PRODUCT DATA

COMFORT 600 BY NILAN

Ventilation & passive heat recovery

Domestic

Passive heat recovery

Ventilation < 800 m³/h

NILAN®
OUTSTANDING INDOOR CLIMATE

COMFORT 600

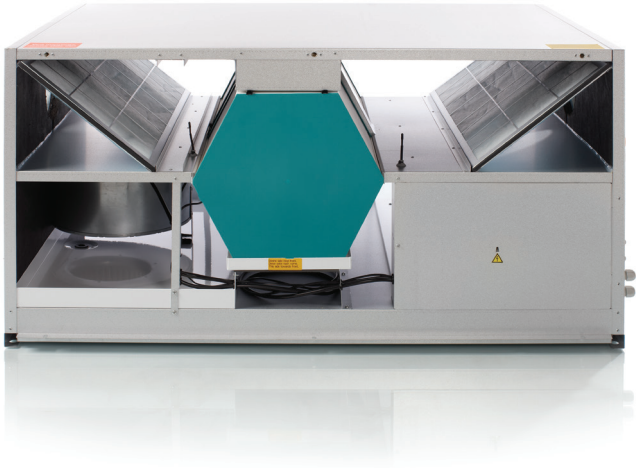
Product description

The Comfort 600 is an energy-efficient ventilation unit with heat recovery for homes and smaller commercial buildings with a ventilation requirement of up to 800 m^3/h.

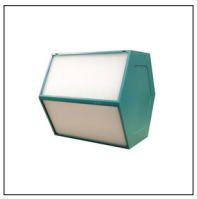
This unit has been thoroughly tested, with improvements being continually made during its manufacture for more than 15 years. These have focused on low energy consumption, easy user operation and maintenance.

The Comfort 600 is a compact unit which can be ordered as a left- or right-handed model.

The Comfort 600 is factory tested and ready for use. Installation and commissioning must be performed by an authorised electrician.



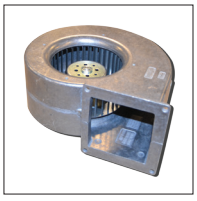
The large door provides easy access for changing filters and cleaning the unit.



Counterflow heat exchanger made of polystyrene, which has a higher temperature efficiency than aluminium exchangers.

The unit comes with a clear and user-friendly operating panel.

The modern CTS 602 control panel runs Modbus communication.



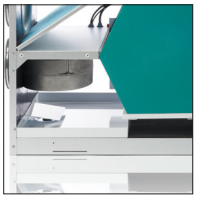
The efficient fans are powered by energy-saving EC motors.

They provide a constant air volume with a four-step adjustment.

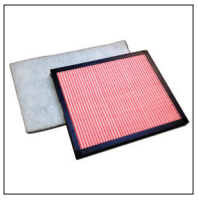
Prepared for an integrated or external water heating element.

Intelligent humidity sensors provide an option for controlling the ventilation as required, based on the average air humidity in the home.

A CO_2 sensor can be purchased as an accessory.

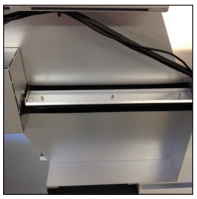


The powder-coated condensate drain prevents the formation of "acid water" and allows the condensate to be drained away.



Filter monitor with timer

G4 filters are supplied as standard, but it is also possible to buy a F7 pollen filter as an accessory.



The automatic bypass damper makes the outdoor air bypass the heat exchanger when heat recovery is not required, thereby saving energy.

Bypass cooling as an option.

