

INSTALLATION INSTRUCTIONS FOR HOTJET ZETXe HEAT PUMP

Monobloc heat pumps
Air/water system for heating and cooling



7ZETXe
10ZETXe
15ZTEXe



Please read this manual carefully before putting this equipment into operation/use!

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1. Safety instructions

Thank you for purchasing the Hotjet heat pump. To ensure it serves you well for as long as possible, familiarize yourself with the manual. The heat pump is a compact unit designed for heating water and space. It is equipped with a frequency inverter and adjusts the heating or cooling capacity to immediate needs. The heat source is air, and the heat extracted from it is transferred to water in the heat exchanger. The heat pump is a product with long durability and high safety. We wish you smooth operation and thermal comfort.

1.1 Notice



DANGER: Upon receiving the heat pump from the shipping service, immediately inspect the condition and contents of the delivery. Claims for damage during transport are typically accepted for a maximum of 3 days!



DANGER: When installing, operating, and maintaining, adhere to the relevant legal regulations applicable in the installation country.



DANGER: After a certain amount of refrigerant, a leak tightness inspection must be carried out on the heat pump at prescribed intervals by a certified technician, following the prescribed procedure.



DANGER: Before connecting or removing any panel, always turn off the electrical power supply and exercise utmost caution.



DANGER: The heat pump may be tilted at a maximum angle of 45° during transport and installation!



DANGER: Never turn on the heat pump unless it is connected to a heating circuit filled with water.



DANGER: The heat pump must never be turned on when the casing is removed or when safety devices are bypassed.



DANGER: Do not put your hands into the air intake and exhaust openings. Risk of cutting on the evaporator or injury from the fan!



DANGER: Arbitrary manipulation of connection to the heating circuit, the heat pump, and electrical connections is dangerous and can lead to serious injuries.



DANGER: Only qualified service personnel may perform equipment servicing.



DANGER: Do not modify the equipment or interfere with its assembly. Do not use the equipment if it is mechanically damaged, dropped, or otherwise compromised.



DANGER: Never cover the heat pump; it must have unrestricted air intake and exhaust.



DANGER: Do not place the heat pump in areas that may be flooded with water.



DANGER: The equipment should not be installed near the occurrence of flammable liquids and vapors.



DANGER: Pipes and the compressor contain a cooling mixture under high pressure, so they should not be exposed to high temperatures and puncture risks, which can lead to burns or suffocation..



DANGER: Water with a temperature above 52°C can cause severe burns up to death from scalding.



DANGER: All markings, labels, and warnings placed on the heat pump must never be removed or covered and should always be visible. Replace damaged ones with new ones.

1.2 What is a heat pump for?

Use the heat pump only for the purpose intended by the manufacturer. It is essential to strictly adhere to the technical and operational conditions specified in the technical data sheets. The above requires compliance with the appropriate project documentation, including the use of prescribed equipment! Refrain from replacing them without consulting the project author. Technical changes to the equipment are only possible with prior written consent from HOTJET CZ s.r.o. A declaration of conformity is issued for the heat pump, listing the standards it complies with.

1.3 Legal regulations and guidelines

The heat pump is intended for heating residential and apartment buildings, hotels and other accommodation facilities, offices, shops, and similar work environments. The heat pump can be operated by trained laypersons, experienced and knowledgeable individuals. Children and individuals with reduced physical, sensory, or mental abilities, or those without knowledge and experience, should only use it under supervision or according to the instructions of a responsible person. Under no circumstances should children play with the heat pump.



ATTENTION: Indicates a potentially hazardous situation that could result in personal injury, property damage, or environmental harm if not prevented.



NOTE: Indicates important information.



ATTIRE: Maintenance technicians and operators must wear protective clothing that complies with basic safety requirements.



GLOVES: Gloves: Suitable protective gloves must be worn during maintenance or cleaning.



MASK AND GOGGLES: Respiratory protection (mask) and eye protection should be used during cleaning.

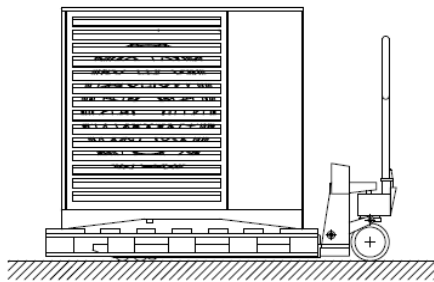
2. Warranty, post-warranty conditions and liability for defects

For a complaint to be recognized, it is necessary for the customer to inform the supplier - HOTJET CZ s.r.o. - in cooperation with the seller in a timely manner. Warranty conditions are specified in the document "Terms and Conditions of Sale and Delivery." Although the device's integrity has been verified several times during the manufacturing process, malfunctions can still occur. If the operator cannot rectify the fault using the "Troubleshooting Guide," they must contact their seller or contractual partner.

3. Transportation

Upon receiving the heat pump from the shipping service, immediately conduct a thorough inspection of the condition and contents of the delivery.

- Request information on the conditions for claiming delivery upon receipt. Record all identified damages, discrepancies, and missing parts in the delivery note.
- If you discover any damages, immediately inform the shipping service and request an investigation. Sending a copy of the report to the supplier or manufacturer is crucial for further steps in the claim process. Inadequate documentation may result in the rejection of later claims.
- When handling the heat pump during transportation and installation, it is important to prevent the device from tilting more than 45°. The heat pump is securely attached to a pallet during transportation. After dismantling, it is advisable to recycle the pallet or return it to the manufacturer.



Pic. 1 Transportation using a pallet truck.

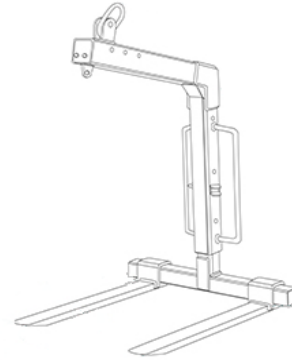
3.1 Transport by crane

The use of a crane is permitted only by a qualified and properly trained crane operator holding a valid crane operator certificate.

- The crane operator is required to strictly follow the instructions of the rigger/signalman, who must be clearly identifiable. Special pallet forks known as "C" hooks must be used for transporting pallets with the crane. Care must be taken during handling to ensure that the crane forks do not damage the heat pump on the pallet.
- Handling pallets of heat pumps using rigging lines is not permitted. During unloading and handling, it is important to ensure the safe attachment of pallets with pumps to the handling equipment and provide adequate space for movement.



DANGER: Handling loads using cranes and other lifting equipment poses a safety risk not only to crane operators, riggers, and other workers on the construction site but also to individuals moving around in the vicinity



Pic. 2 Transportation using suspended pallet forks

3.2 Transport to the installation site

For short-distance handling of the heat pump, human force can be utilized using moving straps or a stair climbing hand truck.

- The center of gravity of the heat pump is located in the compressor area, which is important for maintaining stability during handling.
- Before handling, it is necessary to ensure that workers do not exceed the maximum permissible ergonomic limit for the weight of manually handled loads, which is crucial for injury prevention and maintaining workers' health.

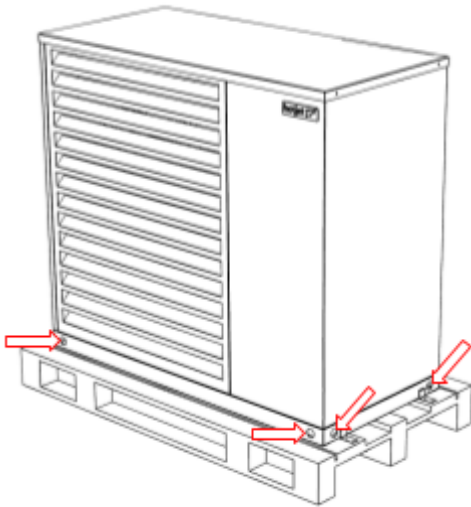


Pic. 3 Transport on stairs using a stair trolley

- During transportation, protect the equipment from strong impacts.
- If it is necessary to tilt the equipment, it is recommended to do so briefly over one of the long sides, with the compressor always at the top (see Fig. 3).
- During prolonged tilting of the equipment, the cooling oil expands within the system.
- After tilting the equipment, wait for at least 30 minutes before starting operation.



ATTENTION: When handling the pump with the pallet removed, use the openings in the base of the heat pump.



Pic. 4

Display of handling openings

- For handling using the handling openings, we recommend using a strap with loops with a minimum capacity of 250kg (see Fig. 5)



Pic. 5

Thread the strap through the handling openings.

3.4 Storage

- The heat pump should never be stored lying on its side. The maximum angle of inclination in any direction is 45°; it should be transported in an upright position.
- Failure to adhere to these instructions may result in damage to the heat pump.
- When storing for more than 6 months, it is necessary to have the refrigeration circuit checked by the manufacturer or an authorized technician before putting it into operation.

- If you disconnect the heat pump from the heating system or electrical power supply, it must be stored at temperatures above 0°C to protect it from freezing residual water in the hydraulic circuit.
- When disconnected from the heating circuit or during prolonged operational shutdowns, it is important to ensure drainage of the hydraulic part of the outdoor unit if the circuit is not filled with antifreeze mixture.



WARNING: Packaging, especially plastic films or bags, pose a danger to children. Do not leave them lying unattended. Prevent them from getting into the hands of children.



ATTENTION: After 2 months of storage, your warranty period will begin.

3.8 Disposal of packaging

- Dispose of packaging by recycling it at designated recycling locations.



3.5 Disposal of the heat pump, its components or accessories

- All materials used in the production of the heat pump are recyclable.
- To contribute to environmental protection, it is important to dispose of them in accordance with local regulations, such as through specialized companies for disposal and recycling or at municipal collection points.



3.7 Noise reduction measures

- During installation, keep in mind that after startup, the unit is louder on the air inlet and outlet side than on the two enclosed sides.
- It is not recommended to place the unit in living rooms or bedrooms and ensure that neighbors are not disturbed by noise.
- It is not recommended to securely attach the outdoor unit to the building and prevent air discharge directly towards neighbors or walls, as reflections may increase noise.
- Noise reduction can be achieved through acoustic measures such as lawns, plants, fences, or palisades. It is advisable to avoid installation between two enclosed walls, in corners and angles, and to use the quiet mode at night.



NOTE: Information about the noise level can be found in the Technical Specifications section, page 7.

4. Technical parameters

The heat pump is designed to heat the heating water in existing or newly installed heating systems. This heated water is intended not only for heating but also for heating domestic hot water.

i NOTE: The ZETXe heat pump is primarily designed for household use.

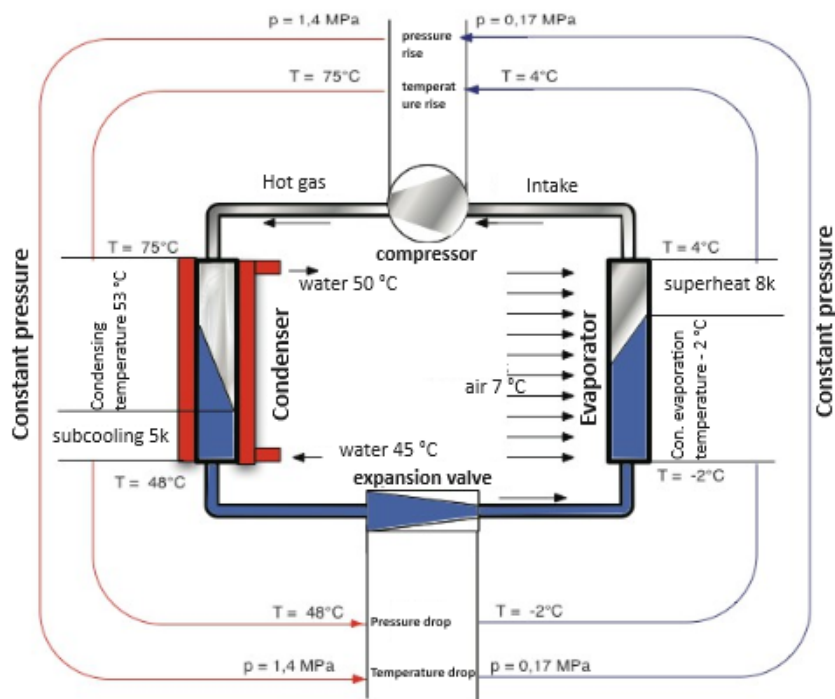
i NOTE: For air-to-water heat pumps, it is important to ensure a minimum heating water temperature of 18°C for the defrosting mode. Starting the heat pump with too cold water in the heating circuit can lead to malfunction or deviations from normal operation

i NOTE: A new or reconstructed building may have up to 50% higher heat demand during the first two heating seasons. This excessive consumption may result in increased power consumption of the heat pump, leading to longer operation and, in some cases, activation of the backup heat source.

