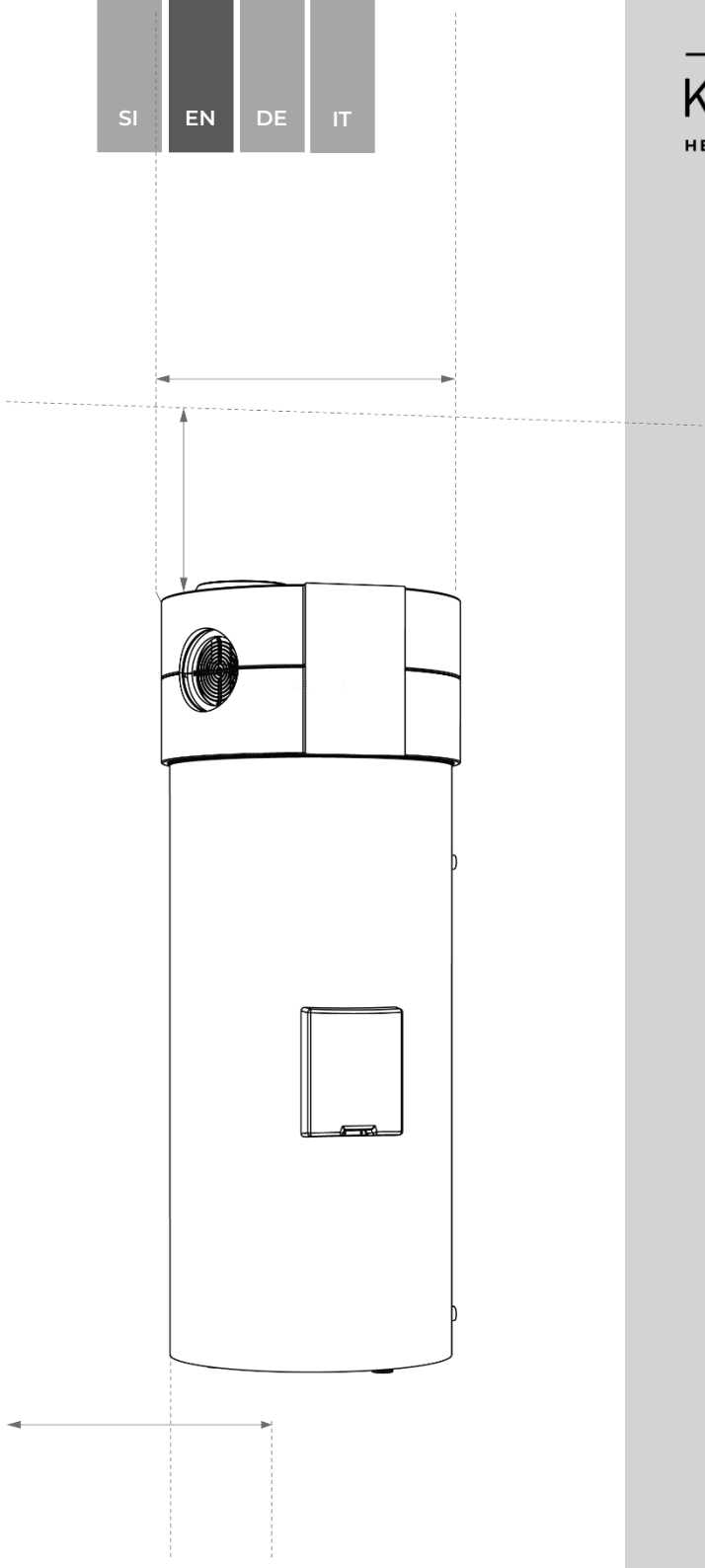
SI EN DE IT

KRONOTERM 1976
HEAT PUMPS



INSTALLATION

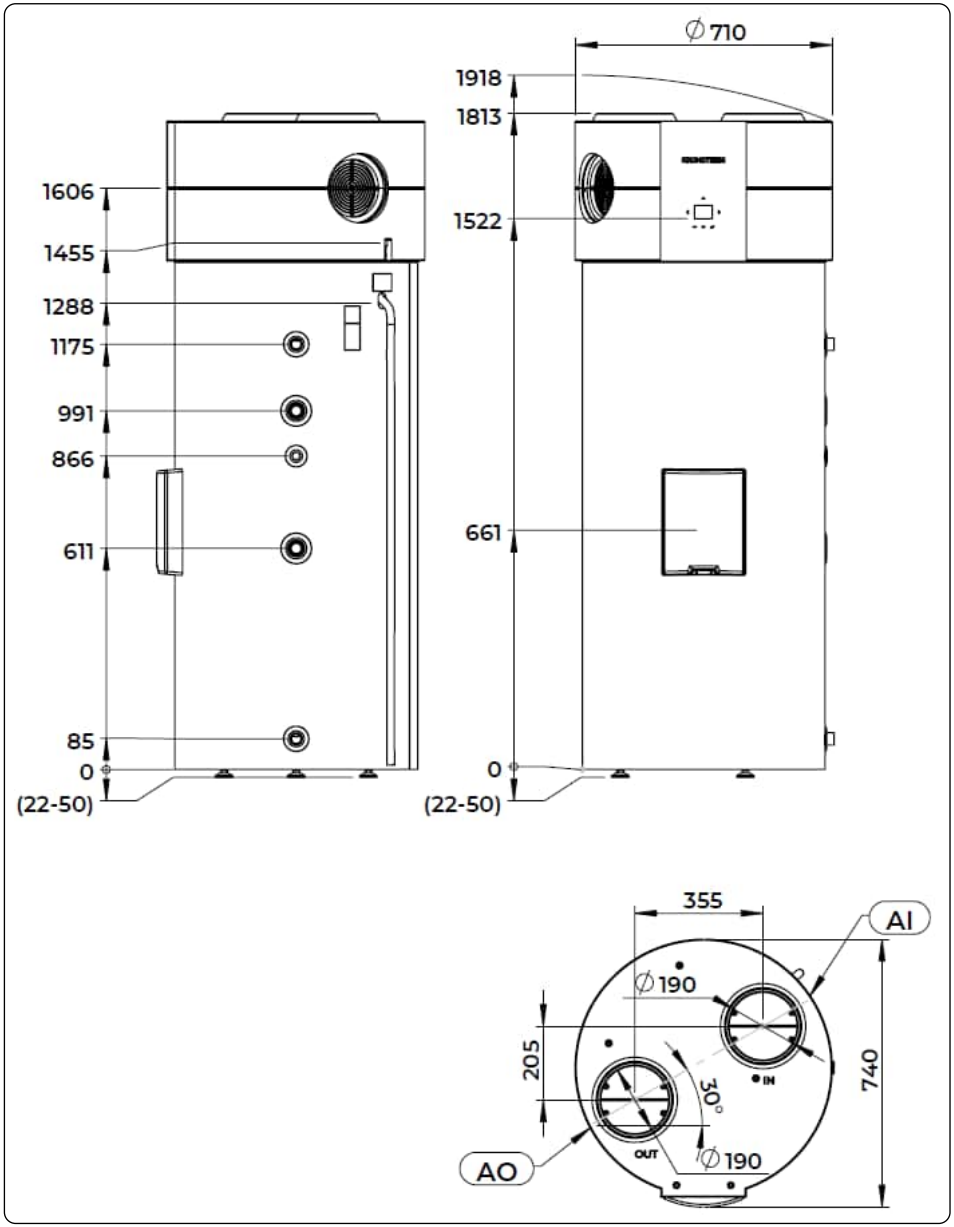
INSTRUCTIONS FOR PLANNING, INSTALLATION PREPARATION, INSTALLATION, AND MAINTENANCE

System designer, Installation technician, User

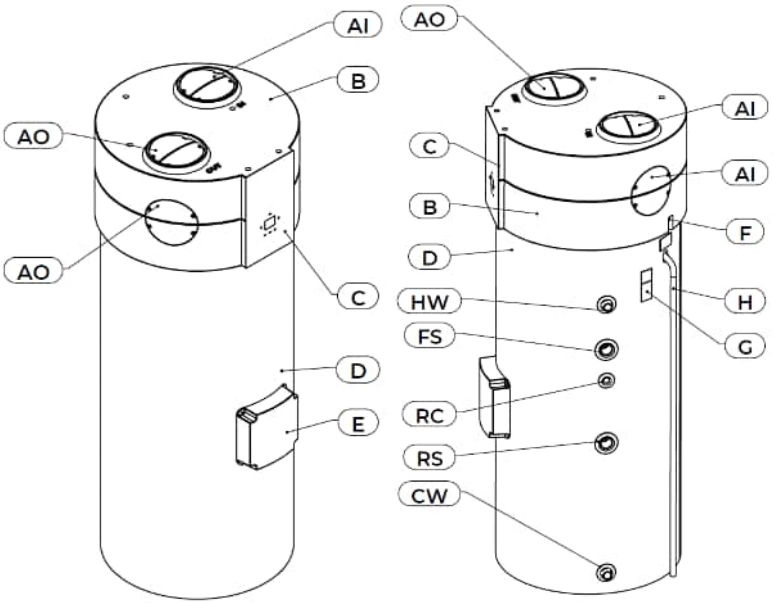
ESSENTA

Heat pump

ESSENTA System



NOTE: All dimensions listed in this document are in mm.