Technical specifications

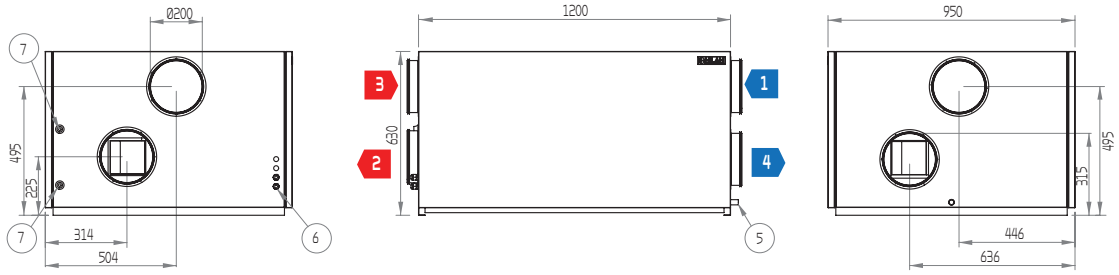
Dimensions (W x D x H)	1200 x 950 x 630 mm
Weight (*1)	101/75 kg
Plate type casing	Aluzinc steel plate
Heat loss casing (*2)	59 W/-59 W
Heat exchanger type	Polystyrene counterflow heat exchanger
Fan type	EC, constant volume
Filter class	Standard G4
Duct connections	Ø 200 mm
Condensate drain	PVC, Ø 20×1,5 mm
External leakage (*3)	< 0.1 %
Internal leakage (*4)	< 3.6 %

Supply voltage	230 V (±10 %), 50/60 HZ
Max. input/power (*5)	1145 W/7.1 A
Tightness class	IP31
Standby power	4 W
Power consumption (*5&6)	1220 kWh/år
Ambient temperature	-20/+40 °C

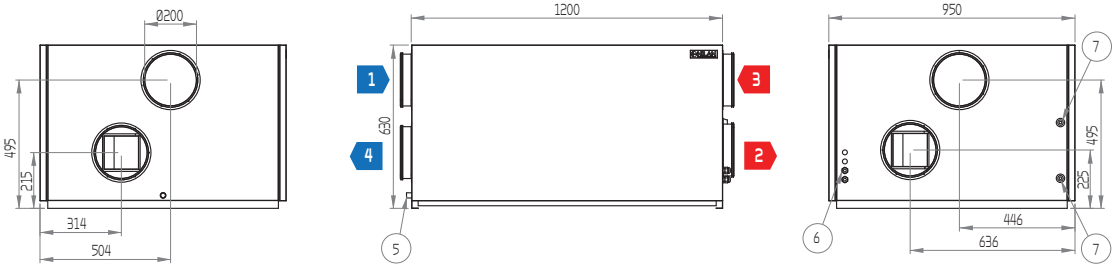
*1 75 kg is without side plates and exchanger.
*2 59 W: Outdoor air temperature -12 °C. Fitting location -12 °C. Extract air temperature 20 °C (room).
-59 W: Outdoor air temperature -12 °C. Fitting location 20 °C. Extract air temperature 20 °C (room).
*3 At ± 250 Pa and 600 m³/h according EN 308/EN 13141-7.
*4 At ± 100 Pa and 600 m³/h according EN 308/EN 13141-7.
*5 Input without heating element (accessory).
*6 Power consumption on comtinuous operation for system with SFP value 1000 J/m³ ved 500 m³/h.

Dimensional drawing

Left model



Right model



All dimensions are in mm

Connections

1: Fresh air
2: Supply air
3: Extract air
4: Discharge air
5: Condensate drain
6: Electric and water heating
7: Primary side (heat exchanger)

PLANNING DATA

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

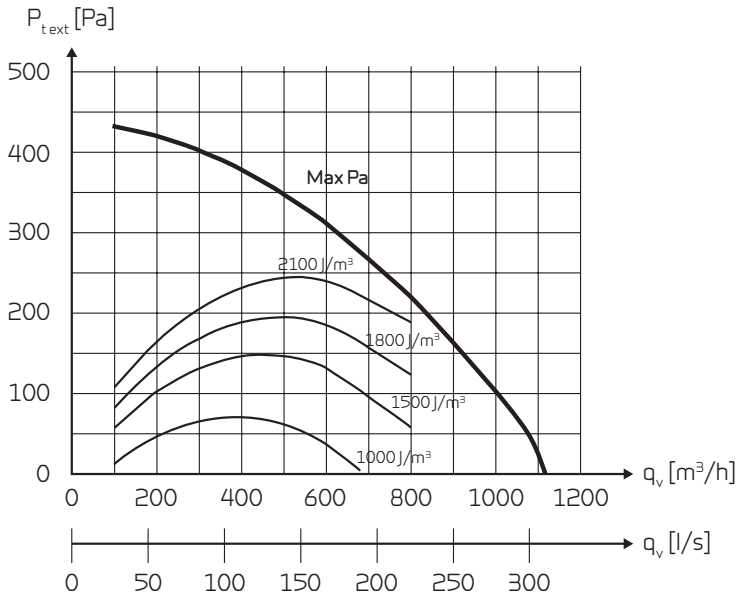
Capacity

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 G4 filters and no heating element.

