

PRODUCT DATA

COMPACT P - AIR 9 PROPANE BY NILAN



PROPANE R290

A green and CO₂-neutral refrigerant



Domestic



Passive
heat recovery



Active
heat recovery



Ventilation
< 300 m³/h



Comfort
heating



Comfort
cooling



Sanitary
hot water
production



Heating

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 275 m³/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.

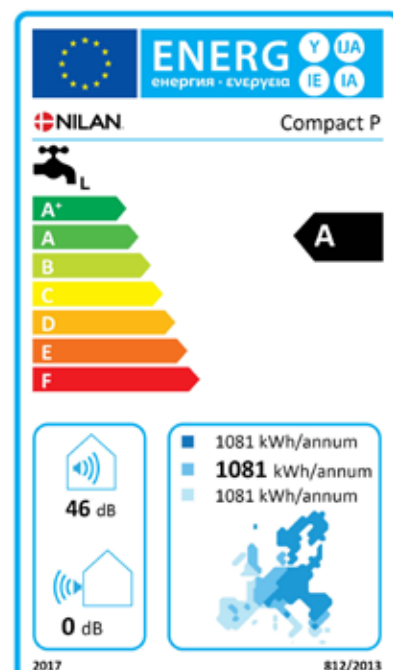
The heat pump has a reversible cooling circuit, which means that, in the summer, the unit can cool the supply air by up to 10 °C. Due to the low air exchange, the cooling does not function as an air conditioning system. On cooling, the supply air is dehumidified, which gives a more pleasant indoor climate 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.



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.

CO₂-sensor can be purchased, for further demand management.



A clear, user-friendly HMI Touch panel is included.

The modern CTS 602 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 USB 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.

Emergency operation.

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

Compact P

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	Polyethyleneterephthalat 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).