4.1 Principle of operation



The heat pump consists of a hermetically sealed circuit, which includes a scroll compressor, a plate heat exchanger (condenser), a tube heat exchanger (evaporator), and an electronic expansion valve. The electrically driven compressor compresses the refrigerant, increasing its pressure and temperature. Heat is transferred to the condenser, where it is delivered to the heating water, and the refrigerant condenses. It then passes through the expansion valve, where the temperature and pressure decrease. The refrigerant then enters the evaporator, where it vaporizes and cools the heat source - air or water. The cycle repeats as the refrigerant re-enters the compressor.

The heat pump operates on the principle of transferring heat from a "cold" to a "warm" environment, where it is "transformed" to a higher temperature. This energy is obtained for free. Operating costs arise from the consumption of the compressor and other electrical components, such as controllers, circulation pumps, and fans. The ratio between the extracted and consumed electrical energy is variable and is called the coefficient of performance (COP), which ranges between 1.5 and 6 depending on the conditions. In heating mode, the heat pump extracts energy from the external environment and transfers it to the heating water. In cooling mode, the process is reversed, where heat is extracted from the heating water and expelled outside or recovered where needed.



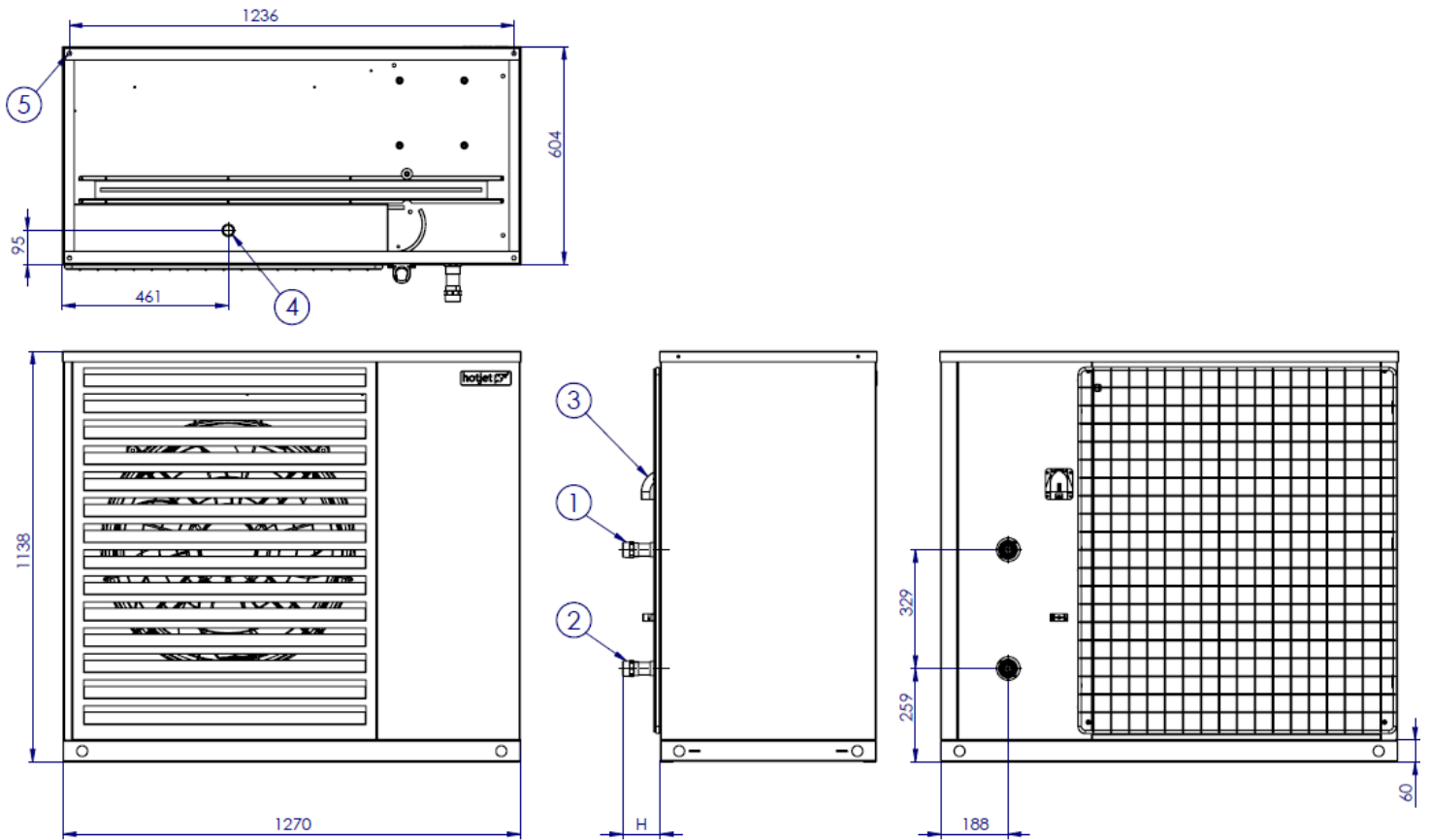
Pic. 6 Functional diagram

5. Technical data ZETXe

Technical specification of HOTJET ZETXe				
				
Model		7 ZETXe	10 ZETXe	15 ZETXe
Performance data		Heating capacity [kW] / Power input [kW] / Heating factor [COP]		
Nominal performance (min. / max.)	kW	6,0 (0,9-8,0)	8,0 (2,0-10,7)	10,0 (3,0-14,5)
Nominal performance / COP pro A7/W35 1) - pro 60Hz	kW / -	6,25/5,10	8,04/ 5,02	10,29/ 5,03
Nominal performance / COP pro A2/W35 1) - pro 60Hz	kW / -	4,33/4,09	6,35/4,04	8,33/4,11
Nominal performance / COP pro A-7/W35 1) - pro 60Hz	kW / -	3,82/3,55	5,57/3,42	7,85/3,57
Nominal cooling capacity for compressor (pro 60Hz)	kW	5,0 (1,1-8,9)	6,0 (3,3-11,9)	11,0 (5,5-14,0)
Energy class 4)		A+++ / A++	A+++ / A++	A+++ / A++
Technical specification				
Version		Monoblock		
System		Air - Water		
Type of operation		Heating/cooling		
Tested		EHPA lab		
Inverter technology		Emerson Copeland Scroll		
System control		Siemens RVS 21		
Backup power supply		External		
Night operation (attenuation)		Yes, configurable parameters		
Working range of the heat source	°C	-23 až +37		
Max. compressor outlet temperature up to -7°C	°C	+65		
Minimum cooling output temperature (counter-current condenser)	°C	+7		
Nominal water flow (heating) for Δt 5 K	m ³ / h	1,95	2,34	3,37
Maximum external pressure drop of the heating system	kPa	5,5	6	7
Maximum working water pressure	bar	3		
Heating and return water connections		D 28		
Recommended diameter of the connecting Cu pipe or its equivalent	mm	28		
Cooling circuit				
Refrigerant 2)		R454B		
Amount of refrigerant	kg	1,2	1,4	1,8
Cooling circuit		hermetically sealed		
Mechanical information, weight				

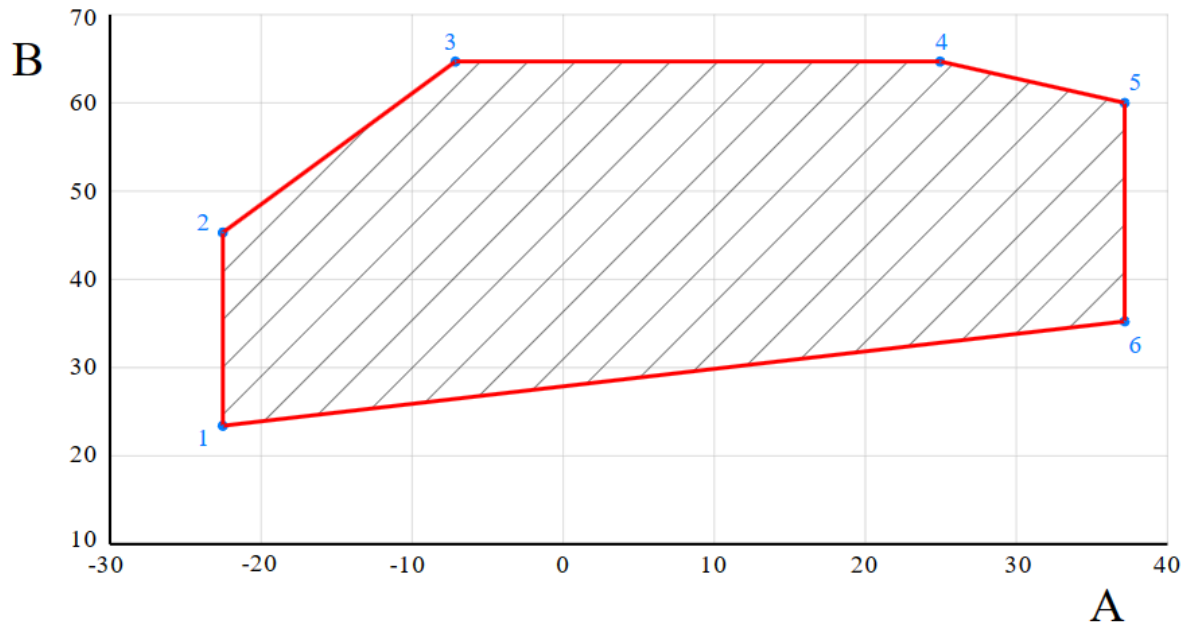
Width x depth x height	mm	1 271 x 600 x 1 136		
Weight of outdoor unit	kg	175	180	185
Electrical data				
Compressor power supply	V/ Ph/ Hz	230/1~/50	400/3~/50	400/3~/50
Switchboard power supply with RVS	V/ Ph/ Hz	230/1~/50	230/1~/50	230/1~/50
Power supply for electric bivalence	V/ Ph/ Hz	400/3~/50	400/3~/50	400/3~/50
Nominal power input for cooling A7/W35	kW	1,22	1,6	2,04
Current A7/W35 (heat pump on phase)	A	5,3	2,57	3,27
Outdoor unit protection (switchboard without electrical bivalence)	A char B	1 x 16	3 x 20	3 x 25
Inlet for heat pump switchboard CYKY	n x mm2	3 x 2,5	5 x 2,5	5 x 4
Coverage IP	-	IP44	IP44	IP44
Noise level				
Acoustic performance LwA, nominal sound pressure LWp 1m	dB(A)	52/ 47	53/ 47	54/ 50
Nominal sound pressure LpA 3) / nighttime attenuation	dB(A)	32/ 25	34/ 27	36/ 29
1) COP / EER according to EN 14511 2) GWP = 466 3) Distance 5 m, hemisphere, A7/W55 4) Medium zone, W35/55°C				

5.1 Dimension drawing



Position	Description	Dimension
1	Heating water output from the heat pump	Ø 28 mm
2	Heating water input to the heat pump	Ø 28 mm
3	Cable grommet	max. Ø 34 mm
4	Condensate drain	ex G1"
5	Nuts for anchoring or silentblocks	M8
H	15ZETXe	70 mm
H	10ZETXe, 7ZETXe	47 mm

5.2 Temperature operating range ZETXe



Pic. 7 Applicable limits

A: Outdoor air temperature [C°]
 B: Outlet water temperature [C°]

point number	Inlet air temperature [C°]	Outlet temperature of heating water [C°]	Volumetric flow rate of heating water [m ³ /h]
1	A-23	W24	Minimal
2	A-23	W45	Maximal
3	A-7	W65	Maximal
4	A25	W65	Maximal
5	A37	W60	Maximal
6	A37	W35	Minimal

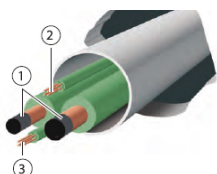
The ZETXe heat pump is fully capable of operating at temperatures throughout the entire operating range.

