

# PERFEKT<sup>?</sup> SYSTEM HEAT

PHA-50 Inverter Heat Pump  
Heating/Domestic Hot Water/ Cooling

Installation Guidelines

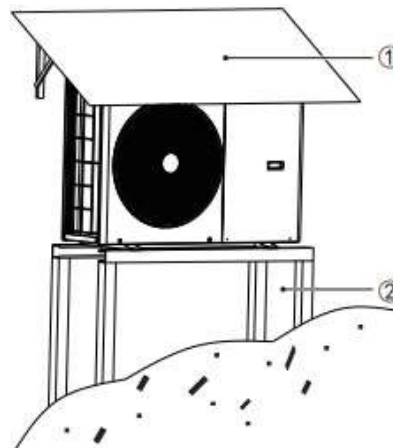
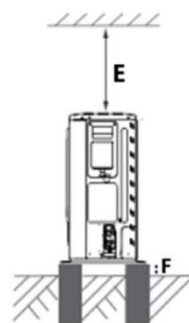
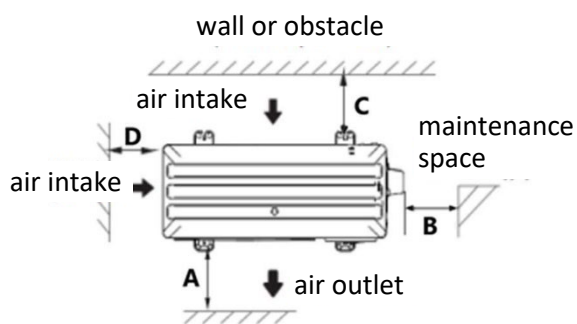


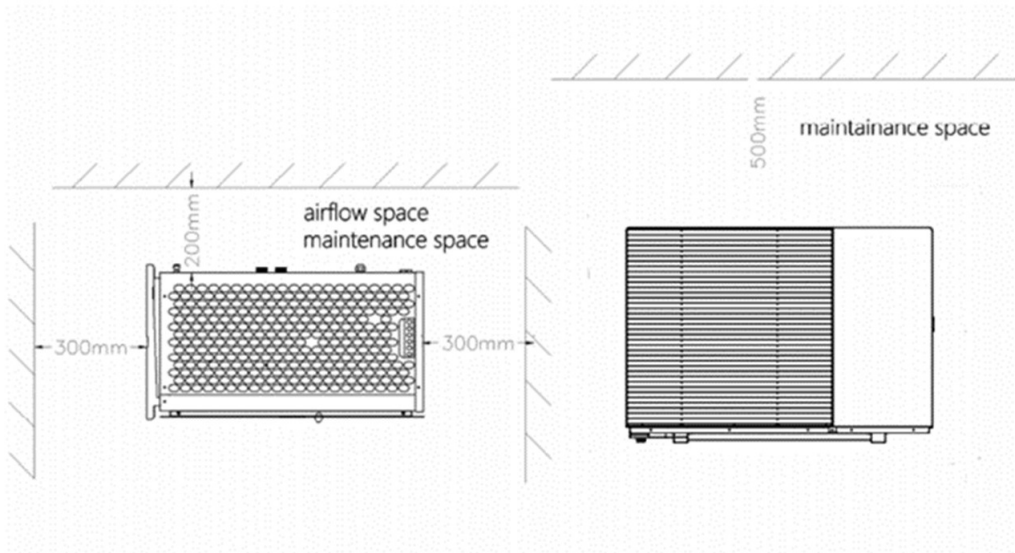
Qualifying for maximum  
subsidies in the „Clean Air“ programme.  
Suitable for installation in every building!