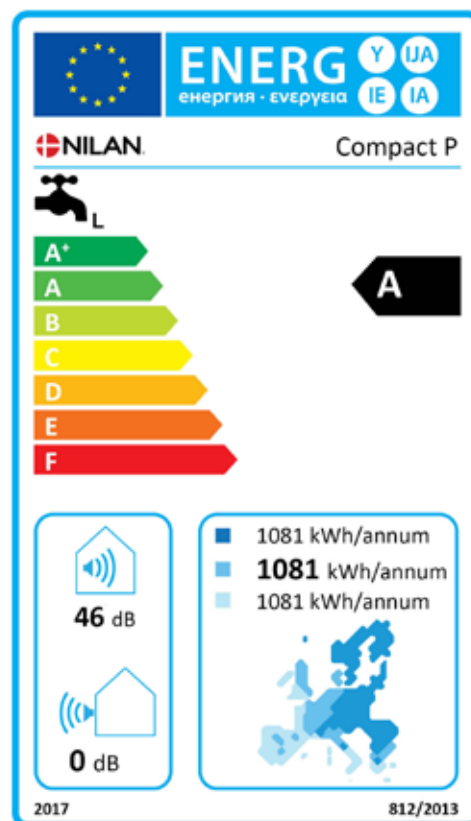
*2 Input Compact Polar

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

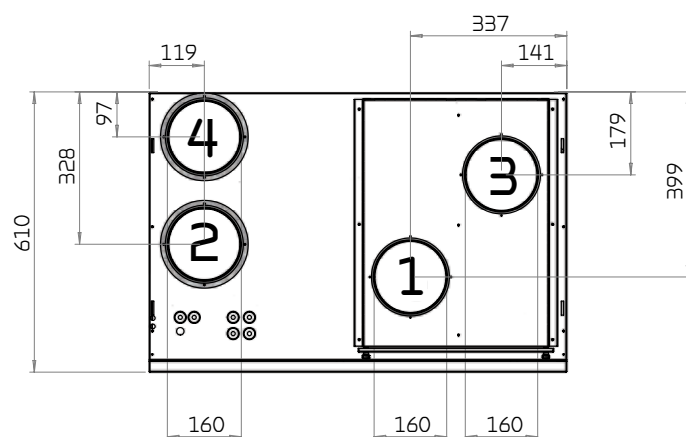
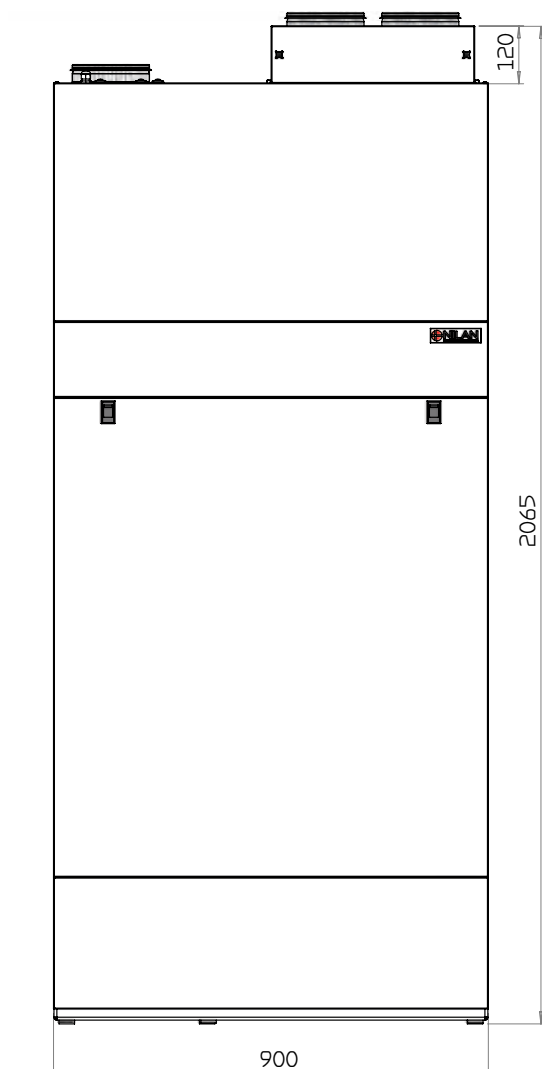
*4 At ± 100 Pa and 265 m³/h according EN 308/EN 13141-7.

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 _{WA}	46 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

AUTOMATION

CTS 602 Control



The Compact P is controlled using its CTS 602 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, supply-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.

There is an option for selecting between 2 front page images for the main screen.

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

Nilan User APP

A Nilan gateway is fitted as standard on the Compact P, 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.



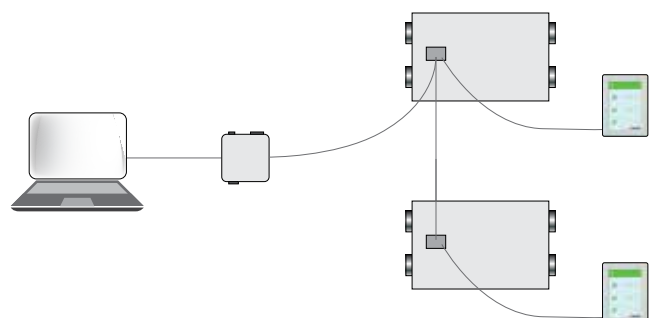
External communication

The CTS 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.