6. Installation instructions

This section of the documentation is intended for qualified installation and service technicians as a guide for proper installation, operation, and maintenance of the HOTJET heat pump. It is important to study it carefully, as failure to follow the instructions provided may result in heat pump malfunction, material damage, burns, or electrical shock.

6.1 Breakthrough walls

- Before installing the heat pump, it is necessary to create a wall penetration with a diameter of at least 70 mm and a 10 mm outward slope.
- To prevent damage, the penetrations should be lined with a material such as PVC piping.
- After installation, the wall penetration on the building side must be sealed with an appropriate sealant to maintain fire protection.



Pic. 8 Hole in the wall

1. Supply/return flow of heating water.
2. Control wiring.
3. Power cable of the heat pump.

6.2 Handling refrigerant

- The refrigeration circuit of the HOTJET heat pump is filled with refrigerant supplied by the manufacturer.
- Only a company with the appropriate qualifications (trade license: installation, repair, and reconstruction of refrigeration and heat pumps) may work on the refrigeration circuit. The type of refrigerant used in the heat pump is listed on the label, e.g., R454B, R410A, R404A, R407C, R134a.
- Complete safety data sheets for the refrigerant used can be requested at obchod@hotjet.cz.



DANGER: Flammable refrigerant. Serious health risks due to fire and explosion!



DANGER: The most severe adverse health effects from the use of this substance/product: Refrigerant vapors are heavier than air, which can displace oxygen. Rapid evaporation of the liquid may cause frostbite.

- **Handling refrigerant:** Use only in well-ventilated areas. Ensure adequate ventilation.



PROTECTION: When handling refrigerant, ensure your safety by using protective equipment.

6.3 First aid instructions

- General recommendations: In case of exposure, it is important to move the affected person to fresh air, keep them calm and warm. Immediately call a doctor and perform artificial respiration if necessary.
- Inhalation: If the substance is inhaled, move to fresh air and if necessary, provide artificial respiration or oxygen to the affected person.
- Skin contact: Remove all contaminated clothing, wash with plenty of lukewarm water.
- Eye contact: Flush with plenty of water for about 15 minutes, seek medical advice.

6.4 Location and installation „ZETXe”

- The heat pump is equipped with a base and legs, allowing it to be elevated above the ground. It is important to ensure a minimum clearance of 0.2 m (see Fig. 11) between the heat pump and the surface to prevent direct contact between the pump and the base surface in case of ice formation.
- The heat pump can be installed on a solid foundation such as a concrete footing or paving. The horizontal placement of the heat pump is adjusted using adjustable feet. The base material should be filled with a water-permeable material, such as crushed stone, which should extend across the entire width of the evaporator.
- Before positioning the device, it is crucial to inspect the installation site. If possible, place the pump in a sheltered location, such as behind a wall or under a roof overhang. Exposure to adverse weather conditions can reduce its efficiency.
- An air-source heat pump cannot operate in enclosed spaces without air intake and exhaust. The heat pump should be installed in a location where there is no risk of snow or ice falling from the roof onto it.

6.5 Carrying capacity of the structure

- If you are installing the equipment in a higher floor, attic, or on the roof, verify the load-bearing capacity of the building structure.
- Installation on wooden structures should be carefully considered as such structures may transmit vibrations.
- Installation on a facade: Due to the large amount of condensate, the suitability of mounting on the facade should be carefully considered, as uncontrolled runoff of the condensate can occur. Freezing condensate may overload the structure.

6.6 Placement on the roof

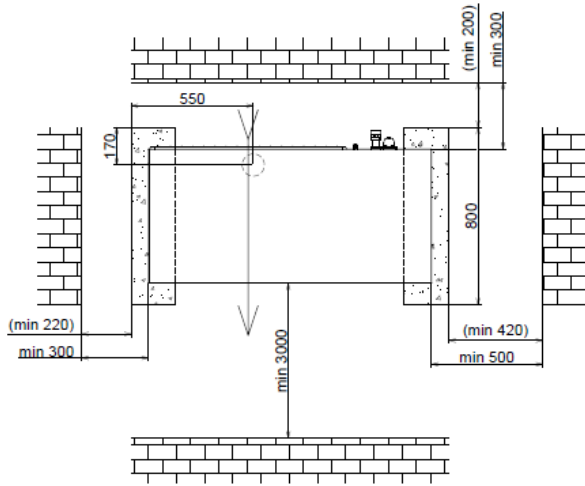
- Verify the load-bearing capacity of the wall and the method of anchoring the bracket to the wall with a structural engineer. Condensate must be discharged using a heated hose; otherwise, it may soil the facade.

- Recommended foundation includes cast foundations, curbstones, or stone slabs.
- Secure the equipment using brackets and suitable plugs and screws. Do not use screws that are used to attach the equipment to the transport pallet.

NOTE: Uneven surfaces may have an adverse effect on the noise level of the heat pump.

6.8 Spacing distances

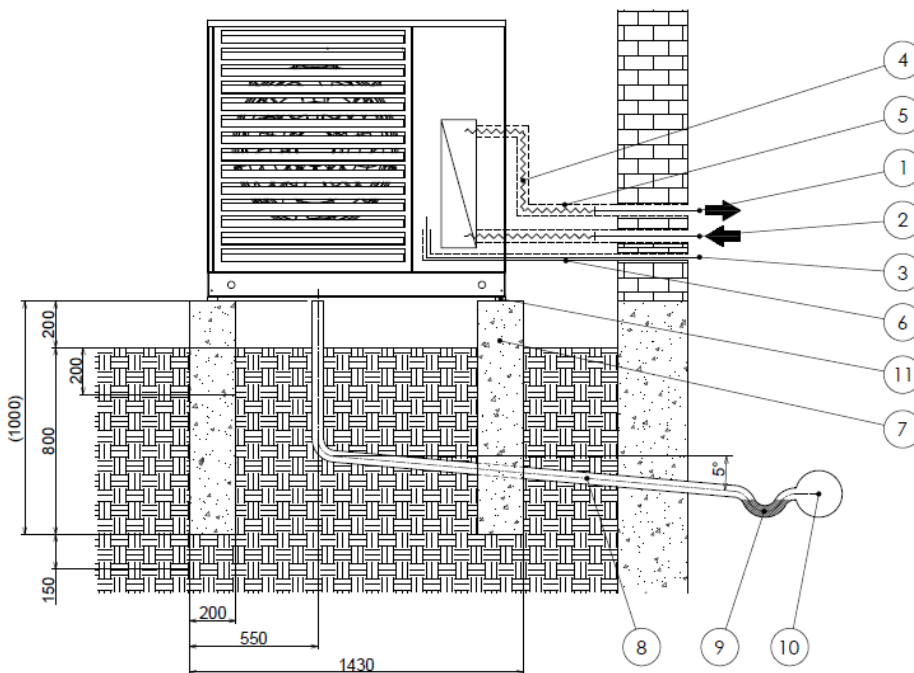
- To minimize noise and facilitate maintenance, it is necessary to maintain a minimum distance from the walls (see Pic. 10).



Pic. 10 Spacing distances

- Surface for installation of the heat pump should be horizontal, sturdy, and durable.
- The frame of the heat pump should lie evenly.
- The heat pump must be accessible from all sides.

INSTALLATION WITH CONDENSATE DRAINAGE



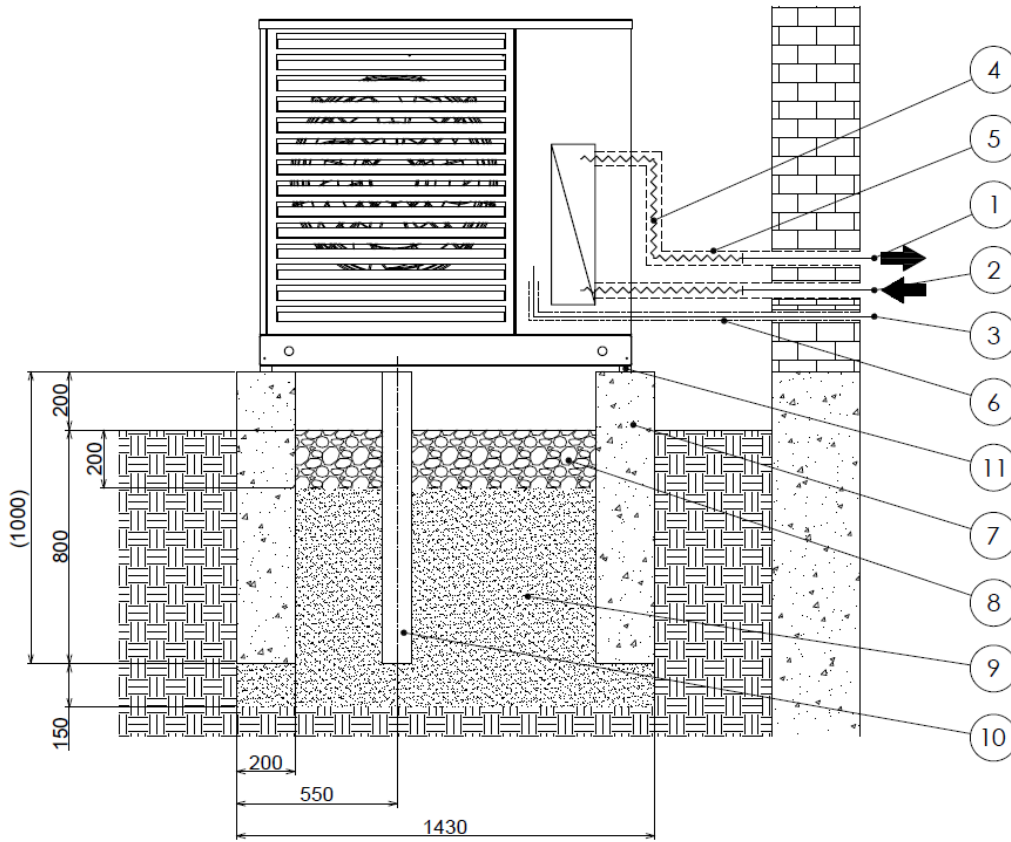
Pic. 11 ZETXe mounted on a concrete base using a siphon.

6.9 Condensate drainage

- During operation, a larger amount of condensate may accumulate, so it is important to ensure proper drainage of the outdoor unit installation area. Make sure that water cannot escape and freeze on pathways or sidewalks. Ideally, condensate should be drained into the sewer through a trap to prevent potential flooding of the building.
- For outdoor heat pump installations, the optimal drainage solution involves using frost-protected pipes that lead water into the sewer.
- To ensure proper slope for condensate drainage, the heat pump must be installed at an appropriate height.
- An alternative option is to directly utilize the condensate, for example, by directing it into the rainwater drainage system. In this case, using a trap is advisable.

Legenda	
1	TV output
2	TV input
3	Cable harness
4	Flexible hose
5	UV resistant insulation
6	Protector
7	Concrete base
8	Piping
9	Sifon
10	Sewer pipe
11	Silent blocks/building feet

INSTALLATION ON A LEACHING BASIS



Legenda	
1	TV output
2	TV input
3	Cable harness
4	Flexible hose
5	UV resistant insulation
6	Protector
7	Concrete base
8	Piping
9	Gravel
10	Sewer pipe DN100
11	Silent blocks/building feet

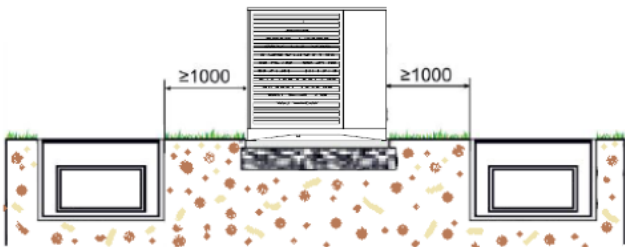
Pic. 12 ZETXe mounted on a concrete base with the use of each.



