

PERFEKT[?] SYSTEM HEAT

PHA-50 Inverter Heat Pump
Heating/DHW/Cooling

R290 Propane



Highest subsidy level in the Clean Air Programme.
For use in any building!





IDEAL IN EVERY RESPECT

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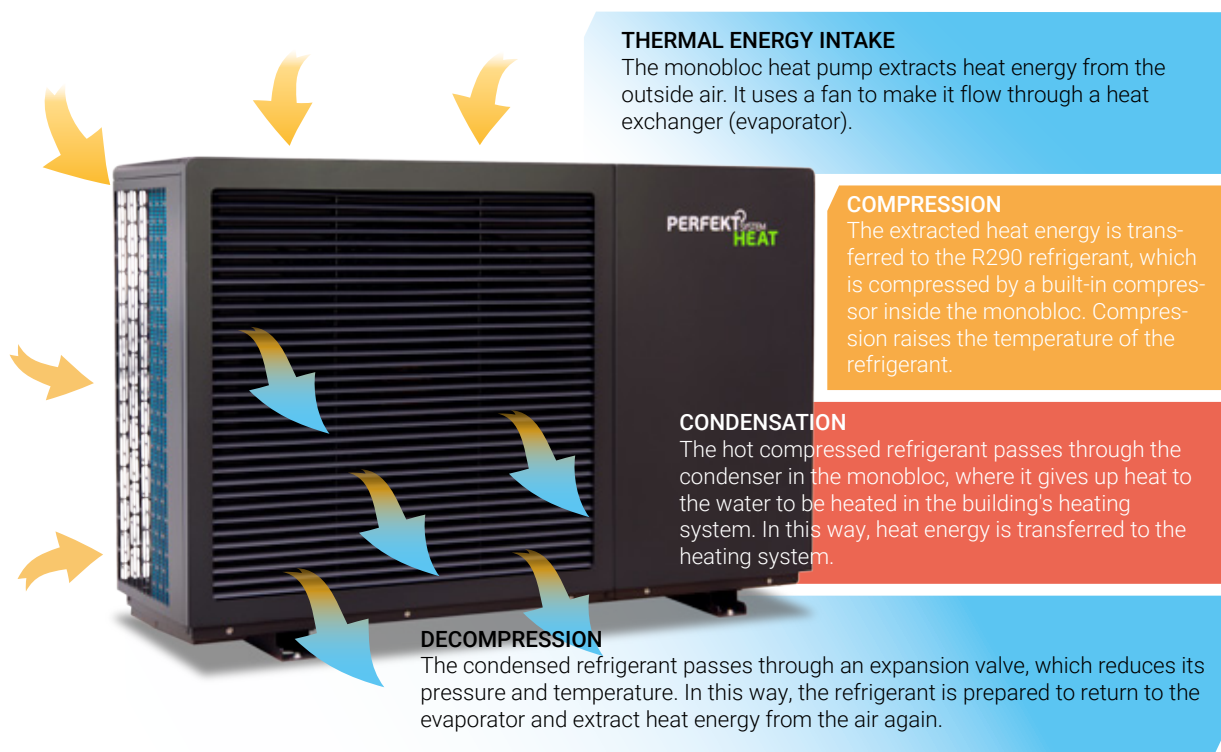
*"In the annals of innovation, new ideas are only part of the equation.
Execution is just as important"*
Steve Jobs

Perfexim

*For over three decades, our family-owned enterprise has thrived, honing our craft and perfecting our offerings. Throughout this journey, we've tirelessly innovated, embracing cutting-edge solutions to align with the evolving demands of the contemporary market. In step with the latest eco-friendly trends in heating technology, we've broadened our product portfolio to introduce a comprehensive selection of air-to-water heat pumps, complemented by additional accessories under the **Perfekt System HEAT** product line. Our commitment to ecological solutions tailored to the demands of a dynamic world is the cornerstone of our development, vividly reflected in the offerings presented within this catalog.*

How does a heat pump work?

A monobloc heat pump is one type of heat pumps in which all the main components (such as the compressor, condenser, evaporator and expansion valve) are mounted in a single housing located outside the building. So, how does a heat pump work? Read on...



During this cycle, the monobloc heat pump uses electricity to drive the compressor, which runs the refrigerant. The heat is transferred to the heating system, raising the temperature of the target medium - water in the heating system.

The terms defined below will help you to navigate through the multitude of cutting-edge options. Know them for an informed choice!

Important terms

COP (Coefficient of Performance)

_____ a pivotal energy efficiency measure for heat pumps.

It quantifies the ratio of delivered heat energy to the consumed electricity or other energy carriers. A higher COP signifies superior efficiency, ensuring you get a larger amount of thermal energy for every unit

of electricity invested in the heat pump. For example: if the heat pump has a COP of 5, then for every unit of electricity consumed by the heat pump, we get 5 units of thermal energy.



*)A7°C/w 35°C

The COP of heat pumps can vary depending on the operating conditions, such as the outdoor temperature, the temperature of the heat source and the target temperature. Therefore, it is a good idea to check the specifications of a particular heat pump to know its performance under different conditions.

SCOP (Seasonal Coefficient of Performance)

_____ measures efficiency of heat pumps on a seasonal scale, helping you to determine the total energy efficiency of the pumps throughout the heating season, factoring in the dynamic outdoor conditions. SCOP goes beyond lab settings and considers the heat pump's performance under diverse weather scenarios experienced throughout the entire heating season, incorporating outdoor temperatures at various points in time and the pump's electricity consumption.

Expressed as the ratio of total thermal energy delivered to total electrical energy consumed over the heating season, SCOP provides a comprehensive measure of your heat pump's efficiency.

Since SCOP depends on many factors, such as weather conditions, building insulation, heat source temperatures and pump settings, it is worth checking the declared SCOP for a particular heat pump to assess its performance under actual operating conditions.



*)SCOP(55°C)

The higher the SCOP coefficient, the more efficient the heat pump is in using available electricity to produce heat energy throughout the heating season.

EER (Energy Efficiency Ratio)

_____ the key metric for assessing the energy efficiency of heat pumps in cooling mode. Specifically tailored for evaluating heat pump efficiency in air-conditioning mode, EER quantifies the ratio of cooling power delivered to electrical power consumed by the heat pump during cooling. A higher EER value signifies superior efficiency in transforming electricity into cooling. EER values are denoted in BTUs (British Thermal Units) per watt (W) or kilowatt (kW). Heat pump labels often feature both EER and COP values, providing a comprehensive overview of the unit's performance in both cooling and heating modes.

EVI (Enhanced Vapor Injection)

_____ an advanced technology integrated into select heat pumps to elevate performance in challenging low-temperature environments. Developed to address the demand for effective heating in extreme cold, heat pumps featuring EVI incorporate an additional compressor circuit which facilitates the injection of surplus compressed refrigerant vapor into the compressor cylinder during low temperatures. By doing so, the compressed refrigerant's temperature rises, creating an amplified temperature difference between the heat source and the target medium.

The enhanced circulation and heightened temperature difference empower EVI heat pumps to deliver optimal heat energy even in the harshest low-temperature conditions. This exceptional capability makes them particularly efficient in regions characterized by cold climates.

While EVI heat pumps excel in heating applications, showcasing superior efficiency at low temperatures for enhanced energy savings, it's essential to note that they may entail increased complexity and cost compared to standard heat pumps.

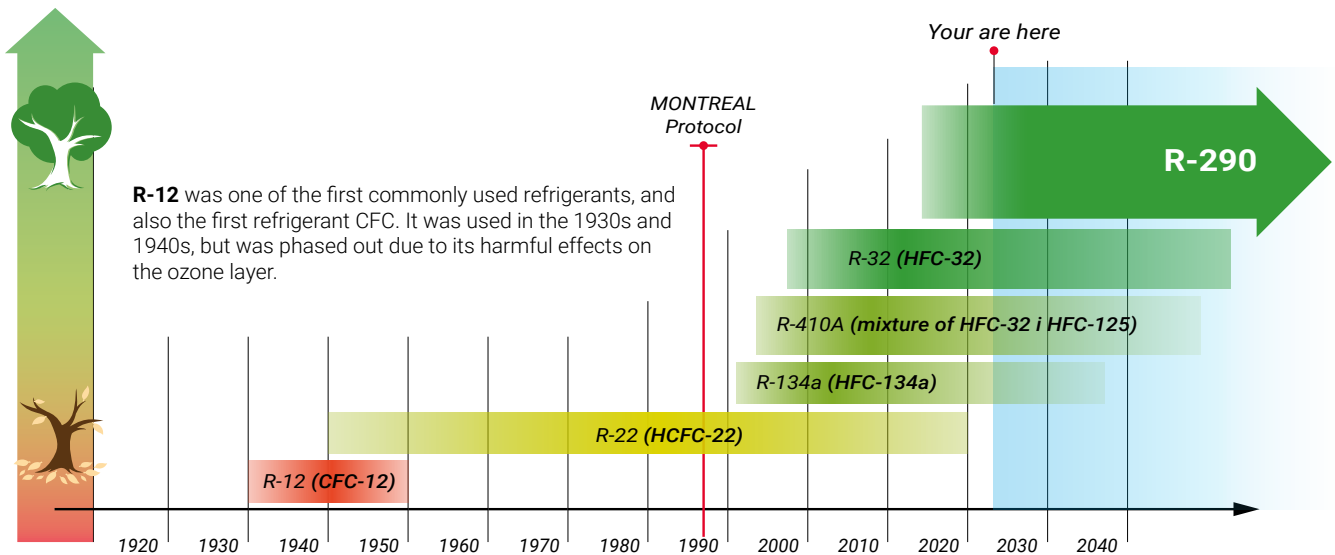
Environmental: R290 (propane) is a refrigerant with low ozone impact and low global warming potential. It is an eco-friendly alternative to some traditional refrigerants such as CFCs.