## HEAT PUMP INSTALLATION GUIDELINES

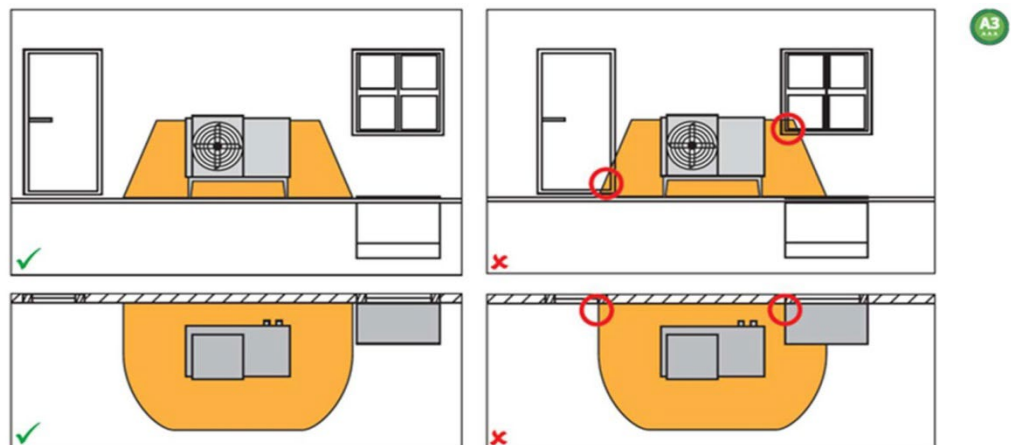
### 1. Mechanical installation – for details see installation instructions

- 1.1. The pump should be installed in a location and in a manner that ensures free air flow through the pump and access to the pump's serviceable components (approximately 1 m).
- 1.2. The pump should be fixed to a stable steel frame or concrete base.
- 1.3. The pump should be levelled in both planes.
- 1.4. Minimum installation distances are:
  - Distance from a wall ( C ) : 300mm
  - Distance from base ( F ) : 400mm
  - Air outlet from the pump ( A ) : 2000mm to a nearest obstacle
  - Distance from side air intakes ( D ) : 600mm
  - Distance on maintenance side ( B ) : 600mm
  - Distance under the canopy ( E ) : 300mm – recommended to protect the pump against heavy snowfall.





- 1.5. The heat pump shall be installed at a safe distance from openings in the building. Special precautions should be employed to prevent propane from entering the building through the water heating circuit.
- 1.6. R290 is classified as highly flammable gas with A3 rating and must be accompanied with suitable markings.
- 1.7. Use of ATEX certified pump is not obligatory but it must be suitable for use with equipment using R290 refrigerants.



Sketch: The safety sector is limiting the freedom of choice of the installation location. This limitation will restrict the use. (yellow marking – indicative, distances to be defined by manufacturer)

- 1.8. The heat pump should be placed at a minimum distance of 3 meters from plot border.
- 1.9. The heat pump should be installed on a stable base.

**2. Hydraulic installation – for details see installation instructions**

- 2.1. Hydraulic installation should be performed using exclusively materials suitable for central heating systems.

- 2.2. An additional membrane type expansion vessel should be used. The capacity of the expansion vessel is to be determined by the volume of water in the system.
- 2.3. Check valves and cut-off valves should not be installed on a line leading to the expansion vessel. For the purpose of monitoring of system pressure it is recommended to install a manometer and safety valve. Bleed valve should be installed on a highest point of the hydraulic system.
- 2.4. The table below should be used for a correct selection of the capacity of the expansion vessel. Assumed value is in the range between 5% - 8% of the volume of water in the system.

