

# PRODUCT DATA

COMPACT P - SERIES BY NILAN



Domestic



Passive  
heat recovery



Active  
heat recovery



Ventilation  
< 300 m<sup>3</sup>/h



Comfort  
heating



Comfort  
cooling



Sanitary  
hot water  
production



Heating

# THE VENTILATION AND HEATING SOLUTION OF THE FUTURE

Compact P is developed for future homes. The system can be used in all types of low-energy and passive buildings, but can also ensure low energy consumption in any home or flat.

## Top-class efficiency

Compact P is equipped with the latest technology, comprising a highly-efficient counterflow heat exchanger, as well as a special designed heating pump that utilises the residual energy in the extracted air.

Overall, the system yields top-class performance. The counter flow heat exchanger has a temperature efficiency of up to 95%, combined with a heat pump that ensures a high supply air temperature and very low costs to production of sanitary hot water.

The integrated AIR 9, GEO 3, GEO 6 and GEO 9 heat pumps utilise the latest compressor technology to ensure that the heat output is continuously matched to the home's requirements.

## Many benefits

The compact design and numerous functions combined in one unit ensures minimum installation, space requirements, as well as rapid and easy installation. The latest technology and high-quality components not only provide an optimum indoor climate, but also low annual operating costs, making this a sound investment in every respect.



# ONE UNIT - SEVERAL SOLUTIONS

Since Compact P is module-based, it offers not just one, but several solutions. The unit can be combined with a geothermal or an outdoor air heat pump that can be fully integrated into Compact P. As either a supplementary or total heating solution, Compact P combines up to five functions:

- Ventilation with active and passive heat recovery
- Comfort heating
- Comfort cooling
- Sanitary hot water production
- Heating of the home (with AIR 9 or GEO 3/6/9)

## Compact P

- Ventilation with heat recovery
- Sanitary hot water production

Compact P can ventilate up to 300 m<sup>3</sup>/h and recovers more than 100 % of the energy from the extracted air via a counter flow heat exchanger that is combined with a heat pump.

The heat pump produces hot water and contributes to heating the supply air.

The heat pump has a reversible cooling circuit, so that in the summer it can cool the intake air while it also producing hot water.

*Compact PEK has a built in electrical kettle to heat the home via the central heating system.*



## Compact P AIR 9

- Ventilation with heat recovery
- Sanitary hot water production
- Space heating via an air/water heat pump

Besides ventilating the home and producing hot water, Compact P AIR 9 can also heat the home via underfloor heating or low-energy radiators.

AIR 9 is an air/water heat pump with a high heat output and a low energy consumption.



## Compact P GEO 3/6/9

- Ventilation with heat recovery
- Sanitary hot water production
- Space heating via a geothermal/water heat pump

Besides ventilating the home and producing hot water, Compact P GEO 3/6/9 can also heat the home via under floor heating or low-energy radiators.

GEO 3, GEO 6 and GEO 9 are geothermal heat pumps that both have a high output and low energy consumption compared to their sizes.



# COMPACT P

## Product description

Compact P is an energy-efficient total indoor climate solution for all types of low-energy buildings, single-family homes, flats and small office areas in commercial leases with a ventilation requirement of up to 300 m<sup>3</sup>/h.

Compact P recovers the energy from the extracted air using a highly efficient counter flow heat exchanger. The remaining energy that is not utilised by the counter flow heat exchanger is used by the heat pump to produce hot water, and to further heat the supply air.

The heat pump has a reversible cooling circuit, which means that, in the summer, the unit can cool the supply air by up to 10 °C. Due to the low air exchange, the cooling does not function as an air conditioning system. On cooling, the supply air is dehumidified, which gives a more pleasant indoor climate than is possible with an ordinary ventilation unit without a heat pump.

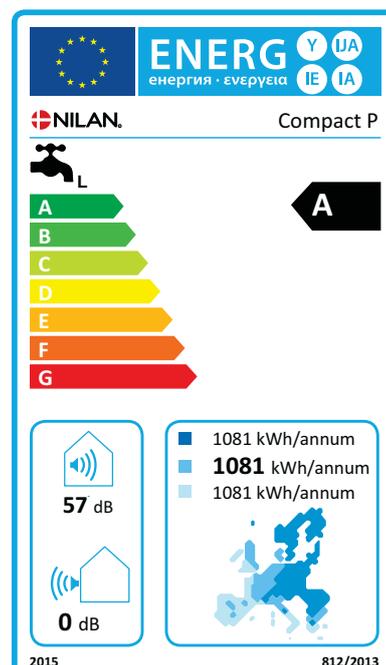


## Future-proof system

Compact P hot water production fulfils the most stringent requirements in the ecodesign regulation and thereby achieves the highest energy labelling.