B	Heat pump	AI	Air inlet 190/160 mm (f)
C	Control panel - Display - Heat pump regulator	AO	Air outlet 190/160 mm (f)
D	DHW tank	CW	Domestic cold water G1" ET
E	Flange - Electric heater - Magnesium anode	RS	Heat exchanger for DHW heating with external boiler – return G1" IT
F	Cable protective conduit - Power supply - External circulation pumps and valves - External temperature sensor - SG signals	FS	Heat exchanger for DHW heating with external boiler – supply G1" IT
G	Temperature sensor channel	RC	Recirculation – DHW G3/4" IT
H	Condensate drain pipe	HW	DHW G1" ET

KRONOTERM INSTRUCTION SYSTEM

This document is a part of the KRONOTERM instruction system, which follows our products' lifecycle from design phase to service support.

The installation instructions serve as the foundation for the professional installation and implementation of the KRONOTERM heat pump system.

Instructions for planning, installation preparation, installation, and maintenance – 17-25-23-220185-00 / 3.2026

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TABLE OF CONTENTS

1 IMPORTANT INFORMATION

WELCOME TO THE KRONOTERM FAMILY!
These instructions describe the process of choosing an appropriate place to install your heat pump and tips for readying a building for mounting the unit.
Only properly qualified individuals may install or maintain and install Kronoterm devices.
Before installation, read the instructions carefully, as this will familiarise you with the purpose, functionality and handling of the device.

1.1 SYMBOLS

This symbol indicates various risks for the user or the device:
DANGER: Risk that can lead to serious bodily injury.
WARNING: Risk that can lead to minor bodily injury.
CAUTION: Risk that can lead to device damage or malfunction.

The symbols indicate information:

NOTE: NOTE: Notification that provides important information about the device and the manufacturer's requirements.

INSTRUCTIONS FOR USE: Read the attached manual before use.

REFRIGERANT: The device contains the A3 flammable refrigerant.

FURTHER INFORMATION: You can scan the QR code with your smartphone.

Instructions for a professionally trained person (installer, service technician...)

Instructions, intended for the user.

1.2 GENERAL WARNINGS

Heed the recommendations and requirements in these instructions to ensure the device's proper operation. Improper handling of the device may result in damage to the device, injury to the user or property.

NOTE

Read these instructions before starting work and installation. More detailed information is available following the links marked with a QR code.
The warranty is voided if the installation preparation process and the installation of the device differ from the manner prescribed herein.
Heed required clearances during installation.
Any modification or replacement of the original components of the device excludes the manufacturer's guarantee for safe and functional operation.
The manufacturer is not responsible for the consequences of careless and improper use of the device.
The manufacturer is not responsible for any claim for compensation in the event of device or other damage resulting from not adhering to the instructions herein.
Required minimum clearances and dimensions of the indoor unit and heat pump are specified at the start of the manual.
The dimensions of the power supply and communication cables are specified below in the instructions.
The cooling system of the device is hermetically sealed.

NOTE

Ensure regular maintenance of the device by an authorized service technician.
Keep these instructions in a dry place in the device's vicinity.
After the preparation and installation phase these instructions must be given to the end user.
If the product is ever given to a third party, these instructions must also be given to said third party.

1.3 SAFETY WARNINGS AND INSTRUCTIONS

DANGER

Do not clean or tamper with the device while it is in operation.
Electrical installation must be conducted by a qualified expert.
Disconnect the device from the power supply while connecting the elements of the heating system.
Failure to follow the instructions and good practice when electrical connection of the device may result in serious injury or death.
Inspect the building's electrical wiring in accordance with valid legislation on the requirements of low-voltage electrical wiring.

DANGER

Do not puncture or burn the device.
The device contains the R290 (C3H8) flammable refrigerant.
The refrigerant R290 is heavier than air and odorless.
Only persons who are trained in handling flammable refrigerants and authorized by the manufacturer are allowed to access the refrigerant system of the device.
In case of refrigerant leakage, a flammable or explosive atmosphere can be formed in the immediate vicinity of the device. Follow the following rules:
Install the device in such a way that in case of leakage, there is no stagnation of refrigerant in the surroundings.
There should be no sources of ignition in the vicinity of the device, such as open flames, hot surfaces, sparking electrical devices, battery-powered devices (such as mobile phones, etc.).
Only use tools that meet the requirements for working with flammable refrigerants in Safety Group A3 in Zone 2.
Use antistatic equipment and clothing. Before touching the device, touch other grounded parts to discharge yourself of any static electricity.

DANGER

It is prohibited to remove, disable, bridge or block the security mechanisms and systems of the device.
Any modification of the device is prohibited.

CAUTION

Service and maintenance of the device can only be performed by an authorized service technician.
In case there are issues with the device's operation, contact the installer who installed your device.
Do not place other objects on or next to the device.
Do not tilt the device more than 45° in any direction except during the final transport to the installation site.
The device may only be tilted in the direction indicated on the packaging.
To ensure proper operation of the unit, provide power supply with the appropriate quality of electrical voltage (SIST EN 50160).
The actual power supply must not fluctuate more than ± 10% of the rated voltage. You can get information on power supply from your electricity service provider.
Connect the device to the electrical network via the circuit breaker built into the electrical installation.

CAUTION

The device must be connected in accordance with national regulations on electrical installations.
Use a circuit breaker that separates all contacts under overvoltage category III conditions - minimum contact spacing of 3 mm.
Due to excessive pressure in the heating system or the domestic hot water system, water may leak from the safety valve. Ensure that the safety valve's drainage pipe is clear and installed in a place that will never freeze.
The manufacturer guarantees the operation of the device if the intended additional equipment KRONOTERM is installed in the heating system. In case of using additional equipment from other manufacturers, the manufacturer is not responsible for any malfunctions of the device or system.
Do not use any other substances for accelerate the defrosting or cleaning, except those prescribed by the manufacturer.
To ensure proper operation of the safety valve, perform regular annual inspections of the valve. Remove any limescale if necessary and check that the safety valve is not blocked.

CAUTION

Water from the unit is drained through the inlet pipe of the water heater. For this purpose, it is recommended to install a special fitting or drain valve between the safety valve and the inlet pipe.
Minimum clearances are specified later in the instructions.
Connection of the device is described in detail later in the instructions.
A safety valve with a nominal pressure of 0,8 MPa (8 bar) must be installed on the inlet pipe of the device to prevent the pressure in the water heater from exceeding the nominal pressure.
The connection to the additional heat exchanger is described in detail later in the instructions.
To avoid hazards, only the manufacturer or their authorized installer is allowed to replace a damaged power cable.
The attachment of the device is described further in the instructions.
The maximum inlet water pressure is 3,0 bar (0,3 MPa).
The device must not be connected to a construction site power supply.

WARNING

Disconnect the device from the power supply before operating it.
Do not play with the device. The device may only be used independently by trained individuals who are familiar with safe operation and understand the possible dangers of operating the device.
Children are not allowed to clean or maintain the unit without supervision. Prevent access to the device by children and persons who are not trained for operating the device.
Ensure that the device's operation does not pose a risk to anyone. The device can be used by children aged 8 years and older and persons with reduced physical, sensory or mental abilities or with a lack of experience or
knowledge, if they are supervised or instructed in the safe use of the device and if they understand the possible dangers.
All mechanical installations must be carried out in accordance with applicable national regulations.
Electrical installation must be conducted in accordance with current national regulations on electrical installation and in accordance with the manufacturer’s instructions.

1.4 SCOPE OF DELIVERY

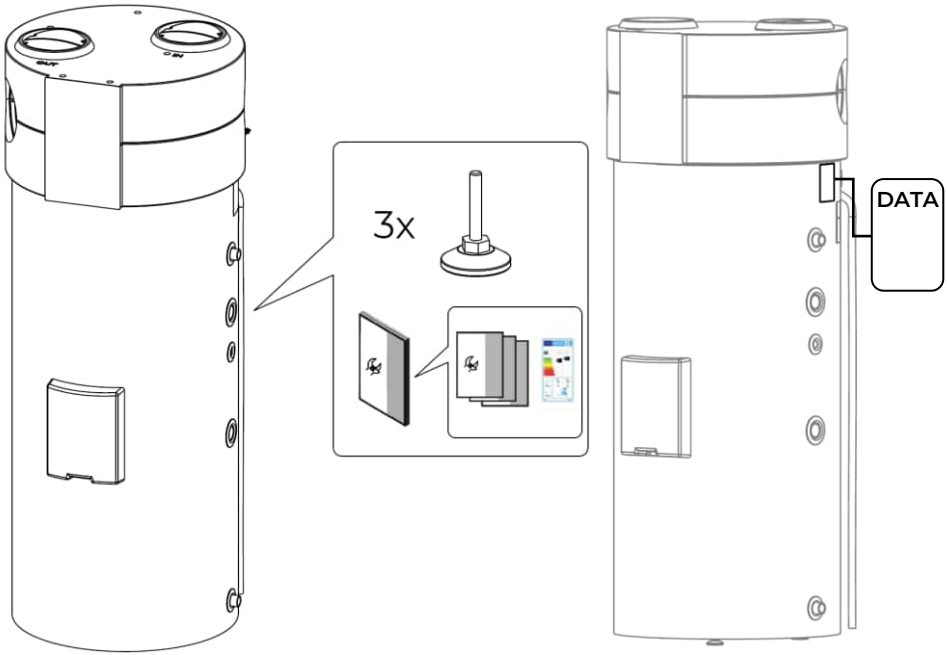


Figure 1: ESSENTA Scope of delivery and position of the specification label

1.5 TRANSPORT AND STORAGE

CAUTION

Do not place objects with a total weight of more than 10 kg on the device during transport.
Do not place any load on the outer casing of the device.
Transport and store the device in a dry place at a temperature of 4 to 45 °C (50 °C up to 24 h).
Keep the device in a place where there is no permanent source of ignition, such as: an open flame, working gas stoves or working electric heaters.

