

Certificate

Passive House Suitable Component

For cool temperate climates, valid until 31. December 2018

Category: **Compact Heat Pump System**
 Manufacturer: **Nilan A/S**
8722 Hedensted, DENMARK
 Product name: **Compact P (92 m³/h)**

This certificate was awarded based on the following criteria (limit values*):

Thermal Comfort: $\theta_{\text{supply air}} \geq 16,5^{\circ}\text{C}$
 Heat Recovery of ventilation system: $\eta_{\text{WRG,eff}} \geq 75\%$
 Electric efficiency ventilation system: $P_{\text{el}} \leq 0,45 \text{ Wh/m}^3$
 Air tightness (internal/external): $V_{\text{Leakage}} \leq 3\%$
 Total Primary Energy Demand (**): $PE_{\text{total}} \leq 55 \text{ kWh}/(\text{m}^2\text{a})$
 Control and calibration (*)
 Air pollution filters (*)
 Anti freezing strategy (*)
 Noise emission and reduction (*)

**Measured values to be used in PHPP (set point 92 m³/h)
 useful air flow rates 52 to 120 m³/h**

Heating

		Test point 1	Test point 3	Test point 3	Test point 4	
Outside Air Temperature	T_{amb}	-7.0	2.1	7.1		°C
Thermal Output Heating Heat Pump	$P_{\text{WP,Heiz}}$	0.49	0.62	0.67		kW
COP number Heating Heat Pump	COP_{Heiz}	2.43	2.55	2.78		-
Maximum available supply air temperature with Heat Pump only(*)		33.6				°C

Hot water

		Test point 1	Test point 3	Test point 3	Test point 4	
Outside Air Temperature	T_{amb}	-6.9	1.9	7.2	20.2	°C
Thermal Output Heat Pump for heating up storage tank.	$P_{\text{DHW heating up}}$	0.51	0.72	0.89	1.02	kW
Thermal Output Heat Pump for reheating storage tank	$P_{\text{DHW reheating}}$	0.54	0.71	0.83	0.94	kW
COP Heat Pump for heating up storage tank	$\text{COP}_{\text{DHW, heating up}}$	2.11	2.60	3.08	3.38	-
COP Heat Pump for reheating storage tank	$\text{COP}_{\text{DHW reheating}}$	1.94	2.50	2.80	3.05	-
Average storage tank temperature		50.5				°C
Specific storage heat losses		1.63				W/K
Exhaust air addition (if applicable)						m ³ /h

(*) detailed description of criteria and key values see attachment.

(**) for heating, domestic hot water (DHW), ventilation, auxiliary electricity in the reference building, explanation see attachment.

Heat Recovery

$$\eta_{\text{WRG,eff}} = 77\%$$

Electric efficiency

$$0.43 \text{ Wh/m}^3$$

Air tightness

$$V_{\text{leak, internal}} = 1.0\%$$

$$V_{\text{leak, external}} = 1.1\%$$

Frost protection

down to -7 °C

Total Primary Energy Demand (**)

54.1 kWh/(m²a)



CERTIFIED COMPONENT

Passive House Institute

Certificate

Passive House Suitable Component

For cool temperate climates, valid until 31. December 2018

Category: **Compact Heat Pump System**

Manufacturer: **Nilan A/S**

8722 Hedensted, DENMARK

Product name: **Compact P (172 m³/h)**

This certificate was awarded based on the following criteria (limit values*):

Thermal Comfort: $\theta_{\text{supply air}} \geq 16,5^{\circ}\text{C}$
 Heat Recovery of ventilation system: $\eta_{\text{WRG,eff}} \geq 75\%$
 Electric efficiency ventilation system: $P_{\text{el}} \leq 0,45 \text{ Wh/m}^3$
 Air tightness (internal/external): $V_{\text{Leakage}} \leq 3\%$
 Total Primary Energy Demand (**): $PE_{\text{total}} \leq 55 \text{ kWh}/(\text{m}^2\text{a})$
 Control and calibration (*)
 Air pollution filters (*)
 Anti freezing strategy (*)
 Noise emission and reduction (*)

**Measured values to be used in PHPP (set point 172 m³/h)
useful air flow rates 120 to 205 m³/h**

Heating

		Test point 1	Test point 3	Test point 3	Test point 4	
Outside Air Temperature	T_{amb}	-3.7 °C	2.0 °C	6.9 °C		°C
Thermal Output Heating Heat Pump	P_{heating}	0.61	0.78	0.92		kW
COP number Heating Heat Pump	$\text{COP}_{\text{Heating}}$	2.65	3.18	3.58		-
Maximum available supply air temperature with Heat Pump only(*)		28.6				°C

Hot water

		Test point 1	Test point 3	Test point 3	Test point 4	
Outside Air Temperature	T_{amb}	-4.0 °C	2.0 °C	7.0 °C	20.2 °C	°C
Thermal Output Heat Pump for heating up storage tank.	$P_{\text{DHW heating up}}$	0.60	0.83	0.99	1.14	kW
Thermal Output Heat Pump for reheating storage tank	$P_{\text{DHW reheating}}$	0.53	0.82	0.95	1.05	kW
COP Heat Pump for heating up storage tank	$\text{COP}_{\text{DHW heating up}}$	2.13	2.87	3.31	3.68	-
COP Heat Pump for reheating storage tank	$\text{COP}_{\text{DHW reheating}}$	1.81	2.72	3.05	3.28	-
Average storage tank temperature		50.5				°C
Specific storage heat losses		1.63				W/K
Exhaust air addition (if applicable)						m ³ /h

(*) detailed description of criteria and key values see attachment.

(**) for heating, domestic hot water (DHW), ventilation, auxiliary electricity in the reference building, explanation see attachment.

Heat Recovery

$$\eta_{\text{WRG,eff}} = 80\%$$

Electric efficiency

$$0.40 \text{ Wh/m}^3$$

Air tightness

$$V_{\text{leak, internal}} = 1.0\%$$

$$V_{\text{leak, external}} = 1.1\%$$

Frost protection

down to -4 °C

Total Primary Energy Demand (**)

51.4 kWh/(m²a)

