

HEAT PUMP COMBI UNIT

PKOM⁴

OVERALL SOLUTION FOR LOW ENERGY HOUSES

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25.10.2019, Laholm

 **PICHLER**
Air for living.



To reach 365 days optimal room climate

- # Hygienic clear air (no dust, pollen allergy, mould)
- # Ideal temperature, humidity, Co2 content
- # Low energy consumption
- # Space saving system
- # High quality- Made in Austria
- # Easy and Smart Home technology
- # Lower investment and operating costs
- # All in one solution





PKOM⁴ – ONE DEVICE, 4 BENEFITS.

Ventilating. Heating. Cooling. Hot water.

PKOM⁴ The system solution in the passive house, the energy-efficient heat pump combi unit in 2 versions:

PKOM⁴ classic with a 212 liter hot water storage

PKOM⁴ trend without a hot water storage



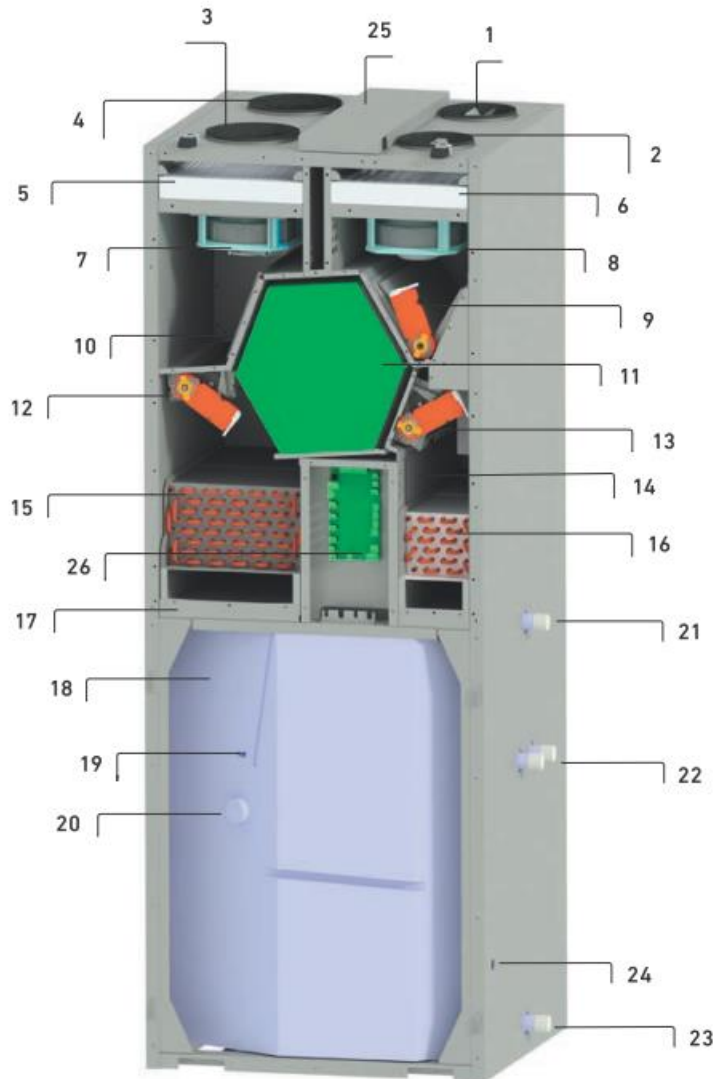
www.pichlerluft.at



 **PICHLER**

Systematic ventilation.