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

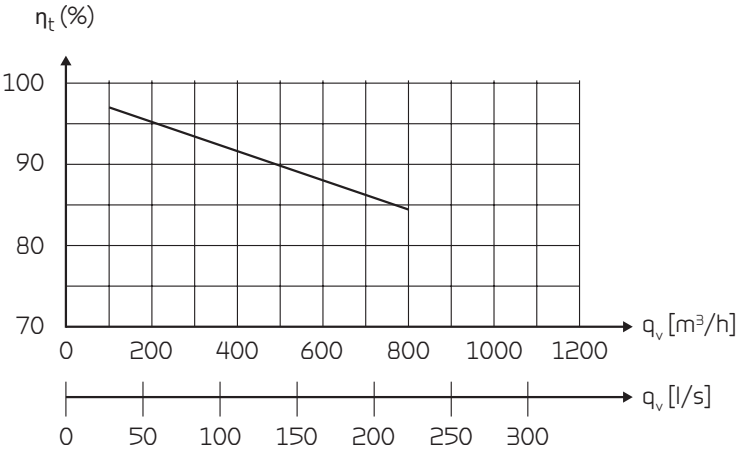
Conversion factor: $\frac{J/m^3}{3600} = W/m^3/h$



Temperature efficiency

Temperature efficiency for units 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 = 600 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})

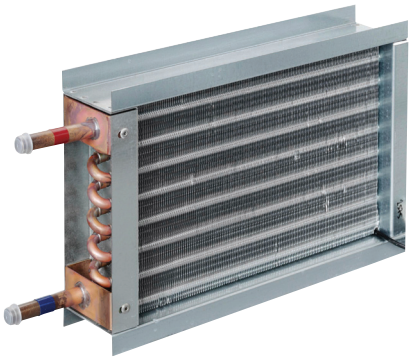
Octave band Hz	Surface dB(A)	Supply air dB(A)	Extract air dB(A)
63	34	58	41
125	43	59	42
250	48	64	47
500	47	65	41
1000	53	67	31
2000	43	63	27
4000	38	60	17
8000	36	59	13
Total ±2 dB(A)	55	72	50

Capacity - Heating element (accessory)

Electrical heating surface

The electrical heating surface is fitted in the air inlet duct at a distance of min. 2 x duct diameter from the system´s fresh air inlet connection pipe (normally min 400 mm.) and connected to the CTS 602 control panel and 230 V supply.

The electrical heating surface can supply up to 3,0 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 602 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 [m³/h]	Pressure drop [kPa]	Output [kW]	Flow [m³/h]	Temperature before WHE* [°C]	Temperature after WHE* [°C]	Pressure drop over WHE* [Pa]
40/30	0.1	0.74	1.1	200	16	32.2	2
	0.12	1.11	1.4	270	16	30.9	3
	0.16	2.1	1.9	420	16	29.2	4
	0.21	3.2	2.5	620	16	27.7	8
60/40	0.09	0.6	2	200	16	45.4	2
	0.11	0.9	2.5	270	16	43.1	3
	0.15	1.6	3.4	420	16	40	4
	0.2	2.5	4.5	620	16	37.2	8
70/40	0.07	0.36	2.3	200	16	49.4	2
	0.08	0.53	2.8	270	16	46.6	3
	0.11	0.92	3.9	420	16	42.9	4
	0.14	1.47	5	620	16	39.6	8

* Water heating element.