THE ULTIMATE HEATING SOLUTION

R290, commonly known as propane (C3H8), stands out for its remarkably low global warming potential (GWP=3). Systems utilizing this refrigerant are exempt from the F-Gas Act, eliminating the need for leakage testing and shielding them from potential future restrictions under this legislation. Aligned with EU Directive 517/1014/EU, propane R290 heat pumps are poised to emerge as the new industry standard.

Evolution of refrigerants and their impact on the climate and environment



R-22, also referred to as Freon-22, served as a widely employed refrigerant, notably from the 1940s to the 1990s. It was a more ozone-friendly alternative compared to CFCs.

Recognizing the environmental concerns related to ozone depletion, a shift towards alternatives with a reduced ecological footprint gained momentum. HFC refrigerants like fluorocarbon **R-134a** emerged as substitutes for R-12 and R-22, offering a more ozone-friendly choice. In subsequent years, the industry transitioned to refrigerants with lower global warming potential (GWP) to address concerns related to both ozone layer impact and greenhouse gas emissions, with **R-410A** being a notable example.

R-32, scientifically known as difluoromethane and categorized within the hydrofluorocarbons (HFCs) family, is alternatively referred to as HFC-32. Frequently employed as a constituent in refrigerant blends, R-32 is commonly paired with other refrigerants like R-125 to create mixtures with tailored thermodynamic characteristics.

R290


Leveraging the favorable thermodynamic attributes of propane, **R290**-based equipment can deliver hot water supply temperatures reaching up to **70°C**, even in outdoor temperatures as low as **-10°C**. Additionally, these systems efficiently prevent exchanger freezing while maintaining low energy consumption. Such advantageous properties enable **R290** heat pumps to attain a Coefficient of Performance (COP) that is notably **20-40%** higher compared to their synthetic refrigerant counterparts.

*Negligible impact on the greenhouse effect (GWP = only 3)
AND zero ozone depletion potential (ODP = 0)*

GWP (czyli Global Warming Potential) a metric employed to evaluate the influence of substances on climate change. Primarily utilized in the assessment of greenhouse gas emissions like carbon dioxide (CO₂), methane (CH₄), or nitrous oxide (N₂O), GWP gauges a gas's capacity to absorb thermal radiation relative to carbon dioxide, acknowledged as the "benchmark gas" with a GWP of 1. A higher GWP value indicates an increased potential of the gas to contribute to the greenhouse effect and climate change.

ODP (Ozone Depletion Potential) a metric used to evaluate the capability of chemicals to harm the ozone layer in the atmosphere. The ozone layer plays a crucial role in filtering out harmful UV-B rays from the sun. Substances like chlorofluorocarbons (CFCs), halons, and methyl bromide, when released into the atmosphere, can lead to the destruction of ozone molecules. The ODP coefficient compares the ozone-depleting potency of a specific compound to that of methyl chloride (CH₃Cl), regarded as a reference substance with an ODP of 1. A higher ODP value signifies an increased potential of the substance to harm the ozone layer. However, due to international agreements like the Montreal Protocol, many substances with elevated ODPs have been phased out and substituted with less harmful alternatives.





High efficiency is what characterizes heat pumps utilizing R290. R290 boasts excellent thermodynamic properties, translating to the capability of achieving elevated efficiency levels in heat production.



PERFECT HEAT PUMP

With over 30 years of experience in the installation market, **PERFEXIM** continually evolves its product offerings, staying at the forefront of technological advancements in the plumbing industry. Through ongoing collaboration with industry specialists, keen market trend observation, and a commitment to environmental sustainability, we proudly present our latest product: the PHA-50 **Perfekt System HEAT**. Our heat pump operates on the highly efficient and environmentally friendly **R290** propane refrigerant. Versatile in its application, it is suitable for installation in both new and older buildings. This adaptability is made possible through intelligent inverter technology, complemented by the proprietary PHA-55/R900 controller, renowned for its exceptional control capabilities over the heating system. The controller, featuring a touch color panel, supports up to four heating circuits, ensures circulation operation, and provides remote control capabilities via the Internet. The extensive product range caters to the heating and cooling needs of single-family homes, as well as medium- and large-sized houses. Noteworthy attributes of PHA-50 **Perfekt System HEAT** pumps include economic operation, minimal noise levels, excellent craftsmanship, and a modern design that meets the highest standards and requirements. To enhance user confidence, we offer up to 5 years of warranty protection.



Modern heat pumps PHA-50 Perfekt System HEAT

A heat pump, despite its seemingly straightforward name, boasts versatility beyond its primary function of extracting heat from the environment. In a reversible process, it can also cool indoor air by expelling excess heat to the outside when needed. The utilization of the refrigerant **R290**, or propane, presents numerous advantages in heat pump applications.

The advanced monobloc air heat pump proves highly effective in both new constructions and older retrofitted buildings. Operating seamlessly across a broad spectrum of outdoor temperatures, ranging from **-25°C** to **45°C**, it translates into a practical heating range of **20°C** to **75°C** for the heating system flow temperature. Consequently, in a well-designed installation, supplementary heat sources, like heaters, are triggered exceptionally infrequently.

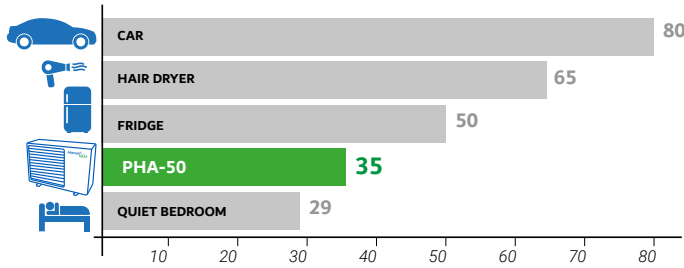


*For every 5kW generated, it needs only 1kW of supplied energy.
With an outdoor temperature of -10°C, it can achieve up to 70°C
in a powered heating system.*

Efficient and silent = PERFECT

VAPORIZER

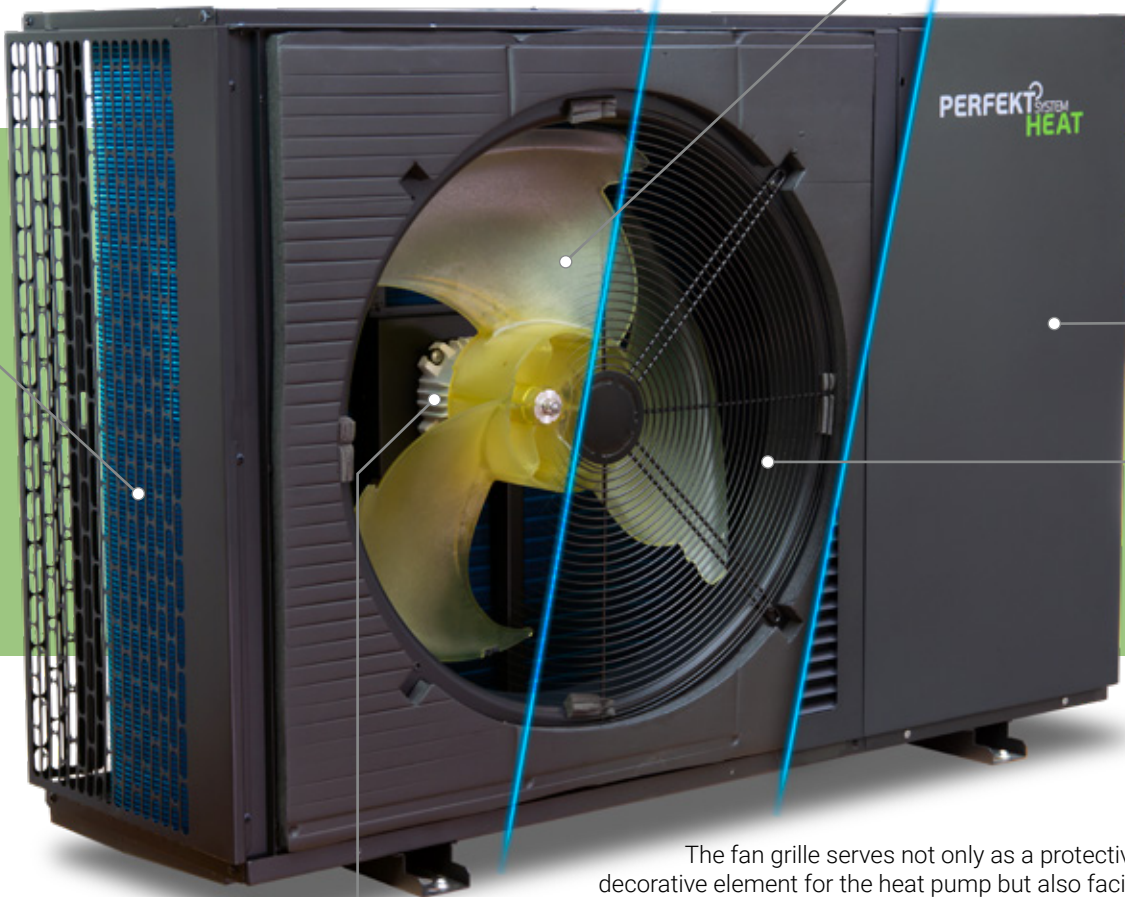
Utilizing **Perfekt Fin** technology, our plate heat exchanger is equipped with a specialized anti-corrosion coating. The innovative design of the flow paths incorporates a corrugated pipe with internal threads, inducing a swirling motion in the gas to increase COP and enhance evaporator efficiency. This results in a significant increase, by several percent, in the effectiveness of both heating and cooling processes.