HEATPUMP COMBI UNIT PKOM⁴



Ventilation
250 (300) m³/h



Heating
1.300 Watts

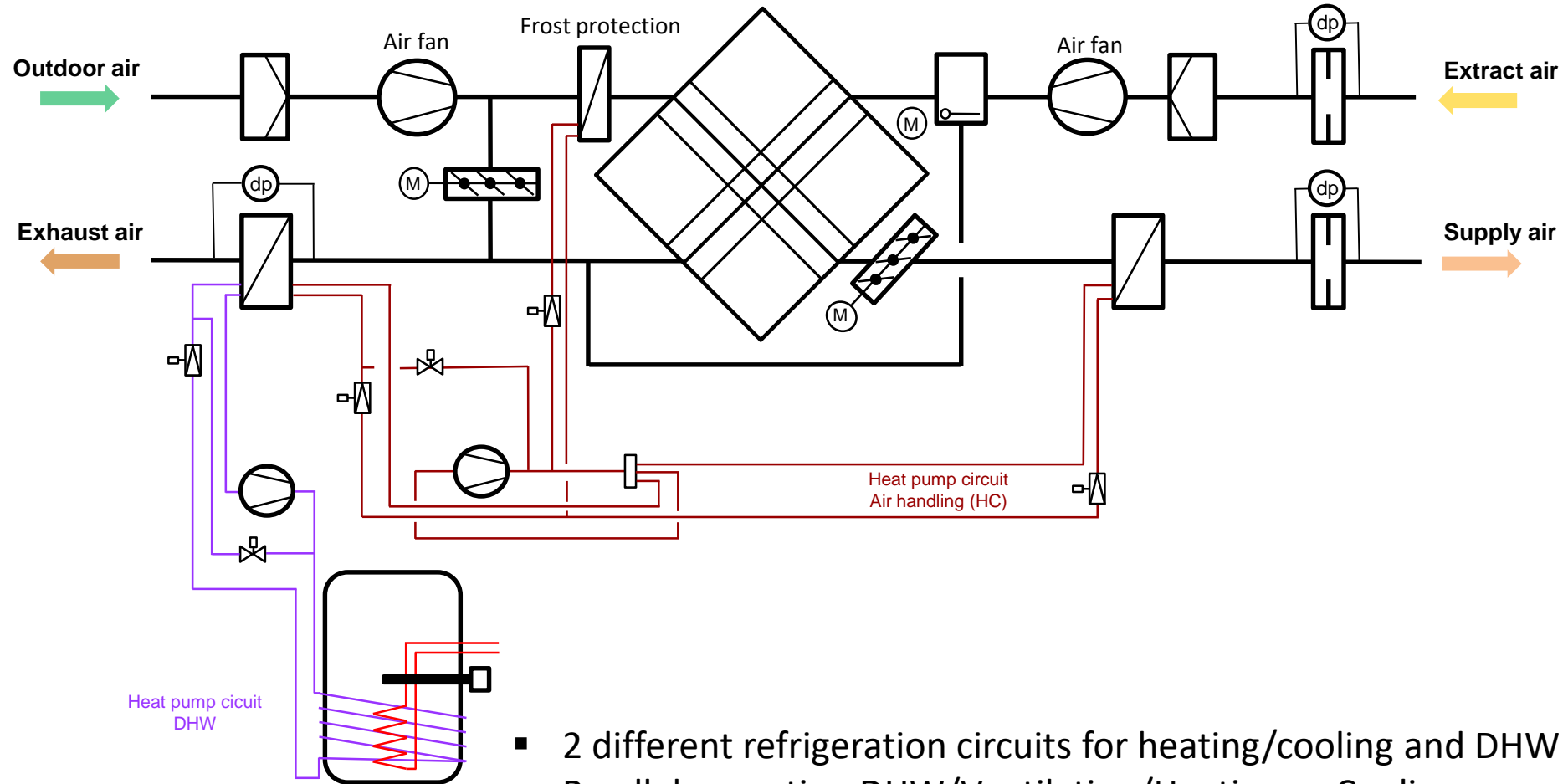


Cooling
1.300 Watts

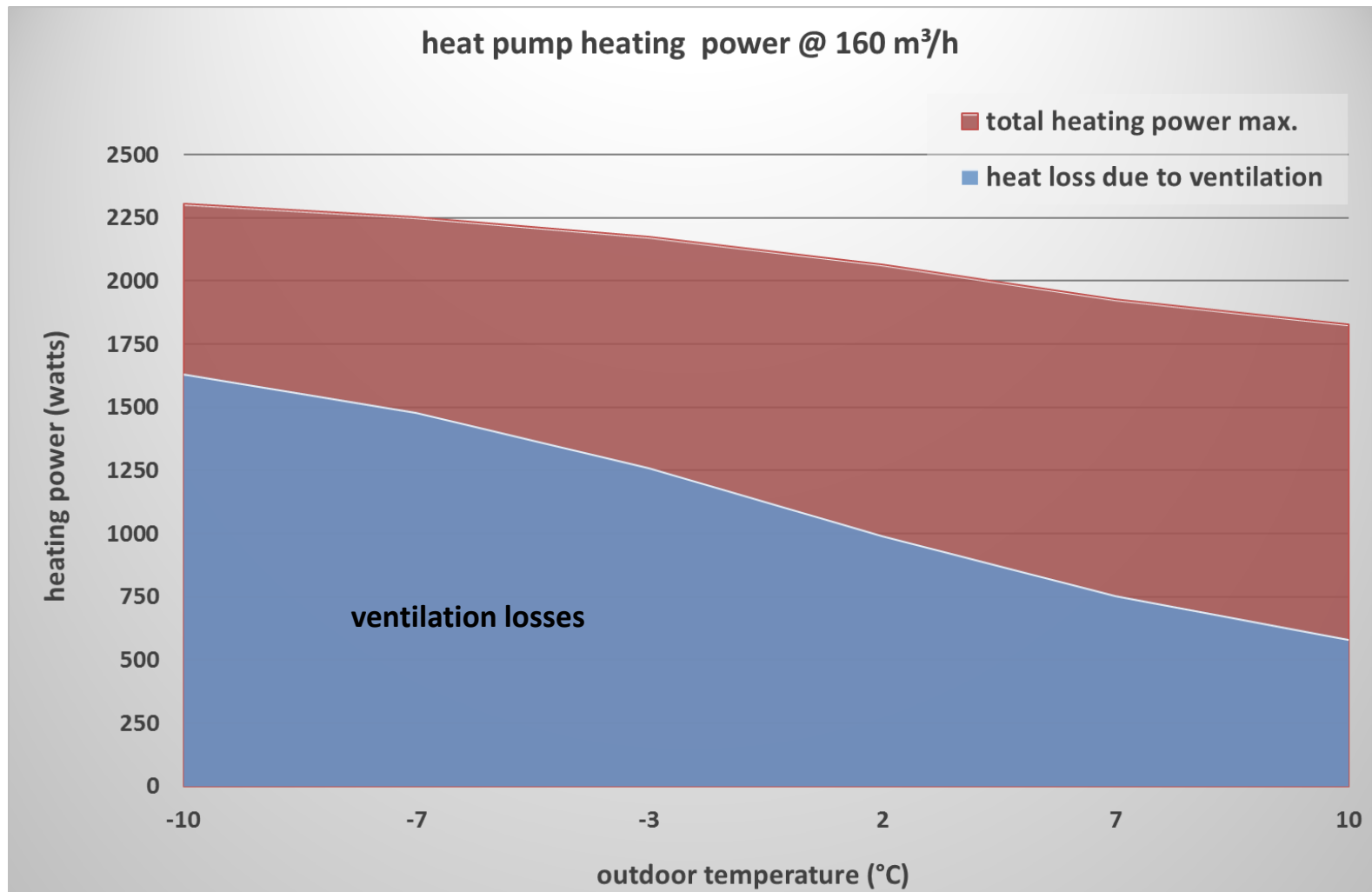


Hot water
4 persons

FUNCTIONAL DIAGRAM PKOM⁴ CLASSIC



- 2 different refrigeration circuits for heating/cooling and DHW
- Parallel operation DHW/Ventilation/Heating or Cooling
- Frost protection via the heat pump





Sample:

Single family house with 100m² living space

Room temperature 22 °C

Outdoor temperature -10 °C

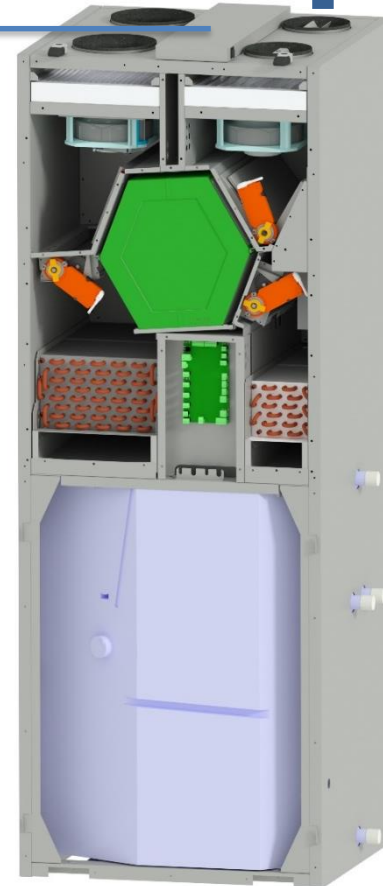
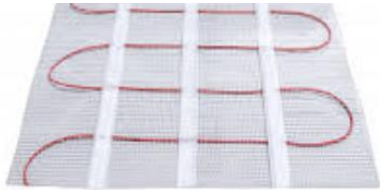
Building efficiency	Energy demand	Heating load	Covering due to PKOM4	Additional Energy demand
Low energy house B	≤ 32 kWh/(m ² *a)	≤ 25 W/m ²	77%	407 kWh
Low energy house A	≤ 25 kWh/(m ² *a)	≤ 20 W/m ²	92%	93 kWh
Low energy house A+	≤ 15 kWh/(m ² *a)	≤ 15 W/m ²	99%	12 kWh
Passive house A++	≤ 10 kWh/(m ² *a)	≤ 10 W/m ²	100%	0 kWh

