

Certificate

Passive House Suitable Component

For cool temperate climates, valid until 31. December 2018

Category: **Compact Heat Pump System**
 Manufacturer: **Pichler G.m.b.H.**
9021 Klagenfurt, AUSTRIA
 Product name: **PKOM 4**

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
useful air flow rates 121 to 192 m³/h

Heating

		Test point 1	Test point 3	Test point 3	Test point 4	
Outside Air Temperature	T_{amb}	-15	-7	2	7	°C
Thermal Output Heating Heat Pump	$P_{\text{WP,Heiz}}$	0.612	0.933	0.771	0.776	kW
COP number Heating Heat Pump	COP_{Heiz}	1.53	2.61	3.15	3.86	-
Maximum available supply air temperature with Heat Pump only(*)		35				°C

Hot water

		Test point 1	Test point 3	Test point 3	Test point 4	
Outside Air Temperature	T_{amb}	-7	2	7	20	°C
Thermal Output Heat Pump for heating up storage tank.	$P_{\text{DHW heating up}}$	0.84	1.15	1.38	1.67	kW
Thermal Output Heat Pump for reheating storage tank	$P_{\text{DHW reheating}}$	0.80	1.19	1.35	1.66	kW
COP Heat Pump for heating up storage tank	$\text{COP}_{\text{DHW, heating up}}$	2.28	2.97	3.34	3.94	-
COP Heat Pump for reheating storage tank	$\text{COP}_{\text{DHW reheating}}$	2.02	2.88	3.10	3.76	-
Average storage tank temperature		45				°C
Specific storage heat losses		1.51				W/K
Exhaust air addition (if applicable)		200				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.

(***) All key values of heat pump were measured with enthalpy (humid) heat exchanger.

The dry heat recovery was measured, too and is shown here alternatively.

All other key values are valid respectively for dry heat recovery, too.

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Heat Recovery by enthalpy heat exchanger(*)**

$$\eta_{\text{WRG,eff}} = 85\%$$

alternative:

Dry Heat Recovery by heat exchanger(*)**

$$\eta_{\text{WRG,eff}} = 88\%$$

Electric efficiency

$$0.33 \text{ Wh/m}^3$$

Air tightness

$$V_{\text{leak, internal}} = 0.8\%$$

$$V_{\text{leak, external}} = 1.4\%$$

Frost protection

down to -15°C

Total Primary Energy Demand ()**

$$45 \text{ kWh}/(\text{m}^2\text{a})$$



CERTIFIED COMPONENT

Passive House Institute