The heat pump housing is soundproofed using specialized soundproofing materials, ensuring remarkably low noise levels, reaching as low as **35 dB** at a distance of 2 meters from the heat pump.

FAN

The unique design of axial fan blades, free from framing, ensures optimized performance. This design enhances airflow in the vaporizer compared to standard fans, resulting in increased efficiency. Besides, the additional airflow dispersion leads to reduced vibration and **exceptionally low noise levels**.



The fan grille serves not only as a protective and decorative element for the heat pump but also facilitates air dispersion while concealing the fan propeller.

DC FAN INVERTER

The DC Fan Inverter, featuring highly refined inverter technology, ensures variable fan speed, resulting in minimal noise, exceptional efficiency, and an extended service life.

ATTRACTIVE DESIGN IN ANTHRACITE COLOR

The heat pump's housing is crafted from premium anti-corrosion materials. An additional side grille ensures protection for the heat exchanger against mechanical damage. Precision-fitted components prevent vibration transmission, while sound-absorbing mats inside effectively minimize noise levels. Accessing the service panel is exceptionally easy.

COMPRESSOR

Inverter technology, specifically designed to operate with the **R290** refrigerant, boasts an impressive operating range from -25°C to $+45^{\circ}\text{C}$. The system can supply heating temperatures up to $+75^{\circ}\text{C}$, demonstrating remarkable efficiency. Its well-damped housing and flexible-legged feet ensure minimal vibration transmission, allowing for operation at an exceptionally low noise level.



INVERTER

A dependable and intelligent heat pump management system ensures optimal operation, maximizing efficiency and minimizing operating costs. This guarantees trouble-free and cost-effective performance.



CONDENSER

The patented unique design of the condenser enhances operational efficiency.



INVERTER CIRCULATION PUMP

Promotes flow optimization in complete synchronization with the heat pump electronics. The circulation pump's design is robust and permanently tailored to the **R290** refrigerant.

R290 - the most environmentally friendly refrigerant: GWP 3, ODP 0

R290 - heating system supply temperature from **20°C to 75°C**

R290 - cooling system supply temperature from **10°C to 25°C**

Operating range of **-25°C to 45°C**

PHA-R900 controller: ability to control up to four heating circuits, operation of circulation, communication via the Internet

PHA-50 heat pump range from 6-50kW with cascade capability

COP minimum 5.00

Sound level 1m from the heat pump **42dB(A)**

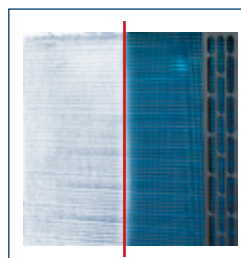
Anti-corrosion casing, exchanger with **Perfekt-FIN** technology

Elegant black design


5-YEAR WARRANTY

EXCHANGER DEFROST

3-minute intelligent defrost technology: precision, speed, and high efficiency. The heat pump incorporates independently developed patented intelligent defrost technology. Automatically switching to defrost mode when the frost layer exceeds 85%, it ensures exceptional operating efficiency.



Cost-effective operation: Leveraging high energy efficiency, R290 heat pumps contribute to minimizing energy expenses for heating or cooling spaces, resulting in reduced electricity bills.



Controller - enables daily temperature adjustments in the circuits, promoting more economical heating by operating during off-peak hours.

IDEAL PHA-R900 CONTROLLER CREATED WITH THE USER IN MIND

Based on the experiences and insights gained from heat pump users, we have developed a controller that fulfills all technical requirements. It is user-friendly, intuitive, and versatile in terms of installation and service functions. With this controller, we can optimize the heating system's operation to the maximum extent. This optimization results in reduced heat pump usage costs, an extended device lifespan, and the assurance of optimal operating parameters aligned with user preferences.



PHA-R900 controller

The PHA-R900 controller is a device designed to control and regulate the efficient operation of the heat pump for both heating and cooling purposes. By continuously monitoring key parameters such as temperature and pressure, it allows making informed decisions to maintain optimal thermal comfort with minimal energy consumption. PHA-50 series heat pumps are exclusively compatible with the PHA-R900 controller.

- ⇒ **Temperature Monitoring and Control:** The controller actively monitors both the ambient temperature and the temperature of the fluid circulating within the heat pump circuit. Utilizing this data, it autonomously regulates the pump's activation and deactivation and compressor power.
- ⇒ **Fault Protection:** The controller is provided with the capability to identify critical situations, including excessively low or high pressure, insufficient refrigerant levels, etc. In the event of such emergencies, it has the functionality to initiate an automatic shutdown of the heat pump, mitigating the risk of damage.
- ⇒ **Operating Modes:** The controller provides the flexibility to choose from various operating modes, including heating mode, cooling mode, or energy-saving mode.
- ⇒ **Thermostat Regulation:** For precise temperature control in individual rooms, we recommend the installation of additional devices, such as the PHA-Nano Color 2 or PHA-Nano thermostat (refer to the controller's assortment for detailed descriptions).
- ⇒ **Scheduled Programming:** Our controllers enable users to program specific cycles for heat pump operation at designated times. This feature allows for the customization of the system's operation according to the user's schedule.
- ⇒ **User Communication:** Through the display or communication interface, the controller can convey information about the current operational status, any errors, or maintenance needs.
- ⇒ **Remote Control:** Once an Internet connection is established, you can remotely adjust heat pump settings, including temperature, operating mode (heating, cooling, ventilation), operating schedules, and diagnostic/service functions. For stable Internet communication, an RJ45 Internet cable connection has been implemented, preventing potential issues associated with Wi-Fi connections, such as intermittent losses of connectivity to the heat pump. Logging is accessible at www.pompyciepla.perfexim.pl.

PHA-50 series heat pumps work only with the PHA-R900 controller.

Controller's exceptional capabilities

Seamless Control of 4 Heating Circuits

Control of up to 4 heating circuits equipped with mixers. Standard time control features for domestic hot water and circulation.

Anti-Legionella Function

A powerful feature designed to sterilize your domestic hot water tank effortlessly. The heat pump elevates the DHW tank temperature beyond 65°C automatically or in manual mode, eliminating Legionella bacteria effectively.

Easy Communication via MODBUS

With this feature, you can effortlessly:

- Switch operation modes
- Access and read selected parameters
- Receive instant alerts on any alarm conditions

Online Communication with Your Heat Pump:

Using a reliable RJ45 internet cable, your controller gets a dedicated address at www.pompyciepla.perfexim.pl, enabling you to:

- Read parameters
- Change selected parameters
- Read diagnostic data

Built-in Clock

With this functionality, you gain control over temperature adjustments in your circuits, making heating more cost-effective, especially during off-peak hours like the second tariff.

Control of DHW Circulation Pump

This feature enables you to establish a customized hourly or daily schedule for the pump's operation. This not only translates into significant electricity savings but also contributes to reducing overall utility costs.

Smart DHW Tank Charging

Our advanced controller ensures automatic temperature regulation, consistently maintaining the DHW tank at the user-defined temperature.

Reliable PHA-SAZ/2 Anti-Freeze System

Safeguard your heat pump against potential damage during power outages. Seamlessly communicating with the PHA-R900 controller and the room thermostat PHA-NANO COLOR 2, the system ensures easy access to the anti-freeze system parameters.