Additional e-heater



- ✓ Infrared panel
- ✓ Electrical floor heating
- ✓ E-Radiator
- ✓

RT

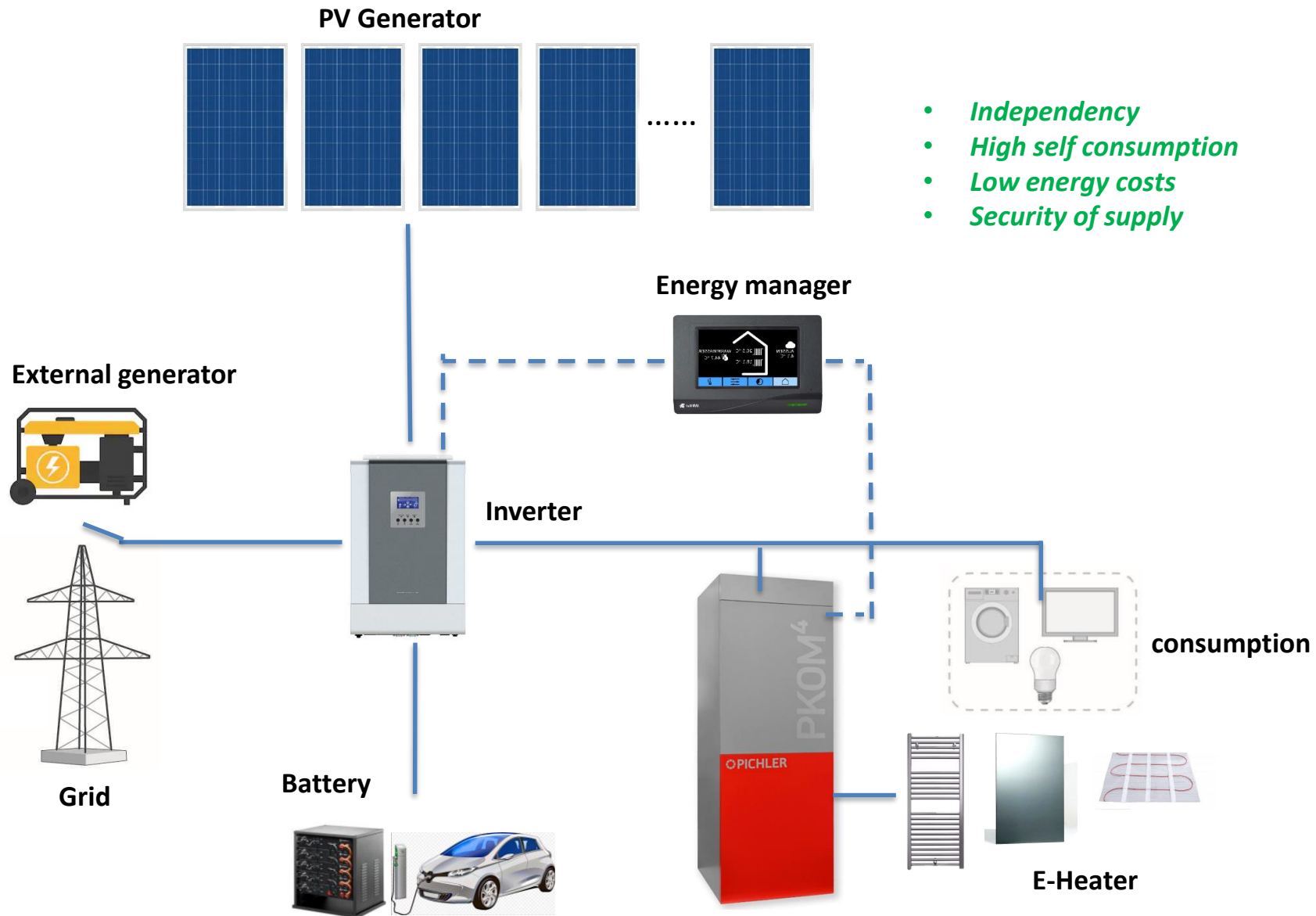


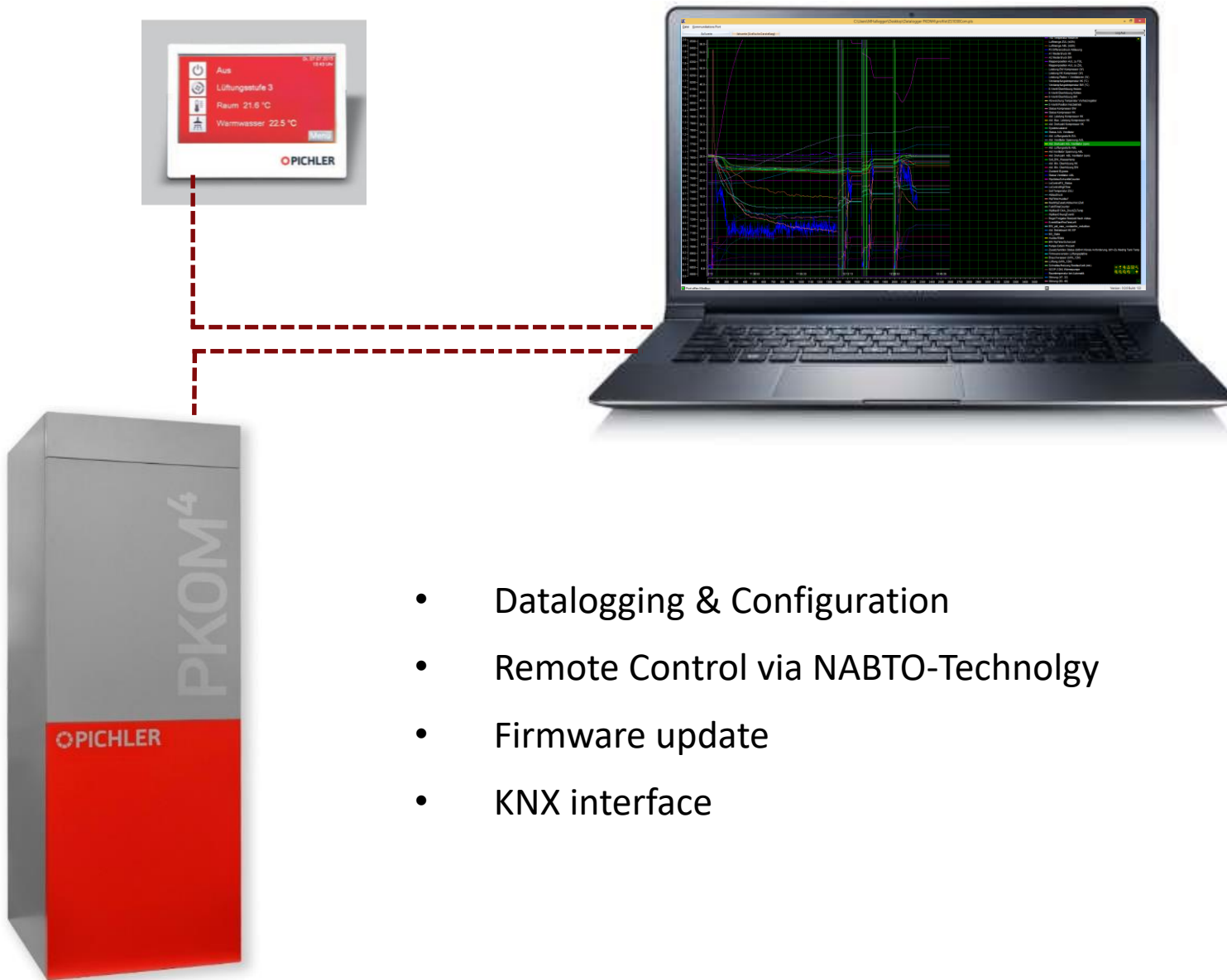
T9

Duct heater element
0 – 1.200 Watt
0-10 V control signal

Ext. 230VAC

Energy management system „all in one“





- Datalogging & Configuration
- Remote Control via NABTO-Technology
- Firmware update
- KNX interface



- Easy remote control with PKOM4 app
- Check energy consumption
- Filter alarm and link to webshop





Certificate

Passive House Suitable Component

For cool temperate climates, valid until 31. December 2019

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 (**): $PE_{\text{total}} \leq 55 \text{ kWh/(m}^2\text{a)}$
 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	$P_{\text{thp,heating}}$	0.612	0.933	0.771	0.776	kW
COP number Heating Heat Pump	$\text{COP}_{\text{thp,heating}}$	1.53	2.61	3.15	3.86	-
Maximum available supply air temperature with Heat Pump only(*)		33				°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	$P_{\text{thp,heating up}}$	0.84	1.15	1.38	1.67	kW