Functional overview		+ Standard - Accessories
Filter monitor	Filter monitor with timer notifies when it is time to change filters. Can be set between 30 and 180 days.	+
Operating mode	Can be set to Auto according to set values or set to heating or cooling mode.	+
Stepless regulation	The four ventilation steps can be set steplessly 20- 100%, with various values for supply air and exhaust air.	+
Humidity control	Built-in humidity control can be set to high ventilation operation at high humidity (when in the shower) and low ventilation operation if the humidity in the home becomes too low.	+
Active cooling	The unit can be set to cool the supply air in the summer, should the need arise. When the heat pump cools, the heat is deposited in the hot water tank, so that you get "free" hot water when the unit is in cooling mode.	+
Low outdoor temperature	It is possible to lower the ventilation at low outdoor temperature, to avoid the indoor humidity becoming too low.	+
CO ₂ control	It is possible to control the ventilation level according to the CO ₂ level in the home.	-
Temperature settings	The temperature settings are used by the controller to regulate the operation of the entire system.	+
Frost protection	The control has an automatic function for defrosting the heat exchanger to prevent formation of ice.	+
Frost protection Polar	The Polar model has a built-in frost protection preheater to protect the counterflow heat exchanger so no ice occurs.	+
Frost protection EHD	The controller can control the EHD damper if the outdoor air enters through roof terminals.	+
Domestic hot water	Compact P produces the domestic hot water via the air / air heat pump in the ventilation part.	+
Pause domestic hot water	It is possible to set the hot water production on pause e.g. if no one is at home. In that way, energy is saved.	+
Frost protection domestic hot water	To protect the hot water tank, it is fitted with a frost protection function.	+
Supplementary electrical heater domestic hot water	If the need for domestic hot water increases and the heat pump cannot keep up, a supplementary electrical heater can be activated to heat the domestic hot water.	+
Anti-scald protection	The control has a built-in scalding protection, which prevents scalding of the users when the hot water tap is opened.	+
Anti-Legionella	The control has an Anti-Legionella treatment of the domestic hot water that can be activated manually or automatically.	+
Anode	Electronically monitored anode. Notifies when it is time to replace it to ensure a long service life of the hot water tank.	+
Week program	A week program can be made with various settings depending on the use of the home.	+
User selection program 1	A user selection program enables you to use special settings that override the standard operating settings via a potential-free signal. Used e.g. if a cooker hood is connected to the system.	+
User selection program 2	Used as user selection 1, but at the same time has an output signal that can be used e.g. to control a damper.	+
Datalog	Data logging as well as error messages and warnings.	+
Output data	All current values in the system operation. Most often used for troubleshooting.	+
Emergency stop ventilation	Do not turn off the ventilation, as this may damage the unit, duct system and in the worst case the home. But it may be necessary to briefly turn off the ventilation e.g. due to a emergency notification.	+

AIR 9 PROPANE

Product description

AIR 9 Propane is delivered with a reversible heat pump, which also makes the unit capable of cooling.

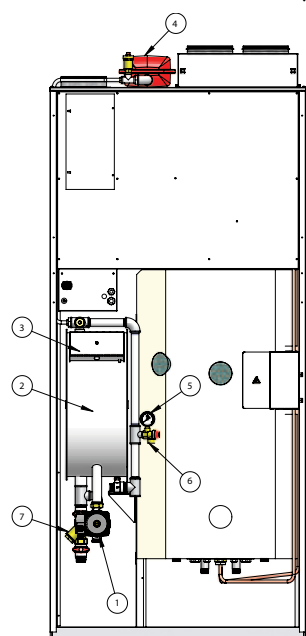
AIR 9 Propane is very silent and can be placed without disturbing its surroundings. During summer, when only hot sanitary water is needed, the fan is limited, reducing the noise level. This limit occurs when the outdoor temperature exceeds 7 °C and limiting the compressors output to a maximum of 60 %. These criteria can be set individually.

Propane R290 is a green refrigerant that is already to be found in nature and is therefore considered a CO₂-neutral refrigerant.