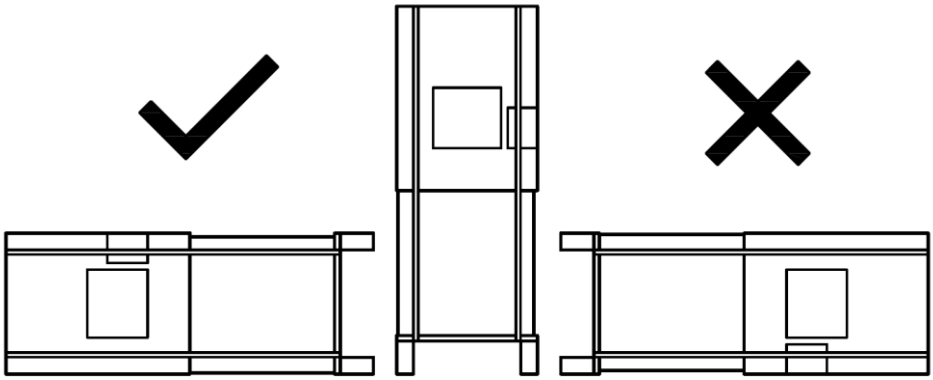


Figure 2: Horizontal transport

CAUTION

Horizontal transport of the device is only allowed in the original packaging and for distances up to 150 km.
You may place the device in a horizontal position only as indicated on the packaging. A maximum tilt of 45° is allowed in any other direction.

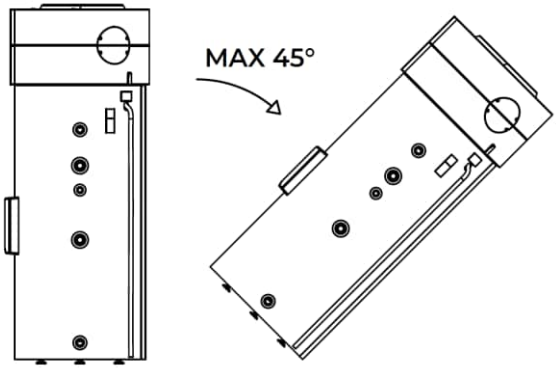


Figure 3: Tilting the device during transport

DANGER

Transport the device only with appropriate transport equipment that is qualified for the weight of the device.

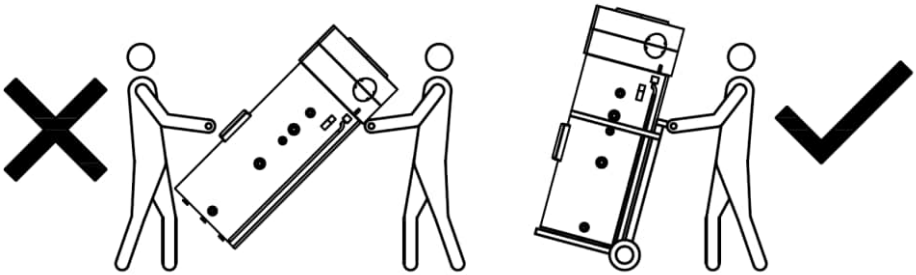


Figure 4: Transport the device using a trolley

1.6 HANDLING THE PACKAGING AND END-OF-LIFE DEVICE

Dispose of the packaging in compliance with applicable regulations.

Dispose of the device in accordance with applicable legislation on waste electrical and electronic equipment.

2 INSTALLATION PLANNING

2.1 HEAT PUMP CONNECTION DIAGRAM

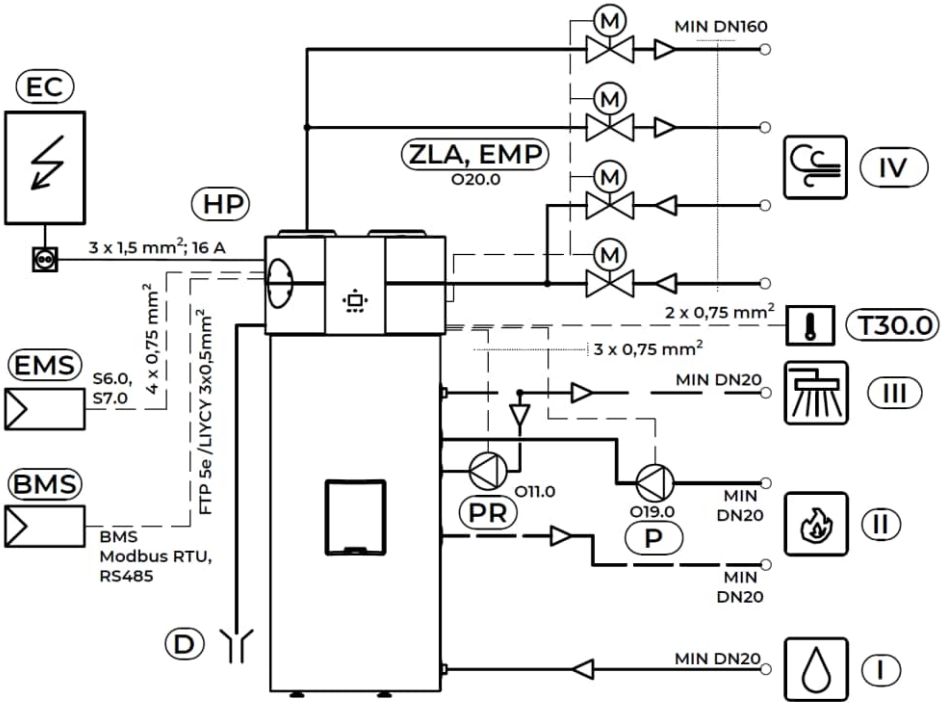


Figure 5: Connection diagram ESSENTA

I	Domestic cold water
II	External boiler or solar thermal collectors
III	Domestic hot water
IV	Air
BMS	Building management system – Modbus RS485
D	Drain
EC	Electrical distribution cabinet
EMS	Energy Management System (EMS) – SG1, SG2
HP	ESSENTA
P	Circulation pump for DHW heating with external boiler
PR	Circulation pump for DHW recirculation

ZLA, EMP	Motorized air changeover damper
T30.0	Temperature sensor for wood-fired boiler or solar collectors

2.2 LOCATION REQUIREMENTS FOR THE HEAT PUMP

NOTE

The temperature range in the room can be from +4 °C to +35 °C.
The room must be dry, humidity in the room must not exceed 60 %.
Ensure that the foundation for the equipment is flat, solid, durable, and of sufficient load-bearing capacity for the equipment, including the weight of filled liquids.
Insulate pipes and pipe connections in walls and ceilings with anti-vibration and vapour-barrier thermal insulation of adequate thickness to prevent corrosion and condensate accumulation.
Ensure that the room will always be accessible with manual transport devices for installation, maintenance and servicing purposes.
Costs related to the rental of special equipment for installation, servicing and maintenance are not covered by the warranty.
A floor drain trap must be installed in the utility room.
If using air heat from the installation room, the room size must be at least 30 m^3. To ensure adequate heat, open doors or windows as needed to allow heat from other rooms or from outside to enter.

2.2.1 MINIMUM FUNCTIONAL CLEARANCES

CAUTION

Move the heat pump away from obstacles to ensure proper airflow and allow unobstructed service access. Heed required clearances.

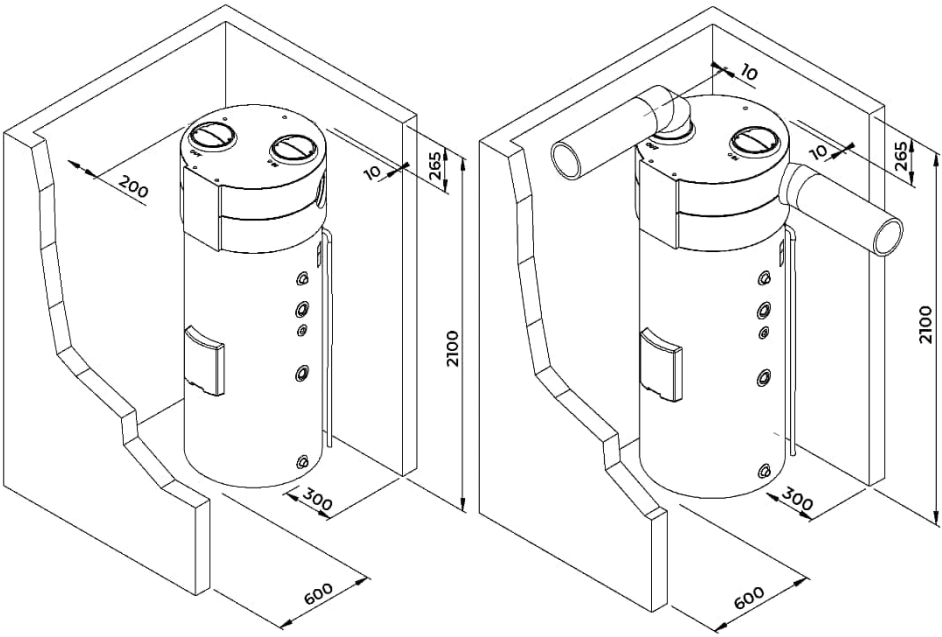


Figure 6: Minimum functional clearances for spatial and ducted installation

2.2.2 REQUIREMENTS FOR INSTALLED MATERIALS

CAUTION

Connect elements of the heating system such that you prevent the formation of galvanic cells. In connecting various materials, use transition fitings made of red brass with a length of at least twice the inner diameter. DO NOT use zinc-coated elements (pipes, fittings, etc.) in the heating system along with anti-freezing agents. Ensure proper grounding of the heating system and the domestic hot water system.