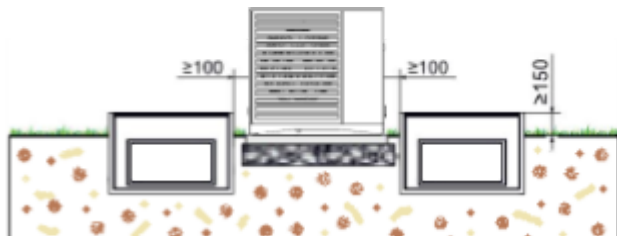
NOTE: This sketch serves as a rough guide.

6.10 Safe distances from light wellsí

- To ensure compliance with the safety concept of the equipment, the following minimum distance from light shafts applies.



Pic. 13 Installation on a base, light shaft at ground level.



Pic. 14 Installation on a base, light shaft above ground level.

7. Assembly

WARNING: Foreign objects such as rust, sand, or sealing material can negatively impact the operational safety of the heat pump. It is important to ensure that the heat pump is not exposed to these risks.

- Before connecting the heat pump to the supply piping, it is essential to thoroughly flush the system piping to minimize the risk of contamination.
- To protect against contamination, it is advisable to install a dirt separator on the return piping of the heat pump. This can reduce the risk of damage to the heat pump and ensure its reliable operation.

WARNING: Pay attention to the quality of the filling water, as the formation of scale or rust may damage the heating system.

- The filling water for the heating system must meet the requirements specified in standard VDI 2035. Compliance with these requirements is important for preventing issues related to sedimentation and corrosion in the heating system.

WARNING: Please note that failure to adhere to proper installation procedures can lead to malfunctions and even damage to the heat pump system.

- When connecting the heat pump, carefully check the tightness of the entire system.
- Ensure that the supply and return piping are correctly connected.
- Perform thermal insulation in accordance with applicable regulations and manufacturer recommendations.
- When designing the heating circuit, pay attention to balancing pressure differentials and ensuring the proper functioning of the entire system (see "Technical Data" section, page 7).

7.1 Bolts

WARNING: Ensure proper tightening of screws, as the stainless steel screws used on the cover may tend to seize up, which could be caused by inadequate lubrication and high tightening torques.

- Use only low tightening torques to prevent over-tightening; for M4, it is 4 Nm.
- Before tightening, apply lubricating paste to the screws, such as graphite paste, to prevent seizing.

7.2 Connectors

DANGER: Connector damage is possible.

- Tighten the connector's screw closure by hand only, without using any tools.
- To ensure secure connection of the joints, pipes with a surface hardness > 225 HV, such as stainless steel, must be grooved.
- Use a pipe cutter to create a groove approximately 0.1 mm deep at the specified distance from the end of the pipe:
 - Ø 22 mm: 17 ± 0.5 mm,
 - Ø 28 mm: 27.5 ± 0.5 mm.

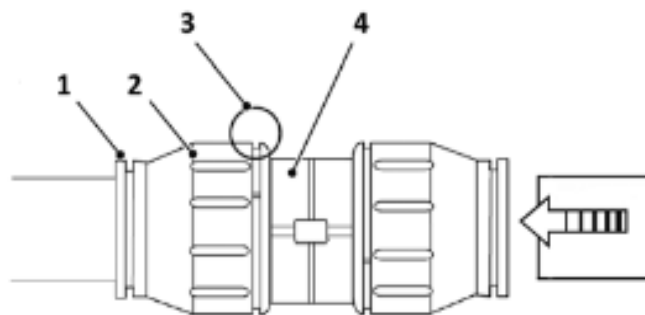
Principle of Connector Operation

- Connectors are equipped with a retaining element with stainless steel teeth and an O-ring for sealing. In addition, connectors have a "turn and secure" function.
- Simply by manually rotating the screw closure, the pipe is secured in the connector, and the O-ring seals it onto the pipe.

DANGER: Pipe ends must be free from burrs, as otherwise it may lead to injury or damage to the connectors.

- Cut pipes only with a pipe cutter.
- Connectors must be in the unlocked position before insertion. In this position, there is a narrow gap between the screw closure and the base body.

Before insertion, the connector must be in the unlocked position. In this position, there is a narrow gap between the screw cap and the base body.

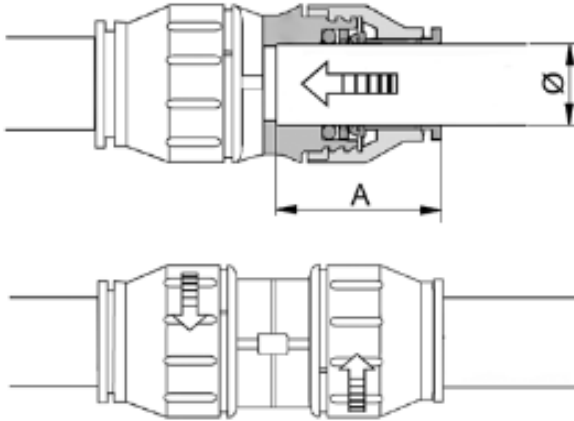


Pic. 14 The plug is unlocked.

1. Retaining element
2. Screw cap
3. Gap between the screw cap and the basic body
4. Basic body

7.3 Creating a plug connection

- Stretch the O-ring of the pipe until it reaches the specified value for insertion into the coupling.
- Tighten the screw cap by hand to the base body until it stops, securing the connector in place.

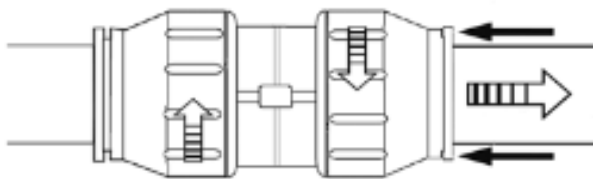


Pic. 15 Creating a connection

- A - Insertion depth 44 mm (only for pipe Ø 28 mm)
- For Ø 22 mm it is 33 mm.

7.4 Disconnecting the plug connection

- If it becomes necessary to disconnect the connectors later, follow these steps:
 1. Rotate the screw cap counterclockwise until a narrow gap of approximately 2 mm is formed.
 2. Press the retaining element back with your fingers and hold it firmly.
 3. Pull out the inserted hose (see Pic. 16).



Pic. 16 Releasing the connector

7.5 Connection to the heating system

- Thread and secure hydraulic couplings onto the heating connections, following the procedure outlined in Chapter 7.3 "Creating a Socket Connection" on page 13.
- Ensure a distance of at least 0.5-1 meter between the heating system connection and the heat pump to reduce the transfer of vibrations through hoses or flexible connectors.
- The minimum amount of circulating water in the heating system should be 15-20 liters of water per 1 kW of heat pump capacity. This rule does not apply to flat systems and may be less.

NOTE: Lower or no flow through the heat pump can lead to freezing of the condenser and damage to the heat pump.

- The connecting pipes must be designed in accordance with applicable regulations and standards.
- The connecting pipes must have a diameter at least equal to the outlets on the pump. We recommend using 28 mm Cu pipes. If using hoses, never use hoses with a smaller diameter than the outlets on the heat pump. Ensure that hoses and pipes match the system pressure and are sized for the required flow.

ATTENTION: Foam polyethylene insulation, such as Mirelon, is not suitable for outdoor insulation of pipes.

- Rubber insulation hoses are typically not resistant to UV radiation. If installed outdoors, they should be coated with a protective layer or UV-resistant lacquer.
- It is recommended to install a filter in the water supply pipe of the heat pump system (preferably inside the building).
- After system commissioning, it is advisable to perform a check after a few days.
- Before connection, it is advisable to flush the heating system pipes to prevent clogging of the heat pump condenser or circulation pumps.
- After installation, ensure that the heating system is filled, vented, and pressure tested.

- Maintain standard pressure in the heating system, which should not exceed a maximum of 1.5 bar.
- By implementing specific hydraulic connections according to the specifications provided in the project documentation and complying with applicable technical regulations and standards, you ensure a trouble-free and safe installation of the heat pump. Thorough adherence to these instructions is crucial for the proper functioning and safety of the entire system, including performance optimization and minimizing the risk of potential malfunctions or accidents.

7.6 Protection against frost

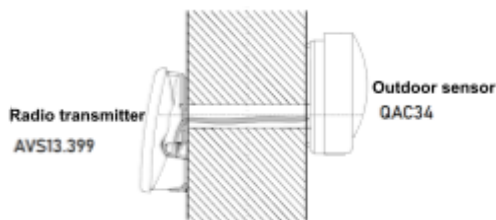
- Once the heat pump is fully installed and powered, its control monitors the temperatures in the condenser. If the temperature drops below a certain level, the control automatically activates the circulation pump to heat the water from the heating system and prevent freezing of the condenser.
- When installing the heat pump in a location prone to freezing, such as due to extended power outages or the pump being turned off, it is advisable to install manual drain valves for the outdoor part of the installation. There are also automatic drain valves that open when the temperature of the heating system drops below a certain value, typically around 3°C.
- Another option is to fill the heating system with an antifreeze solution or install a separate heat exchanger. The indoor unit located in frost-protected areas usually does not need to be drained, as the risk of freezing there is minimal.



WARNING: Water discharged from the heat pump may be hot, posing a risk of scalding.

7.6 Connecting an outdoor sensor

- The outdoor sensor plays a crucial role in the control system, as it is essential for the proper functioning of the equithermal regulation and protection of the heating system against freezing. However, for frost protection of the heat pump, the outdoor sensor is not necessary.
- The outdoor sensor is connected to the BX4 input and utilizes the NTC1k sensor type. We recommend the QAC34 outdoor sensor, which we supply as an accessory; its installation is not mandatory but is recommended for system optimization.
- If a wireless solution is needed, the standard QAC34 sensor can be upgraded to wireless using the AVS13.399 module. This option is suitable when it is not possible to connect the QAC34 to the RVS wire. The prerequisite is that the RVS in the boiler room already has the AVS71.390 radio transmitter. To protect the batteries, the transmitter module is installed in the wall construction.
- The default version of the sensor is supplied as a "white box," which is the standard packaging for this type of device.



Pic. 17 Outdoor sensor

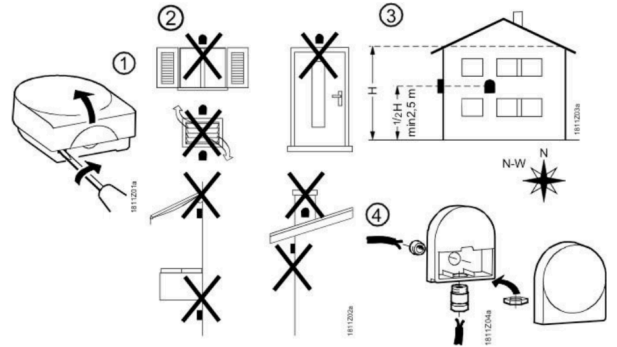


ATTENTION: The outdoor sensor is different from the others in the RVS system and cannot be interchanged.

- It is important to use the correct sensor for smooth operation of the control and protection system.

7.7 Rules for outdoor sensor placement

- The coldest wall of the house is typically oriented to the north.
- The sensor must not be exposed to direct sunlight.
- Minimum recommended height is 2.5 meters.
- Preferred position: centered on the wall.
- The sensor must not be placed above windows, doors, ventilation openings, or other heat sources, nor under balconies, roofs, or eaves.
- It must not be painted over.



