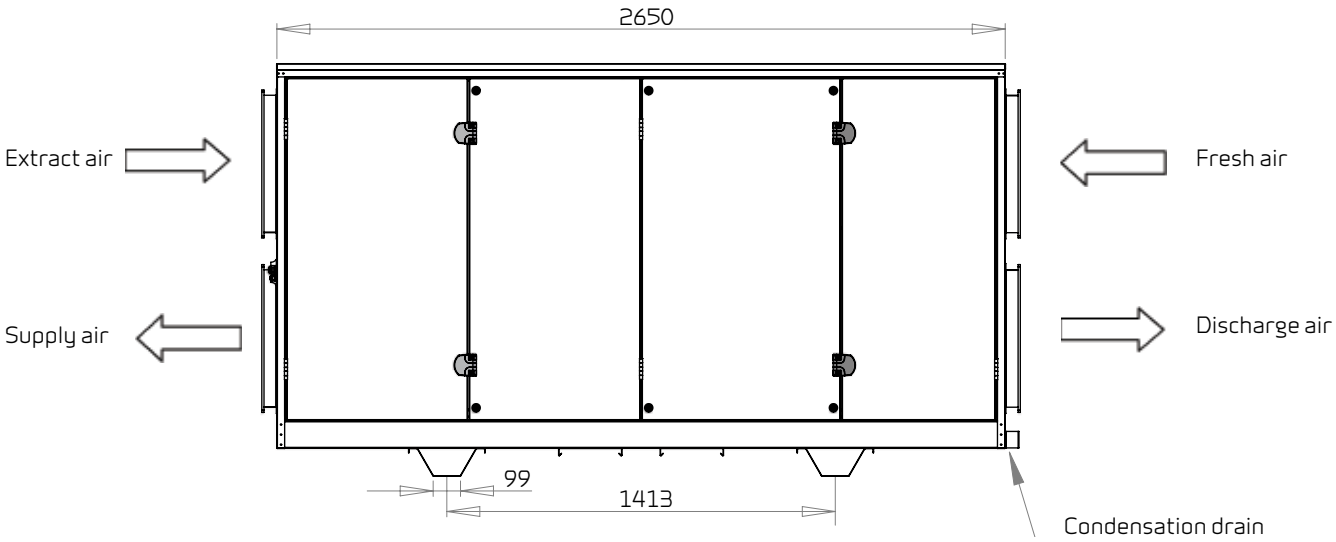
In homes which are occupied at night, it would be advisable to protect the unit against frost when the outdoor temperature is coldest by using a pre-heating element. On the other hand, if the ventilation is for an office, it may be acceptable to decrease the operating level at night.

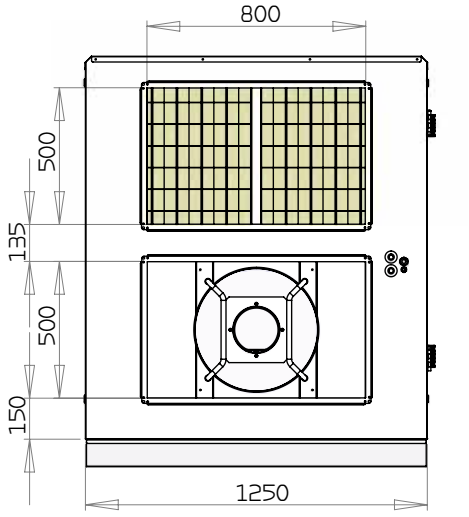


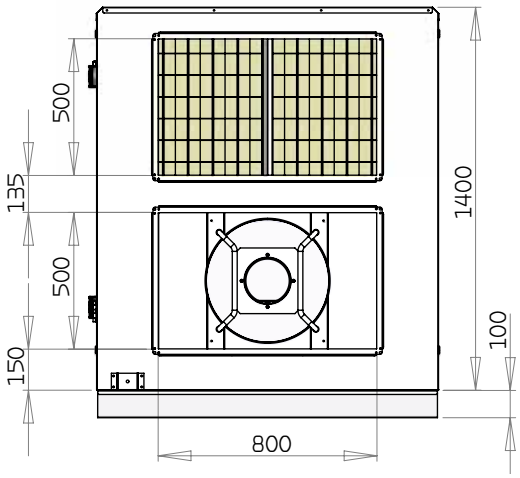
The energy used for the preheating is not wasted, as it ensures a constant high temperature efficiency