2.2.3 REQUIRED SAFETY ELEMENTS

CAUTION

The following must be installed on the DHW system:

- **DHW pressure regulator.**
- **Safety valve for the DHW tank.**
- **Expansion vessel or expansion group for the DHW tank.**

When connecting to an external boiler or solar collectors, the following components must be installed:

- **The heating system safety valve of the appropriate size.**
- **Expansion vessel for the heating system of appropriate size.**

2.3 REQUIREMENTS FOR PIPE CONNECTIONS

2.3.1 DHW PIPES

DANGER

DHW connection pipes must be suitable for tap water.

CAUTION

It is necessary to ensure the possibility of expansion and contraction of long pipelines.

NOTE

Table 1 shows the minimum DHW connection pipe diameter. Larger dimensions must be selected in accordance with the building's demand.

Table 1: Minimum DHW pipe diameter

	Minimum nominal diameter	Minimum internal diameter
Cold domestic water - CW	DN20	20 mm
Domestic Hot Water - HW	DN20	20 mm
DHW recirculation - RC	DN20	20 mm

2.3.2 PIPES FOR CONNECTION TO THE HEAT EXCHANGER

NOTE

For the hydraulic connection of the heat pump to the heating system, use pipes of appropriate dimensions as shown in Table 2. The pipes must be suitable for heating.

Table 2: The minimum pipe diameter for connecting the external boiler

	Minimum nominal diameter	Minimum internal diameter
Gas, oil, pellet, or wood-fired boiler	DN20	20 mm
Heating heat pump	DN20	20 mm
Thermo-solar collectors	DN20	20 mm

2.4 AIR DUCTS

ESSENTA allows various air duct configurations. Choose one of the configurations based on the installation space limitations.

2.4.1 SYSTEM WITHOUT AIR DUCTS

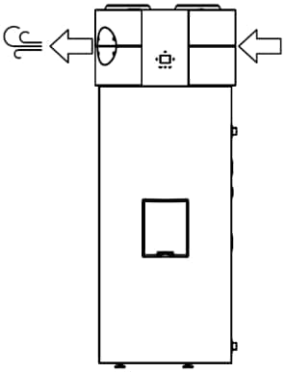


Figure 7: ESSENTA without air ducts

2.4.2 SYSTEM WITH AIR DUCTS

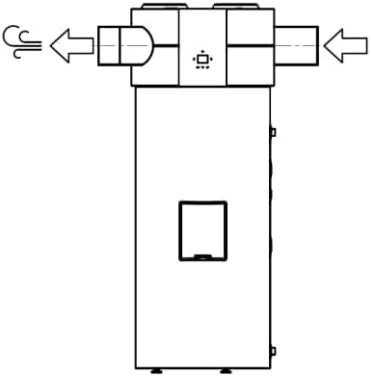


Figure 8: Configuration 1 - side inlet and outlet ducts

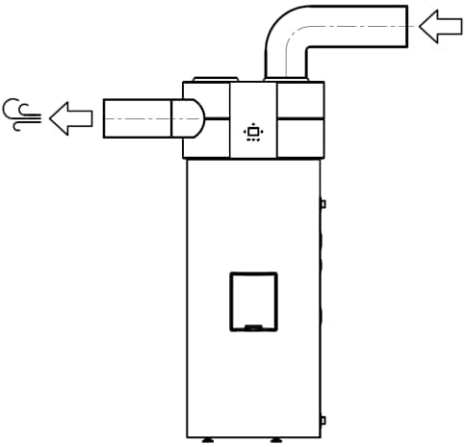


Figure 9: Configuration 2 - top inlet and side outlet ducts

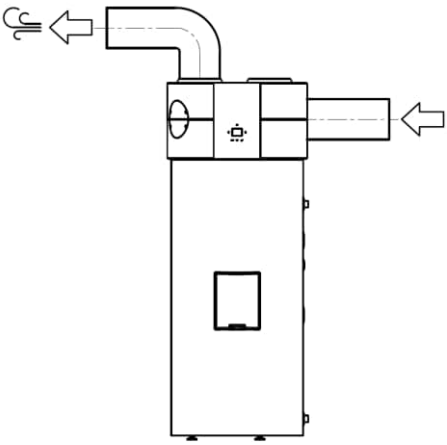


Figure 10: Configuration 3 - side inlet and top outlet ducts

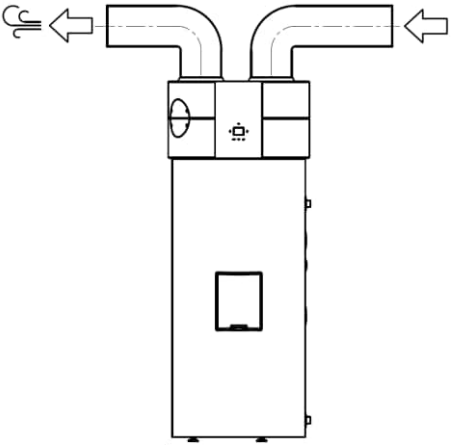


Figure 11: Configuration 4 - top air inlet and outlet ducts

2.4.3 ANGLED AIR INTAKE AND EXHAUST

In an angled installation, there are no restrictions on the distance between the air intake and exhaust.

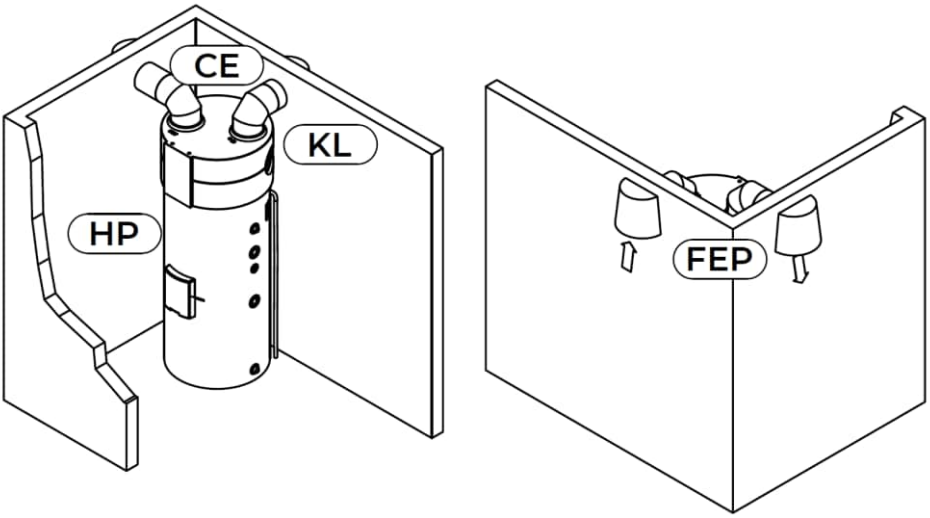


Figure 12: Angled air inlet and outlet

CE	Ventilation pipe
FEP	Facade element with perforated hood
HP	ESSENTA
KL	Ventilation pipe elbow

2.4.4 PARALLEL AIR INTAKE AND EXHAUST

NOTE

Maintain the minimum distance between the air inlet and outlet openings when they are installed on the same surface.