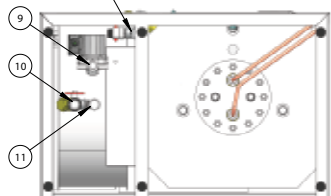
Variable Compressor

Inside unit: Compact P



Front

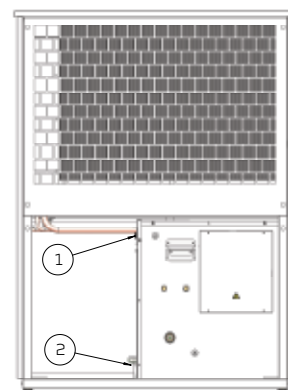
1. Integrated circulation pump interior/ exterior sections 1"
2. 50-litre buffer tank
3. 2 x 3 kW supplementary electrical heating
4. Pressure expansion vessel (central heating circuit)
5. Manometer (central heating circuit)
6. Safety valve, 2.5 bar (central heating circuit)
7. Particle filter



Base

8. Flow, central heating 3/4"
9. Flow to exterior section 1"
10. Return flow from exterior 1"
11. Return flow from exterior 3/4"

Outside unit: AIR 9 Propane



1. Flow 1"
2. Return flow 1"

One unit two designs

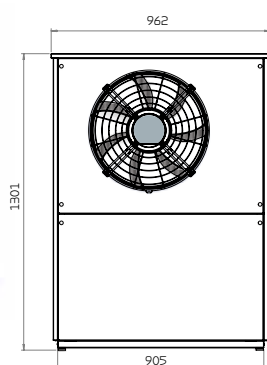


AIR 9 classic

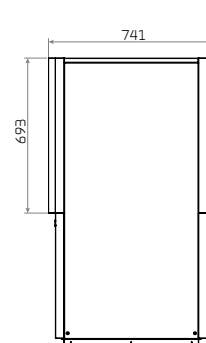
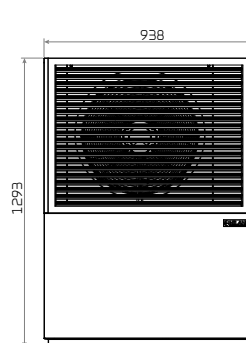


AIR 9+ elegance

AIR 9 classic



AIR 9+ elegance





Effective and quiet ventilator with "owl wings".

Summer/winter setting ensures an extra low sound level in the summer.

Low-energy EC-motor.

AIR 9 exterior unit is made from white powder-coated aluzinc steel plate (RAL 9016).

Powder-coated condensation tray prevents "acid water" and leads off the condensation.

A heating cable for frost protection of the condensation drain is included.

Adjustment screws for levelling

AIR 9 is controlled via the same CTS 602 touch panel as is used for Compact P.

A large, well-dimensioned evaporator ensures a good output.

AIR 9 is reliable right down to -22°C

An inverter-controlled DC compressor ensures a variable output and low energy consumption.

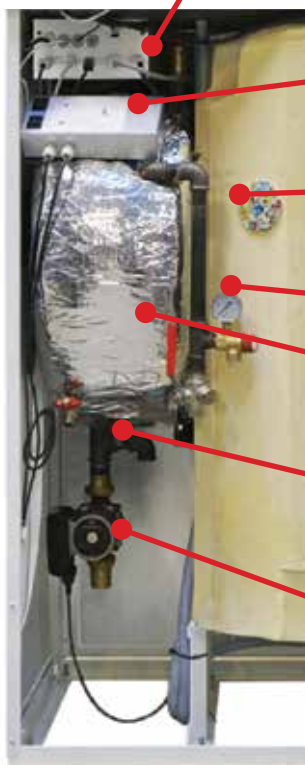
Hermetically-sealed cooling circuit.

The aggregate can therefore be installed without requiring a cooling technician.



AIR 9 interior unit is integrated in Compact P.

This saves space and ensures a neat and tidy installation.



Supplementary electrical heating of 2 x 3 kW
Ensures indoor heating during periods of severe frost.

8-litre expansion tank for central heating.
Placed on top of the system.

Safety valve to the central heating system.

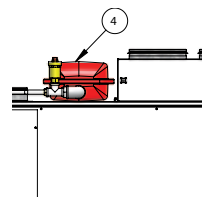
Manometer showing the current pressure in the central heating system.