AUTOMATION

CTS602 Control

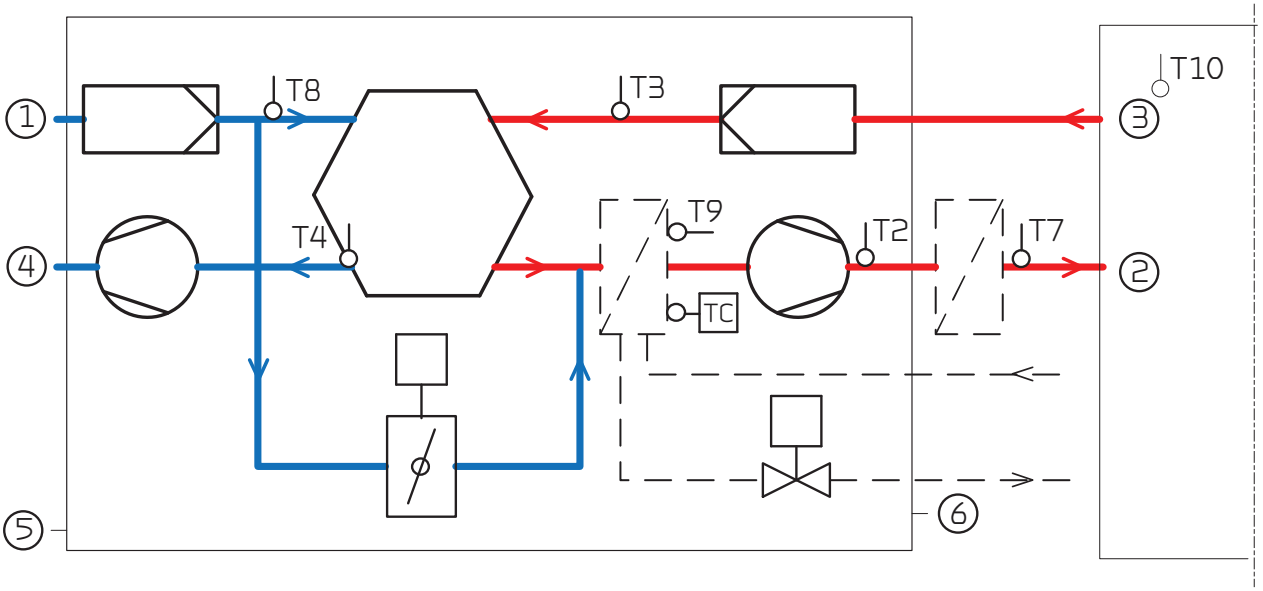
The Comfort 600 is controlled using its CTS 602 operating panel, featuring a wide range of functions, e.g., menu-controlled operation, weekly programme settings, filter monitor with timer, fan speed adjustment, summer bypass (free cooling), post-heating element control, error messages etc.

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

The operating panel must be placed in a dry, frost-free location, at least 1.5 m above floor level and at least 0.5 m from any corner. Avoid placing the panel on an external wall or in areas in direct sunlight.

Operating instructions for the CTS 602 can be found in a separate user manual supplied with the unit.

