PRODUCT DATA

COMFORT CT300/POLAR BY NILAN

Ventilation & passive heat recovery

Domestic

Passive
heat recovery

Ventilation
< 400 m³/h

NILAN®
OUTSTANDING INDOOR CLIMATE

COMFORT CT300/POLAR

Product description

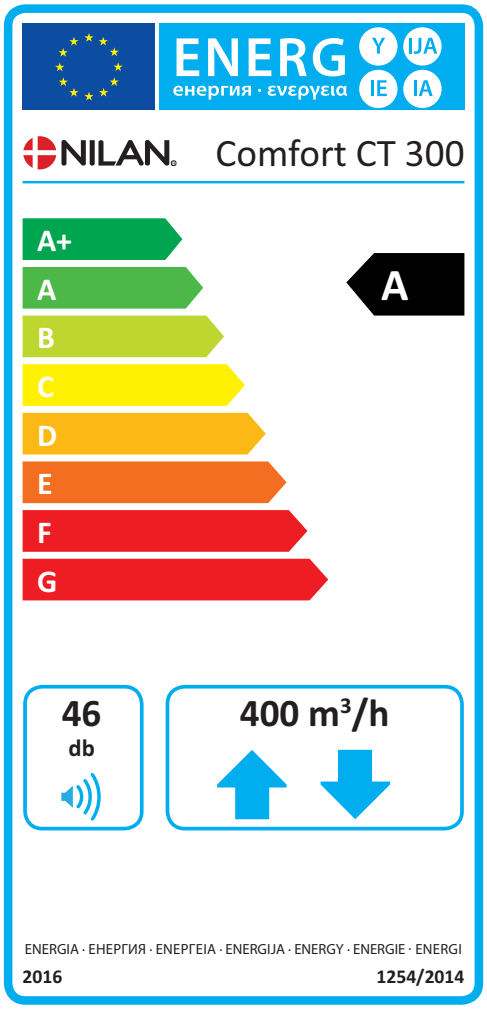
Based on the many years' experience from the Comfort series, Nilan has developed a future-proof system, Comfort CT300, that meets the 2020 requirements of ventilation systems, and is also passive-house certified.

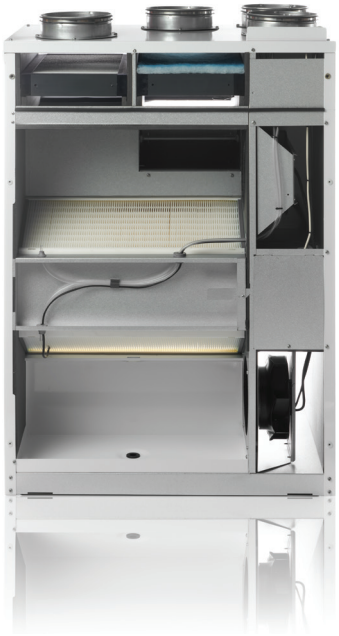
The unit is constructed to ensure low energy consumption by optimising the air flows in the system and thereby reducing the internal pressure loss, as well as using quality components with low energy consumption.

We have thereby developed an energy-efficient ventilation system with heat recovery for homes and smaller commercial buildings with a ventilation requirement of up to 400 m³/h.

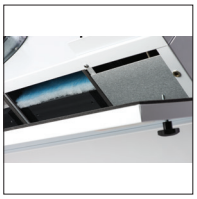
Comfort CT300 is factory tested and ready for use. Installation and commissioning must be performed by an authorised electrician.

Comfort CT300 is also available in a Polar version with built-in pre-heating element, to protect the heat exchanger from ice.



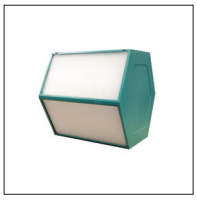


Measuring probe to balancethe volume flow



The large front door gives good access to service the system.

Filters are replaced easily by opening the top door by using two finger screws.

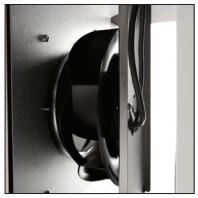


Counterflow heat exchanger made of polystyrene, which has a higher temperature efficiency than aluminium exchangers.

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

The modern CTS 700 control panel runs Modbus communication.

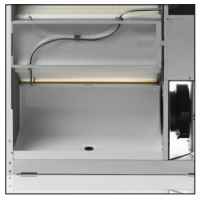
The CTS700 control can operate an external water-based or electrical heating element.



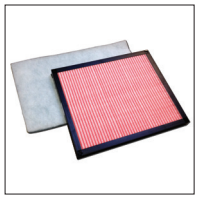
The effective fans are operated by energy-efficient EC motors

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.

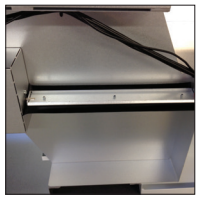


The powder-coated condensate drain prevents the formation of "acid water" and allows the condensate to be drained away.