Pic. 18 Sensor installation

- If it is necessary to extend the sensors, select the connection wire (Cu, twisted pair) according to the table:

Cross section of the conductor [mm ²]	0,25	0,5	0,75	1	1,5
maximum length [m]	20	40	60	80	120

7.8 Cooling mode

- Thanks to the reverse circuit, cooling can also be performed. In the cooling mode, components of the cooling circuit are utilized to produce cold water, which is used to remove heat from the building. This process can be achieved either through dynamic cooling or passive cooling.
- Dynamic cooling involves actively transferring cooling power into the interior space using water fan coils. For efficient performance, it is desirable for the incoming air temperature to be lower than the dew point, enabling the transfer of higher cooling power while dehumidifying the interior space.

7.9 Water treatment

If corrosion occurs in the metallic materials of the heating system, the presence of oxygen plays a key role in this process. Another important factor is the pH value and salt concentration. For a licensed installer striving to ensure trouble-free operation of the heating system for their customers without corrosion issues, it is essential to pay attention to the following aspects.

7.10 Water treatment without chemicals

- Depending on the materials used, it is essential to fill the heating system with demineralized soft water or fully deionized water.
- It is important to regularly monitor the pH value within intervals of 8 to 12 weeks. For these types of systems, the VDI 2035 standard applies. If the recommended values for filling, topping up, and circulating water are exceeded, it is necessary to stabilize the water beforehand.

7.11 Scope of application VDI 2035

- Hot water heating according to DIN 4753.
- Water heating systems inside buildings according to DIN EN 12828 up to an inlet temperature of 100°C.
- Systems serving building complexes with a makeup water volume during their lifetime not exceeding twice the volume of the filling water.

Total hardness [°dH] depends on the specific volume of the system			
Total rated power in [kW]	< 20 l/kW	≥ 20 l/kW and < 50l/kW	≥ 50 l/kW
to 50 kW	≤ 16.8°dH	≤ 11.2 °dH	≤ 0.11°dH

VDI 2035 part 1.

Reference values for heating water	Low salt	Containing salt
Electrical conductivity at 25 °C [µS/cm]	< 100	100-1,500
Oxygen content [mg/l]	< 0.1	< 0.02
pH value at 25 °C	8.2 - 10.0	

VDI part 2.



NOTE: For aluminum and aluminum alloys, the pH range is limited: the pH value at 25°C is 8.2–8.5 (max. 9.0 for aluminum alloys).

7.12 Water treatment with chemicals

Adding chemicals for water treatment should only be done exceptionally. Each use of chemicals for water treatment must be carefully justified and recorded in the logbook. Unprofessional use of chemicals can have the following negative impacts:

1. Frequent failure of elastomeric materials.
2. Blocking and sedimentation due to sludge formation.
3. Malfunction of seals on pumps.

Formation of biofilm, which can lead to microbiologically induced corrosion or seriously affect heat transfer.

4. In water with low salt content and correct pH, oxygen concentrations up to 0.5 mg/l are tolerable in the short term.



ATTENTION: Heat pump systems and components from Hotjet CZ s.r.o. require filling and operation with deionized water (completely desalinated). We also recommend using a complete heating protection unit, which is available. Cooling systems should be fully protected with glycol. System water should be tested at every service intervention and at least once a year. It should be noted that failure to comply with regulations may void the equipment warranty.

8. Electrical installation



DANGER: The risk of electric shock can cause serious health problems, including life-threatening situations.

- Before starting any work, disconnect the system from the power source and secure against accidental reconnection.
- If working on or near the inverter, wait at least 5 minutes after it is turned off for capacitors to discharge, minimizing the risk of injury.



WARNING: Incorrect connection to the electrical network may pose a serious risk of life-threatening touch voltage.

- It is important to adhere to relevant regulations, especially standard ČSN 33 2000-4-41 ED.3/IEC 60364 (installation of low-voltage systems), to prevent accidents and comply with energy company directives.
- Before connection, verify if the current network voltage matches the equipment's label.
- The minimum cross-section of connecting conductors should be designed according to the device's power.
- Use equipment only in accordance with prescribed standards and follow protective measures outlined in the manual.
- In three-phase connections, ensure correct phase polarity.
- The RCD for the heat pump must be sensitive to AC/DC (type B), as type A RCDs may not trip correctly.



DANGER: Avoid electromagnetic interference that may cause disruptions in the heating system.

- Prevent electrostatic discharges that can disturb sensitive electronic devices.
- Keep in mind that strong electric fields, such as using a mobile phone, can negatively affect electronic components and cause damage.

! ATTENTION: Cable laying instructions considering possible malfunctions of the heating system.

- Thoroughly check the correct connection of all cables and connectors.
- Route wiring from busbars separately from cables with voltages exceeding 50 V to prevent electromagnetic interference with the controller.
- Ensure that electrical cables are not hot to the touch.
- Bundle all cables in cable channels and optionally provide strain relief.

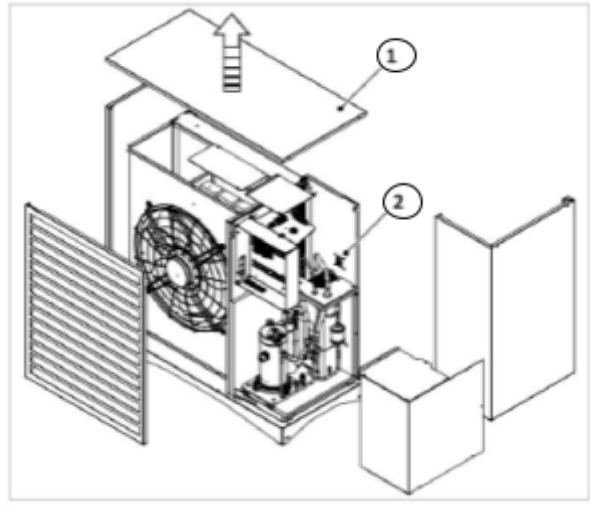
! ATTENTION: Criteria for cable length considering possible system malfunctions or failures.

- The total resistance of sensor cables must not exceed 2 ohms. For cables with a cross-section of 0.25 mm², this corresponds to a length of up to 5 m.
- For cross-sections of 0.5 or 0.75 mm², the maximum cable length is 15 or 50 m, respectively.
- Cables for temperature sensors should not be too long. For long cables, sensor correction can be performed to minimize systematic deviations.
- The length of the cable for the flow sensor should not exceed 10 m.

! ATTENTION: Maintain the environmental climatic conditions within the optimal range.

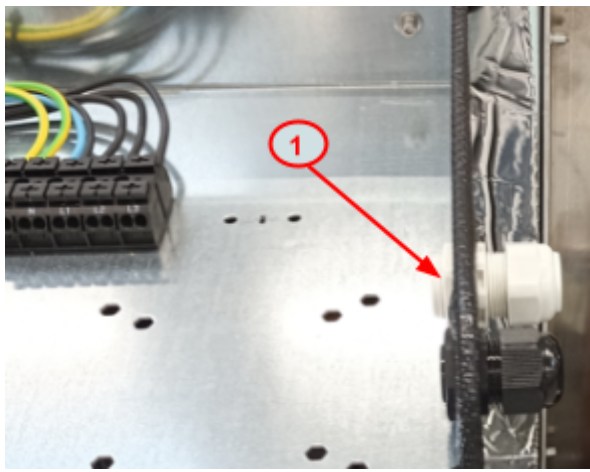
- There is a risk of system malfunction or failure if the ambient temperature exceeds permissible values (5 °C to +50 °C).

8.1 Connecting
 1. Povolte šrouby na stranách víka(1) a sejměte jej.
 2. Našroubujte kabelové koleno na otvor pouzdra (2) a protáhněte kabel.



Pic. 19 Viewing the cover removal

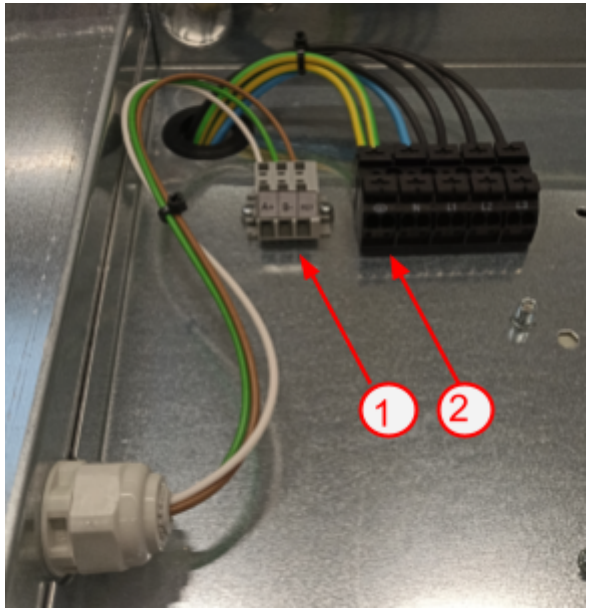
3. Relieve the electrical cables from strain with the help of the wiring in the connection area (1) (see Pic. 20)



Pic. 20 Cable stretching, lightning

8.2 Cable connection

1. Route electrical connection cables and signal cables either with power cables or separately in an empty conduit.
2. Perform the cable connection according to the following diagram.



Pic. 21 Wiring

1. Safety Extra Low Voltage (SELV)
 - BUS A, BUS B, and BUS ground (REF)
2. Compressor (inverter)
 - L1, L2, L3, N, and PE
3. Check cable strain relief.

i NOTE: Always connect emergency/supplementary heating (in monoenergy mode). These units are installed on accumulator tanks to ensure the proper functioning of the heat pump (protection against freezing).

i NOTE: The pipe heating must be connected to a separate power source at the secondary distribution board.

9. Commissioning



WARNING: Before starting the heat pump, disconnect the power supply to the heating element at the fuse box. This prevents damage to the compressor and heating element.

- Allow a minimum of 2 hours for the heat pump unit to stabilize refrigerant before putting it into operation after installation and connection.

Prerequisite for trouble-free commissioning:

Ensure that the heating system is filled with water according to the VDI 2035 standard and properly vented, filters are cleaned, and ball valves are open. When regulating heating circuits, it is essential to bleed the underfloor heating or radiators system as well.

- Verify that the water inputs and outputs on the heat pump are correctly connected.
- With the power off, check if the evaporator is clean and the fan is not obstructed by foreign objects.
- Ensure that the electrical installation is complete.



ATTENTION: The installer supplying the heat pump to the customer is responsible for the installation, organisation and overall quality of the work.

9.1 Starting

- Check that the controller switches are switched on and compressor.
- Turn on the main power supply.



NOTE: If all parameters are correct, the heat pump can be started.

- Some errors may recur and may be tolerated. Therefore, the heat pump may stop after a short operation, and after forced shutdown for several minutes, it may restart!
- If the red indicator is lit on the control panel and "bell" is displayed on the screen, repeatedly press the INFO button to get a description of the error.
- Resolve all errors, especially those related to phase protection.
- Perform all specific settings, especially in the "Configuration" section. Define all multifunction inputs and outputs.
- After clearing errors and configuring, check the functions in the "Test Inputs/Outputs" menu at line 7700 and verify all options of your installation. Perform a "relay test" where, after setting line 7700, all circulation pumps and valves are sequentially activated and checked. You can also test the

compressor activation (it automatically shuts off after a few seconds) and the fan. Also, check the values of all temperature sensors in this menu.

- To reset the lowered outdoor temperature, use the "Consumption Diagnostics" function, line 8703. If the outdoor temperature exceeds normal values, you can simulate the outdoor temperature on line 7150. (Automatically resets after 5 hours).
- Check messages on lines 8000 - 8010 in the "Device Status" menu.
- Detailed device diagnostics can be performed in the "Source Diagnostics" and "Consumption Diagnostics" menus.
- Use the "rotary knob" to increase the desired room temperature and confirm the setting with OK. Alternatively, you can request heating or cooling via the Hx inputs.
- First, the circulation pumps start (at least Q9 - the condenser circulation pump), and only then does the heat pump start.
- The temperature at the water outlet of the heat pump should increase by several degrees within a few tens of seconds.
- The heat pump differs from a gas boiler; during normal operation, the difference between the inlet and outlet temperature is usually about 5°C.
- The maximum acceptable difference between the inlet and outlet is 10°C; ideally, it should be less than 5°C.
- A higher temperature difference indicates a problem with hydraulic connection and low flow through the condenser of the heat pump, which can be caused by too small a circulation pump with low settings, throttling valves, clogged armored hoses, clogged filters, or air in the heating circuit.