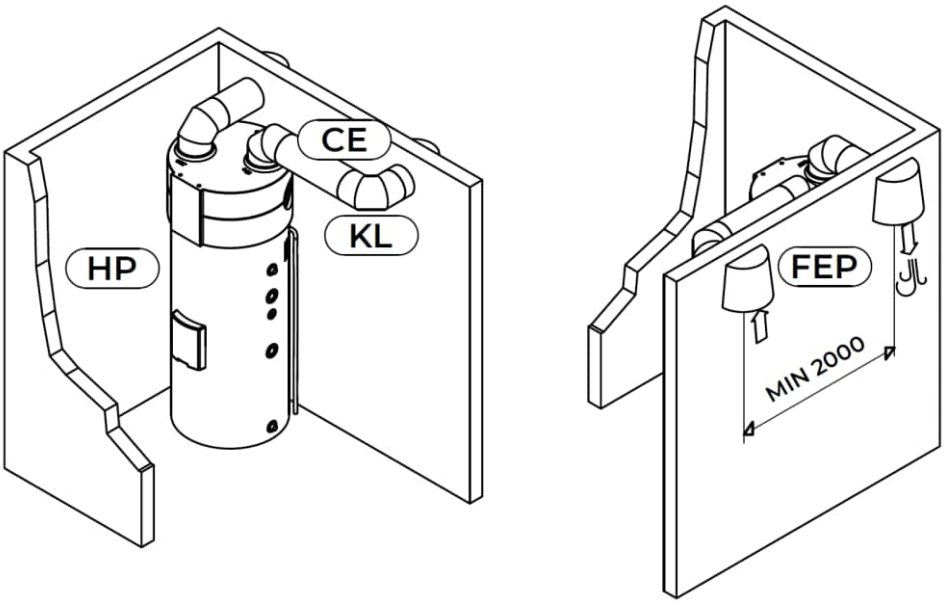


Figure 13: Minimal gap between parallel air inlet and outlet

CE	Ventilation pipe
FEP	Facade element with perforated hood
HP	ESSENTA
KL	Ventilation pipe elbow

2.4.5 MAXIMUM DUCT LENGTH

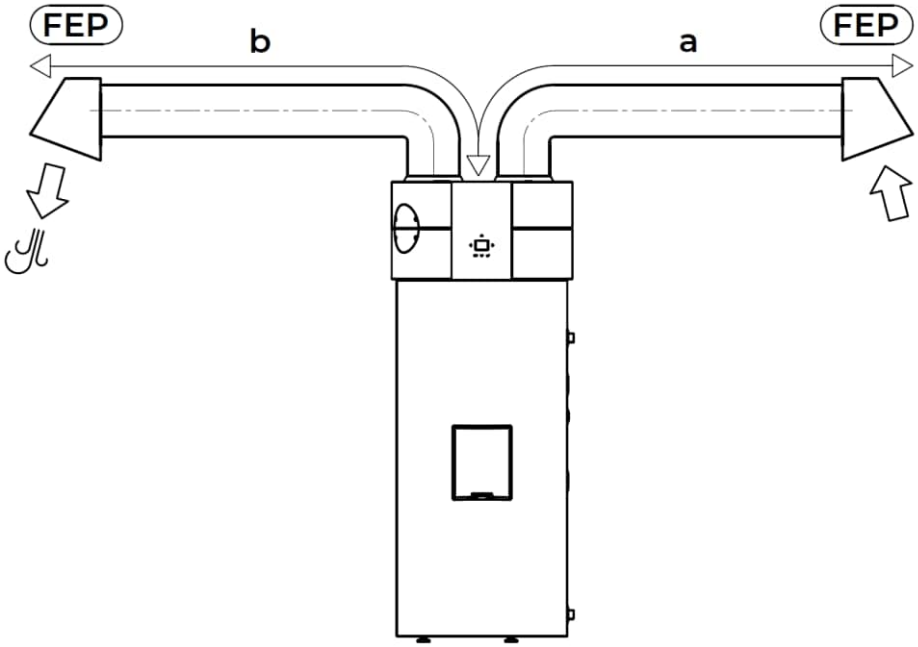


Figure 14: Air duct lengths without changeover

The maximum air ducts length (L_{max}) consists of inlet and outlet ducts, as shown in Figure 14

$$L_{max} = a + b$$

L_{max}	Maximum length of air ducts.
a	Total equivalent length of ventilation duct elements on the inlet side
b	Total equivalent length of ventilation duct elements on the outlet side
FEP	Facade element with perforated hood

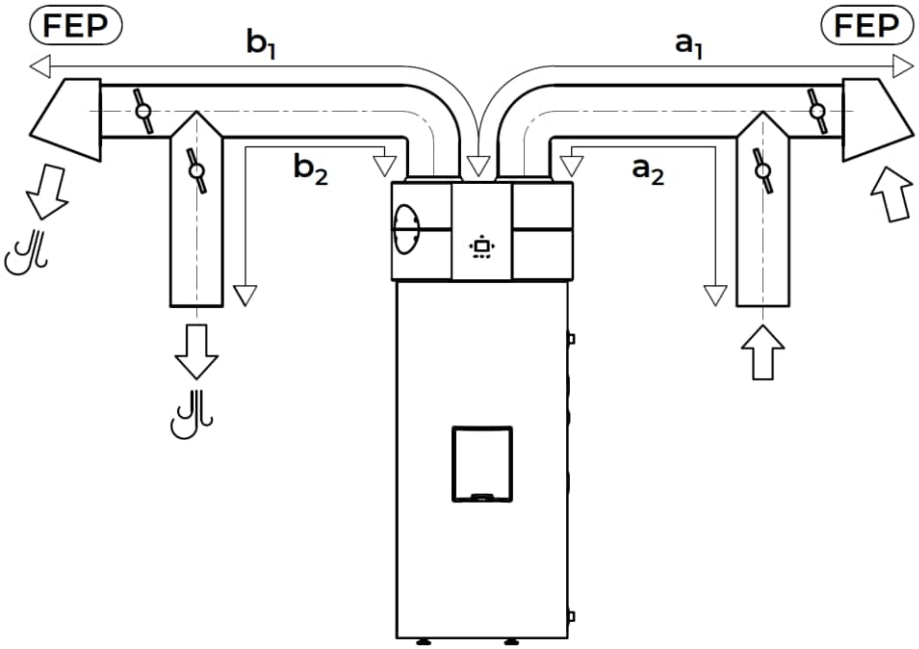


Figure 15: Lengths of switchable air ducts

In the case of switchable air ducts, determine the maximum length of the air ducts (L_{max}) by adding the lengths of the primary inlet and outlet ducts, and separately the length of the secondary inlet and outlet ducts, as shown in Figure 15. The maximum length of the ducts is the greater of these two.

Primary ducts (a_1+ b_1)	These are the ducts connected to the **primary heat source**. The heat pump will **always start** operating on these air ducts unless it is set otherwise.
Secondary ducts (a_2+ b_2)	These are the ducts connected to the **secondary heat source**. The heat pump will **change over** to these ducts when the temperature in the primary ducts **drops below the set value**.

$$L_{max} = \max(a_1 + b_1; a_2 + b_2)$$

L_{max}	Maximum length of air ducts.
a_1	Total equivalent length of primary ventilation duct elements on the inlet side. Consider the equivalent length of the T-piece for both primary and secondary ducts.
b_1	Total equivalent length of primary ventilation duct elements on the outlet side. Consider the equivalent length of the T-piece for both primary and secondary ducts.
a_2	Total equivalent length of secondary ventilation duct elements on the inlet side. Consider the equivalent length of the T-piece for both primary and secondary ducts.
b_2	Total equivalent length of secondary ventilation duct elements on the outlet side. Consider the equivalent length of the T-piece for both primary and secondary ducts.

Select the appropriate length of air ducts when configuring the device. Table 3 shows the maximum duct lengths depending on the device settings.

Table 3: MAX Equivalent length of air ducts

Setting	MAX Available dP [Pa]	MAX Equivalent length of air ducts [m]
$0<L_{max}\leq 40$ m	90	40
$40<L_{max}\leq 48$	135	48
$48<L_{max}\leq 55$	180	54
$55<L_{max}\leq 62$	207	62

Determine the length of the air ducts by adding up the lengths of the pipes and the equivalent lengths of the elbows and other ventilation duct elements. Table 4 shows the equivalent length of individual elements.

Table 4: Equivalent length of air duct elements

Component	Equivalent length of air duct elements – CE_BIR-C 160 [m]	Equivalent length of air duct elements – spiro [m]
Pipe DN160 – 1 m	1,0	0,77
Elbow DN160 – 90°	5,0	3,8

Component	Equivalent length of air duct elements – CE_BIR-C 160 [m]	Equivalent length of air duct elements – spiro [m]
Elbow DN160 – 45°	2,7	2,5
Elbow DN160 – 30°	1,7	1,7
T-piece DN160 – inlet	6,5	5
T-piece DN160 – outlet	15,4	11,8
Damper	1,8	1,8
Facade element FEP_160 – inlet	6,1	6,1
Facade Element FEP_160 - outlet	8,9	8,9

2.5 CASCADE CONNECTION

In case of higher domestic hot water demand, multiple units can be connected in parallel.