50-litre buffer/charge circuit.
The central heating can thus be activated as required.

Filling tank for central heating.

Soil filter.

Integrated circulation pump to AIR 9 (exterior unit).



TECHNICAL DATA

Technical specifications

Dimensions (inside part) (W x D x H) - Integrated in Compact P	550 x 300 x 1100 mm
Weight (inside part)	55 kg
Control	CTS 602
Dimensions (outside part) (W x D x H)	962 x 542 x 1301 mm
Weight (outside part)	125 kg
Supply voltage (inside part)	3 x 400 (3 x 230V), N, PE, 16A, 50 Hz
P _{MAX} (inside part)	6.1 kW
Fuse size (inside part)	16 A
Standby electricity consumption	2.5 W
Supplementary electrical heating	2 x 3 kW
Buffer tank (integrated)	50 L
Design pressure (central heating)	4 bar
Opening pressure safety valve (central heating)	2.5 bar
Expansion vessel (central heating)	8 Litre
Booster expansion vessels	0.5 bar G
Max. air volume	3.100 m ³ /h
Variable compressor	20 - 100 %
Tightness class fan	IP54
Supply voltage (outside part)	230V 1 N+PE, 50Hz
P _{MAX} (outside part)	3.3 kW
Fuse size (outside part)	16 A
Rated output, (max/min) A-Pump	31/99 W
Rated output, (max/min) A-Pump	0.2/0.63 A
Condenser pressure loss (central heating)	15 kPa/0.42 l/s
Central heating connection	3/4"
Refrigerant (Propane)	R290
Refrigerant filling	1,1 kg
Pressostat low pressure (on/off)	1,0/2,2 bar G
Pressostat high pressure (on/off)	24/16 bar G
Operating temperatures	-22 °C → 50 °C
Central heating, flow temperature	10 °C → 55 °C
Connection dimension	1"
Heat output P _H with variable compressor at 7 °C/35 °C, according to EN 14511:2012 (max. 5200 RPM)	6,2 kW
Heat output P _H with variable compressor at 2 °C/35 °C, according to EN 14511:2012 (max. 5200 RPM)	5,0 kW
Heat output P _H with variable compressor at -7 °C/35 °C, according to EN 14511:2012 (max. 5200 RPM)	4,3 kW
Heat output P _H with variable compressor at -10 °C/35 °C, according to EN 14511:2012 (max. 5200 RPM)	3,4 kW
SCOP testet according to EN 14825:2012*	5,32
P _{design} (t _{out} -10 °C)	4,00 kW

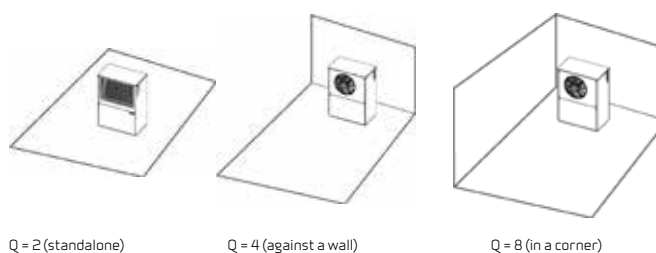
*SCOP (Seasonal COP) is for "low temperature use, average climate, defined flow, reversible"

Sound

The sound from the AIR outside part reverberates depending on the placement around the house as well as the substrate on which the unit stands and the surroundings. The below is measured for hard substrate.

Sound effect L_{wa} dB(A) 7/6 °C - 30/35 °C = 49 dB(A) according to EN14511, EN 12102, EN3743/1 - Ecodesign 811/2013 and 813/2013.