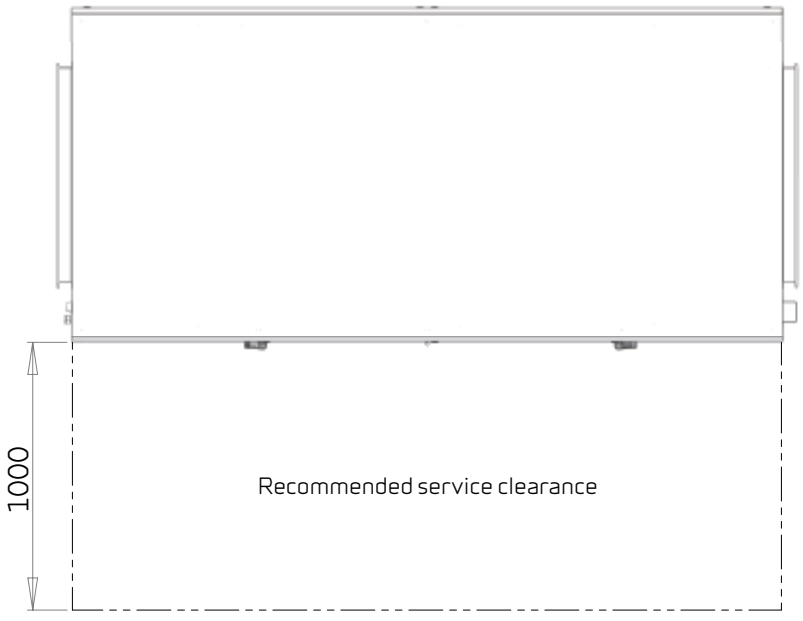


DIMENSIONAL DRAWING









ACCESSORIES

Electrical pre-heating element (Frost protection)

Avoid having to defrost the unit, resulting in a loss of power. With temperature sensors supplied to be fitted in the ducts. (21 kW)

Electrical heating element incl. regulation

The electrical heating element is supplied ready to fit into the fresh air duct and, for easy fitting, the device is pre-fitted with all the required sensors. (15 kW or 21 kW)

Water heating element incl. regulation

The water heating element is designed to be built into the unit and must be connected to the primary heating supply. Supplied with three-way adjustment valve, temperature sensor and frost thermostat.

Pressure transmitter

The extraction and/or supply fan can be operated with the aid of one or two pressure transmitters.

Expansion PCB

The expansion PCB provides additional functions for the CTS 602i control.

Humidity- and CO_2-sensor

For demand control ventilation the unit can be integrated with an humidity- and CO_2 -sensor.

Top cover

If Comfort 5000 is going to be installed outside, it is possible to order a top cover which protects the unit against rain and snow.

Shut-off damper

Damper for external installation with or without spring-return.

Vibration dampers

A set of four vibration dampers can be included.

Water trap

The water seal is intended for negative pressure and has a ball to ensure that the water seal is tight even when not filled with water.

Heating cable

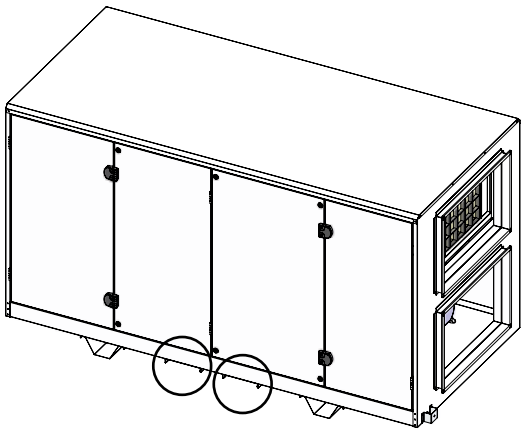
To protect the condensation outlet against frost, a 3 metre-long self-regulating heating cable can be ordered.

DELIVERY AND HANDLING

Transport and storage

Comfort 5000 comes in factory packaging that protects it during transport and storage. Comfort 5000 must be stored in a dry place in its original packaging until installation.

The packaging should only be removed immediately prior to installation.



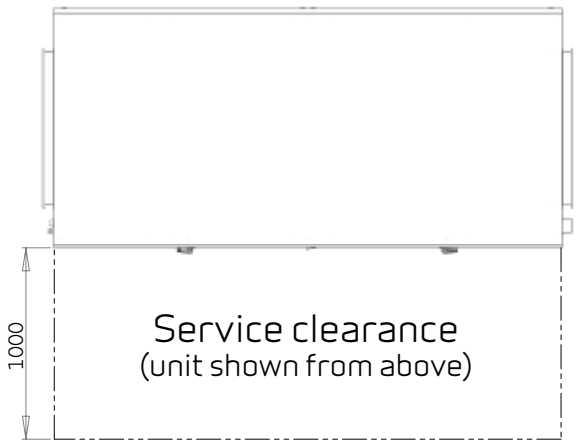
Handling and mowing the Comfort 5000

Comfort 5000 is braced with two tracks at the bottom, which can be used to move the unit with a lifting truck.

Installation conditions

During installation, future service and maintenance should be taken into account. We recommend a minimum gap in front of the unit of 1 m.

The unit must be installed level for the sake of the condensate drain. The condensate drain requires clearance of min. 12,5 cm under the drain nozzle.



INFORMATION FROM A TO Z

Nilan develops and manufactures premium-quality, energy-saving ventilation and heat pump solutions that provide a healthy indoor climate and low-level energy consumption with the greatest consideration for the environment. In order to facilitate each step in the construction process - from choosing the solution through to planning, installation and maintenance - we have created a series of information material which is available for download at www.nilan.dk.

Brochure

General information about the solution and its benefits.

Product data

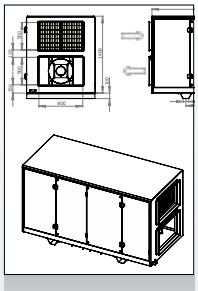
Technical information to ensure correct choice of solution.

Installation instructions

Detailed guide for installation and initial adjustment of the solution.

User manual

Detailed guide for regulation of the solution to ensure optimum day-to-day operation.



Drawings

Tender documents and 3D drawings are available to download for planning purposes.

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Visit us at www.nilan.dk to find out more about our company and solutions, download further information and find your nearest dealer.

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