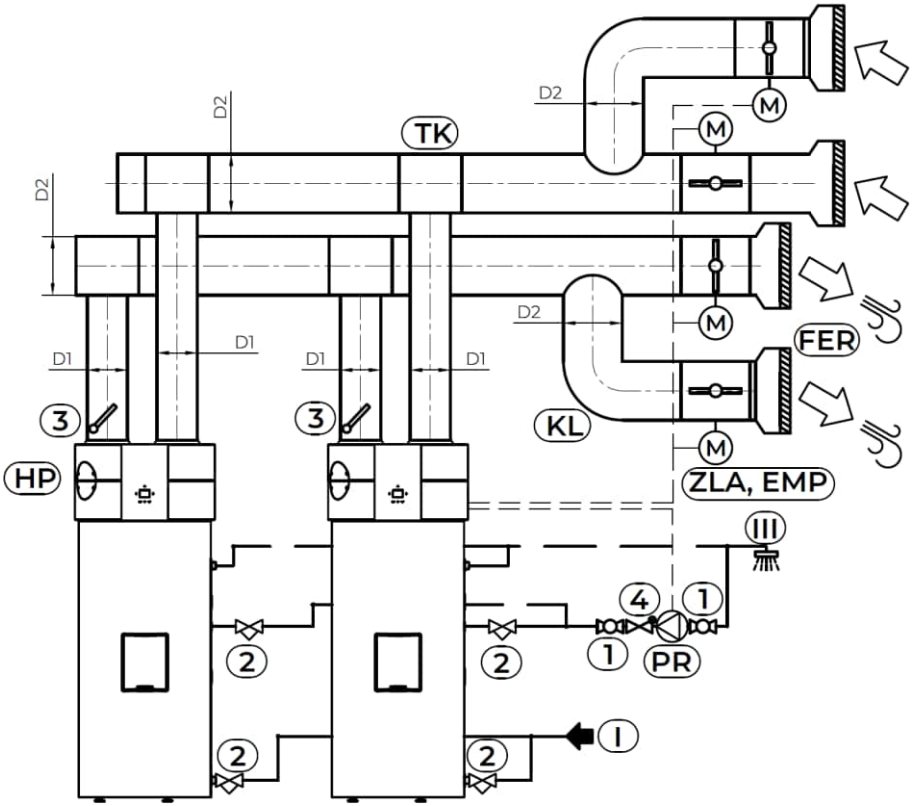


Figure 16: ESSENTA Cascade Connection

I	Cold domestic water supply
III	DHW Consumers
1	Ball valve
2	Balancing valve
3	Backdraft damper
4	Check valve
D1	Dimension of air ducts connected to ESSENTA
D2	Dimension of common ventilation ducts
ZLA, EMP	Motorized shut-off air damper
FER	Air grille

KL	Ventilation pipe elbow
TK	T-piece - ventilation pipe
PR	Recirukulacijska pump DHW

2.5.1 RECOMMENDED DIMENSIONS FOR AIR DUCTS IN CASCADE CONNECTION

Table 5: Available pressure drop in air ducts for cascade connection

Nr. Units in cascade	Flow rate in common duct [m^3/h]	MAX Available dP [Pa]	MAX Equivalent length of air ducts [m]
2	700	162	197
3	1050	147	151
4	1400	144	157

Figure 16 shows the elements in the table below

Component	2 x ESSENTA		3 x ESSENTA		4 x ESSENTA	
	Dimension	Equivalent length [m]	Dimension	Equivalent length [m]	Dimension	Equivalent length [m]
D2	Φ250	1	Φ280	1	Φ315	1
D1	Φ160	2,4	Φ160	2,0	Φ160	2,1
KL D2 90°	Φ250	4,2	Φ280	4,8	Φ315	5,3
KL D2 45°	Φ250	2,6	Φ280	3,0	Φ315	3,3
KL D2 30°	Φ250	1,9	Φ280	2,1	Φ315	2,3
KL D1 90°	Φ160	6,5	Φ160	5,5	Φ160	5,8
KL D1 45°	Φ160	4,1	Φ160	3,4	Φ160	3,6
KL D1 30°	Φ160	3,0	Φ160	2,5	Φ160	2,6
TK D2-D1-D2	Φ250	21,0	Φ280	25,7	Φ315	30,5
TK D2-D2-D2	Φ250	32,4	Φ280	39,0	Φ315	45,6
ZLA, EMP	Φ250	3,7	Φ280	4,5	Φ315	5,3
3	Φ160	2,5	Φ160	2,1	Φ160	2,2
FER	Φ315	43,1	Φ400	10,5	Φ400	19,6

2.6 INSTALLATION EXAMPLES

1	Primary ducts
2	Secondary ducts
CE	Ventilation pipe
DHW	Domestic hot water
FEP	Facade element with perforated hood
HP	ESSENTA
KL	Ventilation pipe elbow
PR	DHW recirculation pump
SP	Ventilation pipe coupling
TK	T-piece - ventilation pipe
ZLA, EMP	Air damper and motor drive

2.6.1 USING AMBIENT AIR HEAT

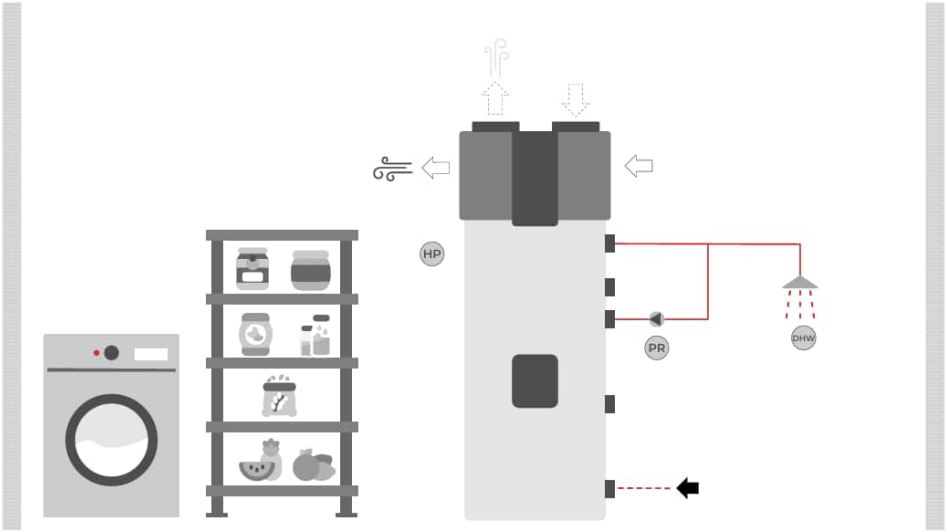


Figure 17: Spatial arrangement without ducts

NOTE

ESSENTA can draw air from the room where it is installed. The air in this room will cool down, so the minimum room size for this setup must be 30 m³. In any case, ensure proper ventilation or heat supply to prevent the room from cooling below the desired temperature.

2.6.2 AIR DUCT CHANGEOVER

Air duct changeover is suitable when cooling of a specific room (e.g., a storage room) is required during domestic hot water heating. The heat pump will cool this room while heating the domestic hot water until it reaches the set temperature. After that, it will change over the ducts either to the outdoor air or to another room.

Examples:

- The heat pump cools the laundry room (primary ducts -**1**). When the set temperature is reached, it changes over the ducts to the storage room (secondary ducts –**2**)
- During the summer, the DHW heat pump cools the house while heating domestic hot water. When or if the set temperature is reached, it changes over to outdoor air. In this case, it is possible to change the duct changeover function during the winter so that the heat pump will not cool the house but will always use outdoor air.

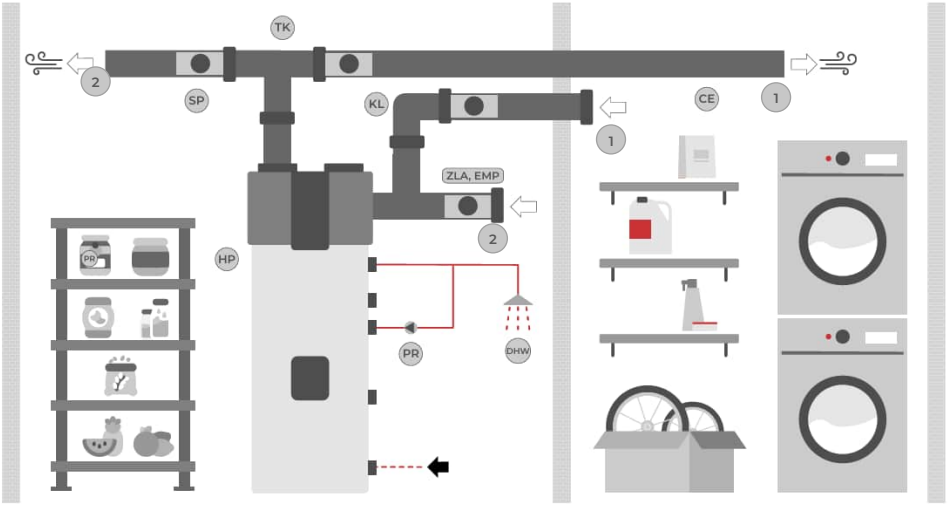


Figure 18: Duct configuration – Duct changeover

NOTE

Duct changeover enables heat recovery from multiple rooms or from a combination of outdoor and indoor air. The heat pump will always start operating on the primary air ducts, so choose the appropriate space or heat source that you want to utilize primarily.

2.6.3 USING OUTDOOR AIR

We recommend using outdoor air if there is no waste heat in the building and you do not want cooling.

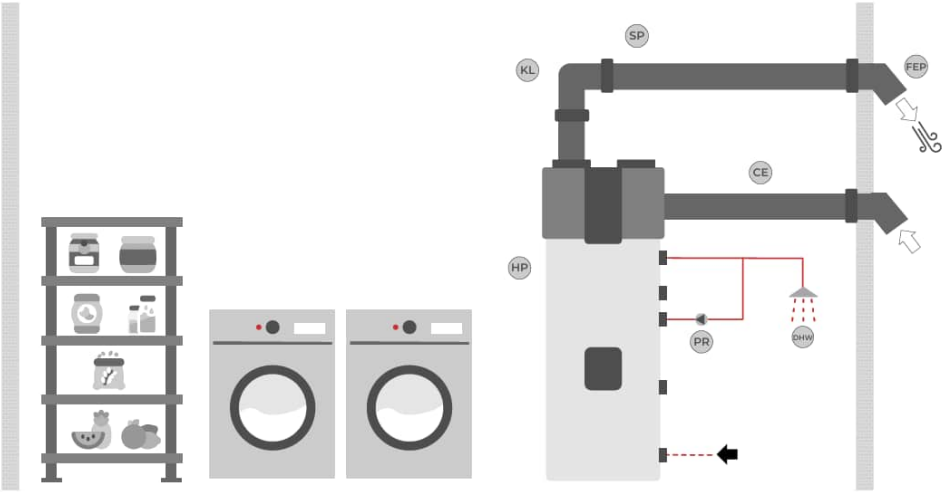


Figure 19: Duct configuration - Outdoor air

2.6.4 USING WASTE HEAT FROM THE HEAT RECOVERY VENTILATION SYSTEM

Central ventilation systems are not 100% efficient, so some unused waste heat always remains in the exhaust air. Connect the exhaust air to the ESSENTA, which will recover waste heat while heating domestic hot water.

