# HEAT PUMP COMBI UNIT PKOM<sup>4</sup>





Systematic ventilation.

## Optimum room climate on all 365 days of the year

Residential living will always be changing and developing with the times. Apart from architectural considerations, the total energy balance is of increasing importance. Legislators, ongoing development of building materials and the quality of construction are consistently raising the standard of residential construction,

**Product description** 

#### One device, 4 benefits:

#### Ventilating – heating – cooling – hot water

The PKOM<sup>4</sup> heat pump combi unit with patented twocircuit heat pump system unites these four functions on a footprint of less than 0.75 m<sup>2</sup>. Controlled ventilation of living rooms will constantly ensure fresh and filtered outside air in the rooms and ensure hygienic exchange of air. The highly efficient heat recovery system is also option-

# PKOM<sup>4</sup> classic 🛛 🕸 🕸

The PKOM<sup>4</sup> classic heat pump combi unit is the preferred compact overall solution for passive house construction homes with up to 130 m<sup>2</sup> living area. The volume of household hot water will comfortably provide for a family of 4 - 5.

A controlled heat pump will in addition condition the supply air, i.e. heated or cooled on demand.

Another heat pump is used for efficient provision of household hot water. Both heat pumps may be operated in parallel to ensure uninterrupted provision of air and water.

## **PKOM<sup>4</sup> trend**



Household hot water storage and the associated heat pump are omitted in the PKOM<sup>4</sup> trend unit version. The PKOM<sup>4</sup> trend heat pump combi unit is the best alternative to conventional living room ventilation units. The supply air into the living rooms will be cooled and dehumidified during summer, as needed. The supplied air will be heated in the colder months. thereby reducing energy consumption. Whether Passive House, EnerPHit or Near Zero Energy Building – ventilation of the living quarters is deemed essential and at the core of modern residential building design. Extension of the functionalities of a ventilation unit to include heating, cooling and hot water supply is a natural consequence!

ally available as a design with recovery of waste air humidity. To prevent overly high summer temperatures in the living rooms, heat recovery may also be bypassed during cooler night hours by means of a bypass flap.

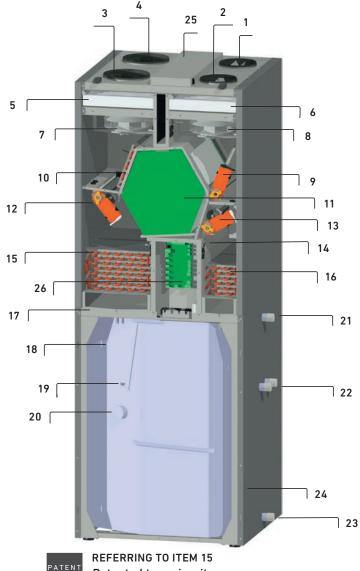
#### We differentiate between 2 versions:

- PKOM<sup>4</sup> classic: Version with household hot water.
- PKOM<sup>4</sup> trend: Version without household hot water.



## Layout sketch

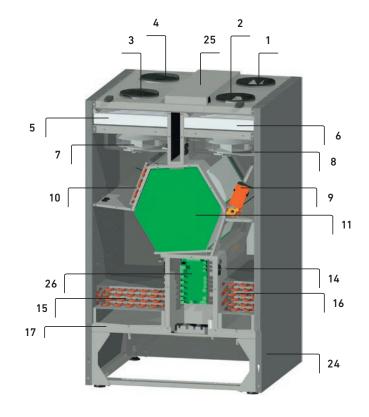
PKOM<sup>4</sup> CLASSIC (RIGHT-HANDED VERSION)



Patented two-circuit heat pump system

- Allows for especially efficient operation
- Both heat pumps can be operated in parallel
- Due to its large surface, it increases the efficiency of the heat pump in basic operation and increases the Seasonal Performance Factor and the \*COP of both the service water and the heat pump
- Allows for especially efficient cooling operation while generating hot water at the same time
- The waste heat that is generated during the cooling operation is recovered for the purpose of heating the service water
- \*) Coefficient of Performance