Seasonal Settings and VACATION/HOLIDAY Mode

Operation Schedule Settings - Days, Hours

SG Ready Function

Enhanced energy efficiency by seamless integration of the photovoltaic system, maximizing the utilization of generated electricity.

NANO Digital Room Thermostat

Effortlessly customize and optimize temperatures across various rooms in your building with PHA-Nano Color 2, PHA-Nano One, and PHA-Nano One Delta thermostats.

Weather Characteristics Configuration

- Intelligent heating or fixed-temperature curve control.
- Standard functionality covers two heating circuits along with domestic hot water (DHW) and circulation.
- With the PHA-L2 extension, you can seamlessly operate up to four heating circuits.

ANTISTOP Post-Season Pump Run-Out

This protective function prevents the blockage of circulation pumps caused by the accumulation of deposits and impurities.

PHA-R900
55-050-0000-000



PERFEKT CONNECT

- very easy installation connection system



CASCADE CONTROL OF HEAT PUMPS

- Control of up to five heat pumps
- Control of a heat pump working with a second heating source
- Optimized cascade operation with the controller.
- Flexible heating based on a heating curve or a weekly schedule.

Discover the functions and system operation scheme

Intuitive and easy-to-use 4.3" touch color panel.



Up to 4* heating circuits, including DHW mixers and circulation.

Thermal disinfection program to eliminate Legionella bacteria.



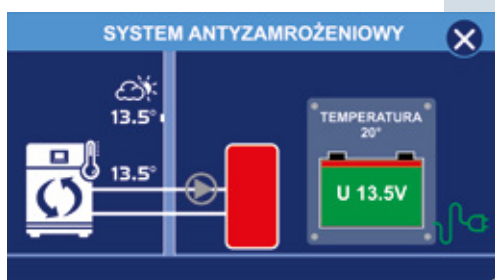
Constant operating temperature of a heat pump.

Customized temperatures dedicated to individual rooms for personalized comfort.



Time programs for DHW circulation control, optimizing electricity costs.

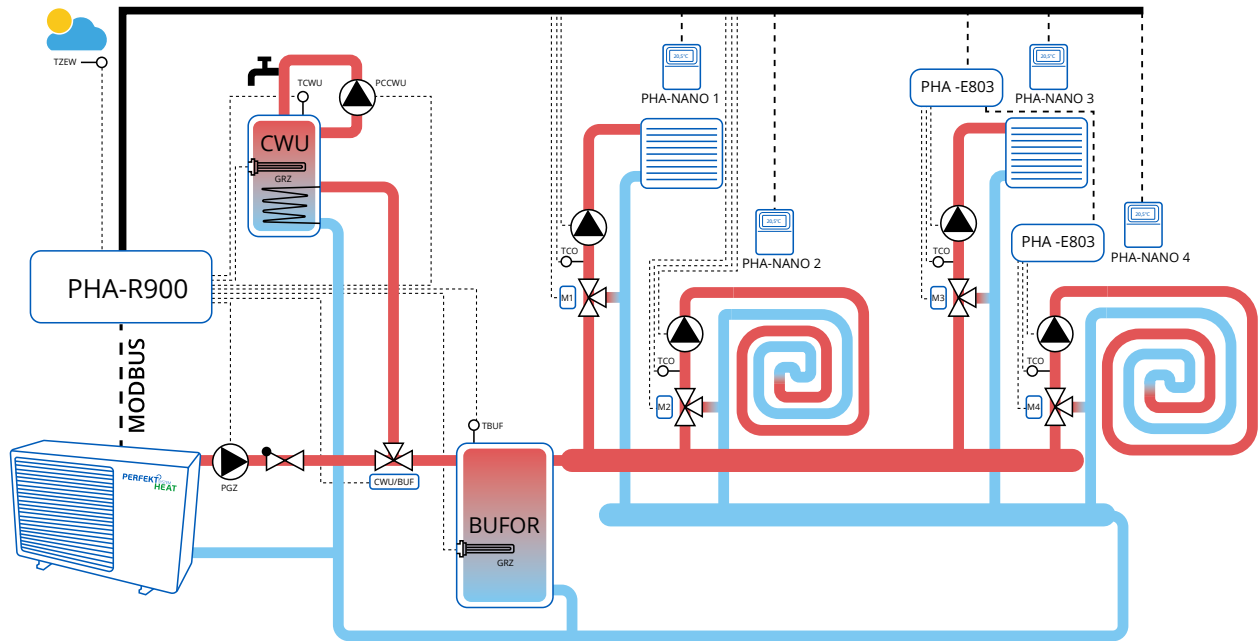
Operation modes adjusted to the heating system for optimized performance.



PHA-SAZ/2 anti-freeze system protects against water freezing in heat pumps during power outages. Fully compatible with PHA-R900 controller and PHA-Nano Color 2 thermostat.

Example of an installation schematic diagram

PHA-R900 controller working with and PHA-NANO controllers

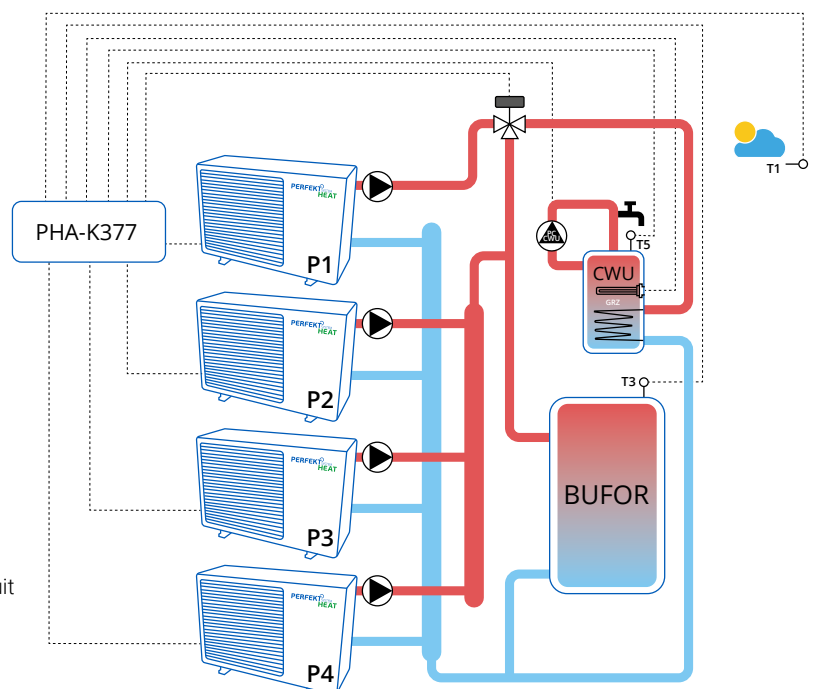


Depending on the service settings, the PHA-R900 controller can employ a technology that is a combination of different number of heating circuits, DHW tank and buffer. Circuits CO1 to CO4 can operate as circuits with mixers or exclusively as pump circuits. In addition, the buffer and DHW tank can be equipped with built-in electric heaters. Two heating circuits are supported as standard.

Example of a cascade connection schematic diagram

Legend

PHA-R900	system controller
PC	heat pump
PGZ	heat pump circulation pump
PCCWU	DHW tank circulation pump
CWU/BUF	DHW/buffer separator
GRZ	electric heater
PHA-NANO 1-4	further NANO digital thermostats
TCO 1-4	further mixer circuit temperature sensors
PM 1-4	further mixer circuit pumps
TCWU	DHW tank temperature sensor
TBUF	buffer tank temperature sensor
T 1	external temperature sensor
PHA-E803	external additional controllers serving circuit 3 and 4 of mixers



PHA-50 Heat Pumps - Our offer

12kW 1phase R290

CE TUV SUD E

Max. intake temp.	75 st C	<ul style="list-style-type: none"> ➤ DC Inverter. Modulation of compressor operation ➤ Intelligent defrost Perfekt FIN ➤ Proprietary PL controller. Online control ➤ Works with photovoltaic system ➤ Heating/cooling ➤ Cascade operation ➤ Supports up to 4 heating circuits
COP	5,57	
Power range	4.30~15.20	
ERP	kW	
	A+++/ A++	

12kW 3phase R290

CE TUV SUD E

Max. intake temp.	75 st C	<ul style="list-style-type: none"> ➤ DC Inverter. Modulation of compressor operation ➤ Intelligent defrost Perfekt FIN ➤ Proprietary PL controller. Online control ➤ Works with photovoltaic system ➤ Heating/cooling ➤ Cascade operation ➤ Supports up to 4 heating circuits
COP	5,57	
Power range	4.30~15.20 kW	
ERP	A+++/ A++	

6kW 1phase R290

CE TUV SUD E

Max. intake temp.	75 st C	<ul style="list-style-type: none"> ➤ DC Inverter. Modulation of compressor operation ➤ Intelligent defrost Perfekt FIN ➤ Proprietary PL controller. Online control ➤ Works with photovoltaic system ➤ Heating/cooling ➤ Cascade operation ➤ Supports up to 4 heating circuits
COP	5,66	
Power range	2.92~9.1 kW	
ERP	A+++/ A++	