The system is tested by an independent testing institute and has achieved the demanding Passive Building Certificate, as further confirmation that this is a highly energy-sustainable solution.

The Compact P series, with both GEO and AIR heat pumps, has achieved the German Smart Grid certification which means it can fit the operation to the power capacity of the power network.



Time-controlled filter change alarm.  
Easy filter access by opening the top front panel with the help of two finger screws.

There is plenty of space to replace filters and to vacuum clean the filter space.

Intelligent humidity control.  
Adapts ventilation to the home's current humidity level.

CO<sub>2</sub>-sensor can be purchased, for further demand management.

A clear, user-friendly Touch panel is included.  
The modern CTS 700 control runs Modbus communication.



Low-energy EC-ventilators with B-wheel, adjustable from 20 to 100%.



Heating pump with hermetically sealed cooling circuit, for production of hot water and active heat recovery. Can raise the air intake temperature up to 34 °C.

Reversible cooling circuit that can also cool the air intake in the summer up to 10 °C, with simultaneous hot water production.

The LAN cable is led down, so that the control can be easily accessed without using tools.

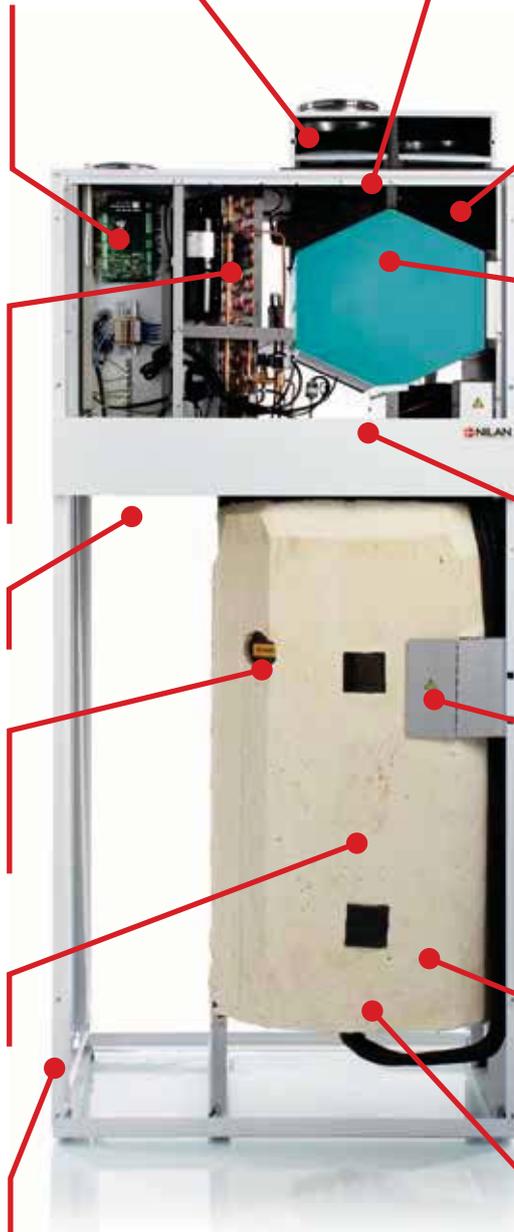
Electrically monitored sacrificial anode and corrosion protection.

On any need for replacement, an alarm is activated in the operating panel.

180 l hot water tank.  
2 layers of glass enamelling to ensure a long lifetime.

Attractive white-painted front with large front panels, giving easy access to service the system.

The cabinet has holes for pipes and tubes for water and heating installations.



Counterflow heat exchanger in polystyrene, with a temperature efficiency ratio of up to 94%.

Automatic bypass function that carries the air past the counterflow heat exchanger when heat recovery is not required.

A powder-coated condensation tray prevents the formation of "acid water", leading out the condensation water.

Compact P has an integrated water lock.

