

# Heat pump installation

## HOTJET MINI 5Ai



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## 1. Read this first!

Congratulation on your purchase of the Hotjet heat pump. To maximize the time the heat pump will work for you, you should familiarize yourself with its manual.

The heat pump is a compact unit designed for heating hot water and for heating. It is equipped with a frequency converter and adjusts the heating and cooling power output to immediate needs.

The heat source is air or brine and the heat collected from it is transferred to the water in the exchanger.

The heat pump is a product with a long lifespan and it is very safe.

We wish you a problem-free operation and thermal comfort.

### 1.1. Important notes

- ⚠ Immediately examine the condition and content of the delivery as soon as you receive the heat pump from the given shipping company. You usually have a maximum of 3 days to exercise any warranty claims related to the transport!
- ⚠ Observe the corresponding legal regulations valid in the country of the pump installation during the pump assembly, operation and maintenance.
- ⚠ Starting with a certain volume of the used coolant, the pump has to be revised for its tightness and possible coolant leakages (observing the specified procedure) in the prescribed intervals by a certified technician.
- ⚠ Always turn off electricity prior to connecting the device or removing any of its panels. Exercise maximal possible care.
- ⚠ The heat pump can be tilted during its transport and installation to a maximum gradient of 45°!
- ⚠ Never turn the heat pump on if it is not connected to a heating circuit filled with water.
- ⚠ The heat pump must never be turned on when its cover is removed or its safety elements taken out of operation.
- ⚠ Do not put your hands in the air suction and exhaust openings. You could cut your hand on the evaporator or get hurt by the ventilator! (for air/water)
- ⚠ Arbitrary handling of the heating circuit connections, heat pump and electric connections is dangerous and can result in serious injuries.
- ⚠ The pump can be serviced only by qualified service workers.
- ⚠ Do not change the device in any way and do not modify its system.

- ⚠ Do not use the device if it is mechanically damaged, falls down or is damaged in any other way.
- ⚠ Never cover the heat pump - its air intake and exhaust have to stay free of obstacles.
- ⚠ Do not install the heat pump at locations that could become flooded.
- ⚠ You should not install the heat pump near flammable liquids and vapors.
- ⚠ The pipes and compressor contain a cooling mixture under a high pressure. That is why they should not be exposed to high temperatures and rupture hazards, which can lead to burns or suffocation.
- ⚠ Water that is warmer than 52° C can cause serious burns or even death from scalding.
- ⚠ No signs, descriptions and warnings placed on the heat pump must ever be removed or covered and they should always remain visible. Replace the damaged ones by new ones.

### 1.2. What has the heat pump been design for?

Use the heat pump only for the purposes, for which it has been produced by the manufacturer.

It is absolutely necessary to comply with all technical and operation conditions specified on the corresponding technical sheets.

The above stated stipulations mean that the corresponding project documentation has to be observed, including the use of the prescribed devices!

Do not adopt any changes without consulting the project author.

Any technical changes on the device can be executed only after obtaining a written consent from HOTJET CZ, s.r.o.

### 1.3. Legal regulations

A declaration on conformity has been issued for the heat pump. The declaration includes the standards, with which it complies.

The heat pump has been designed for heating houses and apartment buildings, hotels and other accommodation facilities, offices, shops and similar work environments.

The heat pump can be operated by trained laymen, experienced and knowledgeable persons. Children and persons with limited physical, sensual and intellectual abilities or persons without the necessary knowledge and experience should use the pump only under the supervision of or in accordance with the instructions issued by a responsible person.

## 1.4. Economical operation conditions

The manner you use your heat pump has a significant impact on your operation cost. Please pay attention to the following information.

The heat pump is equipped with an intelligent regulator, correct configuration of which forms an important condition of an economical operation. The basis of an economical operation is formed by operating your heating system at the so-called equithermal temperature when the heating water temperature changes based on the outside temperature. The higher the outside temperature is, the lower the temperature of the heating water. It is a wrong idea to operate the heat pump with a constant output temperature of the heating water.

You should maintain as little difference between the source and heating water temperatures as possible. Temperature increase by 1°C increase the compressor consumption by approximately 2.5%.

The heating system should use as low of a temperature of the heating water as possible. The heat source should have a maximal possible temperature.

Operation of the heat pump with floor, wall and ceiling heating systems or fan coils is more economical, since the operation temperature is 30-40 °C.

The heating factor is reduced by dirty heat source and heating system exchangers since they increase the difference between the temperatures.

## 2. Use of the heat pump

### 2.1. Usage area

The heat pump has been designed for heating water in existing and new heating systems. Heated heating water can be used not only for heating, but also for heating process water.

During the summer months, it can also be used for cooling.

The heat pump can be used for drying humid environments.

When using air-water heat pumps for melting, the temperature of the heating water has to be at least 18 °C.

The first 2 heating seasons in new or renovated structures can have of up to 50% higher heat consumption requirements, which have to be covered by a bivalent source.

## 2.2. Operation principle

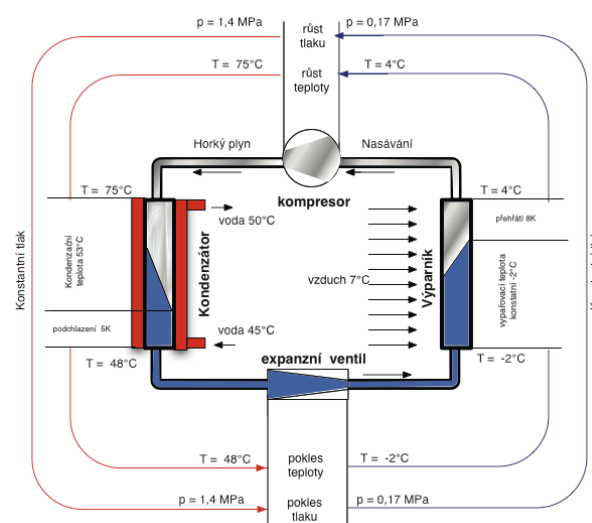
In order to work properly, the heat pump needs several main components: compressor, evaporator, expansion valve, condenser. There are many more components, however, the heat pump will not work without the above mentioned ones.

The compressor, driven by electricity, compresses the coolant, upon which the pressure and temperature increase. The heated coolant passes through the condenser, where it passes its heat to the heating water and condensates into a liquid. The liquid enters the expansion valve where the temperature and pressure rapidly drop. The coolant flows to the evaporator, where it evaporates and cools down the heat source - air or water. Subsequently, it enters the compressor and the cycle is repeated.