18kW 1phase R290

CE TUV SUD E

Max. intake temp.	75 st C	<ul style="list-style-type: none"> ➤ DC Inverter. Modulation of compressor operation ➤ Intelligent defrost Perfekt FIN ➤ Proprietary PL controller. Online control ➤ Works with photovoltaic system ➤ Heating/cooling ➤ Cascade operation ➤ Supports up to 4 heating circuits
COP	5,59	
Power range	7.24~21.9 kW	
ERP	A+++/ A++	

18kW 3phase R290

CE TUV SUD E

Max. intake temp.	75 st C	<ul style="list-style-type: none"> ➤ DC Inverter. Modulation of compressor operation ➤ Intelligent defrost Perfekt FIN ➤ Proprietary PL controller. Online control ➤ Works with photovoltaic system ➤ Heating/cooling ➤ Cascade operation ➤ Supports up to 4 heating circuits
COP	5,59	
Power range	7.24~21.9 kW	
ERP	A+++/ A++	



IDEAL IN EVERY RESPECT

Inverter Heat Pump

PHA-50



Model			6kW 1 faza R290	12kW 1 faza R290	12kW 3 fazy R290	18kW 1 faza R290	18kW 3 fazy R290
INDEX			50-006-0816-001	50-012-1455-001	50-012-1455-003	50-018-1945-001	50-018-1945-003
Power supply		V/Ph/Hz	220~240/1/50	220~240/1/50	380~415/3/50	220~240/1/50	380~415/3/50
Nominal heating (A7/6°C,W30/35°C)	Heating power	kW	2.92~9.1	4.3~15.2	4.3~15.2	7.24~21.9	7.24~21.9
	Input power	kW	0.61~2.11	0.87~3.73	0.87~3.73	1.5~5.88	1.5~5.88
	Input current	A	2.8~9.25	4.02~16.38	1.78~6.04	6.86~30.25	2.82~9.16
	COP	W/W	4.31-5.66	4.07-5.57	4.07-5.57	3.82-5.59	3.82-5.59
Nominal heating (A7/6°C,W47/55°C)	Heating power	kW	2.99~8.16	4.25~14.55	4.25~14.55	6.36~19.45	6.36~19.45
	Input power	kW	1.03~2.92	1.45~4.28	1.45~4.28	2.15~6.85	2.15~6.85
	Input current	A	4.57~12.79	6.71~18.8	2.84~6.78	9.84~30.12	3.71~10.6
	COP	W/W	2.97-3.46	2.83-3.45	2.83-3.45	2.84-3.57	2.84-3.57
Nominal cooling (A35/24°C,W12/7°C)	Heating power	kW	1.38~5.7	3.65~11.04	3.65~11.04	4.55~17.2	4.55~17.2
	Input power	kW	0.67~2.44	1.12~3.97	1.12~3.97	1.85~7.31	1.85~7.31
	Input current	A	3.06~10.27	5.18~17.44	1.97~6.3	8.47~32.1	2.99~11.26
	EER		2,85	2,85	2,85	2,60	2,60
ERP level (Outlet water temperature of 35°C).		/	A+++	A+++	A+++	A+++	A+++
ERP level (Outlet water temperature of 55°C).			A++	A++	A++	A++	A++
SCOP(55°C)			3,85	3,84	3,84	3,84	3,85
Rated power / Maximum input power		kW	3,50	5,40	5,85	7,50	10,50
Rated current / Maximum input current		A	15,00	25,00	10,00	35,00	17,00
Refrigerant / Weight (kg)		/	R290/0.55	R290/0.9	R290/0.9	R290/1.4	R290/1.4
Nominal water flow rate		m³/h	1,00	1,80	1,80	3,00	3,00
Number of fans		/	1	1	1	2	2
Type of fan motor		/	DC inverter	DC inverter	DC inverter	DC inverter	DC inverter
Compressor		/	DC inverter	DC inverter	DC inverter	DC inverter	DC inverter
Circulation pump		/	Inverter type / Built-in	Inverter type / Built-in	Inverter type / Built-in	Inverter type / Built-in	Inverter type / Built-in
IP degree of protection		/	IPX4	IPX4	IPX4	IPX4	IPX4
Sound pressure at 2 m distance		dB(A)	35	36	38	38	39
Maximum outlet water temperature		°C	75	75	75	75	75
Water system connections		/	DN 25 (1")	DN 25 (1")	DN 25 (1")	DN 32 (1-1/4")	DN 32 (1-1/4")
Maximum water pressure drop		kPa	20	25	25	35	35
Operating temperature range (heating mode)		°C	-25	-25	-25	-25	-25
Operating temperature range (cooling mode)		°C	16~45	16~45	16~45	16~45	16~45
Dimensions without packaging (D×S×W)		mm	1187×418×805	1287×448×904	1287×448×904	1187×488×1456	1187×488×1456
Dimensions with packaging (D×S×W)		mm	1218×470×950	1320×500×1050	1320×500×1050	1218×540×1600	1218×540×1600
Weight without packaging		kg	110	134	134	195	195
Weight with packaging		kg	123	146	146	208	208

Cutting-Edge Industrial Heat Pumps PHA-50



Air source heat pumps for heating and cooling. EVI technology heat pump is specially designed for heating and cooling large buildings. With EVI technology, heat pumps can work very well at low temperatures down to -25°C.

Harness the power of free, renewable energy from the air, ensuring a sustainable and cost-effective heating and cooling solution. Achieve up to 80% energy savings compared to traditional heating systems. With a four-way valve for reverse defrost cycle, Modbus communication, built-in water pump, expansion valve, and active cooling. Cascade operation capability. Deliver a high supply temperature of up to 75°C.

Model		BLN-050TC3	
INDEX		50-050-1756-003	
Power supply		V/Ph/Hz	380~415/3/50
Nominal heating (max) (A7/6°C,W30/35°C)	Heating capacity	kW	17.56~50
	Input power	kW	2.61~12.88
	Input current	A	5.46~18.8
	COP		4.24~5.57
Nominal heating (max) (A7/6°C,W47/55°C)	Heating capacity	kW	17.95~49
	Input power	kW	3.48~17.2
	Input current	A	7.78~26.8
	COP		2.99~3.45
Nominal cooling (max) (A35/24°C,W12/7°C)	Cooling capacity	kW	10~32
	Input power	kW	3.84~13.3
	Input current	A	6.42~20.56
ERP Level Outlet water temperature 35 °C		/	A++
Rated input power		kW	19,84
Nominal input current		A	30,30
Refrigerant		/	R290
Nominal water flow rate		m³/h	8,60
Number of fans		/	1
Fan motor type		/	DC inverter
Compressor		/	DC inverter
IP Class		/	IPX4
Noise level		dB(A)	60
Maximum outlet water temperature		°C	75
Water piping connections		/	DN 40 (G 1-1/2")
Water pressure drop (max.)		kPa	65
Operating temperature range (heating mode)		°C	-25~45
Operating temperature range (cooling mode)		°C	16~45
Dimensions without packaging (L × D × H).		mm	1155*990*1880
Dimensions with packaging (L × D × H).		mm	1238*1058*2033
Net weight		kg	500
Gross weight		kg	540

PHA-R900 accessories and automation

Automation stands as a pivotal force, driving both energy efficiency and enhanced comfort within buildings. This transformative approach not only streamlines operations but also trims down operating costs while ensuring optimal thermal conditions in buildings. The advantages extend further, allowing for the integration of secondary heat sources and the establishment of cascade connections.

PHA - NANO COLOR 2

55-050-1000-000

Our room thermostat, with a color touch screen display, not only measures room temperature but also keeps an eye on humidity levels. You can also set your ideal schedule for adjusting switches between WINTER, SUMMER and COOLING modes. The thermostat displays data from various devices in the C14 system, such as heat pump controllers and air quality sensors. You can easily configure settings using the MODBUS protocol.



PHA - NANO ONE

55-050-1000-100

Our room thermostat with black and white graphic display and touch keypad features schedule setting, automatic switch between WINTER, SUMMER, COOLING modes, displays data from devices in the C14 system such as heat pump controllers, etc.



PHA - NANO ONE DELTA

55-050-1000-200

Our PHA-NANO ONE thermostat with built-in DELTA module can be installed in places where cable connection would not be possible. A DELTA converter is required to connect it to the C14 network. Radio-controlled connection eliminates cable connection.



PHA - L2

55-050-2000-000

With PHA-L2 underfloor heating controller you can control from 5 up to 20 circuits (when four controllers are combined). The controller features a cooling function and a pump or system supply boiler which can be switched at your convenience. The controller works with PHA-NANO thermostats.