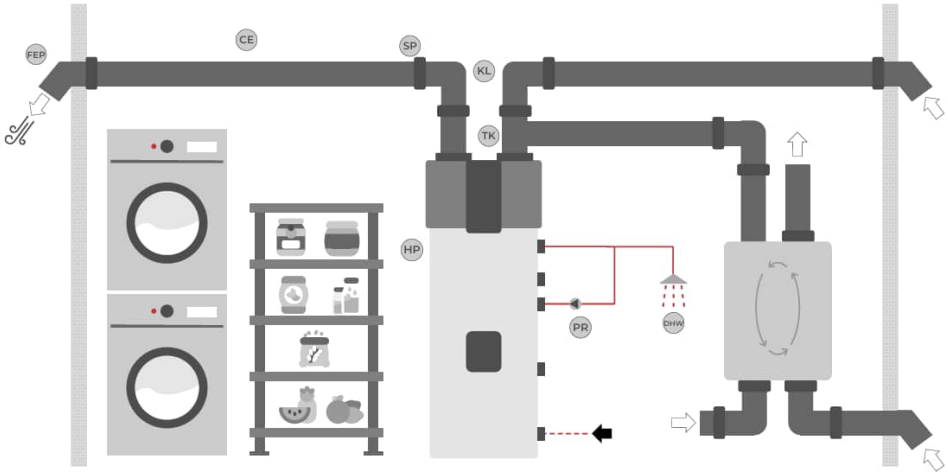


Figure 20: Duct configuration in combination with the central heat recovery unit

2.7 ELECTRICAL CONNECTION PREPARATION

2.7.1 FUSES AND CABLE

CAUTION

The device is equipped with a connection cable (power cord) with a standard Schuko plug (IEC60083, type F). Simply plug the power cord into a matching socket outlet. The socket outlet must be grounded. The socket outlet must be protected with a 16 A fuse.

2.7.2 COMMUNICATION CONNECTION

BMS	**Communication cable** FTP 5e / LIYCY 3 x 0,5 mm^2

3 INSTALLATION

3.1 INSTALLATION AND LEVELING

CAUTION

For proper condensate drainage and operation, it is necessary to correctly level the heat pump.
After leveling, secure the heat pump to the floor.

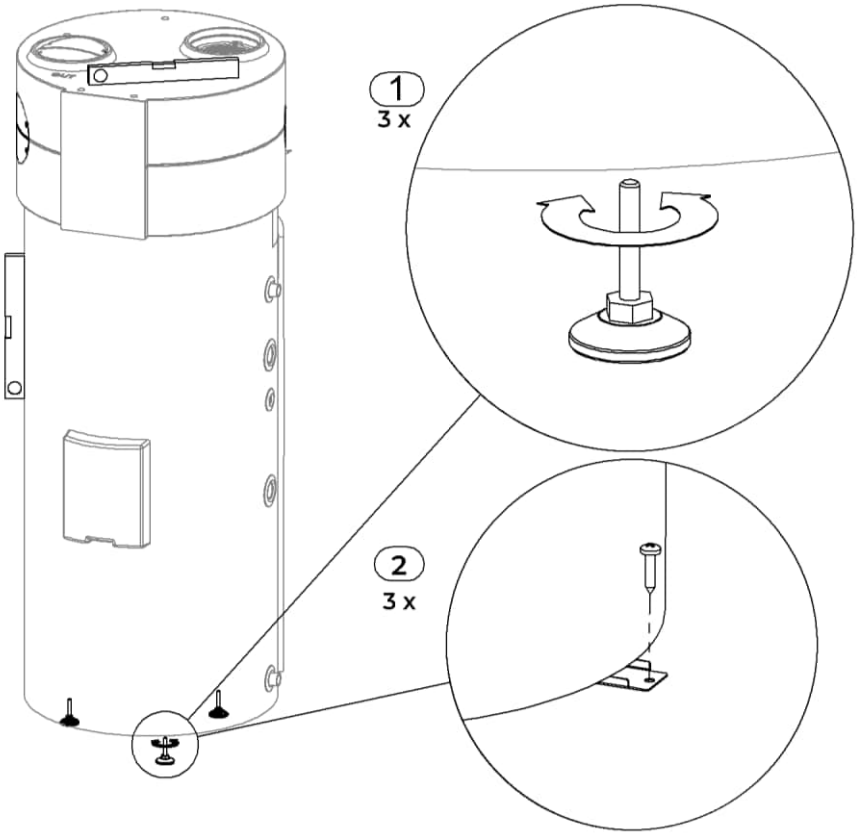


Figure 21: Leveling and securing to the floor

3.2 CONDENSATE DRAIN

CAUTION

For safe and reliable operation, the condensate drain must be connected to a drain with a trap. Ensure the trap is always filled with water, as a dry trap can cause unpleasant odors and ammonia to enter the unit. The presence of ammonia can lead to malfunction, corrosion, and refrigerant leakage.

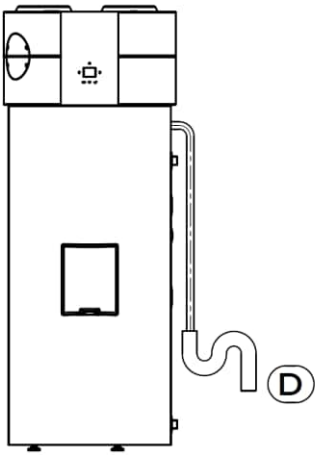


Figure 22: Condensate pipe installation

D	Drain with trap

3.3 PIPE CONNECTION

FURTHER INFORMATION

CIRCUIT DIAGRAM

3.3.1 DOMESTIC HOT WATER CONNECTION

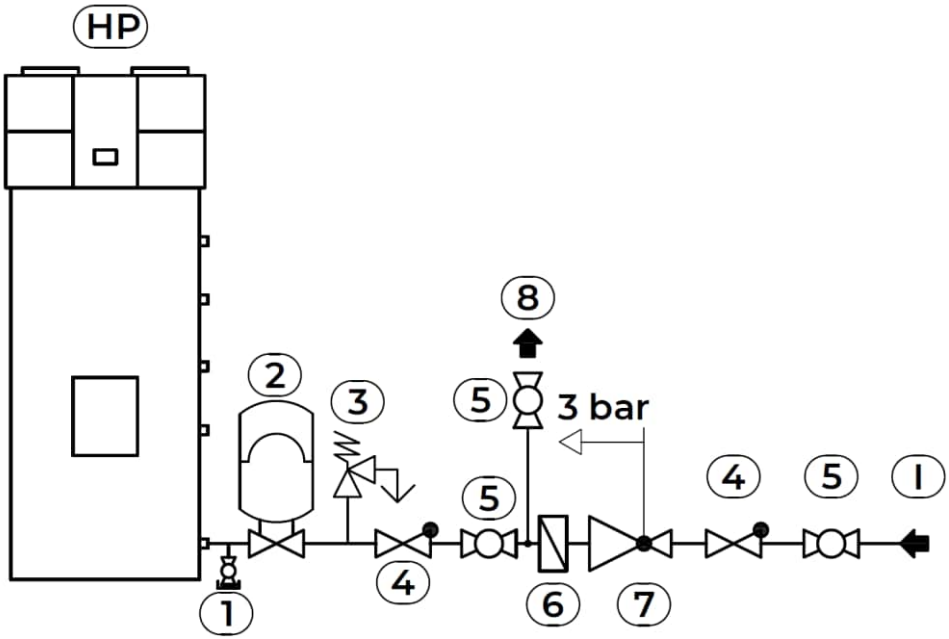


Figure 23: Domestic hot water connection

I	Cold domestic water supply
III	DHW Consumers
1	Drain valve
2	Expansion vessel – flow-through
3	Safety valve
4	Check valve
5	Ball valve
6	Filter
7	Pressure regulator – 3 bar
8	Supply to building consumers
HP	ESSENTA