Consumption during operation can be reduced by collecting heat from a "cold environment" and "transforming" it to a higher temperature. Energy collected in this manner is free. Operation expenses are related to the consumption of the compressor and other electric parts - regulation, circulation pumps, ventilator, etc... The ratio between the collected and consumed electric energy is variable. It is called the heating factor (COP) and its value is, depending on the given conditions, within the following range: 1.5-6.

During the heating mode, the energy is collected from the outside environment and transferred to the heating water. During the cooling mode, the system works in reverse, i.e. heat is collected from the heating water and discharged to the outside environment or recuperated and utilized at a location where heating is required at the given moment.

The picture shows a simplified cooling circuit with a sample temperature and pressure characteristics of the coolant, heat source and heating site at various locations of the cooling circuit.





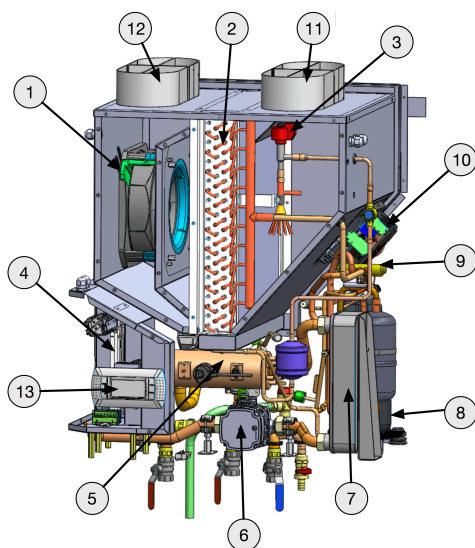
### 3. Content of the delivery

- ¥ Heat pump in a cardboard box
- ¥ Assembly template
- ¥ Accompanying documentation
- ¥ Accessories pursuant to the given order

#### 3.1. Heat pump

The heat pump is delivered fully filled with the coolant and oil.

The heat pump block with its internal control box contains the following main components.



position	description
1	Radial ventilator
2	Evaporator
3	Expansion valve
4	Box with the control system
5	Electric cartridge with a pressure and thermal fuse
6	Circulation pump with a 3-way valve
7	Panel condenser
8	Compressor (DC inverter or ON/OFF)
9	Four-way valve
10	Electronics of the frequency converter
11	Drawn air flange
12	Discharged air flange
13	pGD1 control panel

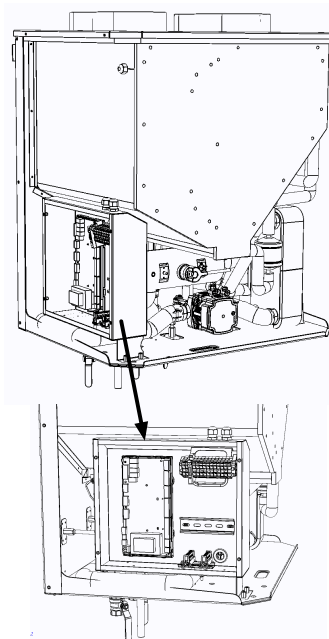
Other components: bleeding and discharging valve,

The cooling circuit of the compact heat pump is hermetically closed and includes the R410A fluoridated coolant, registered by the Kyoto Protocol. The coolant GWP is: 2088. The coolant does not contain Freon (CFC) and it is inflammable.

Coolant can be handled only by appropriately qualified persons

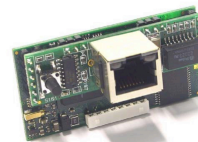
### 4. Control box with regulation

The control box with regulation is a covered, sheet metal box, equipped with regulation for the heat pump and heating system control. A particular diagram of a switchboard connection forms a part of the delivered heat pump documentation.



### 5. Accessories

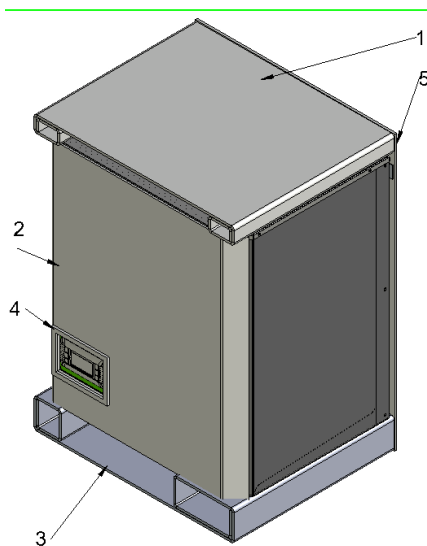
Součásti dodávky tepelného čerpadla může být následující různé příslušenství:



name	description
	exterior equithermal regulation sensor
Carel TH tune	spatial instrument
pCOWeb	Remote monitoring and control
	Air-conditioning and ventilation system building blocks

### 6. Transport and storage

The heat pump is delivered in a cardboard box on a pallet. Optional accessories can be delivered packed separately.



## 6.1. Transport

Heat pumps are normally sent to their installation addresses utilizing the services of hauling companies. All trucks that deliver the heat pumps should be equipped with a hydraulic panel for easy unloading and with a pallet cart for transporting the pump along a given flat surface to, for example, a garage.

The cardboard box and the wooden pallet should be recycled or returned to the manufacturer.

The heat pump should never be stored or installed on its side. The maximal permitted tilting angle in any direction is 45°. It is recommended to transport the pump in the upright position.

Not complying with these instructions can result in damages to the heat pump.

When you receive your heat pump, unpack it, disassemble the cover panels and make sure no damages have occurred during the pump transport. Report any discovered damages to the given hauling company and request their examination. Send a copy of the report to HOTJET CZ, s. r. o.

Once you receive the pump at the given delivery address, use (if possible) a pallet cart for transporting the heat pump to its final location.

## 6.2. Storage

**⚠ Warning:** the defect responsibility period starts running 2 months after the pump is put in storage.

When the storage period is longer than 6 months, the cooling circuit should be inspected prior to putting the pump into operation by the manufacturer or authorized technician.

**⚠** If you disconnect the heat pump from the heating system or electricity, it needs to be stored at temperatures that are higher than 0 °C in order to prevent freezing of residual water in the hydraulic circuit of the heat pump.