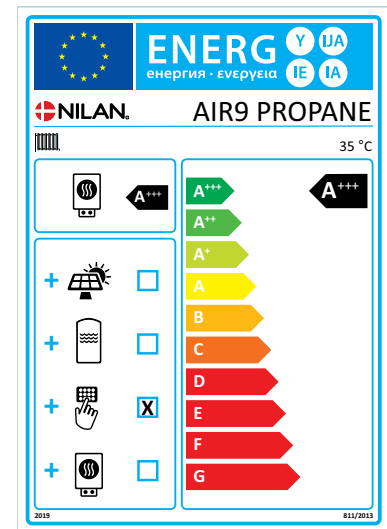
Sound pressure L_{pa} dB(A) according to EN13487:2003



Distance in meters	1	2	6	10	21
Position factor 2	41	35	25	21	15
Position factor 4	44	38	29	24	18
Position factor 8	47	41	31	27	21

Heat pump for space heating

Model	AIR 9
Air-to-water heat pump	Yes
Water-to-water heat pump	No
Brine-to-water heat pump	No
Low-temperature heat pump	Yes
Equipped with a supplementary heater	Yes
Heat pump combination heater	No
Temperature control:	
Model	CTS602
Class	2
Contribution to seasonal space heating energy efficiency	2%



Item	Symbol	Value	Unit
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Rated heat output	P_{rated}	4	kW
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Declared capacity for heating for part load at indoor temperature 20 °C and outdoor temperature of T_j

$T_j = -7\text{ °C}$	P_{dh}	3,41	kW
$T_j = +2\text{ °C}$	P_{dh}	1,99	kW
$T_j = +7\text{ °C}$	P_{dh}	1,30	kW
$T_j = +12\text{ °C}$	P_{dh}	1,51	kW
$T_j = \text{bivalent temperature}$	P_{dh}	4,00	kW

$T_j = \text{operation limit temperature}$	P_{dh}	4,00	kW
For air-water-heating pumps $T_j = -15\text{ °C}$ (if TOL < -20 °C)	P_{dh}		kW
Bivalent temperature	T_{biv}	-10	°C
Cycling interval capacity for heating	P_{cyc}		kW
Degradation co-efficient	C_{dh}	0,94	

Power consumption in modes other than active mode

Off mode	P_{OFF}	0,011	kW
Thermostat off-mode	P_{TO}	0,011	kW
Standby mode	P_{SB}	0,011	kW
Crankcase heater mode	P_{CK}	0,011	kW

Other items

Capacity control:	Variable compressor Variable indoor water flow		
	Variable indoor temperature adjustment		
Sound power level, outdoors	L_{WA}	49	dB
Annual energy consumption	Q_{HE}	1555	kWh

Item	Symbol	Value	Unit
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Seasonal space heating energy efficiency	η_s	211,6	%
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Declared coefficient of performance or primary energy ratio for part load at indoor temperature 20 °C and outdoor temperature T_j

$T_j = -7\text{ °C}$	COP_d	3,66	
$T_j = +2\text{ °C}$	COP_d	5,38	
$T_j = +7\text{ °C}$	COP_d	6,72	
$T_j = +12\text{ °C}$	COP_d	8,49	
$T_j = \text{bivalent temperature}$	COP_d	3,16	

$T_j = \text{operation limit temperature}$	COP_d	3,16	
For air-to-water heat pumps: $T_j = -15\text{ °C}$ (if TOL < -20 °C)	COP_d		
For air-to-water heat pumps: Operation limit temperature	TOL	-22	°C
Cycling interval efficiency	COP_{cyc}		
Heating water operating limit temperature	WTOL	45	°C

Supplementary heater

Rated heat output	P_{sup}	6	kW
Type of energy input	Electrical		

For air-to-water heat pumps: Rated air flow rate, outdoors		3500	m³/h
For water-/brine-water heat pumps: Rated brine or water flow rate, outdoor heat exchanger			m³/h

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.



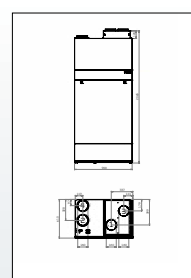
Installation instructions

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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