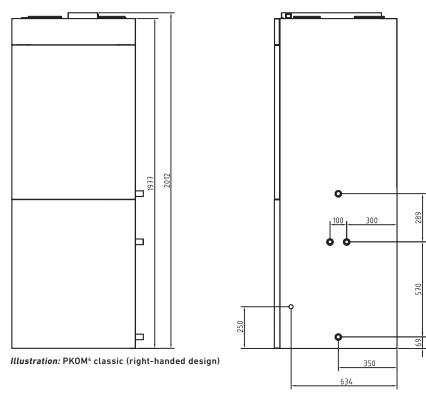
#### **PKOM<sup>4</sup> TREND (RIGHT-HANDED VERSION)**

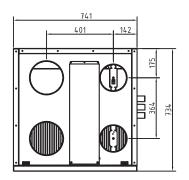


- 1 Supply air (SUP)
- 2 Extract air (ETA) 3 Outdoor air (ODA)
- 4 Exhaust air (EHA)
- 5 Filter ODA ISO ePM1 55%
- 6 Filter ETA ISO ePM10 75%
- 7 Outdoor air fan
- 8 Extract air fan
- 9 Bypass flap with servo motor
- 10 Pre-heater battery for outdoor air
- 11 Counterflow heat exchanger
- 12 ODA/EHA flap with servo motor
- 13 ODA/SUP flap with servo motor
- 14 Compressor in housing
- 15 Heat exchanger in exhaust air
- 16 Heat exchanger in supply air
- 17 Condensate tray
- 18 Household hot water tank
- 19 Sacrificial anode
- 20 Electrical heating element with thermal cut-out
- 21 Hot water connection 1"AG
- 22 Heating battery connection 1"AG
- 23 Cold water connection 1"AG
- 24 Condensate drain
- 25 Electrical connection box with main PCB
- 26 Heat pump PCB

# Dimensions

PKOM<sup>4</sup> CLASSIC





# Dimensions

PKOM<sup>4</sup> TREND

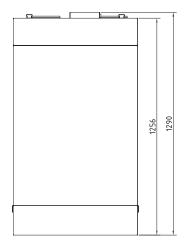
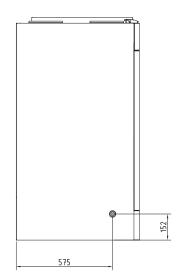
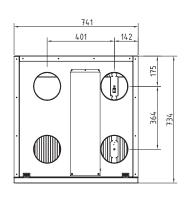


Illustration: PKOM<sup>4</sup> trend (right-handed design)









# Versions

The PKOM<sup>4</sup> heat pump combi unit is available in several versions.

Article PKOM <sup>4</sup> classic	Left-handed version	Right-handed version	
with standard heat exchanger and Heating battery in the storage tank	08PKOM4LSW	08PKOM4RSW	
with enthalpy exchanger* and Heating battery in the storage tank	08PKOM4LFW	08PKOM4RFW	
Article PKOM <sup>4</sup> trend	Left-handed version	Right-handed version	
with standard heat exchanger	08PKOM4LSO	08PKOM4RSO	
with enthalpy exchanger*	08PKOM4LF0	08PKOM4RF0	
		EHA ODA UP EHA ODA ETA ETA ETA	

\*) **TIP!** Compared to the standard heat exchanger, the enthalpy exchanger will recover not only heat from the extract air, but also a large percentage of the humidity. This humidity-heat exchanger will therefore ensure a pleasant indoor climate especially in cold months.