## 7. Installation

### 7.1. Installation location

Air-water thermal pumps need to be installed inside of a building - basement, garage, technical room, hallway or apartment.

The installation location has to have a temperature >0 °C year-round.

It needs to be suspended on a vertical, dry wall where it cannot be hit by splashing or dripping water.

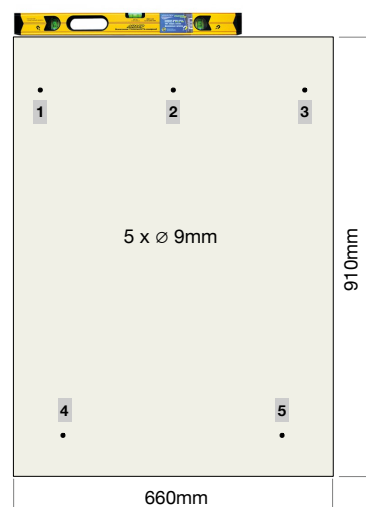
Make sure the given building structure has a sufficient load bearing capacity.

Do not install your thermal pump at locations with flammable substances, pollution sources, dirt and fallen leaves.

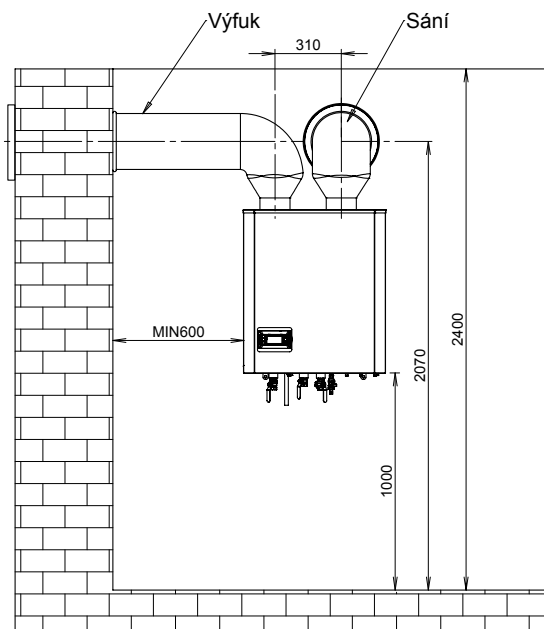
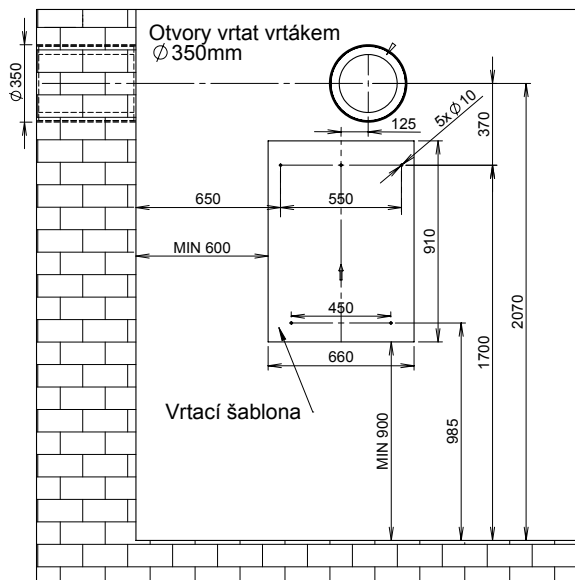
Your thermal pump should be installed at a location with a sufficient space and good ventilation.

You need to remember you will need extra space for connecting the heating circuit and electric power supply.

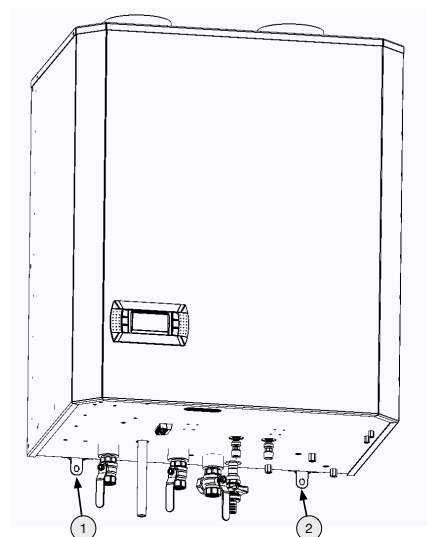
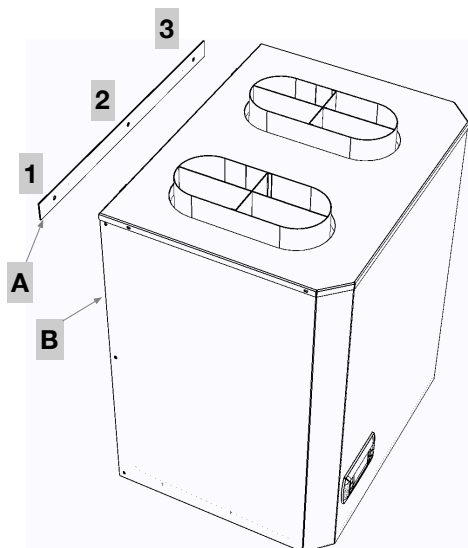
### 7.2. Wall installation



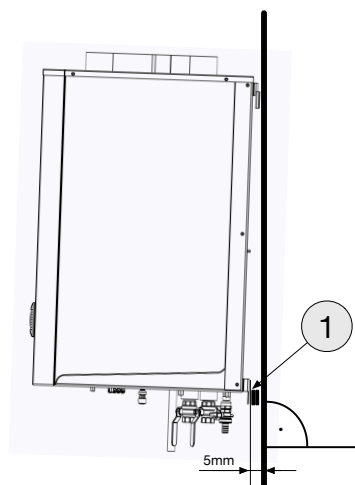
- ⚠ When installing your heat pump on a wall, use the supplied template and drill 5 holes.
- ⚠ The depth, bolts and wall plugs should be selected based on the given wall type
- ⚠ First of all, prepare all holes and openings, including those for the air vents, and install air bushings! You can thus prevent dirt and waste from entering the air-ventilation system of the heat pump.



- Fasten the upper suspension lath "A" using three bolts 1-3.
- Suspend heat pump "B" on the lath.



There are eyes 1 and 2 at its bottom part for possible anchoring of your heat pump to the bottom holes in the wall. Anchoring is



not necessary since the heat pump is sufficiently stable due to its weight.