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 100% 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 DATA

Technical specifications

Dimensions (W x D x H)	715 x 583 x 1000 mm
Weight	59 kg
Plate type casing	Aluzinc steel plate, white powder coating RAL9016
Heat exchanger type	Polystyrene counterflow heat exchanger
Fan type	EC, constant rotation
Filter class	Standard G4
Duct connections	Ø 160 mm
Condensate drain	PVC, Ø 20×1,5 mm
Leakage classification	A1

Supply voltage	230 V (±10 %), 50/60 HZ
Max. input/power	180 W/1,6 A
Max. input/power (Polar)	1380 W/6,8 A
Tightness class	IP31
Standby power	3.4 W
Ambient temperature	-20/+40 °C
Heat loss	W/m².K
Heat loss classification	T2

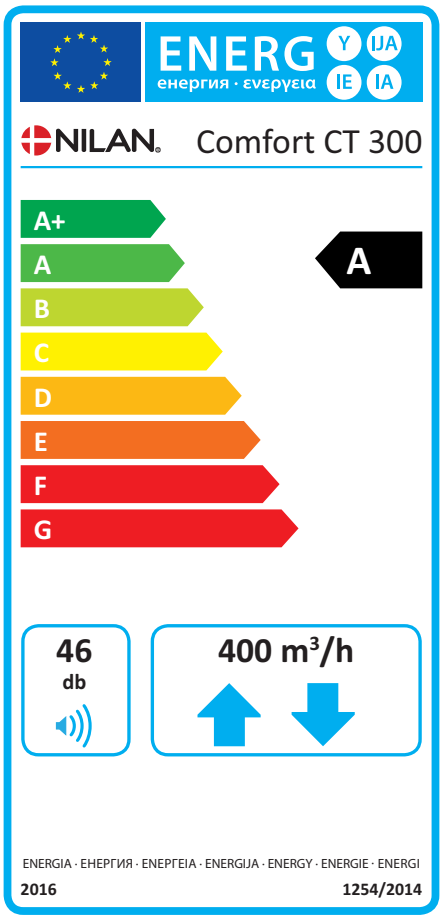
*1 Testet according to EN1886
*1 Testet according to EN1886

SEC* average climate	-40,0 kWh/(m².a)
SEC* cold climate	-78,1 kWh/(m².a)
SEC* warm climate	-15,5 kWh/(m².a)
SEC-Class	A
Type	Residential ventilation unit
Type of drive	Variable speed drive
Type of heat recovery system	Recuperative (counterflow heat exchanger)
Thermal efficiency of heat recovery	87 %
Maximum flow rate	400 m³/h (100 Pa)
Electric power input of fan drive, including any motor control equipment, at maximum flow rate	147 W
Sound power level $L_{WA)}$	46 dB(A)
Reference flow rate	0,078 m³/s (280 m³/h)
Reference pressure difference	50 Pa
SPI	0,22 W/(m³/h)
Central demand control	0.85
Maximum internal leakage	1.5 %
Maximum external leakage	2.9 %
Visual filter warning	A yellow light flashes on the user panel when filters need changing. To maintain the performance and energy efficiency of the unit it is very important to change filters regularly.
Disassembly instructions	www. nilan.dk