# Technical specifications

#### VENTILATION PART WITH HEAT PUMP

	PKOM <sup>4</sup> classic	PKOM <sup>4</sup> trend
Air volume per stage	85 – 250 m³/h variable	85 – 250 m³/h variable
Ventilation stages	4	4
Max. external compression at V <sub>max</sub>	> 200 Pa	> 200 Pa
Permissible outdoor air temperature	-15 bis +40 °C	-15 bis +40 °C
Max. heating power, heat pump with A2 and ${\rm V}_{\rm max}$	1.300 W	1.300 W
Max. cooling power, heat pump with A35 and ${\rm V}_{\rm max}$	1.300 W	1.300 W
Refrigerant	R134a	R134a
Fill volume	1.000 g	1.000 g
VALUES AS PER EN13141-7		
Nominal air volume	175 m³/h	175 m³/h
Percent temperature change ŋ, (standard/enthalpy)	88 / 84 %	88 / 84 %
Specific input power SEL ( standard/enthalpy)	0,31 / 0,27 W/(m <sup>3</sup> /h)	0,31 / 0,27 W/(m <sup>3</sup> /h)
Leakage external / internal	1,64% / 0,48%	1,64% / 0,48%
COP heating at A7 incl. WRG	6,8	6,8
EER cooling at A35 incl. WRG	4,2	4,2
VALUES AS PER PHI		
Nominal air volume	157 m³/h	157 m³/h
Degree of heat provision ŋ <sub>wRG,eff</sub> (standard/enthalpy)	88 / 85 %	88 / 85 %
Electrical efficiency	0,33 W/(m <sup>3</sup> h)	0,33 W/(m <sup>3</sup> h)
Air tightness external/internal	1,4% / 0,8%	1,4% / 0,8%

#### HOT WATER PART WITH HEAT PUMP

	PKOM <sup>4</sup> classic
Storage tank volume	212 l
Heating battery (optional)	0,8 m <sup>2</sup>
Max. household hot water temperature with heat pump	55°C
Max. heating power, heat pump	1.600 W
Max. household hot water temperature with EHP	65°C
Electric-heating EHP	1.500 W
Legionella protection	yes
Refrigerant	R134a
Fill volume	1.000 g
Consumption pattern	L (Large)
Energy efficiency class	А
Energy efficiency	95 %

#### ELECTRICAL

	PKOM <sup>4</sup> classic	PKOM <sup>4</sup> trend
Electrical connection	230V ~ 1/50 Hz	230V ~ 1/50 Hz
Max. power consumption [W]	2.800	750
Max. current consumption [A]	12,8	3,8
Earth leakage circuit breaker	Type A – current impulse sensitive	Type A – current impulse sensitive
Line fuse	C16A	C16A

#### HOUSING

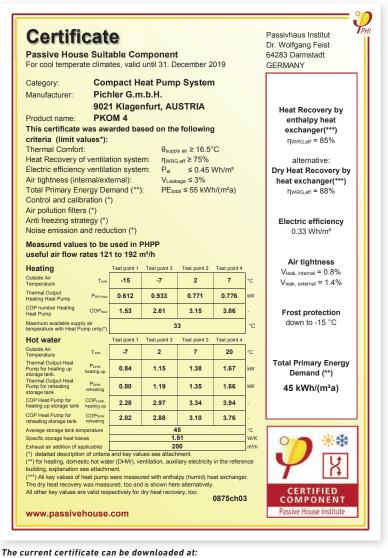
	PKOM <sup>4</sup> classic	PKOM <sup>4</sup> trend
Material	Powder coated sheet steel	Powder coated sheet steel
Duct connections supply air / extract air	Ø 160 mm	Ø 160 mm
Duct connections outdoor air / exhaust air	Ø 200 mm	Ø 160 mm
Dimensions (W x H x D)	741 x 2012 x 734 mm	741 x 1290 x 734 mm
Weight	240 kg	140 kg

#### ACOUSTIC DATA

The acoustic measurements pursuant to EN 12102 refer to an airflow of 250 m<sup>3</sup>/h with 100 Pa external compression and activated heat pump.

	Measuring p	point	Supply air connecting piece	Outdoor air connecting piece	Extract air connecting piece	Exhaust air connecting piece	Housing emission
	63 Hz		74,8	75,3	72,1	73,8	68,8
	125 Hz	]	46,4	67,9	66,2	52,0	55,2
	250 Hz		51,7	69,0	70,5	53,5	58,3
100 Pa	500 Hz	3	43,6	56,6	58,2	45,1	47,9
100 Pa	1000 Hz		33,9	52,8	56,6	40,4	35,7
	2000 Hz		25,6	53,4	52,3	27,2	30,7
	4000 Hz		14,9	43,5	47,2	14,1	12,9
	8000 Hz		1,2	26,8	33,9	1,5	13,2
	Total L <sub>wa</sub> in d	B (A)	50,3	63,1	64,4	50,8	51,9