Thermal Output Heat Pump for reheating storage tank	$P_{\text{thp,reheating}}$	0.80	1.19	1.35	1.66	kW
COP Heat Pump for heating up storage tank	$\text{COP}_{\text{thp,heating up}}$	2.28	2.97	3.34	3.94	-
COP Heat Pump for reheating storage tank	$\text{COP}_{\text{thp,reheating}}$	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				m³/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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www.passivehouse.com

Passivhaus Institut
 Dr. Wolfgang Feist
 64283 Darmstadt
 GERMANY



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 Wh/m³

Air tightness
 $V_{\text{leak, internal}} = 0.8\%$
 $V_{\text{leak, external}} = 1.4\%$

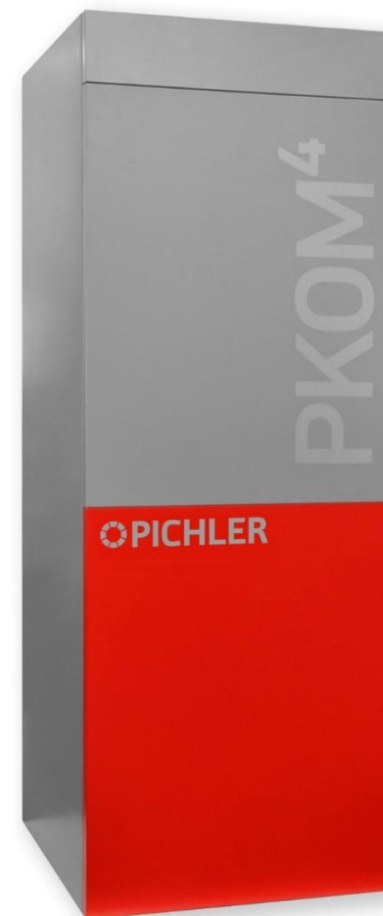
Frost protection
 down to -15 °C

Total Primary Energy
 Demand (**)
 45 kWh/(m²a)



**CERTIFIED
 COMPONENT**

Passive House Institute



LOOKING FORWARD TO SAVE CO2

P ... Pichler is a family owned company and over 60 years old

I ... Innovative products

C... Compact solutions

H... HIGHEST quality

L ... LOW ENERGY

E ... Energy efficient products

R ... Renewable