* Specific energy consumption

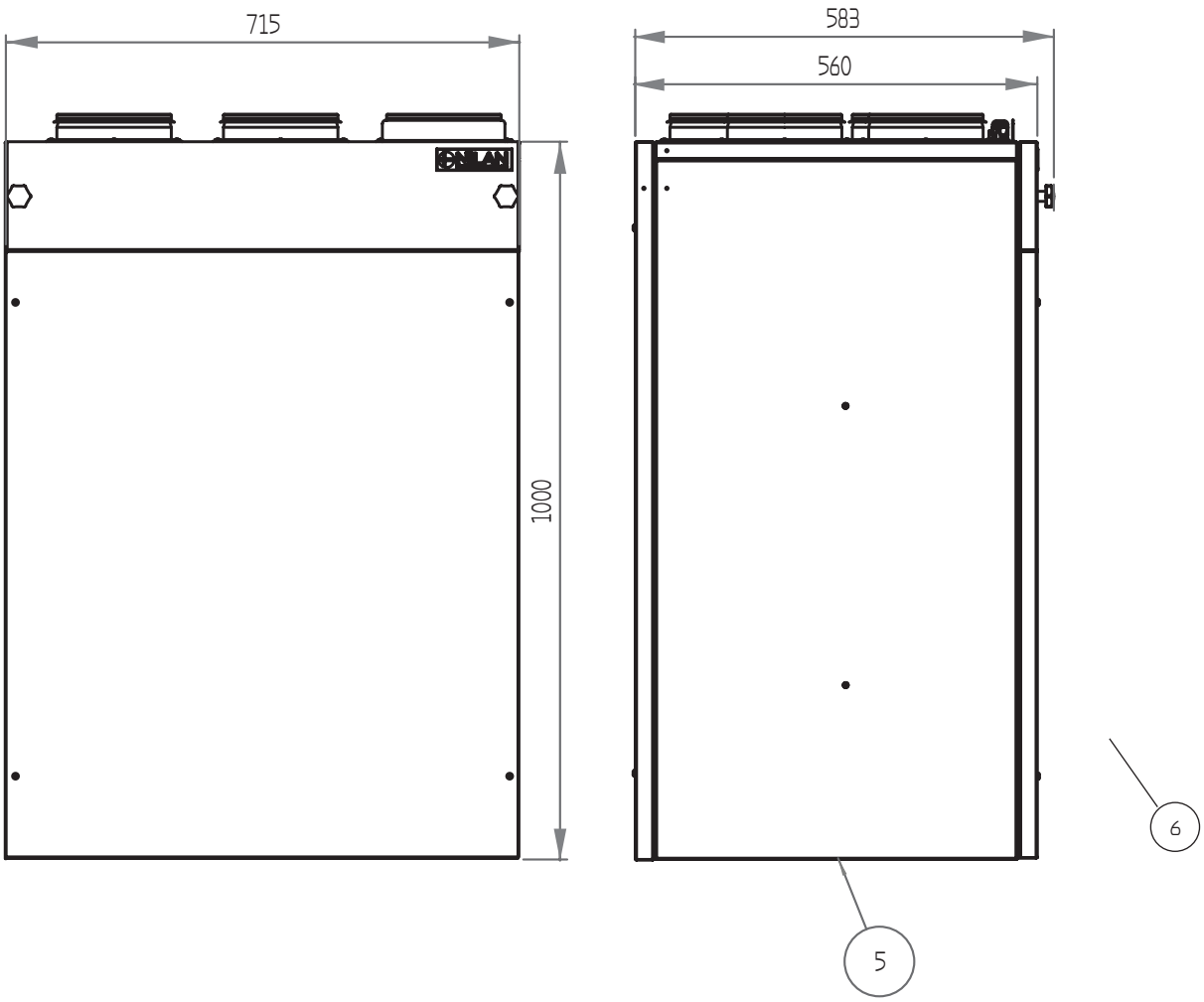
AEC - annual electricity consumption	5,5 kWh/år
AHS** average climate	45,5 kWh
AHS** cold climate	89,0 kWh
AHS** warm climate	20,6 kWh

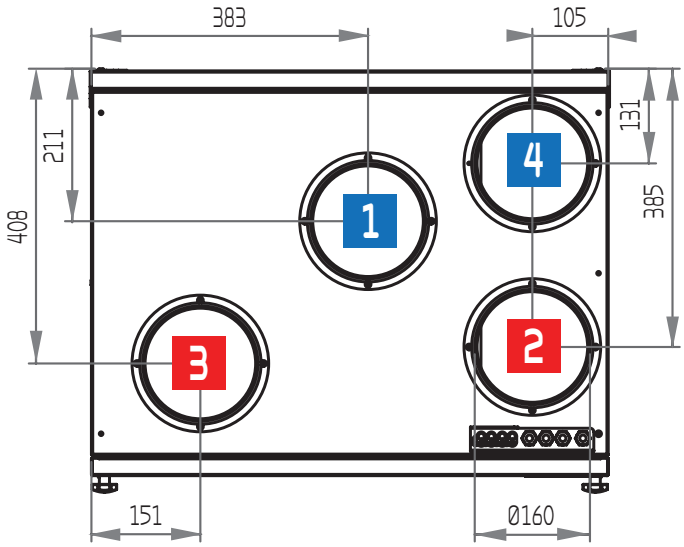
** Annual heating saved



Dimensional drawing

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

PLANNING DATA

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

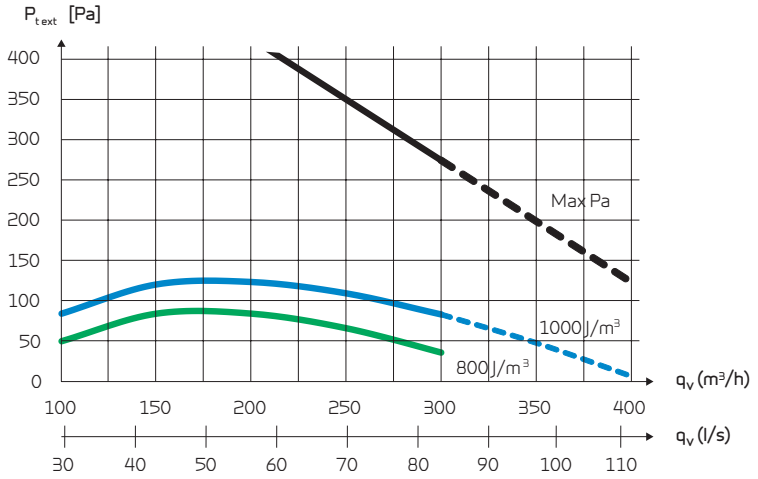
Capacity

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 without heating element.