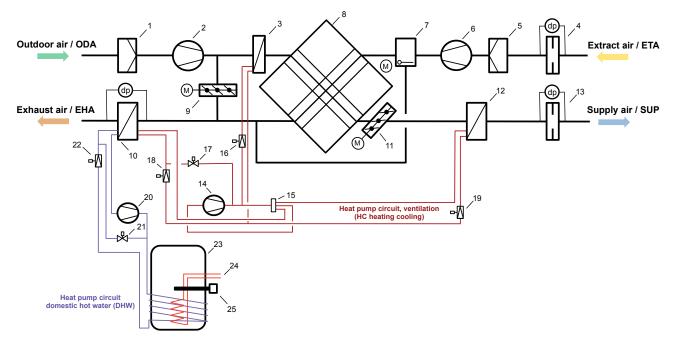
#### PASSIVE HOUSE CERTIFIED TO PHI CRITERIA



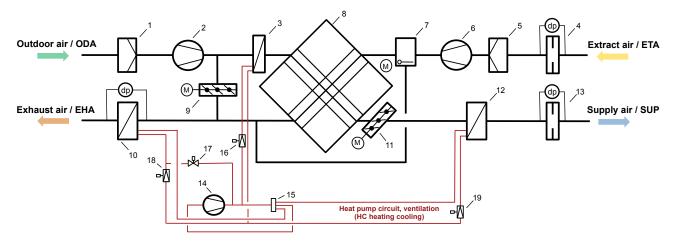
www.pichlerluft.at/heat-pump-combination-unit.html

Remark: Tolerances ± 2 dB for acoustic data

# Functional diagram PKOM<sup>4</sup> classic



## Functional diagram PKOM<sup>4</sup> trend



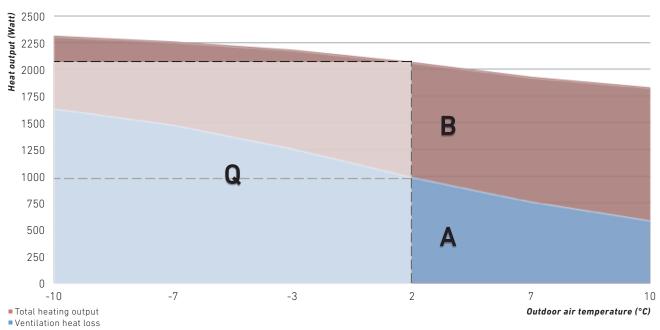
- 1 Filter ODA ISO ePM1 55%
- 2 Outdoor air fan
- 3 Pre-heater battery for outdoor air
- 4 Air volume measurement, extract air
- 5 Filter ETA ISO ePM10 75%
- 6 Extract air fan
- 7 Bypass flap with servo motor 8 Counterflow heat exchanger
- 9 Outdoor air/exhaust air flap with servo motor
- 10 Heat exchanger in exhaust air
- 11 Outdoor air/exhaust air flap with servo motor
- 12 Heat exchanger in supply air
- 13 Air volume measurement, supply air
- 14 Compressor with frequency converter (HC circuit)

- 15 4-way switching valve (HC circuit)
- 16 Control valve pre-heating battery (HC circuit)
- 17 Solenoid valve, defrosting (HC circuit)
- 18 Expansion valve, heating (HC circuit)
- 19 Expansion valve, cooling (HC circuit)
- 20 Compressor circuit (DHW circuit)
- 21 Solenoid valve, defrosting (DHW circuit)
- 22 Expansion valve (DHW circuit)
- 23 Domestic hot water storage tank
- 24 Heating battery in domestic hot water storage tank
- 25 Electrical heating, domestic hot water

DHW = Circuit for domestic hot water HC = Circuit for supply air (heating / cooling)

# Total heating output

#### AT 160 M<sup>3</sup>/H



The full heating output Q (share A + B) will be released into the outdoor air at the given air volume flow. The ventilation heat loss (share A) corresponds to the power required to return the outdoor air to indoor air conditions. Share B is additionally available for actively heating the supply air.