PHA - R377B

55-050-2000-300

Cascade Heat Source Controller - your key to streamlined control over up to five heat pumps (or up to four in a bivalent heat source setup). The controller manages successive switching of heating stages, automatically changing the leading stage for enhanced efficiency. You can also implement heating strategies based on the dynamic weather curve or weekly schedule.



PHA - E803

55-050-3000-000

Auxiliary module for heat pump and boiler controllers used to control the mixer. You can expand PHA-R900 with two more mixers.



PHA - E1

55-050-3000-100

Expansion module - can capture one of the defined messages from the C14 network and based on it switch on or off the built-in relay.



PHA - EX4

55-050-3000-200

Expansion module - equipped with four relays, can work in manual mode - operated with PHA-NANO COLOR 2 or in automatic mode - based on one of the predefined schemes reacting to messages from the C14 network



PHA - KONWERTER DELTA

55-050-4000-000

Enables wireless communication in the C14 protocol. Simple pairing system makes it easy to use two or more converters to communicate between devices.



System antyzamroziowy PHA-SAZ/2

58-000-0000-000 DN25

58-000-0000-100 DN32

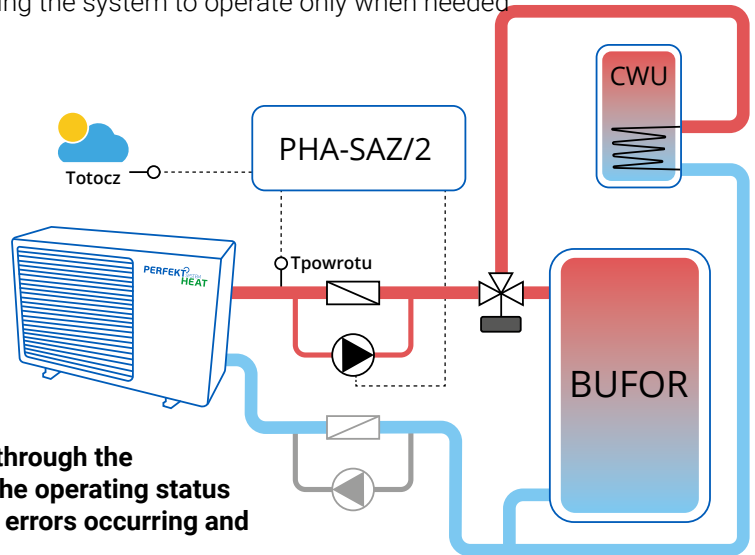
In challenging low-temperature conditions, the PHA-SAZ/2 anti-freeze system stands as a crucial element for maintaining the optimal performance and efficiency of your heat pump. The system is designed to minimize the potential of freezing in a monobloc heat pump setup by forcing water to circulate through the system. It's a proactive solution to ensure your system stays operational, even during power outages.



PHA-SAZ/2 Anti-Freeze System

Main features:

- Return temperature sensor that measures the temperature of the water flowing through the heat pump
- Heat pump ambient temperature sensor allowing the system to operate only when needed
- Pump operation algorithm allowing efficient use of the battery energy
- Controlled charging of the battery to extend its life
- External light and sound signaling device with built-in diode
- Additional alarm output
- Built-in protection and automatic tests of the device
- Possibility of quick reset of the device
- Unit works with heat pump controller

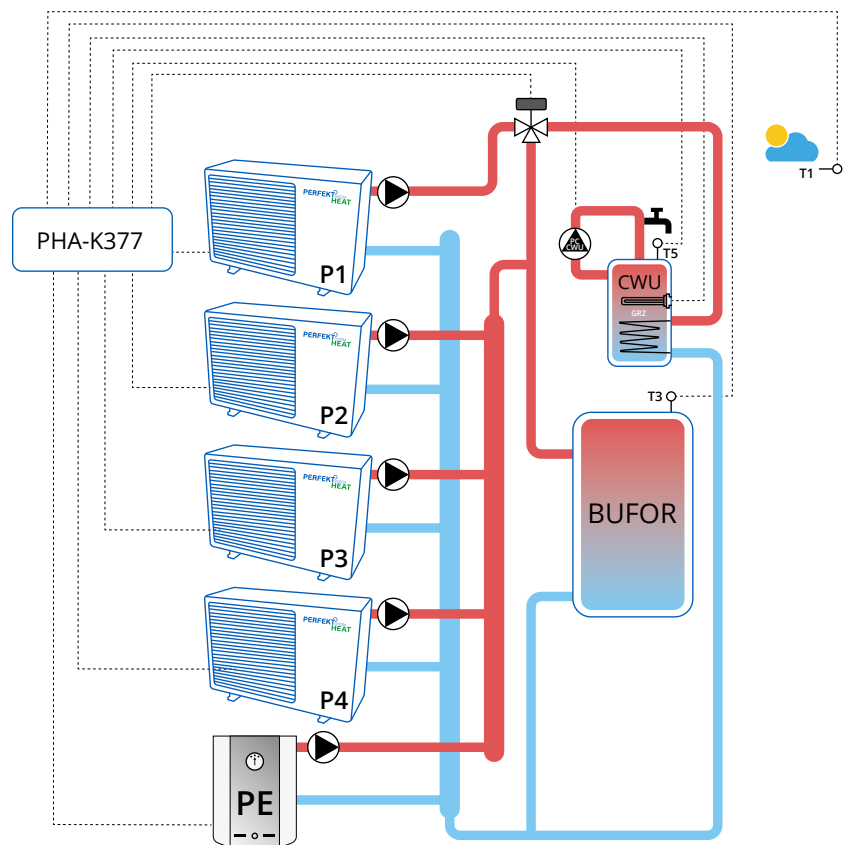


- **Perfekt System Heat PHA-R900** Connecting through the communication interface allows monitoring the operating status and parameters such as battery charge level, errors occurring and pump operation.
- All devices in the system with the Internet module work with PHA-R900 controller and PHA-NANO thermostat

Example of a schematic diagram

of cascade connection working with a second heat source

Heat pumps working in cascade and with a second heating source is an advanced system, which in this case uses four heat pumps and a second source. They provide more efficient and versatile heating and cooling



Certifications

PHA-50 **Perfekt System HEAT** pumps have the following certifications:

KEYMARK

The KEYMARK certification is not a mandatory requirement but a voluntary designation awarded by independent certification bodies in Europe. It is a widely recognized certification that confirms heat pumps' compliance with certain standards and requirements for energy efficiency and quality. Credibility and trust: the KEYMARK certification is recognized throughout Europe and is a symbol of high quality and compliance with standards. Therefore, heat pumps with this certification are seen as reliable and trustworthy by consumers and the industry.

Transparency and comparability:

The KEYMARK certification makes it possible to compare the performance and parameters of different heat pumps, making it easier for consumers to make informed choices. Standardized testing and evaluation methods ensure transparency and uniformity in the evaluation of different heat pump models.



TÜV

TÜV certification for heat pumps is confirmation that a product meets certain safety, quality and performance standards. TÜV organizations conduct tests and evaluations of heat pumps to ensure that they meet technical requirements and any industry regulations or energy efficiency laws. A TÜV-certified heat pump is of high quality, safe to use and complies with applicable industry standards. TÜV certification can cover various aspects such as electrical and mechanical safety, energy efficiency, performance under various conditions, weather resistance, etc. TÜV certification for a heat pump can be an important factor for consumers who are looking for reliable and proven heating and cooling equipment. This certification may also be required in some regions or countries as proof of meeting certain standards before a product can be marketed.