1.5 kW electrical completion.  
For high hot water consumption where the heating pump cannot cope.

The hot water tank is foam-insulated, giving good insulation and saving energy.

Automatic anti-legionella.



*Compact P is also offered in a Polar version with a built-in preheating element to frost proof the counterflow heat exchanger and heat pump.*

# TECHNICAL DATA

## Technical specifications

Dimensions (W x D x H)	900 x 610 x 2065 mm
Weight	202 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	ISO Coarse >90% (G4)
Duct connections	Ø 160 mm
Condensate drain	PVC, Ø 20x1,5 mm
Refrigerant	R134a
Refrigerant filling	2 kg
Capacity SHW tank	180 L
Supplementary electrical heating (sanitary hot water)	1,5 kW
Connection dimension	3/4"

Supply voltage	230 V (±10 %), 50/60 HZ
Max. input/power (*1)	2,2 kW/ 9,6 A
Max. input/power (*2)	3,4 kW/14,8 A
Tightness class	IP31
Standby power	3 W
Ambient temperature	-20/+40 °C
Power consumption build-in preheating element (Polar)	1,2 kW
External leakage (*3)	< 1,4%
Internal leakage (*4)	< 1,1%

\*1 Input without heating element (accessory).

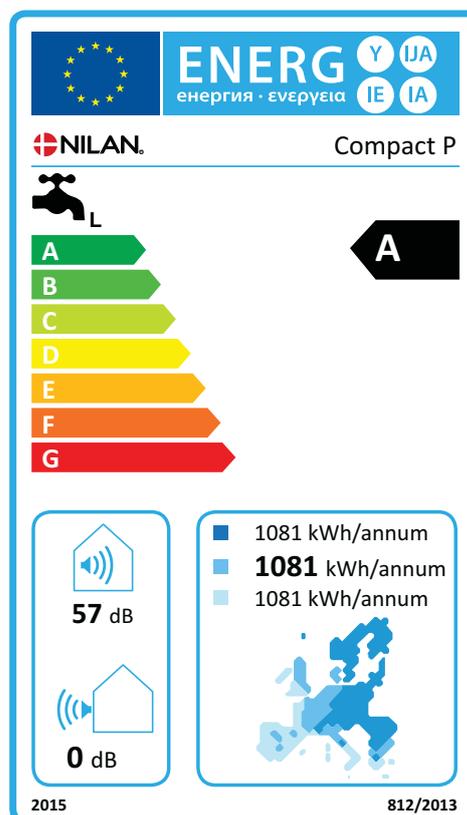
\*2 Input Compact Polar

\*3 At ± 250 Pa and 265 m³/h according EN 308/EN 13141-7.

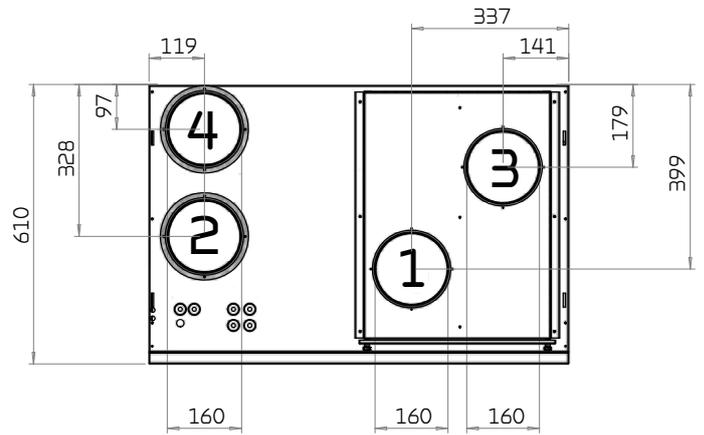
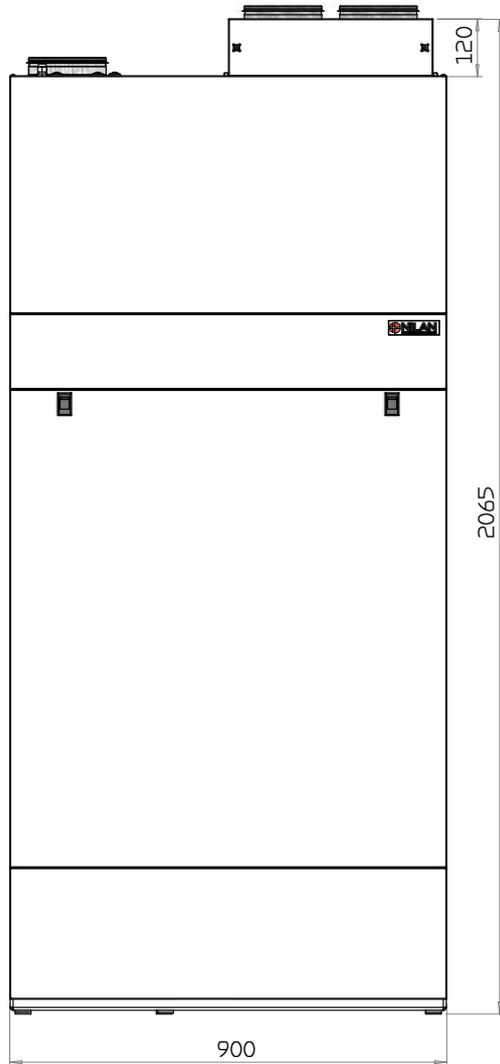
\*4 At ± 100 Pa and 265 m³/h according EN 308/EN 13141-7.