The heat pump has to be slightly slanted (about a 1% gradient) with its bottom edge being slightly forward (approximately by 5 mm) in order to direct the condensate from the evaporator towards the wall.

Make sure the wall is perpendicular and underlay the bottom anchoring eyes with the necessary number of distance rubber washers or other material.

name	description
1	Rectification rubber washers (included in the delivery)

## 7.3. Air intake and exhaust

The heat pump has been primarily designed for being used with air, which is drawn from the outdoor environment, after which it is exhausted out again.

The heat pump can be installed in enclosed areas without air exchange only when appropriate calculations show that the given space is sufficient with regard to the air volume, temperature, etc. When the heat pump runs in the heating mode, such areas will be cooled and dehumidified. In the cooling mode, the space will be heated.

Installation of the internal unit in areas with a humidity greater than 50% at temperatures around 20 °C can cause local condensation at the outer side of the pump cover or in the air vents due to excessive cooling. In this case, it can be suitable to install additional external or internal cover insulation at the condensation location.

It is not possible to ensure a 100% air tightness because of the excess pressure in the air exhaust parts past the ventilator.

Waste air from buildings for raising livestock or sewerage systems cannot be drawn into the evaporator since aggressive vapors (such as ammonia) could damage it.

**!** When the pump is installed in areas with combustion devices and the air is drawn from the given areas, an air intake from the outside with a sufficient cross-section has to be implemented. Some unavoidable leaks can exist at the air suction locations. They can create dangerous negative pressures! Consult such an implementation with a project engineer.

## 7.4. Air vents

Special air vent hoses are installed for air conduction. They are insulated in order to eliminate condensation of the air humidity on its surface as much as possible.

When the installed air vents are made of solid materials (sheet metal air vents), transfer of the vibrations into the given building structure has to be eliminated by installing flexible collars (or similar aids). Moreover, a sufficient thermal and vapor-resistant insulation of the pipe surfaces has to be implemented.

For air intakes and exhausts, we deliver insulated air hoses with an internal diameter of 250 mm, which have the same perimeter as the oval necks for air intake and exhaust.

If other material is used, the given minimal cross-section in the equivalent of circular pipes with a diameter of 0.25 m has to be ensured, i.e. 0.049 m<sup>2</sup>.

Wall bushings can be of any shape, provided the minimal cross-section is observed. Rectangular bushings are then used for adaptation to a circle or oval, to which the standard connecting hose with a minimal diameter of 250 mm can be connected.

The wall bushings have to be insulated, thus preventing freezing of the wall and water condensation. We recommend to use at least EPDM rubber with a thickness of 20 mm

## 7.5. Noise and vibrations

Do not install heat pumps on bedroom walls.

Connect the heat pump to the heating system using flexible hoses or bellows.

The faster the compressor and ventilator rotations, the louder the noise is.

Resonances can occur at some operation frequencies.

## 7.6. Load bearing capacity of the structure

When installing your heat pump on higher floors (i.e. not on the ground floor), attic or roof, verify that the given building structure has a sufficient load bearing capacity.

Any installation on a wooden structure should be carefully assessed since it could result in the transmission of vibrations

## 7.7. Condensate discharge

**!** In order to ensure a proper discharge of the condensate, the heat pump has to be installed in the vertical position, with a slightly slanted bottom edge from the wall, as it is described in Chapter 7.1, Wall Installation. Not complying with these conditions can lead to uncontrolled leaks of the condensate.

50 l of condensate (or even more) can be created on a daily basis as a result of the pump operation. If discharge of the condensate is not addressed, this condensate can cause the building to become waterlogged.

The heat pump is manufactured with a heated waste basin for catching the condensate from the evaporator.

The condensate flows through the hose in the bottom of the heat pump. Extend the hose and connect it to the sewerage system. The minimal slant of the hose horizontal line is 3%.

Use a hose with a greater diameter for the extension than the one on the heat pump. Do not reduce the diameter of the output condensate pipe!

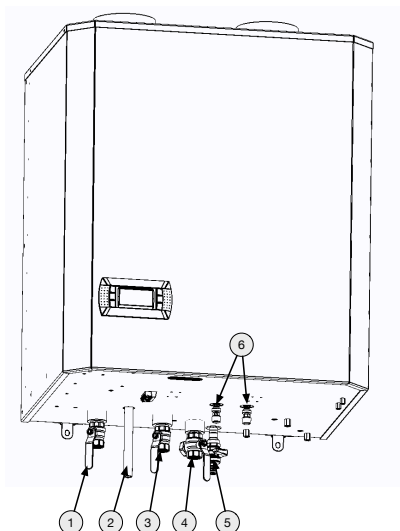
The condensate hose inside of the heat pump is equipped with a sink trap.

The greatest condensate quantity is discharged when the heat pump is being melted. It can be up to 3 l of the condensate in just 3 minutes. This volume has to be taken into consideration when determining the capacity of additionally installed pumps for discharging the condensate and catchment reservoirs.

If the condensate discharge passes through an exterior environment or locations, temperature of which <0 °C, the condensate discharge in these areas will have to be heated using a heating cable.

**⚠ Warning:** Condensation on the heat pump cover can occur even at temperatures that are above freezing as a result of cooling of the air that passes through the heat pump. This condensate can uncontrollably drip under the heat pump.

## 7.8. Connection to a heating system



position	description
1	Water output from the heat pump to the heating system
2	Condensate discharge hose and safety valve lead
3	Heating water output to the hot water heating system
4	Output from the heating system and drawback from the hot water heating system
5	Discharge valve
6	Bleeding valves of the panel exchanger and electric cartridges

**⚠** Heat pump Hotjet MINI 5Wi is normally equipped with internal circulation pump Grundfos UPM3 25-70 or another circulation pump with similar parameters.

**⚠** Install a heating filter at the heat pump water inlet. Inspect and clean it on a regular basis.

The heater connections are furnished with a 3/4" outer thread. Implement the connections using hoses or bellows in order to reduce vibration and noise transmission.

In order to ensure tightness of the connections, use flat sealing and tighten the cap nut on the hose using the appropriate wrench.

Prior to connecting the heat pump to the heating system, the system should be flushed and any dirt, sealing residues, etc. removed. Any dirt in the panel exchanger can cause defects.

Prior to starting the pump, the heating system has to be filled, bled and pressure tested.