9.2 Commissioning with cold water in the heating circuit

The minimum temperature at the inlet of the heat pump, at which the air-to-water heat pump can reliably operate, ranges between 18-20°C. At temperatures lower than these values, the heat pump may activate its anti-freeze protection and enter defrost mode. The temperature difference during the flow through the heat pump is also important.

- One solution is to ensure a bivalent heat source for heating the heating system in case the heat pump is not in operation and an alternative source is activated. An experienced technician can manually perform the heating cycle of the heating system if necessary.
- For example, if the inlet temperature during defrosting is 15°C and the outlet temperature drops below 8°C, the defrosting process will be stopped. The heat pump will then resume heating mode after a while, but if the temperature drops again below 8°C, the defrosting cycle will start again. This cycle can repeat, and if the temperature drops again below 8°C, the heat pump will stop definitively and generate a fault message regarding defrosting.

10. Maintenance

As part of regular maintenance, a comprehensive system status check should be conducted to ensure safety and maintain energy supplies. During maintenance, it is advisable to perform a thorough system status check, including visual inspection and testing of individual components. This ensures smooth operation and energy availability. Wipe equipment surfaces with a damp cloth, using a neutral cleaning agent.

10.1 Heat pump maintenance



WARNING: Risk of electric shock.

- Before commencing any maintenance or cleaning, it is necessary to disconnect the equipment from the power source.
- After disconnecting the equipment, wait at least 5 minutes for the capacitors on the inverter to discharge and remove the risk of electric shock.



WARNING: Risk of injury due to fan rotation.

- Before removing the side cover of the fan, disconnect the equipment from the power source.



ATTENTION: Before servicing the heat pump, the following considerations must be taken into account:

- Adhere to relevant regulations for injury prevention and safety guidelines.
- Maintenance or measurement of the cooling circuit of the heat pump unit may only be performed by authorized cooling specialists.
- Operate the heat pump unit only with refrigerant R454B.

Perform the following routine checks and cleaning tasks regularly:

1. Lift and remove the rear grille of the heat pump.
2. Remove leaves and other debris from the ventilation grille and fins of the evaporator.
3. Check the condensate drainage function and remove any debris. For example, pour water onto the fins using a pitcher and allow the water to drain from the unit.
4. The cooling fins of the heat exchanger must be clean; remove deposits using a brush or compressed air.
5. Bent fins on the evaporator can be straightened using a special tool.



ATTENTION: Do not use high-pressure cleaners! To prevent equipment damage, it is not suitable to use cleaners with high water pressure

10.2 Problem solving



WARNING: Risk of electric shock.

- Before commencing any maintenance or cleaning, disconnect the equipment from the power source.
- After disconnecting the equipment, it is necessary to wait for 5 minutes as capacitors on the inverter may still hold a charge.



WARNING: Risk of injury due to fan rotation.



NOTE: If the heat pump has been blocked due to a malfunction, it is necessary to perform a reset.

POSSIBLE FAULTS

Error	Possible cause	Comment/Correction
No communication	Connection is interrupted, heat pump fuse is tripped or phase loss (L1)	Check connections, check heat pump fuse, check position of slide switch on SEC.
High pressure sensor: Maximum high pressure exceeded	The volume flow rate of the filling pump is too low	Check that the pump is on (A2) and PWM Output (O-4) is "Auto", Check temperature specifications.
Sensor error: e.g. temperature sensor	The connection between the SEC and the sensor is faulty	Check the cable of the corresponding sensor, Replace the sensor if necessary.
Inverter error: phase failure	Loss of phase	Check fuse, check voltage at house connection, check wiring in heat pump if applicable
Compressor unit configuration error	The SEC does not list incorrect or no compressor unit	via In the section "Factory service" => "Heat generator" set the correct type
Loud hissing sound from the expansion valve	Lack of refrigerant in refrigerant circuit, No refrigerant subcooling, Defective expansion valve	Please contact customer service or your service technician
Very frequent and long defrosting	Wind cools the evaporator during defrosting	The suction side must be protected from strong winds

10.3 Switch settings



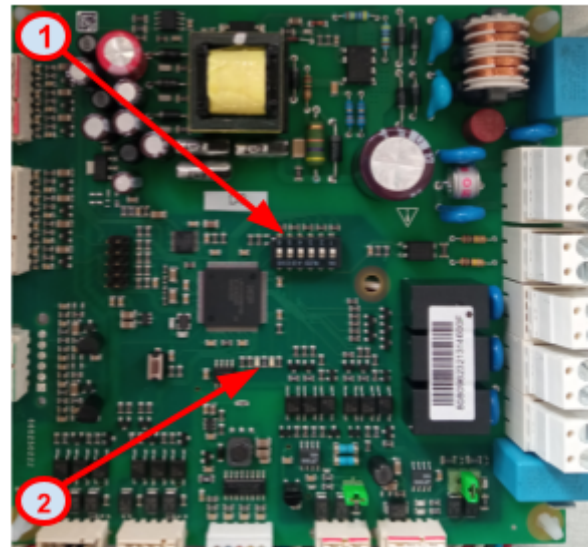
ATTENTION: Everything is already set from the factory, if any problem arises, please contact a service technician.



WARNING: Risk of electric shock.



WARNING: Ensure that the heat pump is disconnected from the power supply to prevent possible electric shock. When replacing the slide switch, it is essential to ensure that all electrical power is disconnected and the equipment is turned off.



Pic. 23 SEC

- 1. Slide switch
- 2. LED row

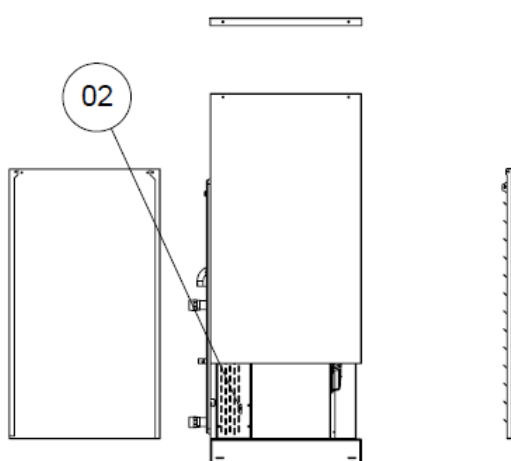
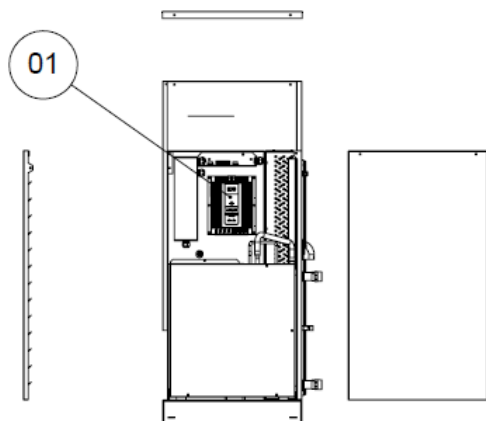
Enabling access to SEC

- 1. Loosen the 4 screws and remove the cover.
- 2. Loosen the 2 screws on the side panel (right).
- 3. Lift the side panel slightly and remove it.

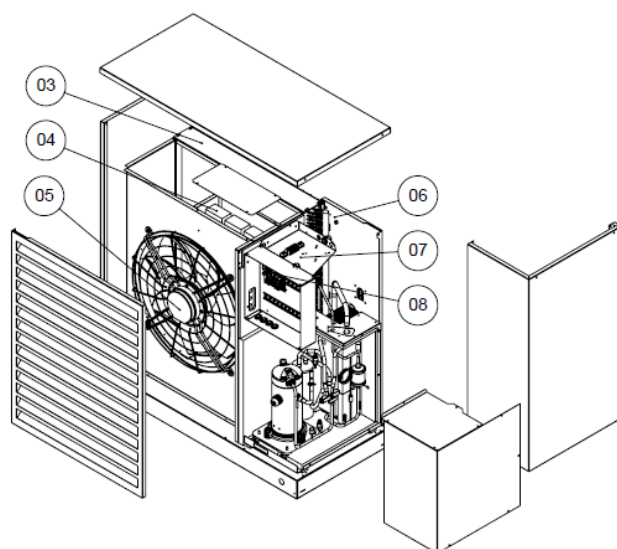
LIGHT EMITTING DIODE SIGNALS

LED display		Meaning of	Solution
Orange	Flashing (twice per second)	Communication is established with the inverter	No intervention required
	Permanently off	Communication with the inverter is interrupted	Pay attention to the error message, pay attention to chapter 10.2 Troubleshooting
Yellow	Flashing (twice per second)	communication with SC - 3 is established	No intervention required
	Permanently off	communication with SC - 3 is interrupted	Pay attention to the error message, pay attention to chapter 10.2 Troubleshooting

10.4 View and spare parts

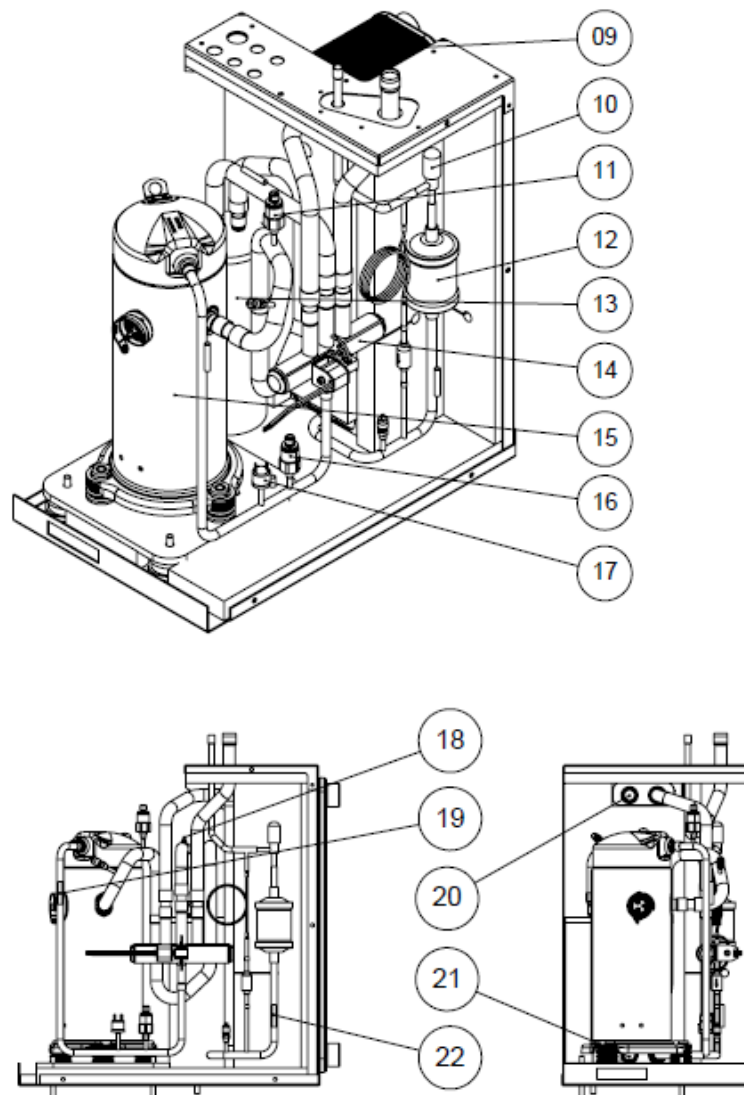


Pic. 24 Heat pump parts part 1.