## Hot water production

Consumer profile, water heater	L (large)
Energy efficiency class	A
Energy efficiency for water heating - average climate	94 %
Annual electricity consumption - average climate	1081 kWh/annum
Temperature settings on the thermostat	10 - 65 °C
Sound power level L <sub>WA</sub>	57 dB(A)
The water heater can function outside peak load periods (Smart-grid)	No
Guidelines for assembly, installation and maintenance	See installation instructions
Energy efficiency for water heating - cold climate	94%
Energy efficiency for water heating - warm climate	94%
Annual electricity production - cold climate	1081 kWh/annum
Annual electricity consumption - warm climate	1081 kWh/annum



## Dimensional drawing



### Connections

- 1: Fresh air
- 2: Supply air
- 3: Extract air
- 4: Discharge air

# MULTI-FUNCTIONAL



## 100 % heat recovery

Compact P ventilates the home, ensuring a good indoor climate. While also producing hot water.

Compact P is an untraditional ventilation unit that, in contrast to other ventilation units, recovers 100% of the heat in the extracted air.

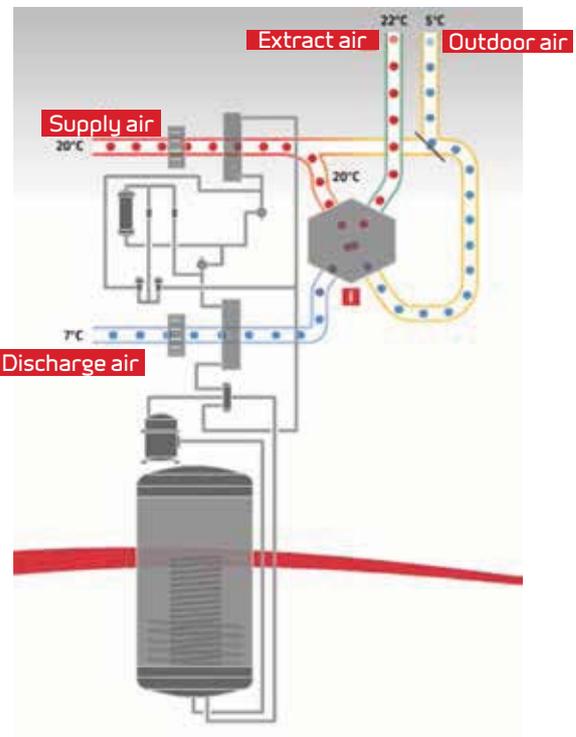
Via a counter flow heat exchanger, up to 95 % of the energy in the extracted air is used to heat the supply air.

The built-in heat pump uses the remaining energy to further heat the supply air, while also producing hot water.