Moreover, you should also thoroughly insulate the pipe elbows and valves. When cooling is used, the pipe insulation has to be impervious to vapor.

For heating systems equipped with closable elements, such as thermostatic heads, a minimal water flow through the heat pump specified in the corresponding technical sheet has to be ensured.

For systems with radiators, you need to dismount some of the thermostatic heads.

The minimal circulation water volume in the heating system has to be 15-20 l of water per 1 kW of the heat pump power output. This rule does not apply to across-the-board systems, for which the water volume can be lower.

A stable flow rate through the heat pump and compliance with the minimal volume of the circulating water rule can be also achieved by installing a compensatory reservoir, connected as a torus.

Lower or no flow through the heat pump can lead to heat pump operation malfunctions and, in extreme cases, to freezing of the condenser and destruction of the heat pump

## 7.9. Safety valve

The safety valve shares the discharge lead with the condensate waste on the bottom side of the heat pump. If the pressure in the system is exceeded, water or steam can start leaking.

You must not handle the safety valve during operation.

The safety valve must not be used for draining the system. The warranty does not apply to valves clogged with dirt from the heating system.

Should the pressure in the heating system be repeatedly lost, it could signal a defect of the safety valve.

## 7.10. Protection against freezing

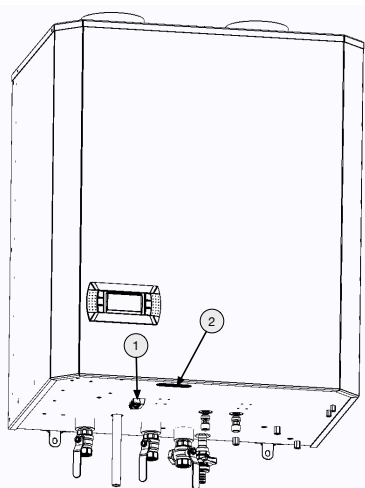
When the heat pump is completely installed and connected to a given power supply, the regulation system monitors the temperature in the heat pump condensate and if it drops low, it starts the circulation pump, thus allowing the water from the heating system to heat the circuit to the heat pump.

### Installation without service personnel present

This installation method applies to, for example, cottages and cabins where one cannot detect electricity outages. For these installations, we recommend to fill the entire system with an antifreeze mixture (-10 °C).

## 8. Electric connection

**⚠ CONNECTING BLOCK.** A CABLES CAN DIFFER BASED ON THEIR DESIGN



position	description
1	System connecting block
2	Bushing for the electric installation

⚠ ⚠ **The heat pump is connected based on the electric diagram, which forms a part of the delivery from the manufacturer.**

⚠ ⚠ Connection of the heat pump to any given building distribution network is subject to approval by the given electric energy supplier.

⚠ ⚠ The necessary capacity of the main building circuit breaker has to be assessed from the perspective of the selected heat pump and other appliances (such as electric bivalence).

⚠ ⚠ All electric-installation works have to be conducted pursuant to the valid standards and regulations.

⚠ ⚠ These works can be conducted only by appropriately trained workers - authorized persons with the necessary qualification.

⚠ ⚠ The manufacturer is not responsible for damages caused by modifications of the heat pump electric installation.

⚠ The control switchboard of the heat pump is not furnished with a main switch. It is expected that such a main switch will form a part of the given secured power lead.

⚠ In order to connect the heat pump to electricity, the following elements have to be brought to the installation location:

⚠ Heat pump with the 3 kW bivalent source is connected using a CYKY 5x2.5 cable and secured by a 16 A circuit breaker

⚠ The heat pump control by HDO signals is implemented using the same cable that is used for powering it.

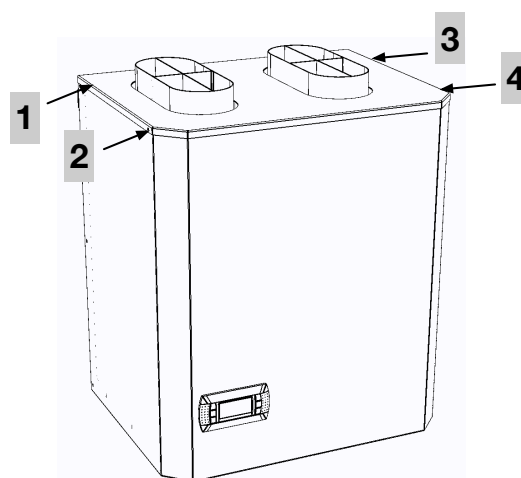
⚠ The heating circuit control signals (signal from spatial thermostats, temperature sensors, ...) are sent via a SYKFY 2x2x0.5 cable or via another suitable equivalent.

⚠ Signals for control members (circulation pumps, 3CV, ...) are sent via a CYSY 3x1 cable or via another suitable equivalent.

⚠

## 9. Disassembly of the heat pump cover

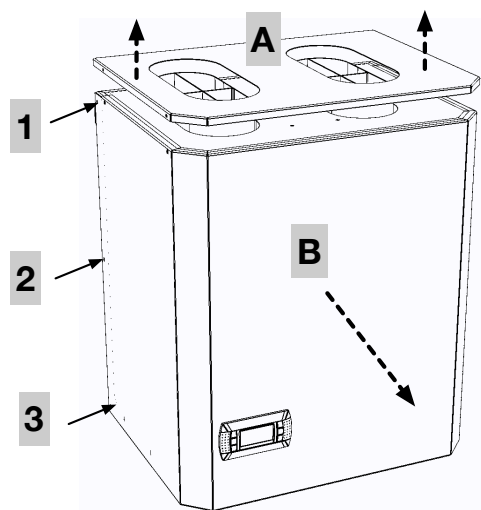
Dismount bolts 1-4



Lift cover A in the direction of the arrows.

Dismount 3 bolts 1-3 on the left side of the cover and 3 bolts on the right side of the cover.

Slide out panel "B" in the direction of the arrow.



## 10. Putting the heat pump into operation

- The heat pump can be put into operation by an authorized technician only.
- In order to ensure long-term, safe and economical operation of the heat pump, you have to observe the manufacturer's technical conditions and to install it in accordance with the given project.



- The installation company that supplies the heat pump to the customer is responsible for the installation and for organizational and overall quality of the work

## 10.1. Preparation for putting into operation

**Prior to putting the heat pump into operation, you need to execute and inspect the following steps:**

Installation and assembly of the heat pump have been executed in accordance with the project and instructions included in this documentation.