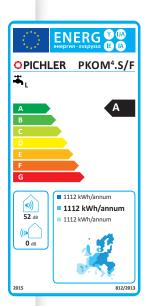




#### **HOUSEHOLD HOT WATER HEAT PUMP PKOM<sup>4</sup> CLASSIC**

The heat pump fulfills the requirements of the Ecodesign Directive, in accordance with EU Regulations 812/813-2013. Specific energy consumption: Efficiency class A is achieved with an outdoor air temperature of +7°C (+6°C wet bulb).

Product fiche	Heat pump combi unit: PKOM <sup>4</sup> .S/F
supplier's name or trade mark	J. Pichler GmbH
model identifier	PKOM <sup>4</sup> .S/F
declared load profile	L
water heating energy efficiency class	А
water heating energy efficiency class	95%
the annual electricity consumption in kWh in terms of final energy	1112 kWh
temperature settings, as placed on the market	55 °C
the sound power level LWA in dB, indoors	52 dB(A)
able to work only during off-peak hours	no
precautions when assembled, installed or maintained	see operating and installation instructions
Storage volume in litres	212 l
Filter change The filters are to be replaced as soon as the command to replace the filters appears on the display of the operator control unit (marked red in the picture alongside).	Bits successor weakness Bits an and water Fibermannial and and



#### CAUTION:

If the filters are not changed regularly, the system can not work efficiently and the power consumption increases.



#### Waste disposal

Units that are no longer in working order have to be dismantled and properly disposed of by a specialized company via suitable collection centres and in compliance with the waste electrical and electronic equipment ordinance (WEEE), which provides for ratification of community law, directive 202/95/EC (RoHS) and the directive 2002/96/EC (the WEEE directive).

Information based on the current state of knowledge of EU Regulation 812/2013 Download from: www.pichlerluft.at

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Sales offices in Slovenia and Serbia. Sales partners in Germany, Switzerland and Italy.

#### PKOM4 - HEAT PUMP COMBI UNIT





TOUCH control unit

MODBUS/KNX-Gateway

# Operation

The PKOM<sup>4</sup> heat pump combi unit can offer the user many different configurations. Switch-over from summer to winter and back may be manually or automatic. Scheduled operation depending on time of day or week will allow setting of different air volumes and room temperatures. Active cooling with the heat pump may be activated or deactivated as desired. The electrical heater may also be switched on should the requirement for hot water increase on occasion.

#### **TOUCH CONTROL UNIT**

Operation is simple and intuitive via touch display. The most important settings and readings are very easy to make. The integrated room sensor is also used to monitor and control the room temperature.

#### Advantages of controlling:

- Automatic summer and winter adjustment
- Holiday function
- Individually adjustable air volumes
- Programs based on time of day and day of the week
- Legionella protection
- Additional functions for solar and additional heater
- Energy balancing
- CO<sub>2</sub> and humidity control
- Eco-Mode (Smart Grid Ready / PV Ready)

#### Control unit dimensions:

(w x h x d) 110 x 84 x 25 mm Cable: Telephone installation wiring JY(ST)Y 2x2x0.8 Max. installation length < 100 m

#### EASY OPERATION WITH THE PICHLER APP

User-friendly: the heat pump combination unit can be operated easily with our free smartphone app for iOS and Android, whether you are at home or out and about:



#### **REMOTE ACCESS / PICHLER CONNECT**

Operational safety: Pichler customer service automatically receives information on your heat pump combination unit in the event of a malfunction. Remote access faciliates a prompt response with minimal effort.



#### **BUILDING AUTOMATION**

Connection to a building automation via integrated Modbus RTU interface. Optionally, a gateway for the KNX bus system is also available.

#### MODBUS/KNX GATEWAY

The Modbus/KNX gateway allows for the connection of the heat pump combi unit PKOM<sup>4</sup> to a KNX bus system. In this process, the gateway serves as a connective link between the two bus systems. It is provided with a Modbus RTU and TCP interface and is always the master on the Modbus. On the KNX side, however, it responds like a common KNX TP-1 unit. This makes it possible to centrally control and monitor the heat pump combi unit by a KNX system. The configuration is implemented via the IP or USB interface.