### Cooling the home is the challenge of the future

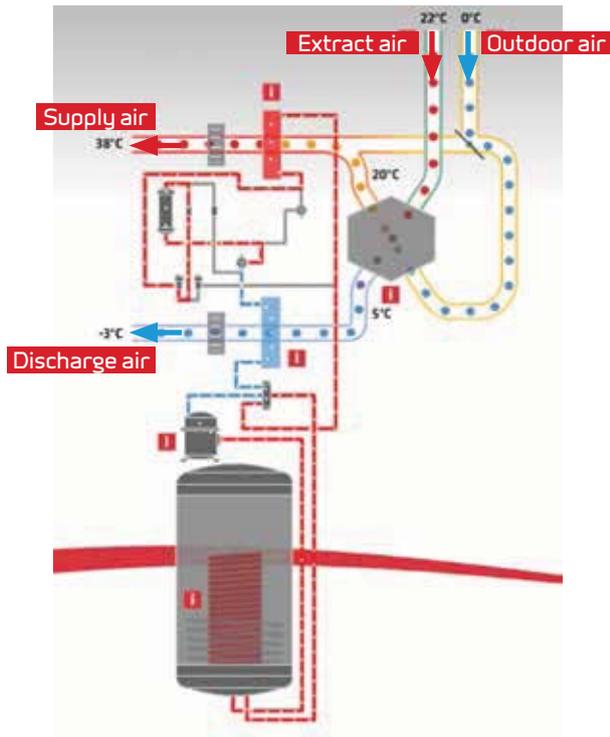
New homes are well-insulated and therefore easy to heat. On the other hand, outdoor temperatures do not need to be very high before getting rid of the heat in the home becomes problematic.

Compact P has a reversible cooling circuit, to cool the supply air. Due to the low air exchange, it will not function as an air conditioning system. When cooling the supply air will be dehumidified, which contributing to a pleasant climate in the home.

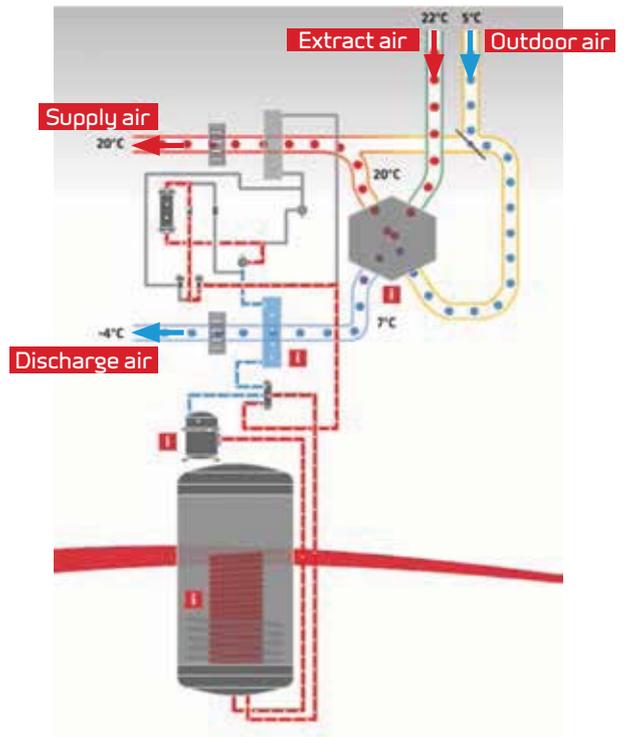


## Passive heat recovery

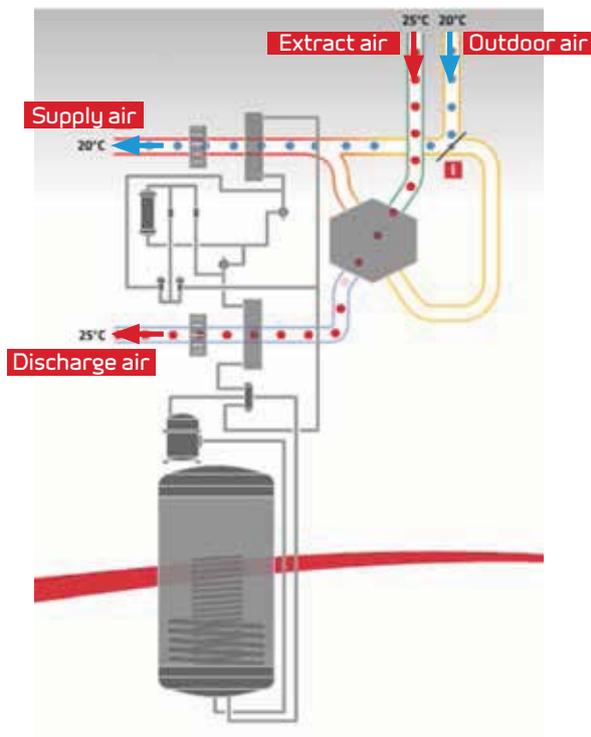
Passive heat recovery takes place via a counter flow heat exchanger with a high temperature efficiency, whereby the supply air is heated by the extracted air.