Pic. 25 Heat pump parts part.2

Position	Description
01	Frequency converter
02	Evaporator temperature sensor
03	Evaporator
04	Chokes
05	Fan
06	Air temperature sensor
07	Terminal block
08	SEC board



Obr. 26 Díly chladícího boxu

Position	Description	Position	Description
09	Capacitor	16	High pressure sensor
10	Expansion valve	17	High Pressure Pressure Pressure Switch
11	Low pressure sensor	18	Low pressure temperature sensor
12	Filter	19	High pressure temperature sensor
13	Separator	20	Heating water outlet temperature sensor
14	4-way valve	21	Heating water inlet temperature sensor
15	Compressor	22	Subcooling temperature sensor

10.5 Declaration of conformity



EU Prohlášení o shodě - No. 0001 / Rok 2024

EU Declaration of Conformity – No. 0001 / Year 2024

Výrobce / Manufacturer: HOTJET CZ s.r.o.

Průmyslová 966

747 23 Bolatice

Toto EU prohlášení o shodě se vydává na výhradní odpovědnost výrobce. Předmětem prohlášení jsou tlakové sestavy popsané v souboru technické dokumentace.

This EU Declaration of Conformity is issued under the sole responsibility of the manufacturer. The object of the declaration are Pressure assembly which are described in technical construction file.

Název / Name:

Tlakový systém tepelného čerpadla HOTJET 7ZETXe

Heat pump pressure system HOTJET 7ZETXe

Předmět prohlášení je ve shodě s příslušnou harmonizační legislativou Evropské Unie, zejména se směrnicí o tlakových zařízeních PED 2014/68/EU* v platném znění a s následující harmonizovanou normou (normami), pokud jsou používány v souladu s našimi pokyny:

This object of declaration are conformity with the relevant European Union harmonization legislation especially with the pressure equipment directive PED 2014/68/EU as amended and with the following harmonized standard(s), provided that these are used in according to our instruction:*

EN 378-2:2017

Použitý postup posuzování shody podle směrnice 2014/68/EU: D1 Zabezpečování kvality výrobního procesu.

Název, adresa a číslo oznámeného subjektu:

TÜV NORD Czech, s.r.o.

Českomoravská 2420/15

190 00 PRAHA

Číslo vydaného certifikátu:

1221-0126/23



Conformity assessment procedure used according to Directive 2014/68/EU: D1 Quality assurance of the production process.

Name, address and number of the notified body:

TÜV NORD Czech, s.r.o.

Českomoravská 2420/15

190 00 PRAHA

Number of certificate issued:

1221-0126/23

Tato EU deklarace je platná pro sestavy vyrobené v roce 2024. / This EU declaration is valid for assemblies made in the year 2024.

V Bolaticích, dne 2.1.2024

In Bolatice, date 2.1.2024



.....
fr. Frank Houthoofd



EU Prohlášení o shodě - No. 0002 / Rok 2024

EU Declaration of Conformity – No. 0002 / Year 2024

Výrobce / *Manufacturer:* **HOTJET CZ s.r.o.**

Průmyslová 966

747 23 Bolatice

Toto EU prohlášení o shodě se vydává na výhradní odpovědnost výrobce. Předmětem prohlášení jsou tlakové sestavy popsané v souboru technické dokumentace.

This EU Declaration of Conformity is issued under the sole responsibility of the manufacturer. The object of the declaration are Pressure assembly which are described in technical construction file.

Název / *Name:*

Tlakový systém tepelného čerpadla HOTJET 10ZETXe

Heat pump pressure system HOTJET 10ZETXe

Předmět prohlášení je ve shodě s příslušnou harmonizační legislativou Evropské Unie, zejména se směnicí o tlakových zařízeních PED 2014/68/EU* v platném znění a s následující harmonizovanou normou (normami), pokud jsou používány v souladu s našimi pokyny:

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Českomoravská 2420/15

190 00 PRAHA

Číslo vydaného certifikátu:

1221-0126/23



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Name, address and number of the notified body:

TÜV NORD Czech, s.r.o.

Českomoravská 2420/15

190 00 PRAHA


Number of certificate issued:

1221-0126/23

Tato EU deklarace je platná pro sestavy vyrobené v roce 2024. / This EU declaration is valid for assemblies made in the year 2024.

V Bolaticích, dne 2.1.2024

In Bolatice, date 2.1.2024



Mr. Frank Houthoofd



EU Prohlášení o shodě - No. 0003 / Rok 2024

EU Declaration of Conformity – No. 0003 / Year 2024

Výrobce / *Manufacturer:* HOTJET CZ s.r.o.
Průmyslová 966
747 23 Bolatice

Toto EU prohlášení o shodě se vydává na výhradní odpovědnost výrobce. Předmětem prohlášení jsou tlakové sestavy popsané v souboru technické dokumentace.

This EU Declaration of Conformity is issued under the sole responsibility of the manufacturer. The object of the declaration are Pressure assembly which are described in technical construction file.

Název / *Name:*

Tlakový systém tepelného čerpadla HOTJET 15ZETXe

Heat pump pressure system HOTJET 15ZETXe

Předmět prohlášení je ve shodě s příslušnou harmonizační legislativou Evropské Unie, zejména se směrnicí o tlakových zařízeních PED 2014/68/EU* v platném znění a s následující harmonizovanou normou (normami), pokud jsou používány v souladu s našimi pokyny:

This object of declaration are conformity with the relevant European Union harmonization legislation especially with the pressure equipment directive PED 2014/68/EU as amended and with the following harmonized standard(s), provided that these are used in according to our instruction:*

EN 378-2:2017

Použitý postup posuzování shody podle směrnice 2014/68/EU: D1 Zabezpečování kvality výrobního procesu.

Název, adresa a číslo oznámeného subjektu:

TÜV NORD Czech, s.r.o.
Českomoravská 2420/15
190 00 PRAHA

Číslo vydaného certifikátu:
1221-0126/23

Conformity assessment procedure used according to Directive 2014/68/EU: D1 Quality assurance of the production process.



Name, address and number of the notified body:

TÜV NORD Czech, s.r.o.

Českomoravská 2420/15

190 00 PRAHA

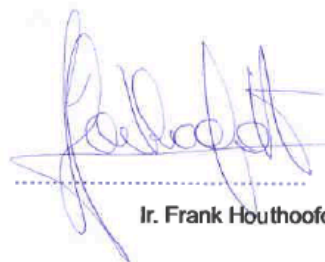
Number of certificate issued:

1221-0126/23

Tato EU deklarace je platná pro sestavy vyrobené v roce 2024. / This EU declaration is valid for assemblies made in the year 2024.

V Bolaticích, dne 2.1.2024

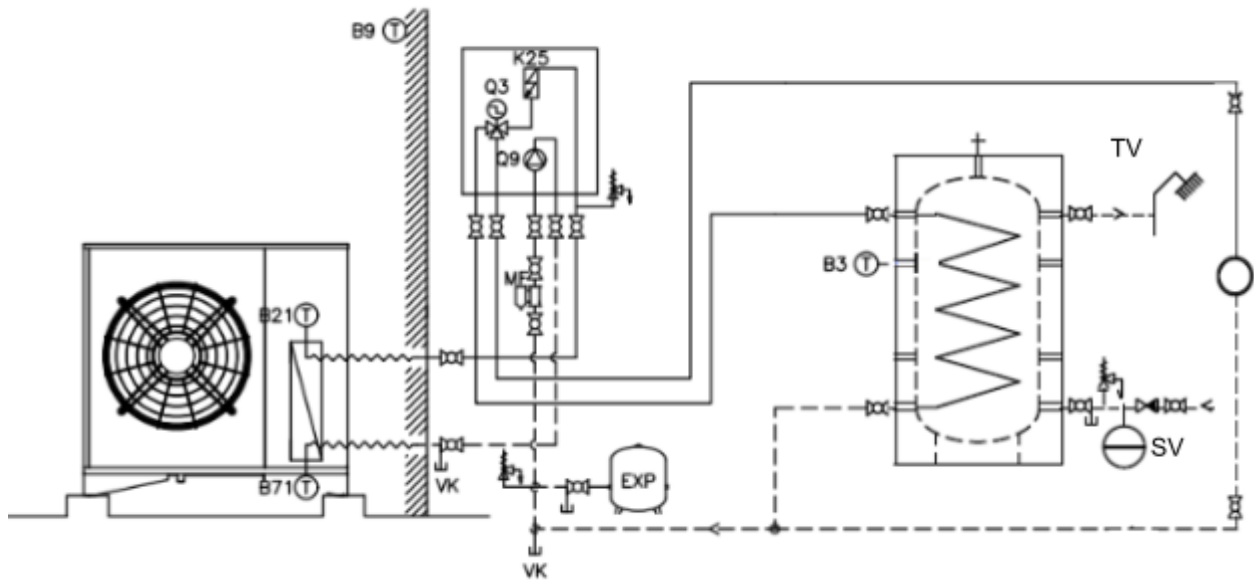
In Bolatices, date 2.1.2024



Ir. Frank Houthoofd

10.6 Hydraulic integration

Basic diagram of a heat pump connection to a direct heating circuit. Typical wiring diagram - does not replace the installation project.