Capacity of expansion vessel (l)	Volume of water in the system (l)
4	50
8	100
10	150
12	200
15	250
20	300

- 2.5. It is recommended to use a buffer of a capacity equal to not less than 10 litres per each kilowatt of the pump's power output. Accordingly, the required minimum is 100 l, needed mainly in order to secure the pump's defrost at adequate level.
- 2.6. The water connection of the heat pump should be made using pipes of internal diameter of not less than 25mm, in a manner that ensures unobstructed flow of central heating water. Pipe diameters stated in technical documentation should be complied with.
- 2.7. Outdoor system pipes should be fitted with insulation lagging suitable for withstanding weather conditions. Recommended material is rubber lagging of wall thickness of min. 19 mm.
- 2.8. Indoor system pipes should be insulated with lagging and fixed to the walls.
- 2.9. NOTE! For new systems it is required to install a magnetic filter on the return line to the heat pump. For central heating system with steel components (radiators, steel pipes, upgrades etc.) **installation of a magnetic separator is obligatory!** Suggested model of magnetic separator is PHA-063M. Users should be trained to perform cleaning of the filter by themselves at least 1 x per month in order to protect a plate heat exchanger forming part of the pump unit. Cleaning of the filter is included in the obligations of the investor.



PHA-063M

2.10. Outdoor heat pump unit should be fitted with drain valves for servicing purposes.

2.11. Condensate drain pipe should be directed to the ground and connected to a dedicated drainage installation, or directed to an inspection chamber in a manner preventing freezing of condensate at low temperatures. It is recommended to connect the heat trace cable to the controller of the drip tray heater.

2.12. It is obligatory to install a system preventing freezing of water in the installation in case of loss of voltage in the circuit supplying the pump. Such system could be the PHA-SAZ/2 (suggested) (as shown on the photo below) or another frost protection system.

(Photo of the PHA-SAZ/2)



PHA-SAZ/2

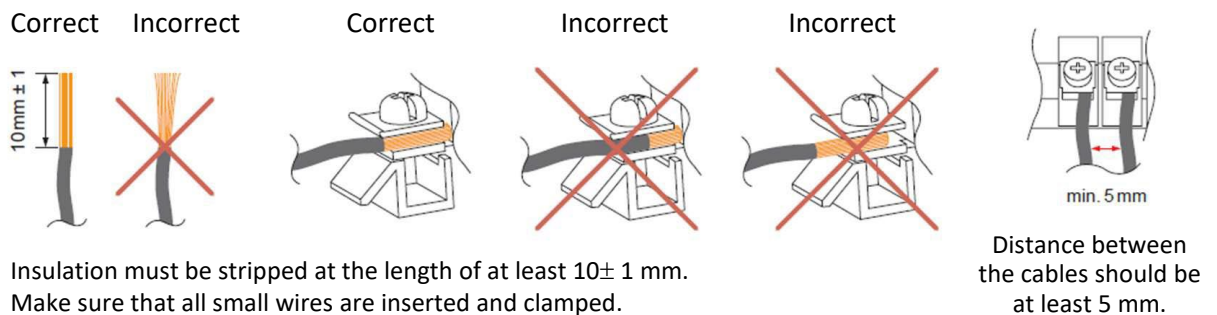
- 2.13. For new domestic hot water tanks the coil pipe should be blown with compressed air.
- 2.14. The recommendations for heat exchange surface areas for the hot water tank coil pipes, as stated in the technical documentation, should be complied with (Photos of the tank). The minimum heat exchange surface area is 1 sq. m of coil pipe for 4-5 kW of heating output.
- 2.15. When performing heat pump start-up in low ambient temperatures, please bear in mind that the temperature of return medium to the heat pump should not be lower than 16° C. Risk of freezing and damage to the pump persists.
- 2.16. Before connecting the heat pump to the existing central heating system, the existing system must be flushed.
- 2.17. Vent all the air from the central heating system.
- 2.18. It is permitted to install the heat pump in a system comprising a heat source using combustion. In such case the connection should be made via the heat exchanger.