**Passive and active heat recovery**  
 Utilising the residual energy that the counterflow heat exchanger does not use, the heat pump further heats the supply air.

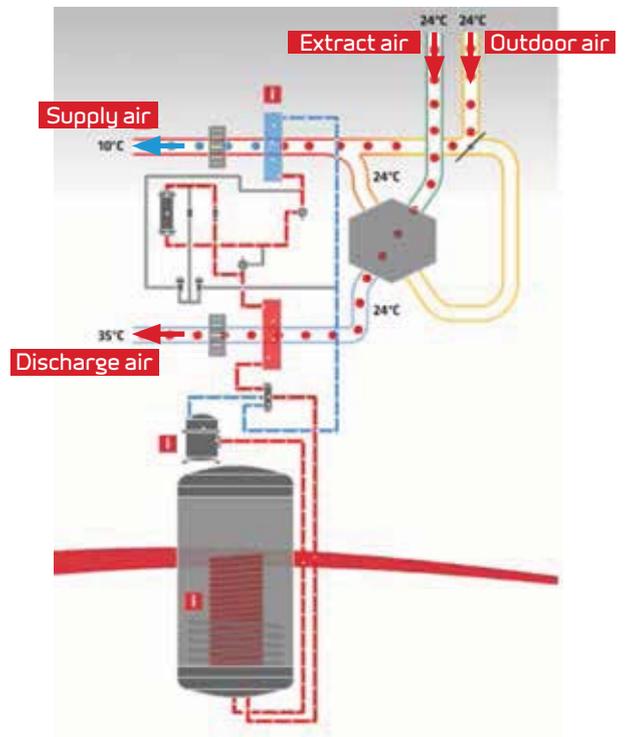


**Hot water**  
 Utilising the residual energy that the counterflow heat exchanger does not use, the heat pump produces hot water.



**100% bypass function**  
 If heat recovery is not required, the bypass damper closes off 100% and leads the outdoor air past the heat exchanger.

Hot water can be produced at the same time. Hot water is produced with a high efficiency (COP).



**Active cooling**  
 The heat pump has a reversible cooling circuit and can cool the supply air during hot periods.

This function does not affect the production of hot water, which takes place with high efficiency (COP).

# AUTOMATION

## CTS 700 Touch panel

The Compact P is controlled by its CTS 700 touch panel, which provides a wide range of functions, including menu-controlled operation, week programmes, 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.

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



## Smart Grid function

Operating mode 1 - is lack of power. Therefore the GEO and AIR heat pumps will be turned off in those periods, typical up to 2 hours.

Operating mode 2 - is normal operation. The unit is running by the set values.

Operating mode 3 - is low cost power available. It is possible to use more power for e.g. hot water production by increasing the setpoint as well as increasing the supply temperature for the underfloor heating and use the floor as a buffer for the periods where the heat pump must be shut off.

Operating mode 4 - is overcapacity of power. It is possible to use more power for hot water production by increasing the setpoint but the GEO and AIR heat pumps must increase the supply temperature for the underfloor heating.



## Intelligent humidity control

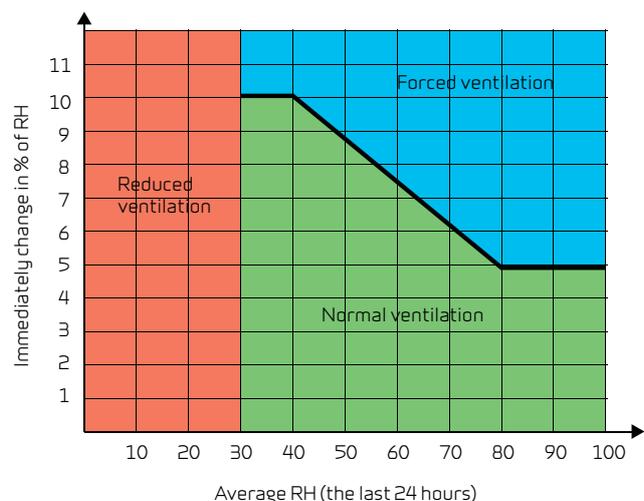
Nilan's humidity control automatically adapts to the needs of the family or the building.