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

Functional overview		+ Standard - Accessories
3 levels	The control function is divided into 3 levels: User/Service/Factory with various options at each level	+
Weekly plan	The unit has 3 weekly programmes (with a factory setting of "off") • Programme 1: for working families • Programme 2: for stay-at-home families • Programme 3: for businesses There is also an option for you to set your own weekly programme.	+
User option 1	This allows you to override the operating mode in the main menu via an external potential-free contact or PIR sensor.	+
Alarms	Alarm log featuring the last 16 alarms.	+
Filter monitor	Filter monitor with timer (factory setting of 90 days). Adjustable to 30/90/180/360 days.	+
Bypass	Bypassing the outdoor air reduces heat recovery, enabling the desired supply air temperature to be maintained spring, summer and autumn.	+
Air quality	Allows you to choose whether to switch humidity sensors and/or CO_2 sensors on and off.	+/-
Humidity control	Allows you to set a higher or lower ventilation step in the case of high/low air humidity.	+
CO_2 control	Allows you to set a higher or lower ventilation step in the case of a high/low CO_2 level.	-
Air exchange	Allows you to select a low ventilation step in the case of low outside temperatures and air humidity.	+
Defrost function	Temperature-based automatic function for defrosting the heat exchanger.	+
Frostprotection	In case of failing heating system, the unit is turned off to avoid further cooling with a risk of the water heating coil frost bursting.	+
Temperature control	Allows you to select the temperature sensor which will control the unit. • T15 ROOM (panel sensor) • T10 EXT (fitted in a representative extraction valve) • T3 EXHAUST (extract air)	+
Room low	Stops the unit at a low room temperature. Hereby is cooling of the home avoided in case of a failing central heating system. Standard set to OFF. Can be set from 1 to 20 degrees and is controlled by: • T15 ROOM (panel sensor) • T10 EXT (fitted in a representative extraction valve) • T3 EXHAUST (extract air)	+
Room control	Allows you to set the regulator to control the room temperature.	+
Air volume	Allows you to set four ventilation steps. Supply air and extract air are set individually. Step 1 < 25% - Step 2 < 45% - Step 3 < 70% - Step 4 < 100%	+
Fire alarm	This allows you to connect fire-detecting thermostats, smoke detectors and other fire alarm contacts. In case of an alarm, smoke dampers are closed and the unit stops.	+
Joint alarm	Outlet for joint alarm	+
Constant pressure control	Allows control from both the extract air and supply air side.	-
Cooling	Via bypass. This allows you to choose whether to run the system at a higher or the highest ventilation step during cooling. The weekly programme has an option for setting cooling at night.	+
Intake air control	Allows you to set the regulator to control the intake air temperature/supply air (only available if the control unit has been configured for a supply-heating element).	+
External heating element	• Temperature sensor T7 is an supply air sensor • Integrated frost protection for external water heating element • Motorised valve and circulation pump control unit	-
External electric heating element	• Temperature sensor T7 is an supply air sensor • Overheating protection	-
Delayed start-up	There is a possibility for a delayed start-up by the fans, when a closing damper is installed.	+
Expansion PCB	Allows you to make additional connections, e.g. • User option 2 overrides User option 1 (e.g. connecting an EM box) • Up to 500 W direct • Can give the signal for external heating if the defrost function is used • Switching the central heating system on/off	-
Reset	Allows you to restore the factory settings.	+
Manual test	Allows you to test the unit's functions manually.	+
Language	Option for setting the relevant language (Danish/Finnish/Norwegian/Swedish/German/English/French).	+

COMMUNICATION

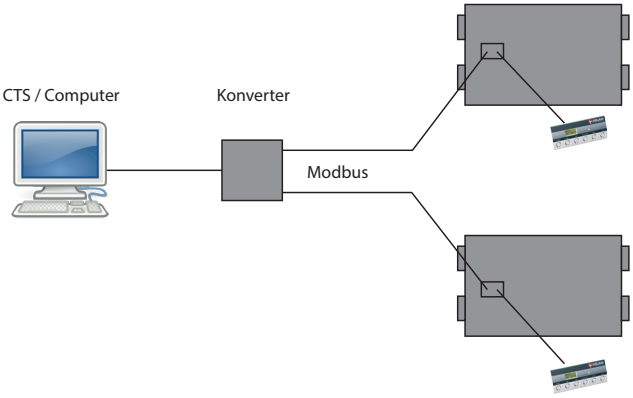
External communication

The CTS 602 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.



OPERATION

Intelligent humidity control

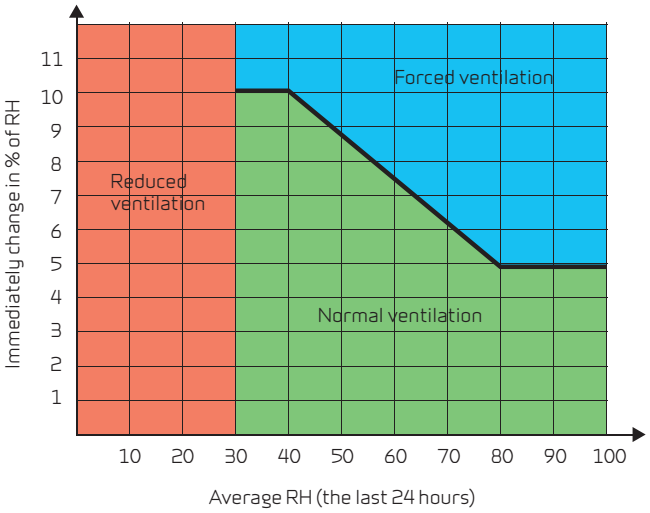
Nilan's humidity control automatically adapts to the needs of the family or the building.