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

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



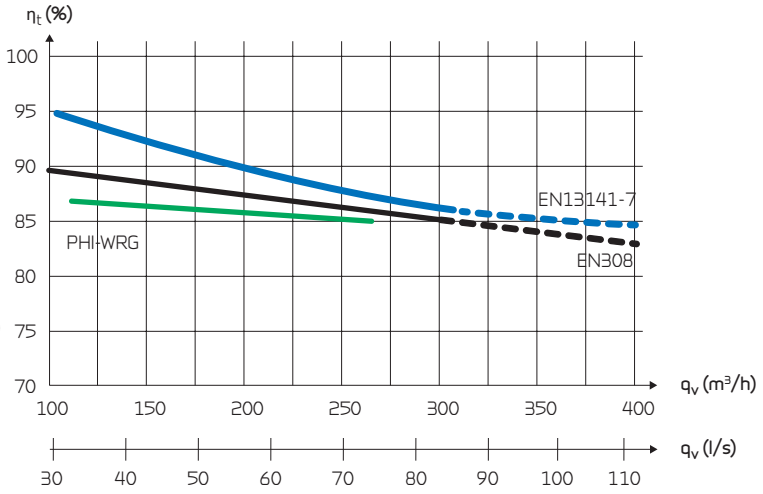
Temperature efficiency

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

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

Temperature efficiency PHI
$\eta_{WRG} = ((t_{extract\ air} - t_{discharge\ air}) + P_{el} / (m * c_p)) /(t_{extract\ air}-t_{fresh\ air})$

- P_{el} is output for the system
- m is the mass flow of air
- c_p is the specific heat capacity



Sound data

Sound data for q_v = 171 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})

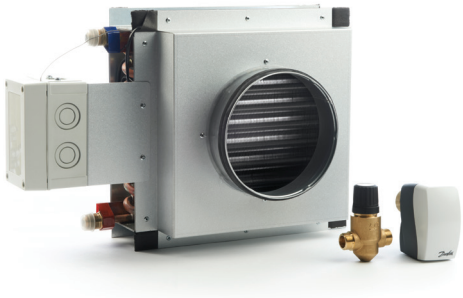
Octave band Hz	Surface dB(A)	Supply air dB(A)	Extract air dB(A)
63	25	47	37
125	34	55	40
250	43	60	48
500	41	60	37
1000	35	53	28
2000	36	51	20
4000	26	43	9
8000	-	34	1
Total ±2 dB(A)	46	64	49

Capacity - Heating element (accessory)

Electrical heating surface

The electrical heating surface is fitted in the supply air duct at a distance of min. 2 x duct diameter from the system´s fresh air connection pipe (normally min 320 mm.) and connected to the CTS 700 control panel and 230 V supply.

The electrical heating surface can supply up to 1,2 kW of heat.



Water heating element for duct fitting

The water heating element is designed to be built into the duct and must be connected to the primary heating supply and the CTS 700 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	0.04	0.85	0.52	100	16	31.1	2
	0.06	1.25	0.64	135	16	29.8	3
	0.08	2.18	0.87	210	16	28.1	6
	0.10	3.38	1.13	310	16	26.7	11
60/40	0.04	0.69	0.94	100	16	43.5	2
	0.05	1.00	1.16	135	16	41.1	3
	0.07	1.58	1.58	210	16	38.0	6
	0.09	2.78	2.04	310	16	35.3	11
70/40	0.03	0.40	1.06	100	16	47.0	2
	0.04	0.58	1.30	135	16	44.2	3
	0.05	1.00	1.76	210	16	40.5	6
	0.06	1.58	2.26	310	16	37.3	11

* Water heating element.

AUTOMATION

CTS 700 Control

As standard, the control panel is delivered in a white casing.
A black control panel can be ordered as an accessory.

The Comfort CT 300 is controlled by its CTS 700 control panel, which provides a wide range of functions, including menu-controlled operation, weekprogrammes, time-controlled filter monitor, fan speed adjustment, temperature control, error messages etc.

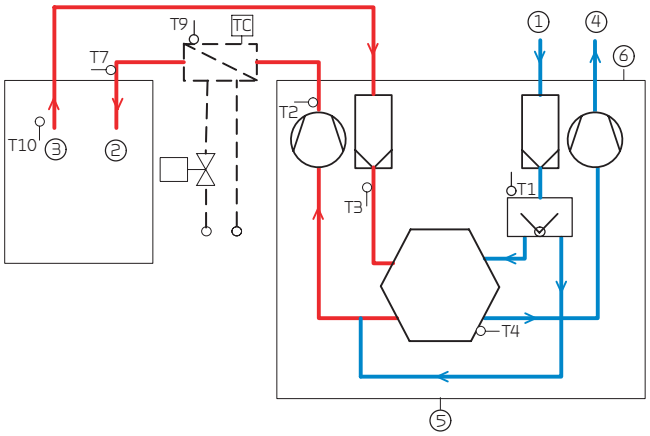
The CTS 700's factory settings are default settings that can be adapted to operating needs and requirements, to achieve optimum operation and utilisation of the system.