### 3. Electrical installation:

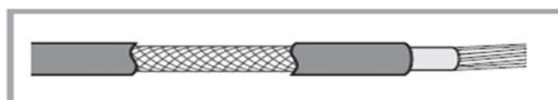
3.1. Electrical connection for the heat pump should be made with the use of cables having cross section of 4mm<sup>2</sup> or 6 mm<sup>2</sup>. Requirements for selection of cable size are given in the table below:

Component	Number of conductors 1-phase/3-phase
Power supply cables	3/5
Cables connecting pump units	4/6
Cable for 2 or 3-way valve	3
Cable to room thermostat	4
Cable to thermal switch in domestic hot water tank	2
Cable to temperature sensor in domestic hot water tank	2
Cable for external control signal	2
Cable for 3-way valve of the solar set	3
Cable for pump of the solar set	2

3.2. Once the insulation has been stripped, the copper cores of cables should be twisted before inserting and clamping of the connection in the terminal. Detailed guidelines are shown on the illustration below.



Signal cables should be screened.



If the distance between the outdoor unit of a heat pump and its indoor unit is increased, the diameter of the signal cable should also be increased. The size of power supply cable to the heat pump should be increased as well.



- 3.3. It is required to use separate electrical protective devices for heaters and to connect them to the heat pump via contactors.
- 3.4. It is required to use separate electrical protective devices for solar systems and to connect them to the heat pump via contactors.
- 3.5. It is required to use separate electrical protective devices for the second heat source and to connect it to the heat pump via contactors.
- 3.6. Requirements for electrical protective devices

c	PHA-50/50-012-1455-003/BLN-012TC3	PHA-50/50-018-1945-003 BLN-018TC3	
Power supply	380~415 V/ 1/ 50 Hz		
Maximum input current (A)	10.5	16	
Rated current of the fuse (A)	16	20	
Air Switch (mA) Overcurrent switch (mA)	30	30	
Power supply cable (mm <sup>2</sup> )	4.00	4.00	
C	PHA-50/50-006-0816-001/BLN-006TC1	PHA-50/50-012-1455-001/BLN-012TC1	PHA-50/50-018-1945-001/BLN-018TC1
Power supply	220~240 V/ 1/ 50 Hz		
Maximum input current (A)	14	25	35.50
Rated current of the fuse (A)	16	32	40
Air Switch (mA) Overcurrent switch (mA)	30	30	50
Power supply cable (mm <sup>2</sup> )	4.00	4.00	6.00

- 3.7. Each phase used requires separate overcurrent protection.
- 3.8. It is recommended to provide separate RCD for the heat pump.
- 3.9. Each heat pump requires ground connection. This applies both to the outdoor and the indoor units.



3.10. The maximum current load of the main PCB of the heat pump is 0.2A. Consequently, in order to prevent damage to the controller, circulating pumps, heaters and other components requiring current higher than 0.2A MUST be connected via contactors.

#### **4. General:**

- 4.1. If during the first start-up the ambient temperature outdoors is below +5°C power supply to the heat pump must be connected at least 2 h before first start-up.
- 4.2. It is recommended to adjust the heating system with the use of heating curve.
- 4.3. The investor should set the parameters of domestic hot water tank for superheating treatment against Legionella in line with the guidelines provided by supplier of potable water.
- 4.4. Please make sure that the user is familiar with the operating manual for pump controller.
- 4.5. Please make sure that the user is familiar with the instructions for cleaning of the filter and that the location and procedure for topping up water/pressure in the central heating system has been demonstrated to him.
- 4.6. Recommended pressure in the central heating system is shown in the technical documentation.
- 4.7. Flow resistance increases with the increase of length of piping in the water system. For example: pipe fitting 2.5 / 1 meter of 0.5 pipe – pipe cross section shall be increased after reaching of 30%
- 4.8. The investor must provide suitable connection power for the heat pump, in line with technical documentation

mail: [pc.heat@perfexim.com.pl](mailto:pc.heat@perfexim.com.pl)  
[www.pompyciepla.perfexim.com.pl](http://www.pompyciepla.perfexim.com.pl)

Info line: 721 21 31 21

Perfexim Spółka z ograniczoną  
odpowiedzialnością (Ltd.)  
ul. Samotna 2,  
61-441 Poznań