The intelligent CTS 602 control unit does not need to have a set level input for air humidity (RH) to control the air exchange. By using the integrated humidity sensor, the control unit calculates the average level itself for the last 24 hours. The average level provides a basis for deciding whether to change the air exchange if the air humidity fluctuates.

This ensures that the unit always runs at its most efficient, based on the actual air humidity level and not on a theoretical one.

This helps save energy because it automatically adapts to the requirements in the home. Whether a large family or a single person is living in the building has a considerable influence on how much humidity is produced.

The unit also adjusts automatically to summer and winter level.



If the air humidity changes by more than 5-10% in relation to the average level, the unit responds with a higher rate of air exchange accordingly.

At an air humidity below 30% is reduced ventilation stp activated (adjustable between 15 and 45%)

OPERATION

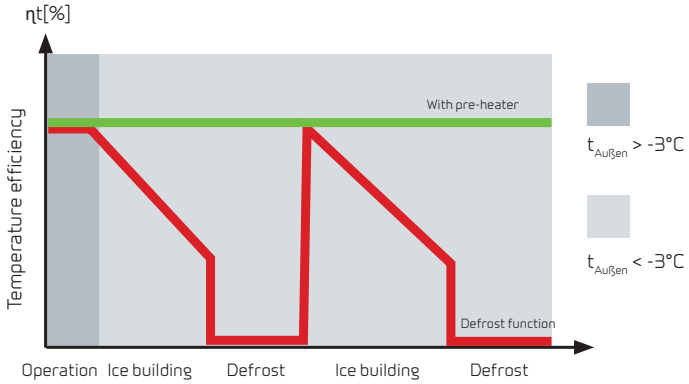
Frost protection

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

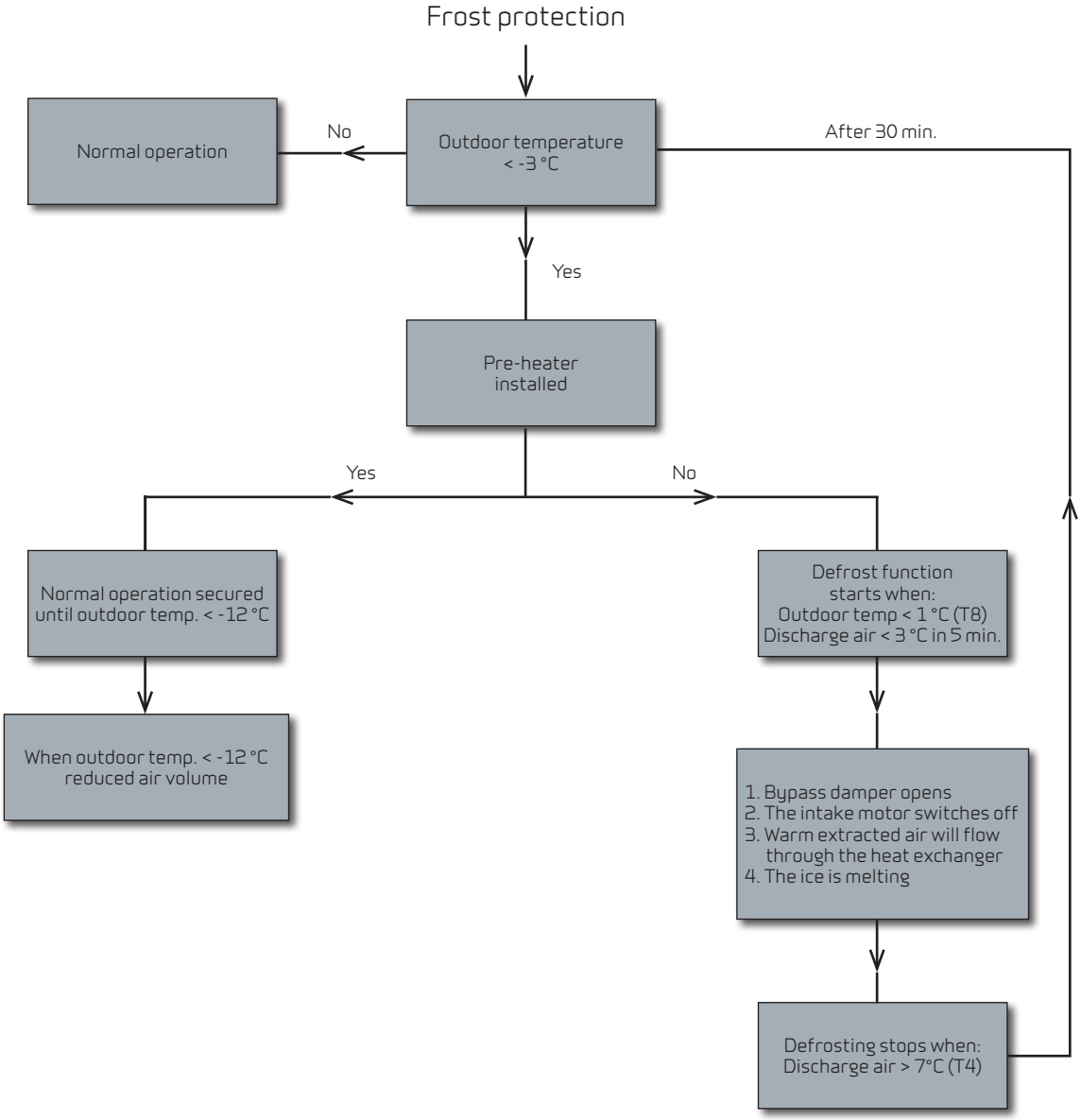
The extracted air condenses when it is cooled down during heat recovery. The high temperature efficiency will slowly turn the condensate to ice, which will block up the counterflow heat exchanger unless action is taken to remedy this.