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

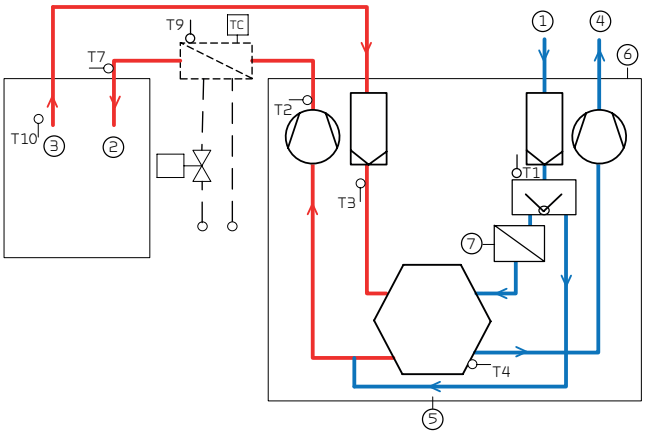
Operating instructions for CTS 700 can be found in the separate user guide supplied with the system.

Functional diagrams

Comfort CT300



Comfort CT300 Polar



Connections

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

Automation

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

Functional overview		+ Standard - Accessories
4 levels	The control function is divided into 4 levels: User/Super user/Installer/Factory with various options at each level	+
Weekly plan	There is 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.	+
User option 2	This allows you to override the operating mode in the main menu via an external potential-free contact or PIR sensor. User option 2 has a higher priority than user option 1	+
User option 2 out	Whenn user option 2 is used, at the same time an output signal is given	+
Alarms	The alarm list is featuring all alarms. A list with alarmlog are show for the last 14 days.	+
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.	+
Night setback	A possibility to set back the ventilation and temperature a night	+
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. • TPanel (panel sensor) • T3 EXHAUST (extract air)	+
Air volume	Allows you to set the ventilation flow stepless from 20 to 100 %.	+
Summer/Winter operation	The unit automatically changes to summer or winter operation.	+
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	+
Cooling	Via bypass or heat pump. The heat pump has a reversible circuit, which means that the units circuit is reversed and the unit cools, rather than heating, the supply air. It is possible to choose whether the unit is to run a higher or highest ventilation stage during cooling. Via a weekly plan night cooling can be set up.	+
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.	+
External network	It is possible to connect the unit to an external network.	+
Reset	Allows you to restore the factory settings.	+
Language	Option for setting the relevant language (Danish/German/English).	+

COMMUNICATION

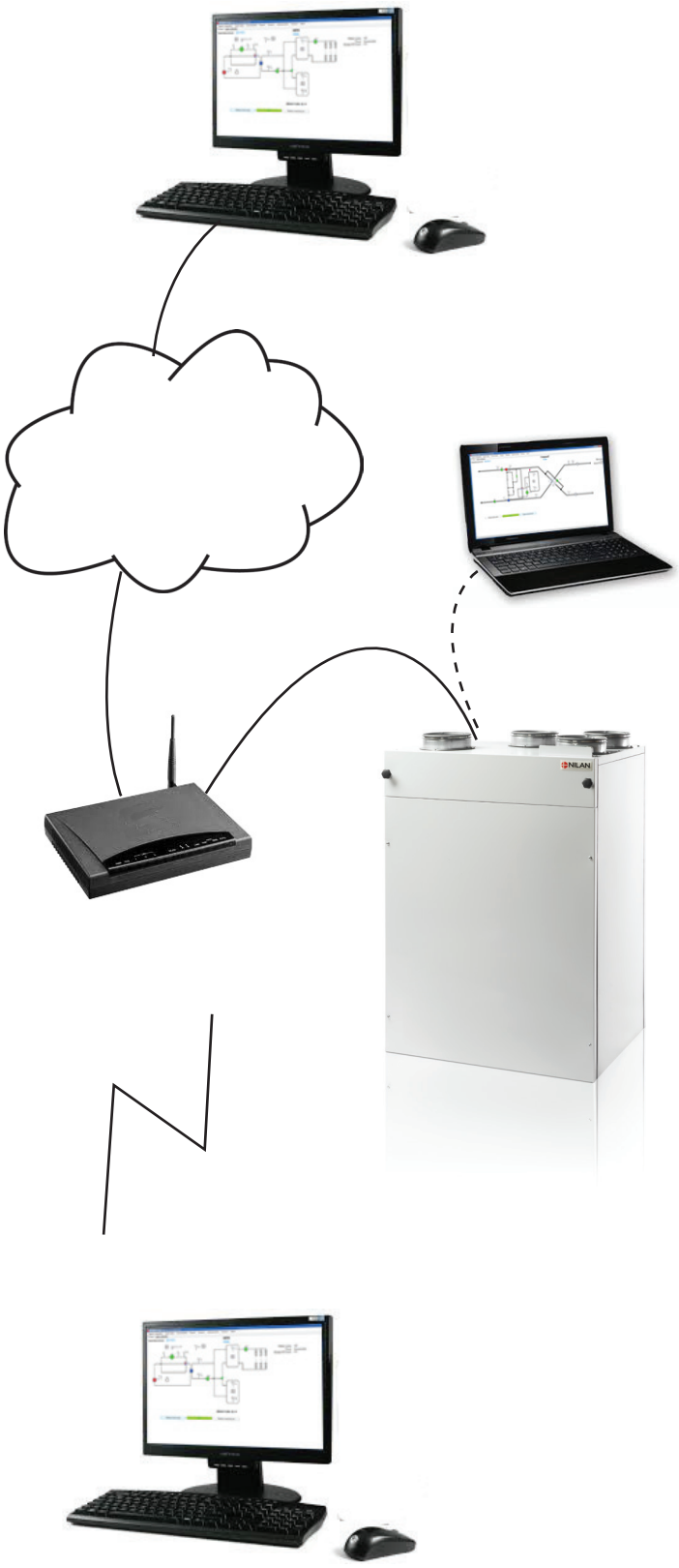
Network communication

The CTS 700 control can be accessed via a PC application that is accessible for installation technicians.