Dimensions: W x H x L = 88 x 56 x 90 mm Mounting: Top hat rail or wall Permissible ambient temperature: 0 – 60 °C Permissible humidity: 5 – 95% non-condensing Protection class: IP20 Voltage: 24V AC/DC Interfaces: Ethernet, EIA-485, KNX-TP1

Item	Item number
MODBUS/KNX-Gateway	08KNXGAPKOM4A

#### PKOM4 - HEAT PUMP COMBI UNIT







Heating circuit module DN20

#### Spare filter

Duct heating battery 1200 watt

# Accessories

#### SPARE FILTER

will ensure perfect hygiene and air quality given regular replacement, also proper functionality and efficient operation of the unit.

Item		Item number
Filter ETA ISO ePM10 75% (Extract air)	synthetic	40LG050280
Filter ODA ISO ePM1 55% (Outdoor air)	glass fibre	40LG050290

#### DUCT HEATING BATTERY 1200 WATT

**Greater power on request.** With integrated temperature limiter and thermal protection. The controller is the PKOM<sup>4</sup> heat pump combi unit. It will only be activated if the heat pump fails to achieve the desired supply air temperature for extended periods.

Item	Item number
Duct heating battery PKOM <sup>4</sup>	08CV16121MTXL
Duct temperature sensor NTC	40LG041920

Max. power	1200 W
Output control	0 – 10 V
Minimum air volume	110 m³/h
Duct connection	Ø 160 mm
Installation length	375 mm

#### HEATING CIRCUIT MODULE DN20

for connecting a small heating circuit (e.g. towel dryer) to the household hot water storage tank of the PKOM<sup>4</sup> classic heat pump combi unit.

Item	Item number
PKOM <sup>4</sup> heating circuit module	08PKOM4HBK33
Wall bracket set	08PKOM4WHHBK33
Pump	Wilo-Yonos PARA RS15/6
Gravity reverse brake	200 mmWs
3-way mixer	Setting range 20 – 50°C
Connections, Inlet (bottom)	1" AG, flat seal
Connections, outlet (top)	3/4" IG
Centre spacing	90 mm
WxH	180 x 385 mm

#### **TEMPERATURE SENSOR**

for the temperature measurement and heating control of an additional room in connection with the heating circuit module. The sensor in the surface-mounted housing is suitable for wall mounting.

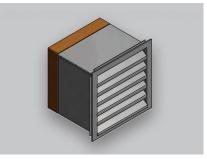
Item	Item number	
Room-temperature sensor	07RTF49357	
Colour	white	
Туре	NTC 10 k0hm	
Reference signal	0 – 10 V	
Dimensions W x H x D	85 x 85 x 35 mm	

#### PKOM4 - HEAT PUMP COMBI UNIT

#### PAGE 13







*Room sensor (temperature, humidity or CO<sub>2</sub> sensor)* 

### Humidity sensor duct installation

Wall duct

#### HUMIDITY SENSOR

for ventilation control to suit requirements. The heat pump combi unit will automatically increase or reduce the air volumes depending on the humidity of the air in the room. The sensor in the surface-mounted housing is suitable for wall mounting.

Item	Item number
Humidity sensor	07RHF49360
Colour	white
Measuring range	0 – 100 % RH
Reference signal	0 –10 V
Dimensions W x H x D	85 x 85 x 35 mm

#### CO<sub>2</sub> SENSOR

for ventilation control to suit requirements. The heat pump combi unit will automatically increase or reduce the air volumes depending on the quality of the air in the room. The sensor in the surface-mounted housing is suitable for wall mounting.

Item	Item number	
CO <sub>2</sub> sensor	07RC0248330	
Colour	white	
Measuring range	0 – 2000 ppm	
Reference signal	0 – 10 V	
Dimensions W x H x D	85 x 85 x 35 mm	

#### HUMIDITY SENSOR DUCT INSTALLATION

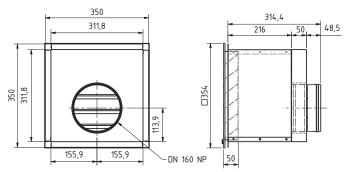
for ventilation control to suit requirements. The heat pump combi unit will automatically increase or reduce the air volumes depending on the humidity of the air in the room. The sensor is installed in the exhaust air duct.