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.



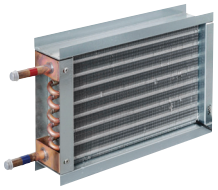
The energy used for the preheating is not wasted, as it ensures a constant high temperature efficiency



ACCESSORIES

CO_2-sensor

With a CO_2-sensor installed, the ventilation speed can be pre-programmed with CTS602 to run at a higher ventilation steps when CO_2 reaches high level in the extract air. CO_2-level is programmable.



Water heating element incl. regulation

The supply temperature can always be raised to the required level using a water heating element. The water heating element is designed to be built into the unit and must be connected to the primary heating supply. Supplied with two-way adjustment valve, temperature sensor and frost thermostat.

Electrical heating surface incl. regulation

When you fit an electrical heating surface, you can raise the fresh air temperature to the desired level at any time. The electrical heating surface is supplied ready to fit into the fresh air duct and, for easy fitting, the device is pre-fitted with all the required sensors.

Electrical pre-heating element (Frost protection)

An electrical pre-heating element heats up the outdoor air before it enters the unit. This avoids having to defrost the unit, resulting in a loss of power.

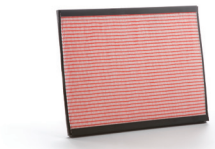
There are temperature sensors supplied to be fitted in the ducts.

EM-box

An EM-box allows heat recovery from the air from the range hood and thereby helps to heat the supply air. The EM-box is equipped with a special filter which efficiently cleans the range hood air of fat particles and thereby protects the system.

Expansion PCB

The expansion PCB provides additional functions for the CTS 602 control unit, e.g., controlling the EM box (see list of functions on page 7).

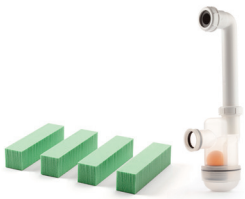


Pollen filter F7

A pollen filter in class F7 can be fitted in the unit. The pollen filter is fitted with the G4 plate filter.

Installation kit

The installation kit comprises of four vibration absorbers and a water trap for the condensation outlet. The water trap can be ordered separately.