The system can be connected directly to a PC, or connected via a local network and accessed via the network.

This makes it possible to remote control/control the system by connecting to the local network via the internet. It is recommended to create a fixed IP address for the network, in order to access the network without problems.

This makes it possible to offer the user a service contract, as the system can be monitored and controlled from any location, as long as there is an internet connection.



Modbus Communication

The CTS 700 control communicates as standard with Modbus TCP/IP 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 TCP/IP.

IP-adress: 192.168.5.107 Port: 502 (adjustable)

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

OPERATION

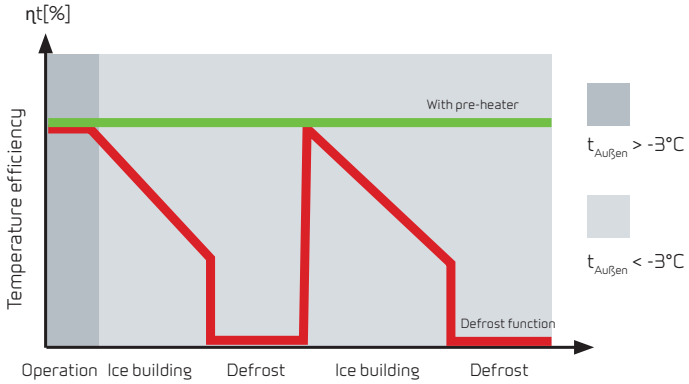
Frost protection

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

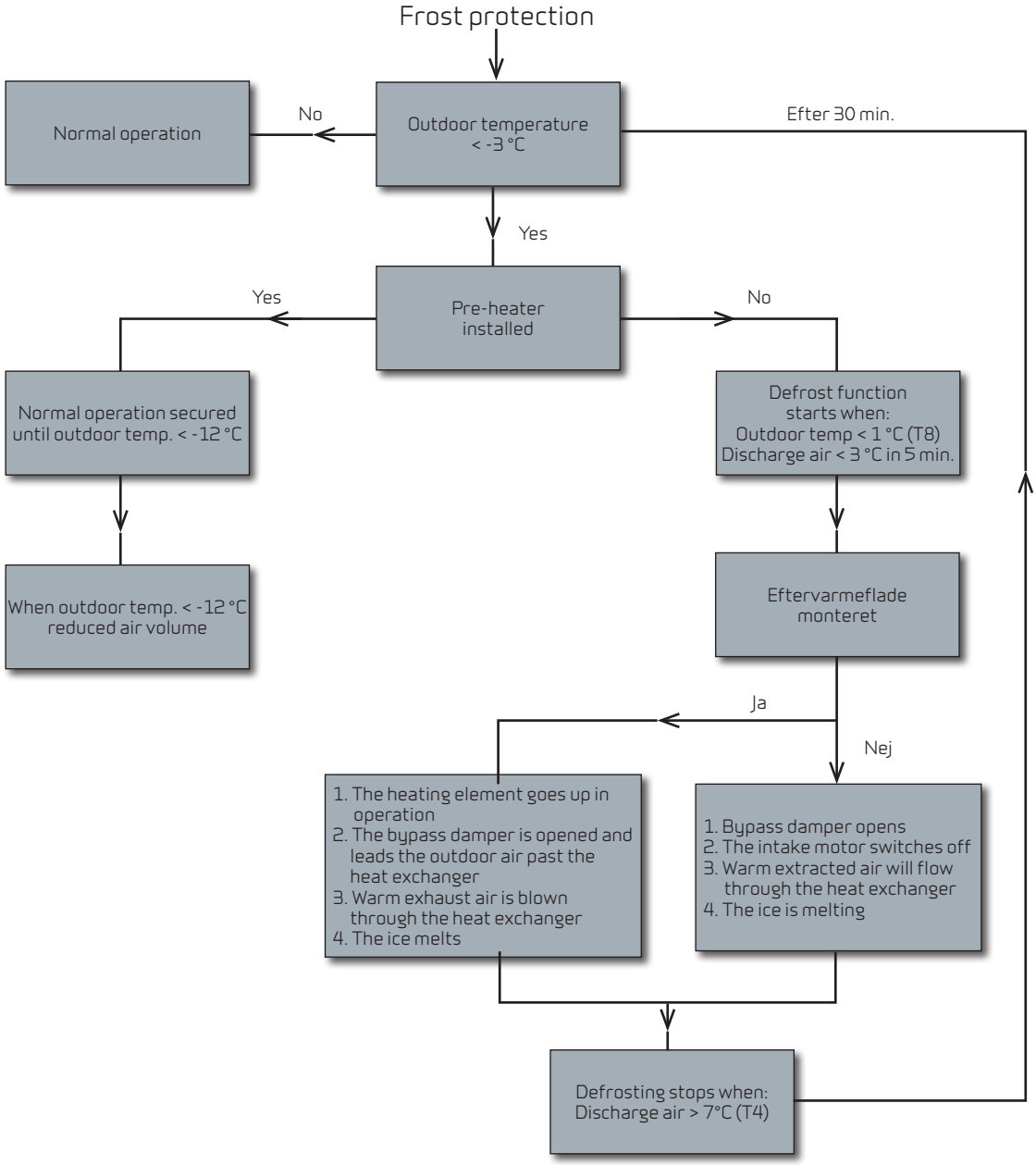
The extracted air condenses when it is cooled down during heat recovery. The high temperature efficiency will slowly turn the condensate to ice, which will block up the counterflow heat exchanger unless action is taken to remedy this.