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%)

# COMMUNICATION

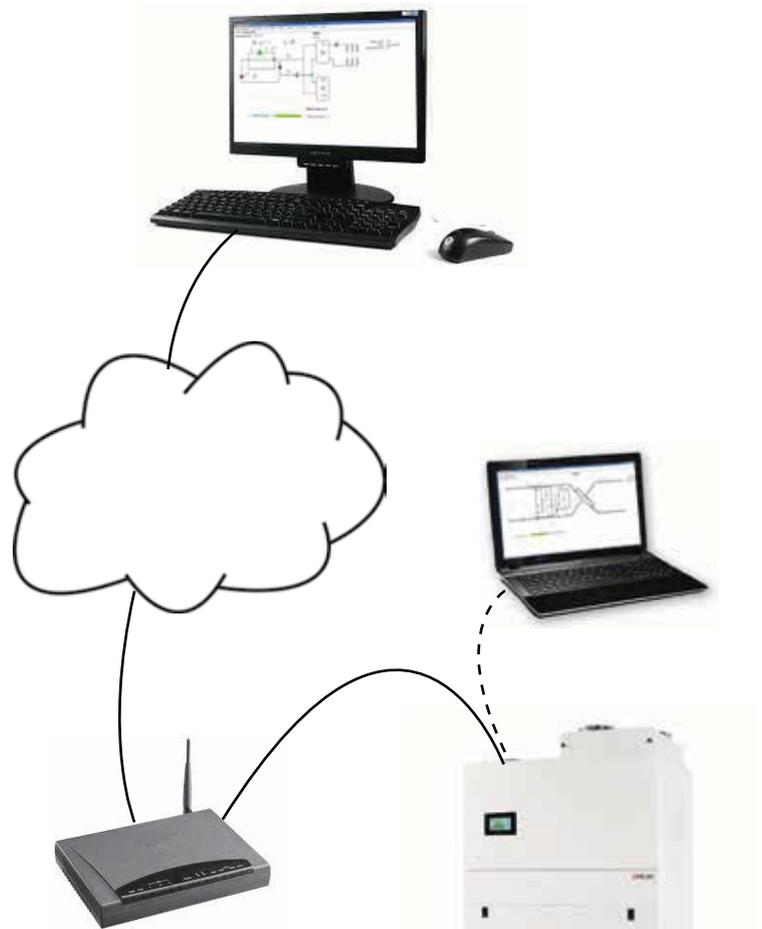
## Network communication

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: 52 (adjustable)

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



# ACCESSORIES



## CO<sub>2</sub>-sensor

With a CO<sub>2</sub>-sensor installed, the ventilation speed can be pre-programmed with CTS 700 to run at a higher ventilation steps when CO<sub>2</sub> reaches high level in the extract air. CO<sub>2</sub>-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 (Integrated in the Polar version)



## 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 ISO ePM1 65-80% (F7)

A pollen filter class ISO ePM1 65-80% (F7) can be fitted in the unit. The pollen filter is fitted with the plate filter ISO Coarse >90% (G4).

## Top cover

To cover the ducting over the unit, Nilan offers a top cover in white-varnished aluminum (RAL 9016).

## Solar

Extra heat exchanger of 0.7 m<sup>2</sup> in the hot water tank, which can be connected to an approximately 3 m<sup>2</sup> solar heating system, or other heat sources.



# DELIVERY AND HANDLING

## Transport and storage

Compact P comes in factory packaging that protects it during transport and storage.

Compact P must be stored in a dry place in its original packaging until installation. The packaging should only be removed immediately prior to installation.

## Lifting cover

Lifting cover for Compact P makes it possible to lift Compact P off the pallet without making any heavy lifts and transport the system around in the home. Detach the filter box and the system fits under an average inner door.



## Installation conditions

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

The unit must be installed level for the sake of the condensate drain.

## Installation of electric heating element

Electric heating elements (accessories) are fitted in the duct. The heating element must be insulated using fire-resistant insulation material. The electric heating element must be connected by an authorised electrician.