All prescribed heating system tests have been conducted. As a minimum, they include flushing and pressure and distance tests.

Prior to putting the device into operation, the heating system has to be filled and bled. The heat pump filling and bleeding procedure is described in the following chapter.

The quality of the heating water complies with the specification of the given national standards (for example, for the Czech Republic: ČSN EN 07 74 01, Table 1).

All valves that could reduce the heating water flow rate in the heating system have to be open.

The air suction and exhaust location has to be free.

Discharge of the condensate has to be ensured.

All weak-current and high-current cables, including MaR cables, have to be connected.

A revision report for the electric connection of the heat pump and its accessories has been prepared.

Configuration of the heat pump regulation has to be adjusted based on the given heating system and in compliance with the operation instructions.

## 10.2. Heating system filling procedure

When the heating system is being filled, the heat pump has to be disconnected from electricity. Fill it slowly, thus allowing the present air to escape through the corresponding bleeding valves. The water quality has to comply with the given standard. It has to be clear, colorless and without any ingredients and suspended substances, oil and chemical additives. Should its pH < 7 or > 9 and should its hardness > 3.5 mval/l (> 1.75 mmol/l; > 9.8 °dH), adjust the water acidity and hardness by suitable additives.

### Filling procedure:

- Inspect and configure the pressure in the expansion container in accordance with the prescribed static pressure in the heating system. The expansion container does not form a part of the heat pump delivery.

- Open the left bleeding valve on the bottom side of the heat pump. The valve is manual. Close it as soon as water starts flowing from it. If needed, you can also open the right valve.
- Open the heating system filling valve and monitor the increasing pressure on the installed manometer. The target pressure is between 1.0 and 1.5 bar.
- Bleed the heating system by starting the circulation pump. No noise of the flowing air bubbles should be heard from the heating system. Increase the system pressure as needed.
- Inspect all filters in the system after the filling procedure is completed.

Manual startup of the internal circulation pump for bleeding purposes. The circulation pump has to be set at its maximal power output (see the circulation pump documentation):

*Menu:*

**G. Service ← F: Manual Mangement**

*Row:*

**NO4 Primary pump: Manual operation of the circulation pump: 1:MAN**

0: AUT

1: MAN

After bleeding, return the parameter to the following value: 0: AUT (!!!)

## 10.3. Putting the heat pump into operation

**⚠ Warning:** When the outdoor temperature is below 10 °C and the heating water temperature drops below 19 °C, the Mini Air 5i air-water heat pump can return errors when the pump is being put into operation due to the low water temperature in the heating circuit. In this case, you have to increase the water temperature in the heating system using another heat source, such as the built-in electric boiler.

## 11. Regular maintenance

Correct maintenance is very important for ensuring as economical operation as possible and as long lifespan of the heat pump as possible. The following points should be used as a general guideline. Particular maintenance requirements should be always consulted with the given installation company.

Do not place any objects on the upper cover of the device.

The evaporator should be cleaned at least twice a year and anytime it is visible dirty. Dirty evaporator reduces the operation efficiency. Outer surfaces of the heat pump can be washed with a sponge and warm soapy water. Do not use bleaches, abrasives or solvents that could damage the device surfaces. The cleaning agents should not contain acids, sodium or chlorides. Make sure water does not come into contact with the electric parts.

When the temperature is below freezing, regularly inspect your exterior unit, making sure there is not too much of rime or ice under the pump. Snowing and heavy winds can clog the evaporator inlets. Ice and snow have to be removed.

#### Filters:

The heat pump heating circuit is equipped with filters that can become clogged. Inspect their cleanliness at least twice a year. Close the closest valves in front and beyond the filter, remove the sieve and clean it. Once you reinstall the filters, bleed the heating system and add water to the heating system.

#### Warning:


The Mini Air 5Ai heat pump includes a ventilator that can start running anytime when the heat pump is under power.

Turn it off, disconnected it from electricity and wait until the ventilator stops prior to conducting maintenance on the evaporator part of the heat pump and around the ventilator.

#### Draining the pump when it is shut down:

Should the heat pump be out of operation for a longer period of time or should it be disconnected from the power, drain the water from it. You will thus prevent freezing problems that you could experience when the power is off.

To drain the heating system, use the valve designated for this purpose. In order to completely drain the heat pump after it has been disconnected from power, use the discharge valve on the bottom side (no. 5).

 **Warning:** Water drained from the heat pump can be hot, which could represent a burning hazard.

#### Warning:

If the heat pump does not start and does not heat, consult the situation with your installation company.

The heat pump cover should be removed only by qualified workers.

### 11.1. Inspection prior to the heating season

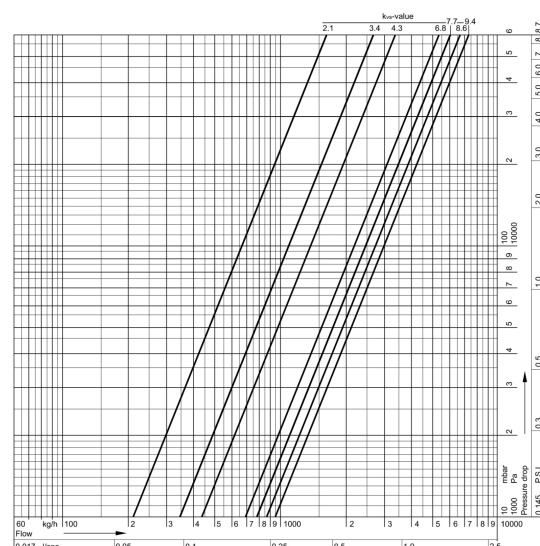
A competent service technician should conduct the following inspection steps:

#### Inspection of the electric installation:

Inspect the condition of the electric installation connections prior to the heating season.

#### Heating system:

HOTJET CZ s.r.o.



The functionality of the heating system has to be inspected prior to the heating season.

## 12. Defects and how to locate them

#### Warning

Any work on the heat pump can be conducted only by authorized and qualified service technicians.

¥ The Mini Air 5i heat pump is a high-quality product that has been designed exclusively for a service-free operation.

¥ Should a malfunction occur, it is displayed on the heat pump display or on the remote access website.

¥ Some operation stops and subsequent error messages are related to reaching the limits of the compressor's operation containment. Their occurrence can be change by appropriate regulation adjustments.