CE

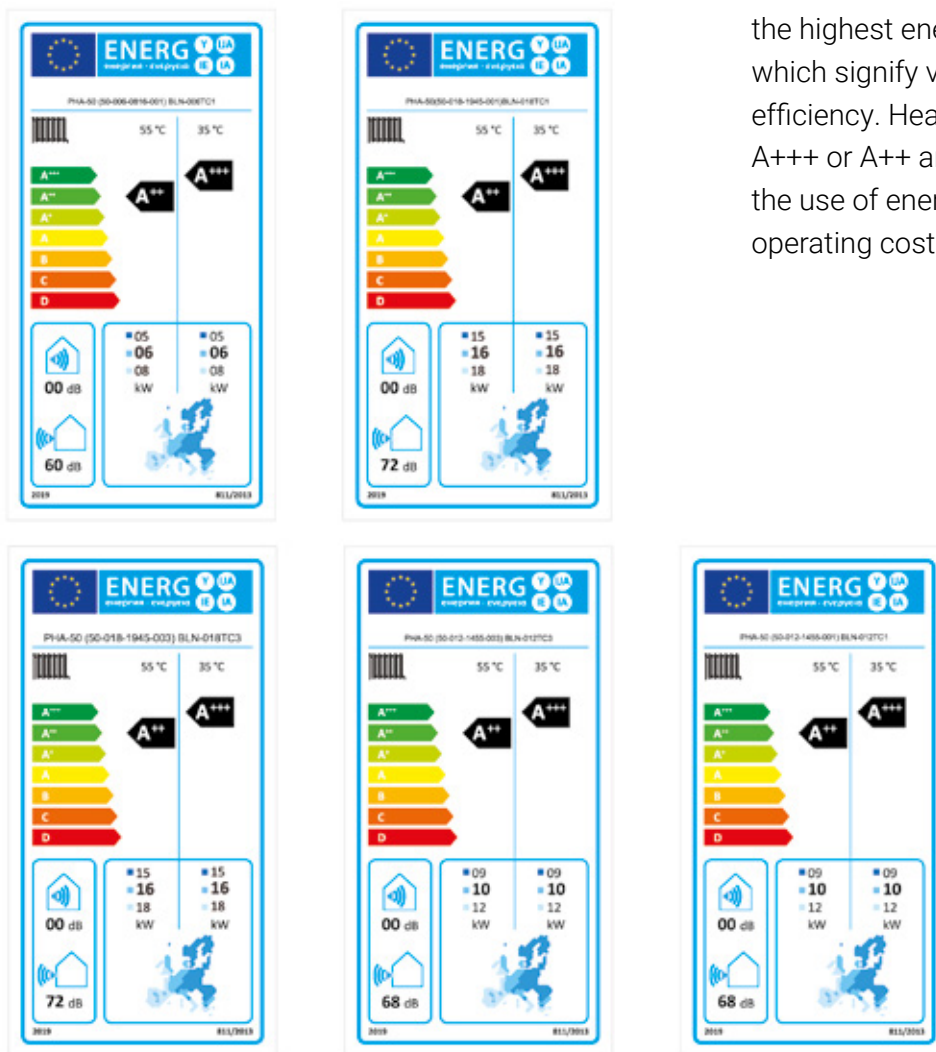
This marking confirms that a particular heat pump meets the requirements of harmonized technical standards of the European Union and can be legally marketed in EU member states. A CE mark on a heat pump means that the product has undergone a conformity assessment against the relevant European technical standards for energy efficiency, safety of use and other relevant aspects. The marking represents the manufacturer's declaration that its product meets these standards.



Acquiring the esteemed KEYMARK certification for a heat pump involves a meticulous journey through rigorous testing and evaluations to confirm that the heat pump adheres to specific technical standards, such as EN European standards. The certification confirms that the heat pump meets certain performance, quality and safety parameters

Energy class

These labels help consumers and businesses choose heat pumps that are more energy efficient and more environmentally friendly. In Europe, the energy label system for heat pumps is based on the EU Directive 813/2013 and standards EN 14825 and EN 16147. Energy classes are denoted by letters ranging from A+++ (highest energy efficiency) to D (lowest energy efficiency). Below is a general description of heat pump energy classes:



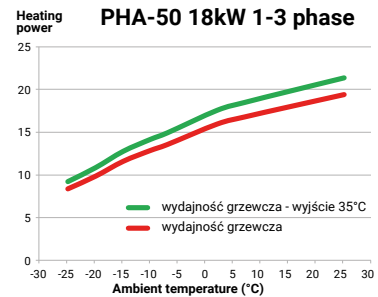
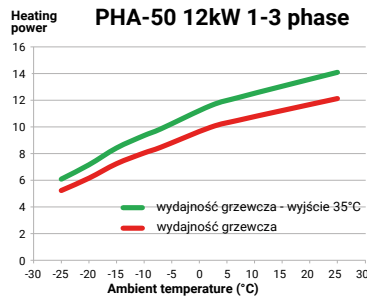
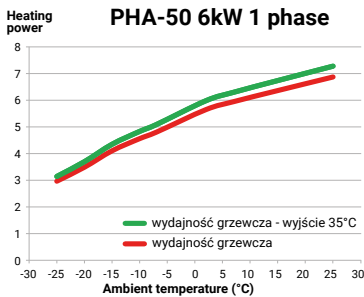
A+++ and A++: These are the highest energy classes, which signify very high energy efficiency. Heat pumps labeled A+++ or A++ are very efficient in the use of energy and have low operating costs.



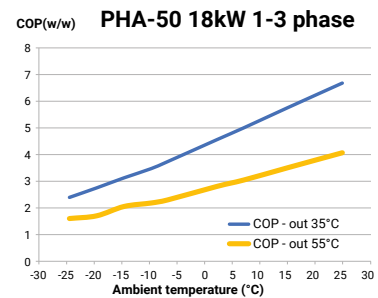
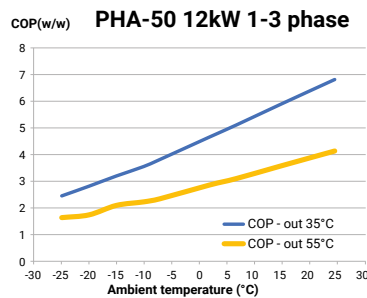
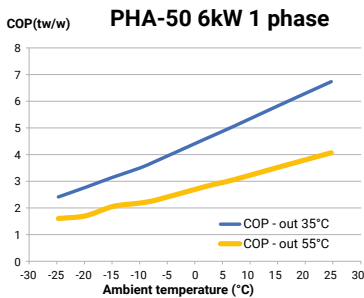
PHA-50 heat pumps on R290 are versatile and can be used in both homes and commercial buildings. They can be used for both heating and cooling, as well as for hot water production.

Performance charts

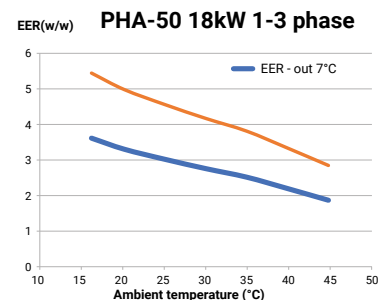
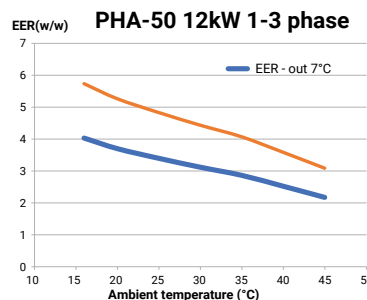
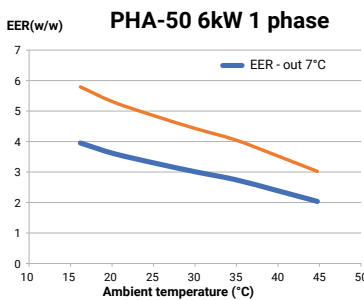
Heating power



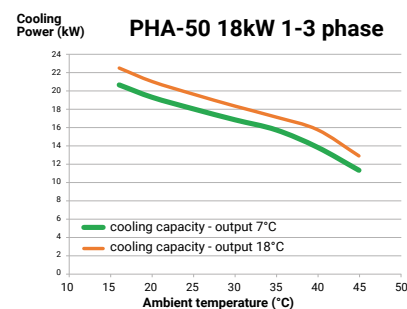
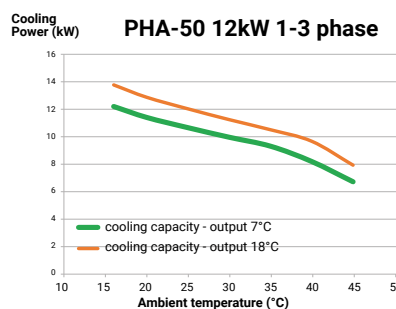
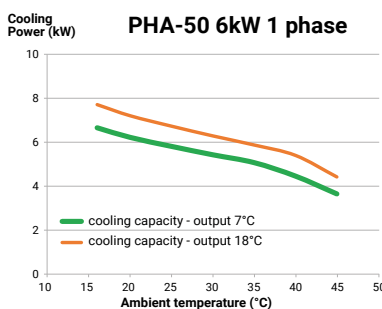
COP coefficient



EER parameter



Cooling Power

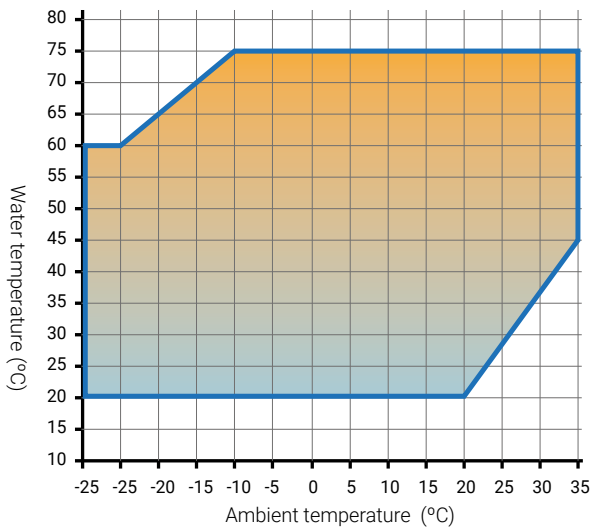


Operating envelopes

Operating envelopes refer to the temperature range in which a heat pump can operate effectively.