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

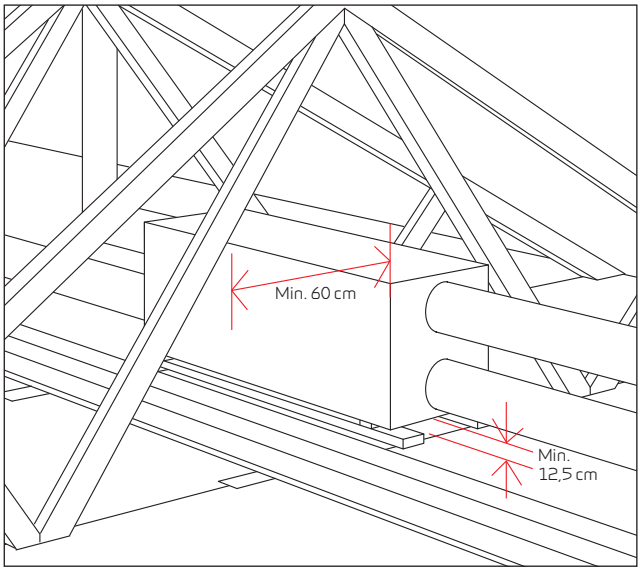
Comfort 600 comes in factory packaging that protects it during transport and storage. Comfort 600 must be stored in a dry place in its original packaging until installation.

The packaging should only be removed immediately prior to installation.

Installation conditions

During installation, future service and maintenance should be taken into account. We recommend a minimum gap in front of and behind the unit of 60 cm.

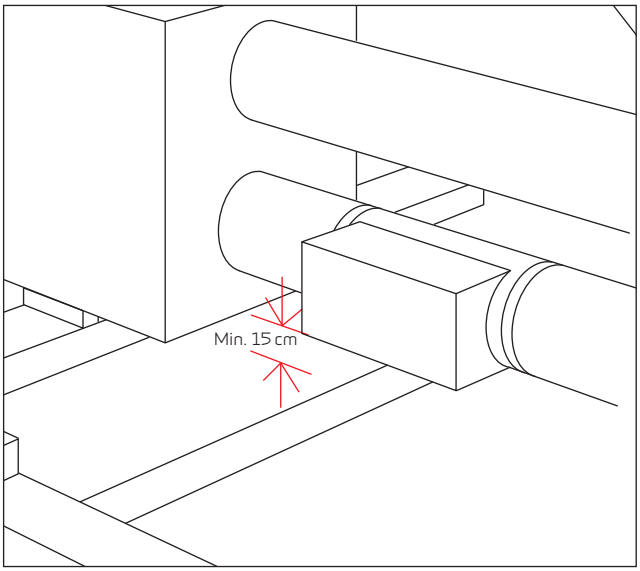
The unit must be installed level for the sake of the condensate drain. The condensate drain requires clearance of min. 12,5 cm under the drain nozzle.

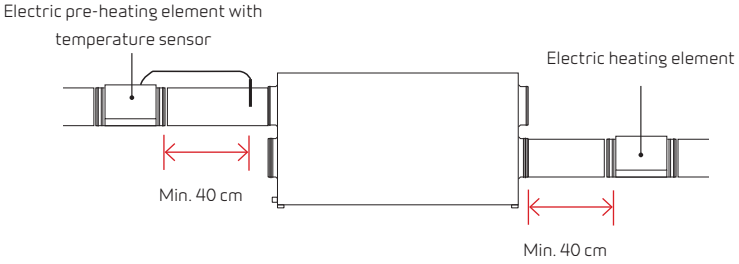


Installation of electric heating element

Electric heating elements (accessories) are fitted in the duct. The fitter should ensure that there is a safe distance of at least 15 cm between the electric heating element and any inflammable material. The heating element must be insulated using fire-resistant insulation material.

The electric heating element must be connected by an authorised electrician.





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

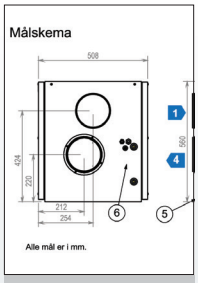
Technical information to ensure correct choice of solution.

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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