¥ When the service key is displayed, it does not signal a defect. It is displayed for informative purposes only and it has no impact on the heat pump operation.

¥ Most defects are related to insufficient heating water flow caused by the closed circuit, air in the system or dysfunction of the circulation pump.

¥ A list of the error messages, including their most common causes, is included in the corresponding chapter of the regulation manual.

¥ If you are not able to correct a defect yourself, contact a service technician.

## 13. Disassembly and liquidation

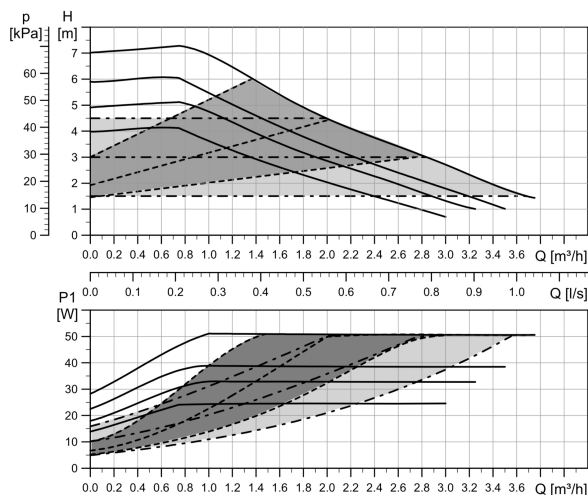
Liquidation of the device should be entrusted to a professional cooling company or to the manufacturer. The product includes certain media (coolant, oil), which have to be liquidated in the prescribed manner.

Close all incoming valves and disconnect them from power prior to disassembling the heat pump.

## 14. Circulation pump parameters

Grundfos UPM3 25-70 HYBRID circulation pump is integrated in the heat pump. This circulation pump is not controlled and it is set at the MAX capacity, thus allowing for conducting bleeding of the system.

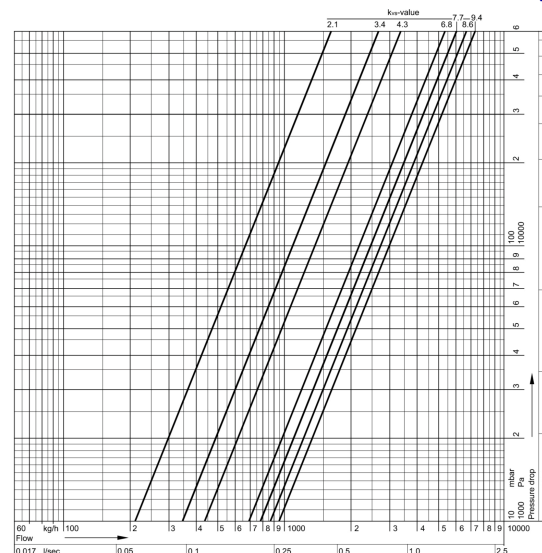
A different operation mode can be set for the pump standard operation based on the given circulation pump documentation .



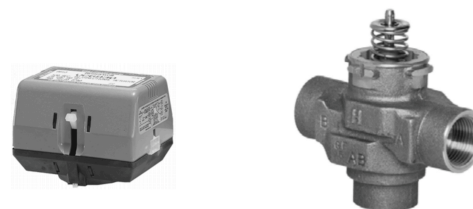
Model	Grundfos UPM3 25-70 Hybrid
Power supply	1-230V, 50/60Hz
Energy class	A
Maximal power input	52 W
Maximal displacement	7 m
Minimal input pressure	0.5 bar at 95 °C
Range of the liquid temperatures	+2 °C to 110 °C
Complies with ecodesign	2015

## 15. Parameters of the 3-way valve

A three-way Honeywell valve for switching the hot water heating is integrated to the heat pump. Its drive has been designed for 230 V and Kvs = 7.7.



Request the corresponding documentation from the valve manufacturer for more information



## 16. Built-in electric boiler

An electric boiler with an automatic startup mechanism forms a built-in part of the heat pump. It is used as a backup source and power output addition in cases when the heat pump is not able to supply a sufficient volume of heat on its own.

The electric boiler is started if a given required temperature is not achieved within the specified time.

## 17. Hydraulic integration

Basic diagram of the heat pump connection to a direct heating circuit. Controlling spatial temperature using a spatial thermostat ON/OFF.