Item	Item number
Humidity sensor duct intstallation	07KTRHF49337
Measuring range	10 – 90 % RH
IP protection class	IP 10
Supply voltage	24VAC
Dimensions	Ø 18 – 200mm

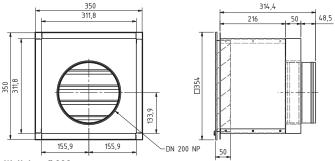
#### WALL DUCT

The thermally insulated and soundproof wall duct with a stainless steel weather protection grille and insulation in the rear area is used as an acoustically optimised outdoor or exhaust air element. A 10 x 10 mm mesh grille is integrated into the wall duct. The A-evaluated sound pressure level is reduced by app. 6 dB(A) on the outdoor and exhaust air connecting piece. An approximate cut-out of 350 x 350 mm has to be established for the installation.

Item	Dimensions W x H x D	Item number
Wall duct Ø 200 mm	350 x 350 x 314,4 mm	08PKOMMLA200
Wall duct Ø 160 mm	350 x 350 x 314,4 mm	08PKOMMLA160



Wall duct Ø 160 mm



Wall duct Ø 200 mm

# Mounting example



PKOM<sup>4</sup> system solution

# System solution with renewable energy

As compact ventilation unit, the heat pump combi unit PKOM<sup>4</sup> replaces a full-featured heating/cooling/service water system. By combination with renewable energy such as photovoltaics and energy management, the PKOM<sup>4</sup> presents an efficient, cost-effective system solution, by means of which operating costs are reduced to a minimum, thus making it possible to implement a zero-energy building, or even a "plus energy" building.

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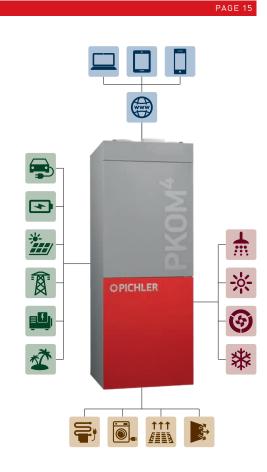
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Operation and visualisation on terminal devices



# **Data monitoring**

Data monitoring example



# PKOM<sup>4</sup> trend at a glance!

- EC radial fans, speed controlled
- Filter ETA ISO ePM10 75% / Filter ODA ISO ePM1 55%
- Plastic counterflow heat exchanger or enthalpy exchanger
- Summer bypass flap to bypass the heat recovery (free cooling)
- Integrated heater using heat pump hot gas for protection against freezing
- Reversible cooling circuit design
- Frequency controlled rotating piston compressor for heating and cooling the supply air
- Electronic expansion valves
- TFT touch display with integrated room temperature sensor
- Integrated WEB server and LAN interface to local networks
- Smart Grid Ready (PV Ready)

# **PKOM<sup>4</sup>** classic at a glance!

#### **PROPERTIES IN ADDITION TO PKOM<sup>4</sup> TREND VERSION**

- Additional cooling circuit with rotating piston compressor for household hot water heating
- Household hot water tank with PU hard foam insulation
- Optionally with additional heating battery (e.g. for solar connection, heating circuit connection)
- Corrosion protection through high quality enamelling in accordance with DIN 4753 and titanium impressed current anode
- Electrical heater for emergency operation or to assist in times of increased demand for hot water
- Patented two-circuit heat pump system





klima <b>aktiv</b>	PASSIVHAUS Austria	NETZWERK PASSIVHAUS www.passivhaus.at	Responsible for the content: J. Pichler Gesellschaft m.b.H.   Graphics and layout: WERK1 Photos: J. Pichler Gesellschaft m.b.H.   Text: J. Pichler Gesellschaft m.b.H. All rights reserved   All photos are symbolic photos   Subject to change without notice   Version: 09/2022 en/
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Systematic ventilation.

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