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



OPERATION

Intelligent humidity control

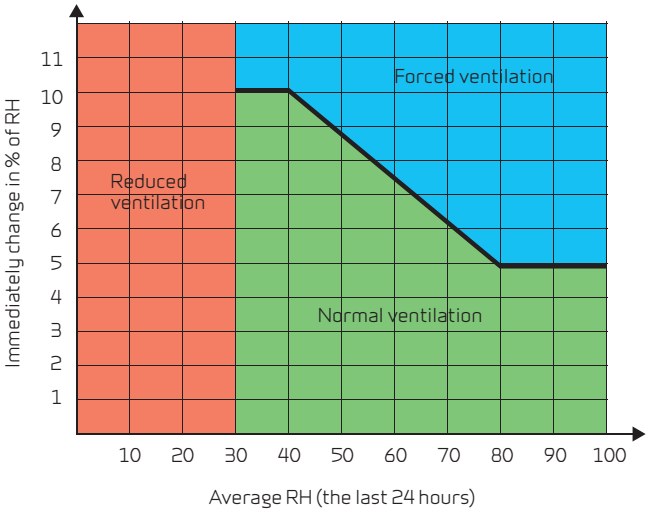
Nilan's humidity control automatically adapts to the needs of the family or the building.

The intelligent CTS 700 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%)

DELIVERY AND HANDLING

Transport and storage

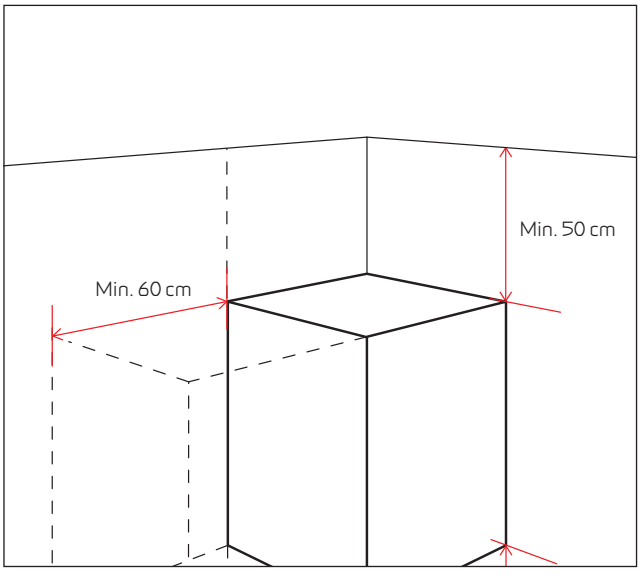
Comfort CT300 comes in factory packaging that protects it during transport and storage.
Comfort CT300 must be stored in a dry place in its original packaging until installation.

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.

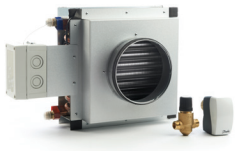
The unit must be installed level for the sake of the condensate drain. The condensate drain requires clearance of min. 12,5 cm under the drain nozzle.



ACCESSORIES

CO_2-sensor

With a CO_2-sensor installed, the ventilation speed can be pre-programmed with CTS700 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 duct 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)

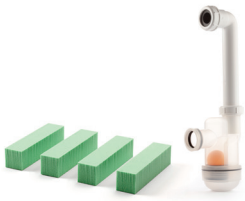
An electrical pre-heating element heats up the outdoor air before it enters the unit. This avoids having to defrost the unit, resulting in a loss of power. There are temperature sensors supplied to be fitted in the ducts.
(In the Polar version integrated)

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.

Pollen filter F7

A pollen filter 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.

NIL*AIR*

Nil*AIR* is installed together with a ventilation unit,which in simple terms consists of distribution boxes from which tubes are led out to air extraction and air supply boxes in the individual rooms.

Nil*AIR* can be installed in ceilings, walls or floors. The lightweight tubes can be used for even the most complicated tube alignments, where e.g. traditional spiral ducts cannot be used.