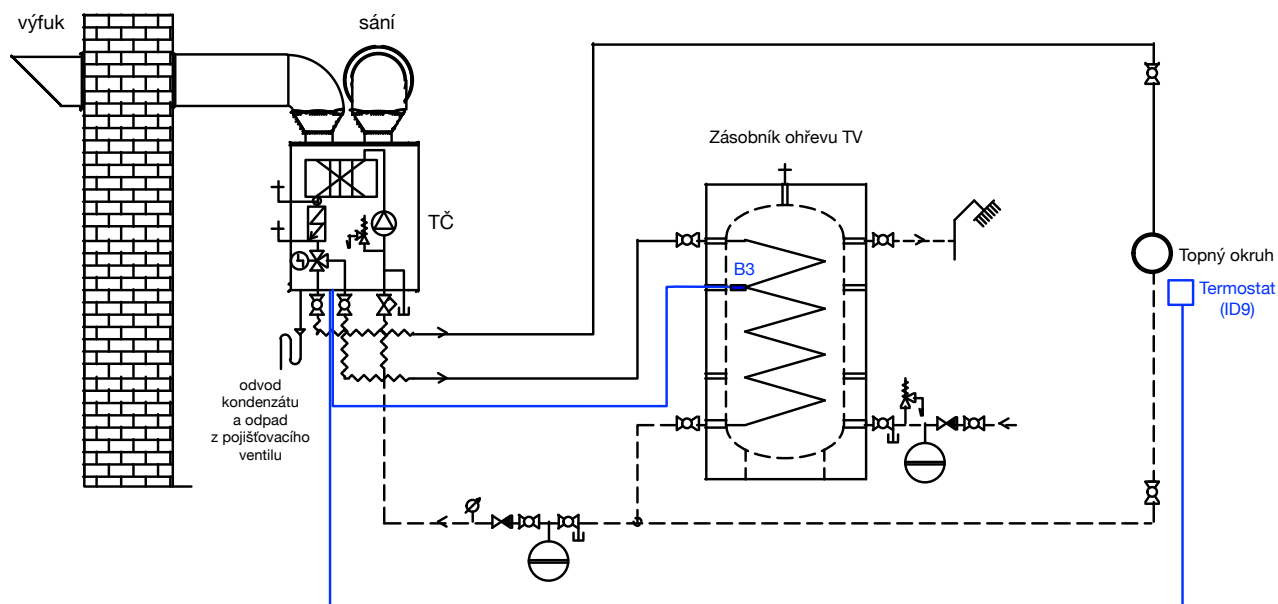
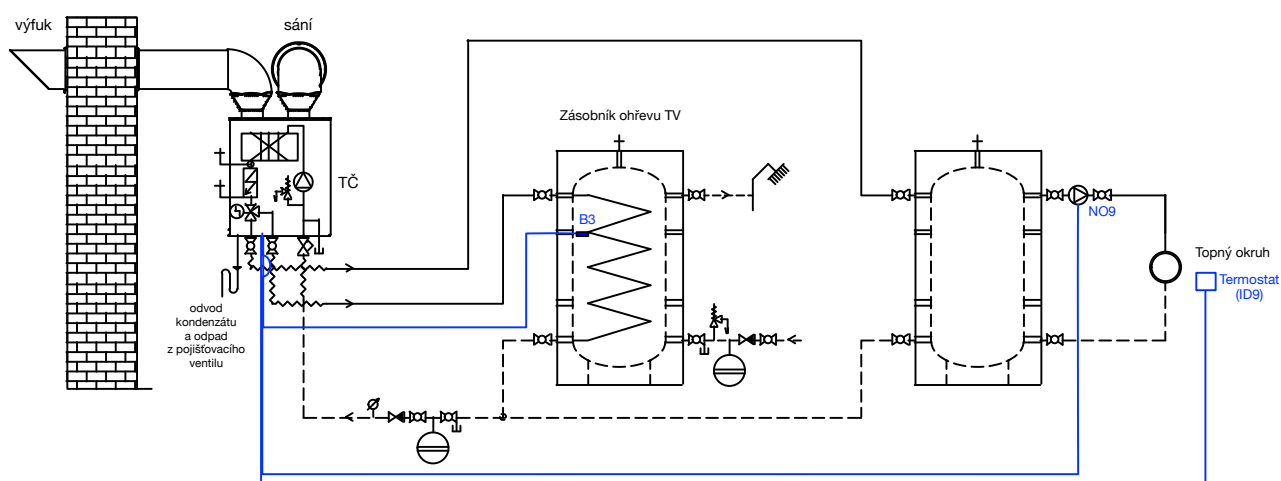


Diagram with a compensatory reservoir



## 18. Warranty, Post Warranty Terms and Conditions and Liability for Defect

- HOTJET CZ s.r.o. (hereinafter only "HOTJET"), shall be liable for the delivery performance in the quantity, quality and design according to the purchase contract..
- HOTJET shall be liable for defects demonstrated within the warranty period, which is 24 months for the final consumer - non-entrepreneur, unless agreed upon otherwise. The warranty period for entrepreneurs is 12 months, unless agreed upon otherwise in writing. Existence of the warranty period for HOTJET products is subject to fulfillment of the terms and conditions set out in this Warranty Certificate.
- The warranty covers defects in material, function and/or workmanship. The warranty is not applicable to defects caused by incorrect project, incorrect installation, handling, wiring or incorrect operation, improper electrical fuses and installation, failure to comply with the specified voltage, unprofessional or inadequate interference and manipulation, modification or dismantling (in case of subsequent installation the preservation of rights resulting from the warranty is a subject to completion of all protocols relating to the assembly), misuse, natural disasters, Force Majeure, violent damage and maintenance neglect. The warranty shall expire also should an unauthorized person interfere into the product. Normal wear and tear of operating fillings is not covered by the warranty. Operating fillings are not covered by the warranty. The warranty covers only the Goods supplied by HOTJET. Responsibility for the product selection and use rests entirely with the buyer. The product must be used in the manner and for the purpose for which it is intended. The installing company provides the warranty adequate to the warranty period provided for the delivered equipment. If specific warranty conditions are applicable to certain types of products and services, these shall be specified in the warranty certificate accompanying the product, whereat the scope and terms of warranty provided to individual product groups may vary.
- The warranty period commences as of the so-called authorized commissioning of the heat pump. The authorized commissioning means the process of control activities and the heat pump starting by an authorized technician certified by HOTJET, however not later than upon expiry of two months from the date of the goods take over by the buyer. The buyer means HOTJET's direct business partner to whom the relevant goods are sold as to the first in the order. The delivery date and the person, to whom the goods were delivered, are always written and confirmed in the warranty certificate. The period, during which the buyer cannot use the goods due to a warranty defect, shall not be included into the warranty period.
- The buyer is entitled and obliged to claim visible defects, quantity and completeness of the goods within 3 days from the goods take over. Any later claims of this nature will be disregarded. Should a defect appear during the warranty period, the buyer shall inform HOTJET in writing or by e-mail on the defect occurrence, it shall describe the defect and indicate how its manifested, furthermore, the buyer shall indicate the manufacturing number, and send the relevant warranty certificate containing the date of sale, invoice number and place of installation. The parties have agreed that by the aforementioned claim submission it shall be deemed that the buyer requires a free of charge removal of the defect – by delivery of the material. Based on the defect description, consultations and possible technical inspections of the equipment, HOTJET shall decide on the manner of the claim solution or the claim process commencement. HOTJET has the right to require other documents, e.g. photographs of the installation place, equipment to which the complaint relates, respectively, from the buyer.
- In case of a justified claim process according to this warranty certificate, HOTJET shall provide the buyer with repair materials for putting the product into operable condition. The costs associated with repairs shall not be paid by HOTJET. Parts and materials to which the claim relates shall be send by the buyer to the HOTJET's address without any delay.
- If HOTJET, based on an expert's opinion on the parts received from the buyer in the claim process, determines that the claim is unjustified, the buyer shall be obliged to pay to HOTJET all costs associated with the claim process, as well as the handling fee in the amount EUR 150.
- The warranty under this warranty certificate and the HOTJET's General Terms and Conditions of Contract, is provided only outside the territories of the Czech Republic and Slovakia. The warranty for other countries of the world community shall also be applicable to these goods, i.e. to warranty repairs, in case of which the goods shall be shipped to the HOTJET's registered office at the buyer's expense and shipped to the buyer after repairing also at the buyer's expense.