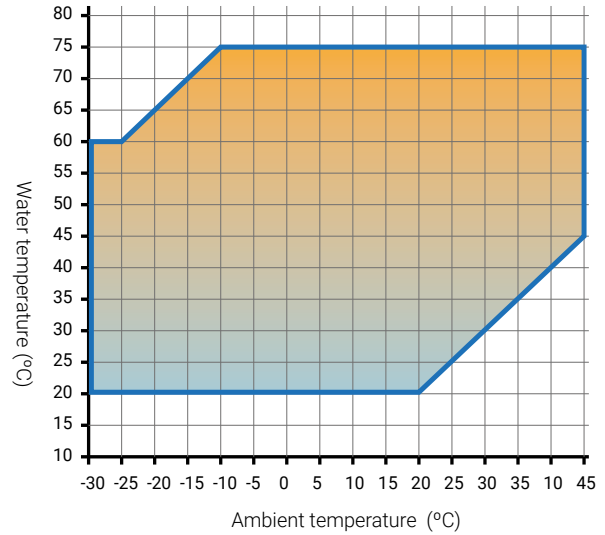
Perfekt System HEAT pumps operate within a very wide operating range, which makes it possible to reduce the use or completely eliminate the electric heater.

OPERATING RANGE - HEATING

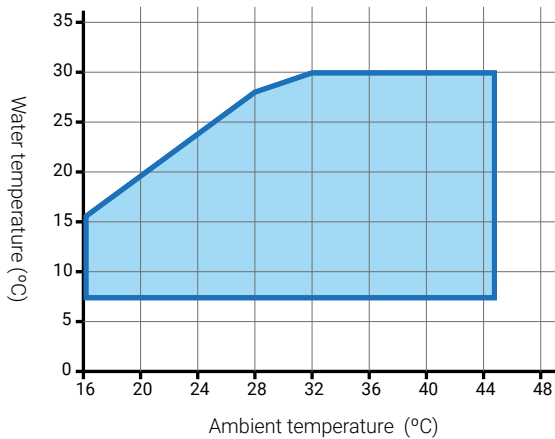


OPERATING RANGE - DHW

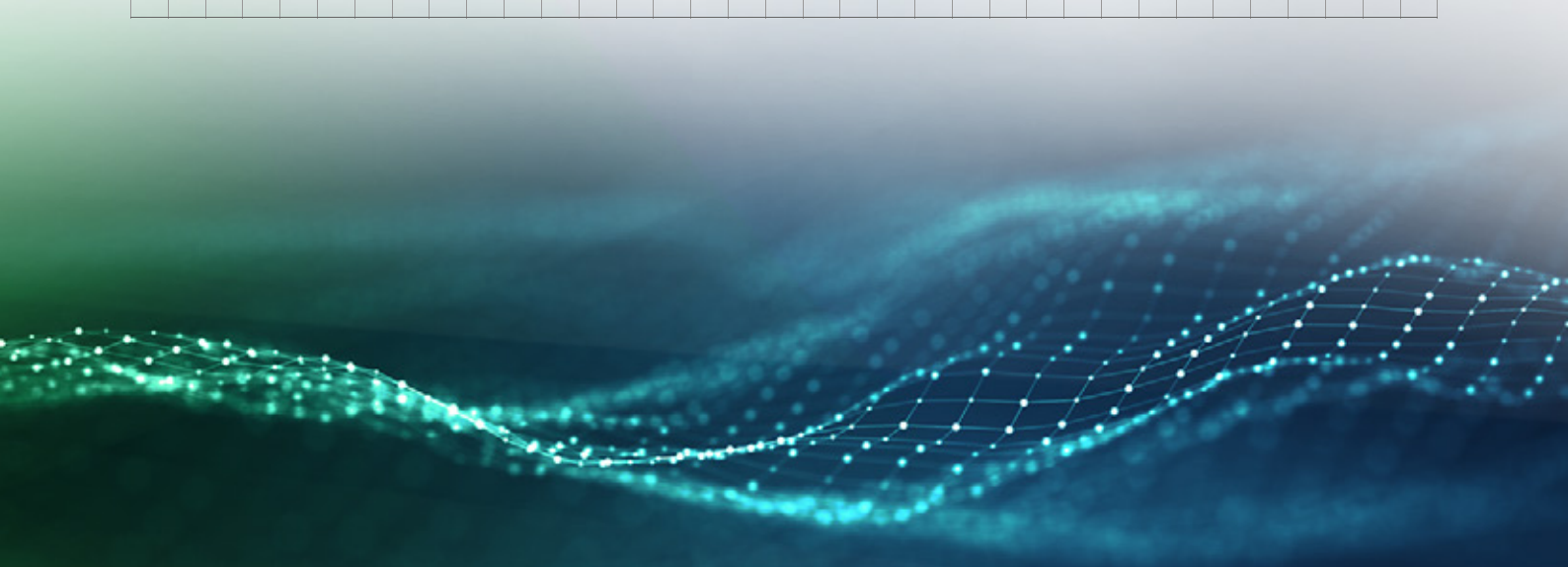
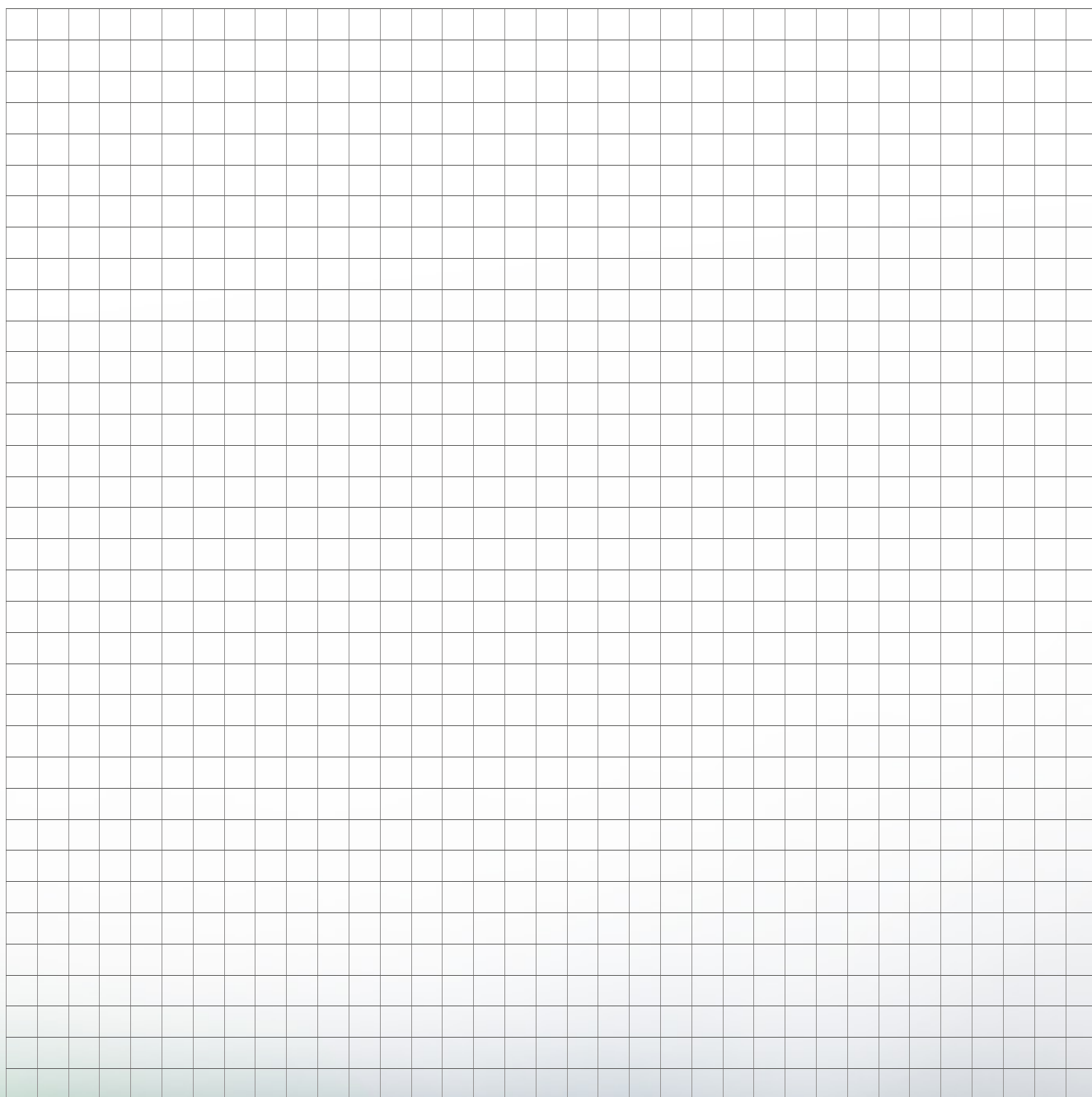
(Domestic Hot Water)



OPERATING RANGE - COOLING



Notes



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www.pompyciepla.perfexim.com.pl
Hotline: 721 21 31 21

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