Advantages

- Flexible and space-saving solution
- Rapid and simple installation with a click system
- Dimensionally stable and corrosion-resistant quality material
- Simple regulation of the air supply volume
- Low weight
- Airtight
- Easy to clean
- Easy to handle and transport
- Prevents sound travelling from room to room

Nil*AIR* is already installed in thousands of European homes and since its introduction more than ten years ago its use has steadily increased, due to the rapid and easy installation without any special tools being required.

Enabling the impossible

Traditional air distribution systems take up a lot of space and often make special building structures impossible. Nil*AIR* virtually eliminates this problem, due to the tubes' size and flexibility.

Installation examples



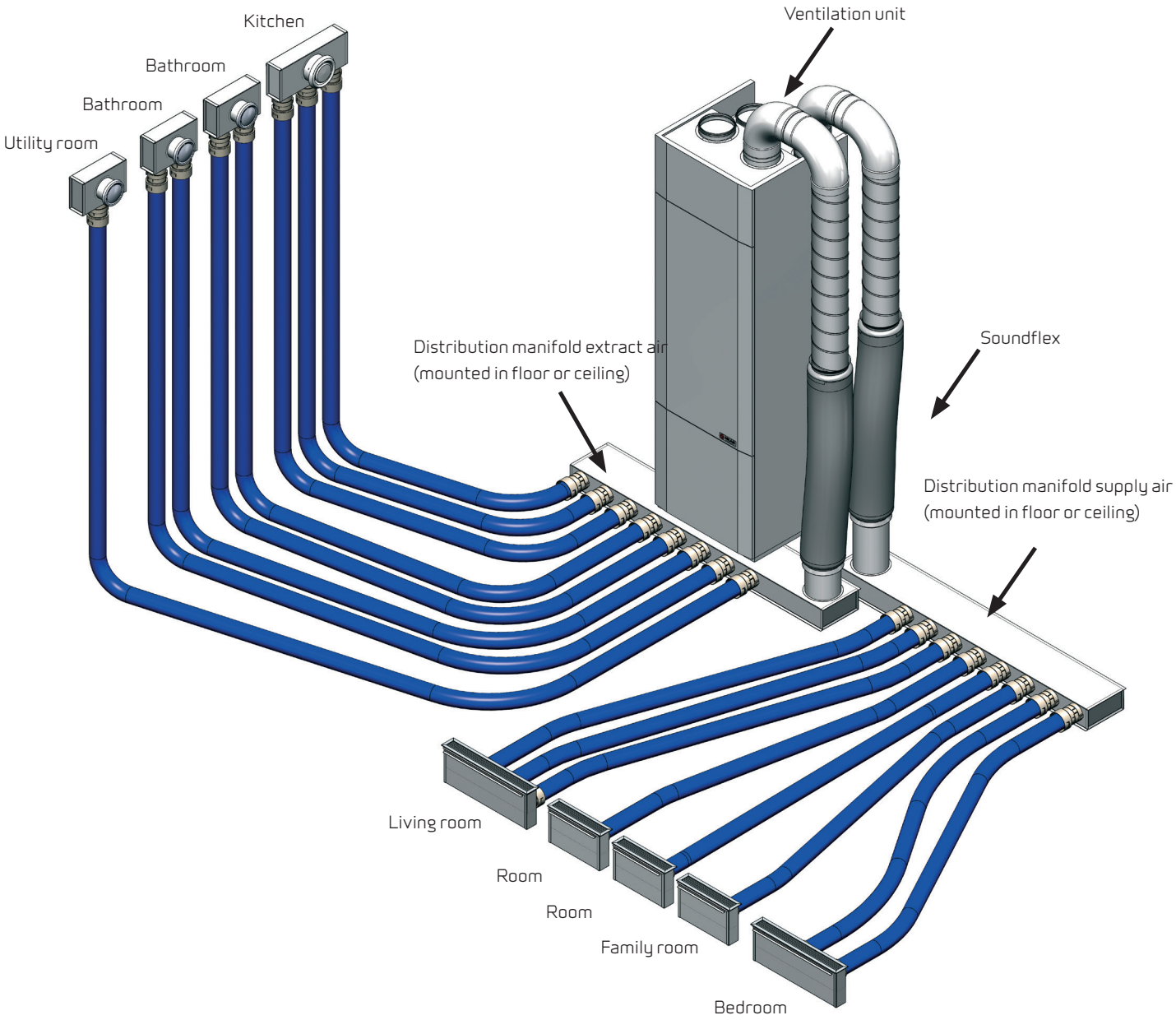





NILAIR PRINCIPLE

Air extraction

(mounted in wall or ceiling)



Air supply

(mounted in floor, wall or ceiling)

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

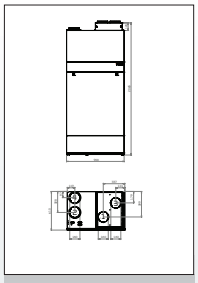
Technical information to ensure correct choice of solution.

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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OUTSTANDING INDOOR CLIMATE

Nilan A/S
Nilanvej 2
8722 Hedensted
DEnmark
Tel. +45 76 75 25 00
Fax +45 76 75 25 25
nilan@nilan.dk
www.nilan.dk