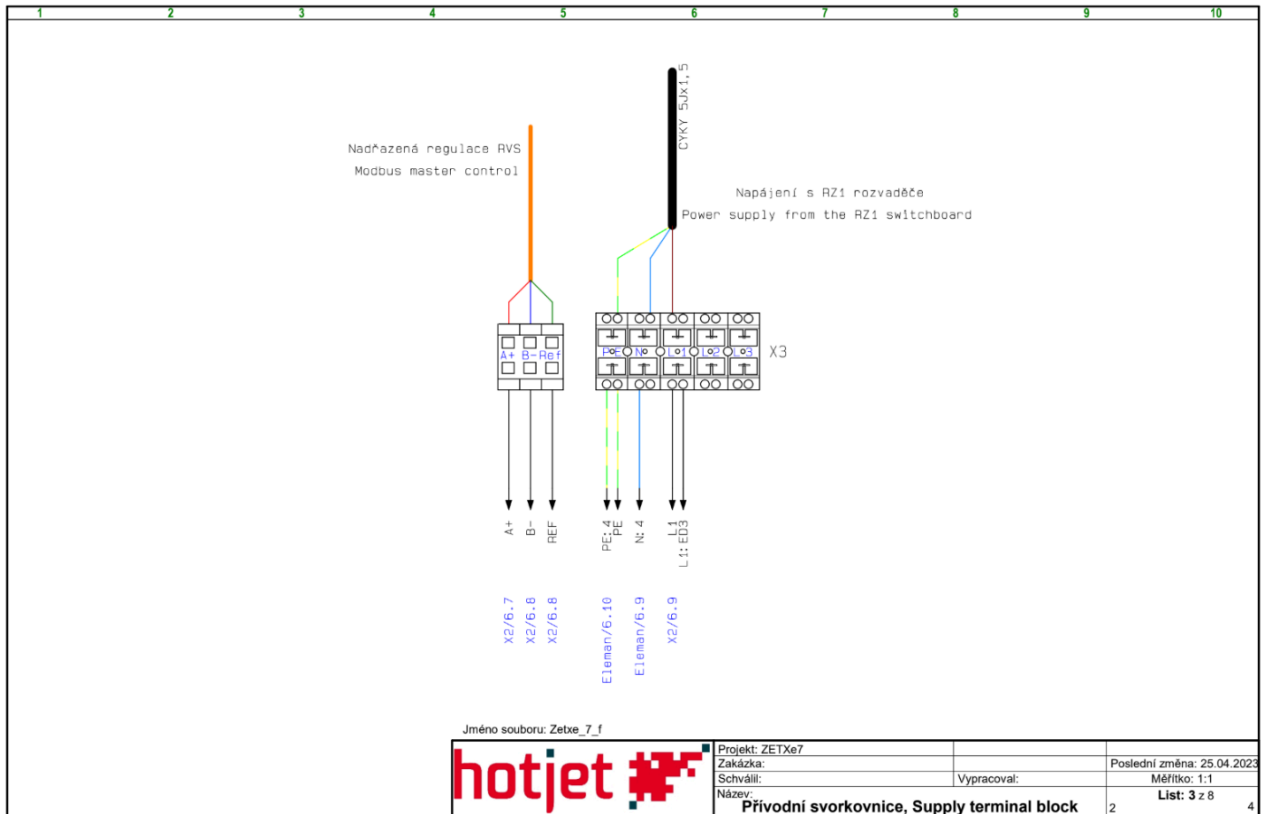
Legend control parts

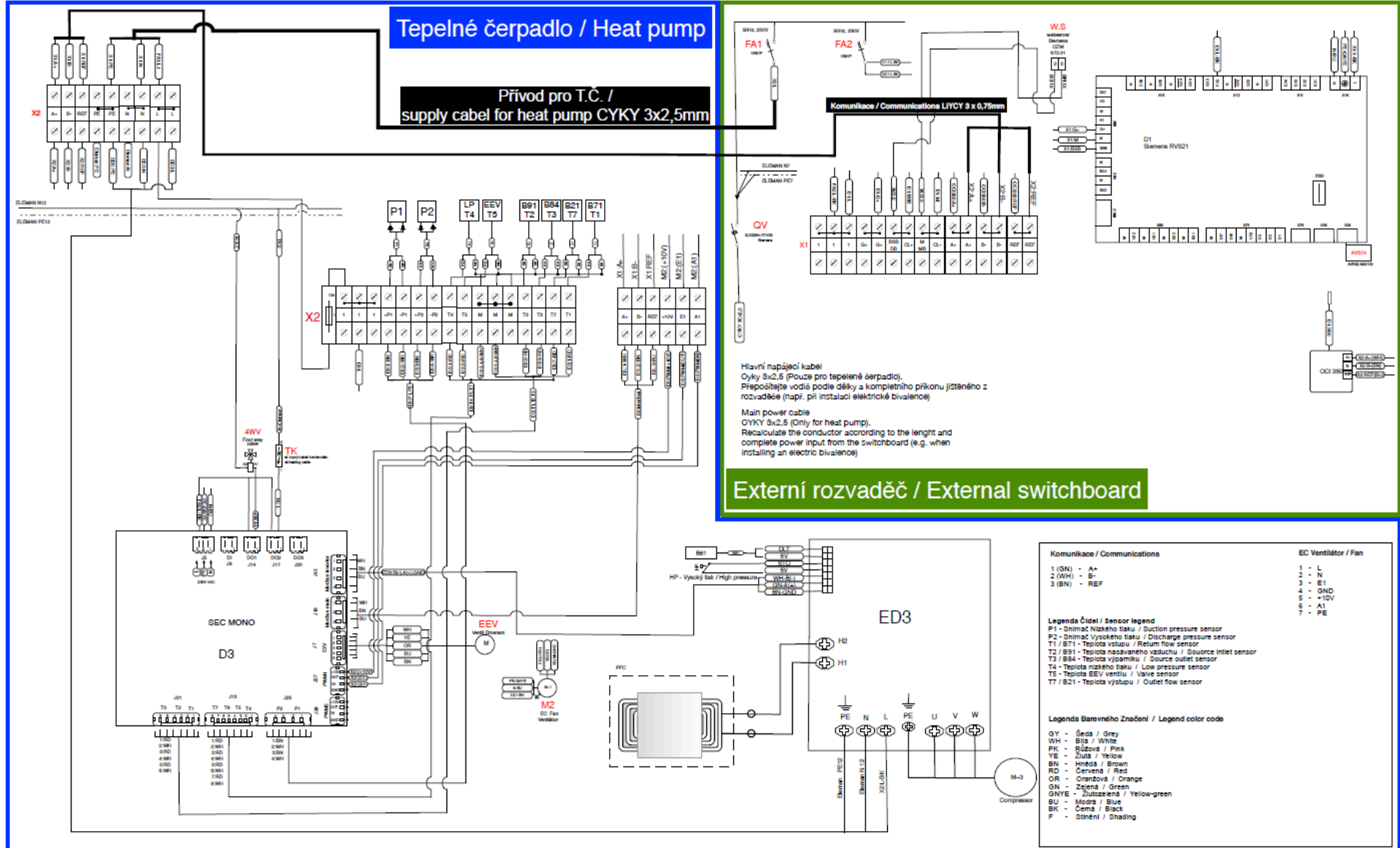
- B - Temperature sensor
- K25/K26 - Water flow immersion heater
- Q3 - Three-way diverting valve
- Q9 - Circulating pump

Legend used parts

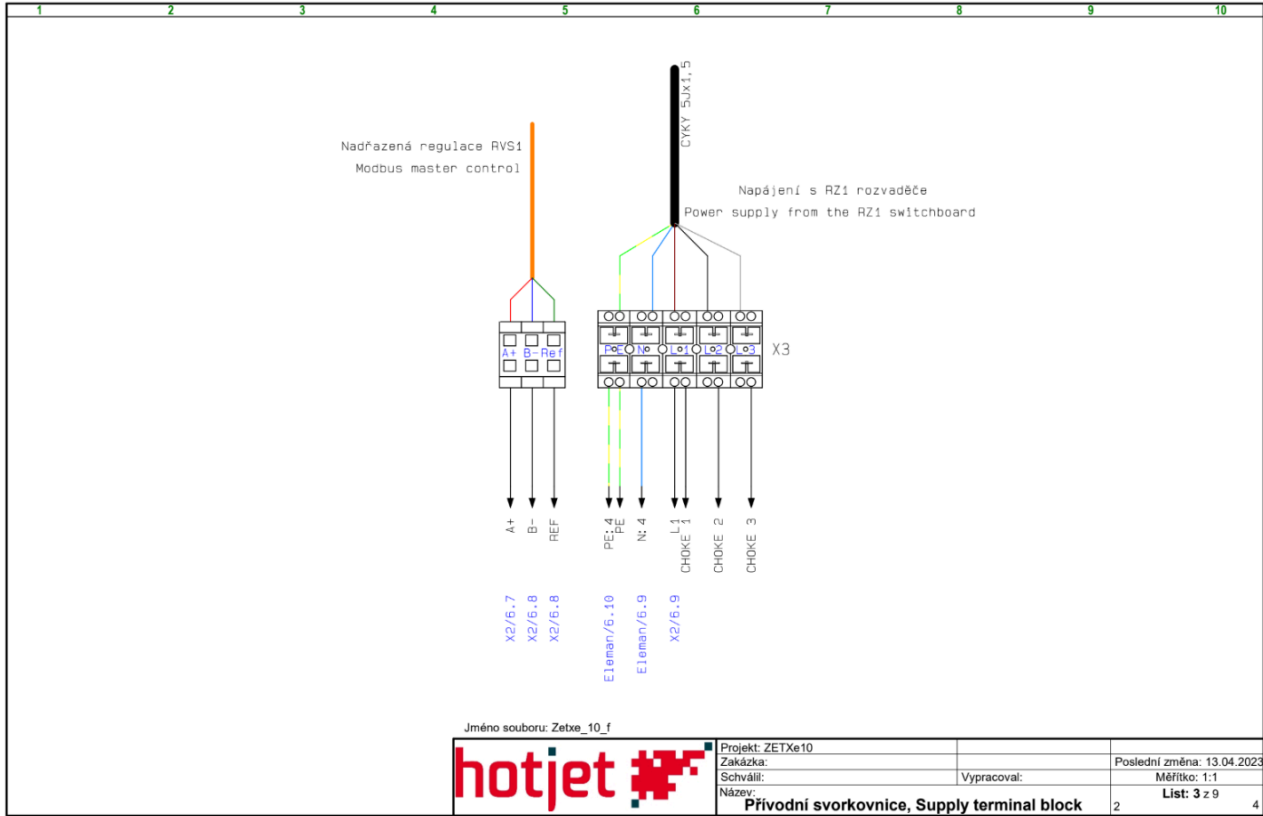
- BO - Boiler
- EXP - expansion vessel
- WT - desk exchanger
- KK - Shutoff valve
- PV - Safety valve
- VK - Drain valve
- OV - Deaerator
- MF - Magnetic filtr
- KR - Check valve
- SV - Cold water
- TV - Hot water
- T - Temperature sensor

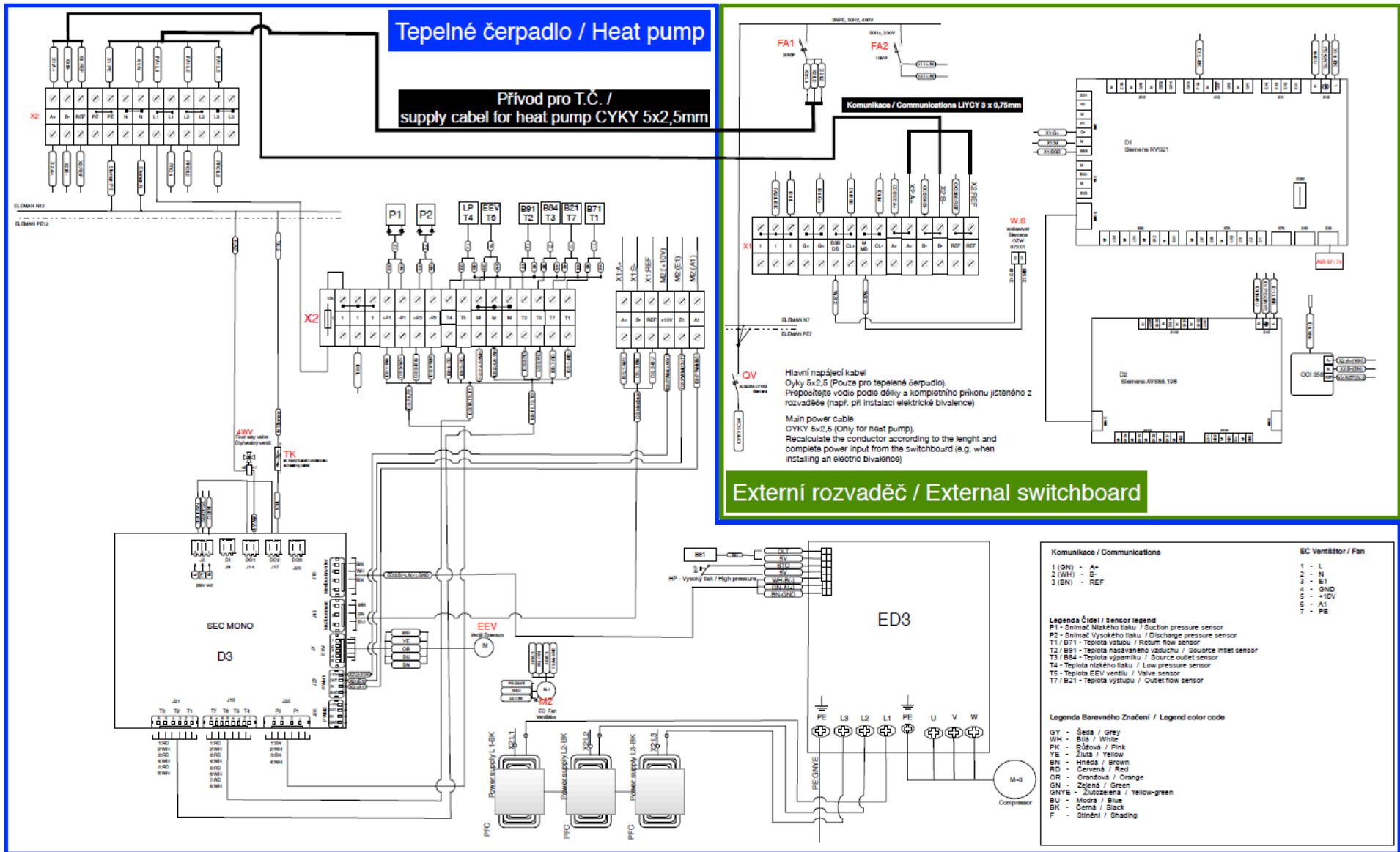
10.7 Annex 1: Electrical diagram of 7 ZETXe





10.8 Annex 2: Electrical diagram of 10 ZETXe





10.9 Annex 3: Electrical diagram of 15 ZETXe