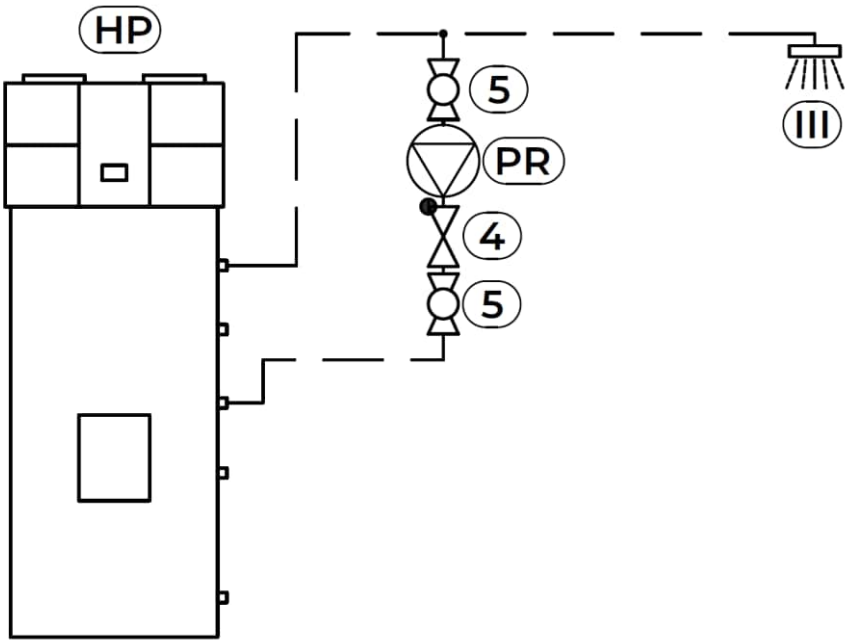


Figure 24: Recirculation connection diagram

III	DHW Consumers
4	Check valve
5	Ball valve
HP	ESSENTA
PR	Recirculation pump

3.3.2 EXTERNAL BOILER CONNECTION

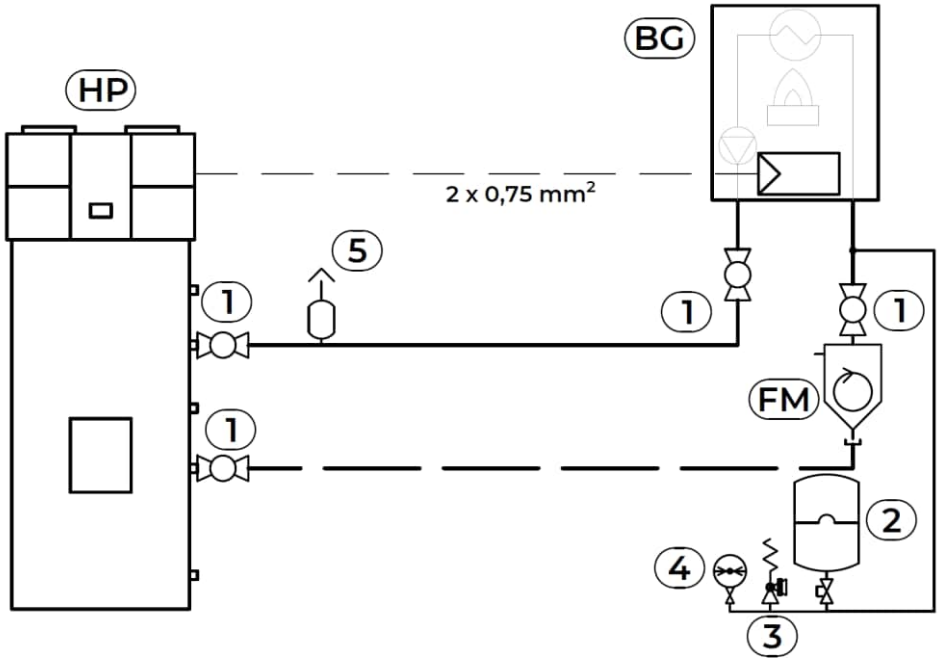


Figure 25: External boiler connection diagram (gas / heating oil / pellets)

1	Ball valve
2	Expansion vessel
3	Safety valve
4	Pressure gauge
5	Air vent valve
BG	Gas / heating oil / pellet boiler
FM	Magnetic dirt separator
HP	ESSENTA

3.3.3 SOLAR COLLECTORS CONNECTION

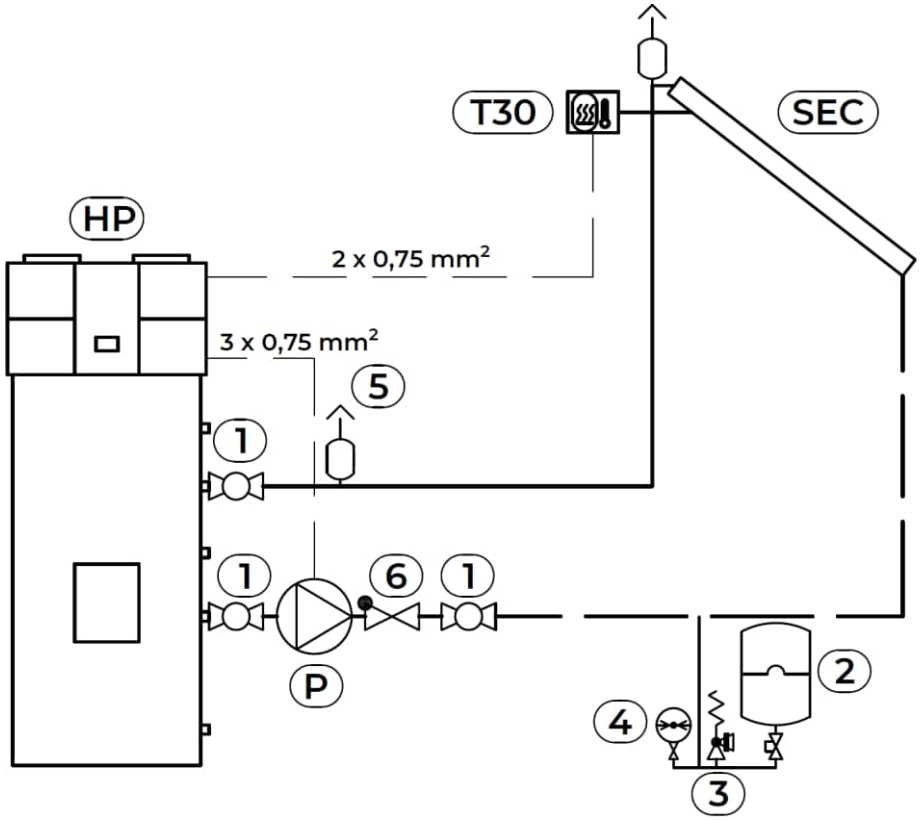


Figure 26: Solar collectors connection diagram

1	Ball valve
2	Expansion vessel
3	Safety valve
4	Pressure gauge
5	Air vent valve
6	Check valve
HP	ESSENTA
SEC	Solar collectors
P	Circulation pump
T30.0	Temperature sensor for solar collectors

3.3.4 CONNECTING THE WOOD-FIRED BOILER

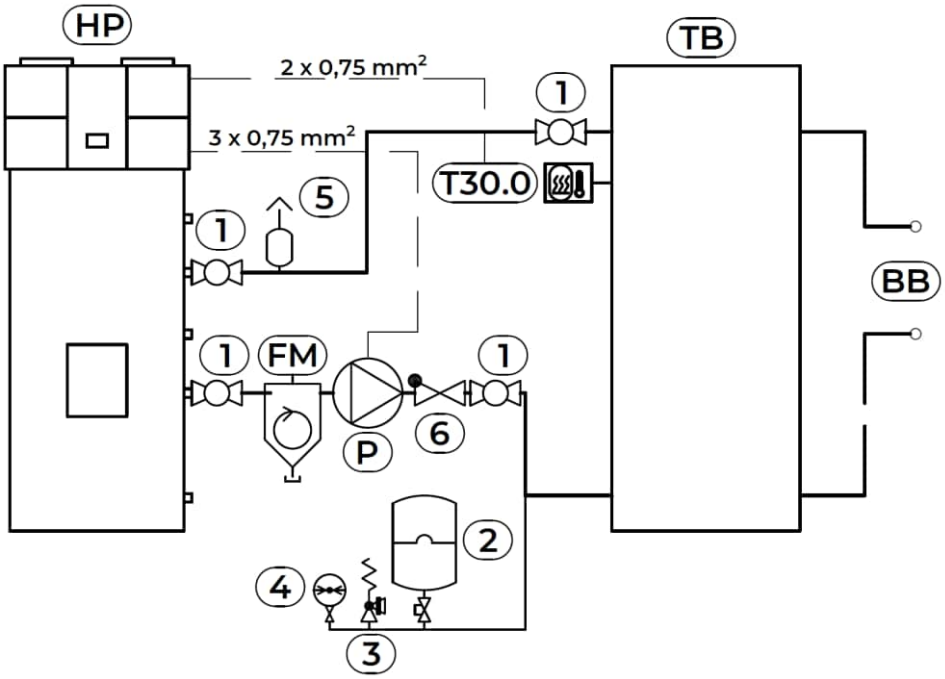


Figure 27: Wood-fired boiler connection diagram

1	Ball valve
2	Expansion vessel
3	Safety valve
4	Pressure gauge
5	Air vent valve
6	Check valve
BB	Wood-fired boiler
FM	Magnetic dirt separator
HP	ESSENTA
P	Circulation pump
T30	Temperature sensor for Wood-fired boiler
TB	Heat buffer tank

3.4 AIR DUCTS CONNECTION

3.4.1 ADJUSTING AIR DUCT CONNECTIONS

The air duct configuration can be changed by repositioning the duct connection covers. When using air ducts, always install one cover on the inlet side and another cover on the outlet side.

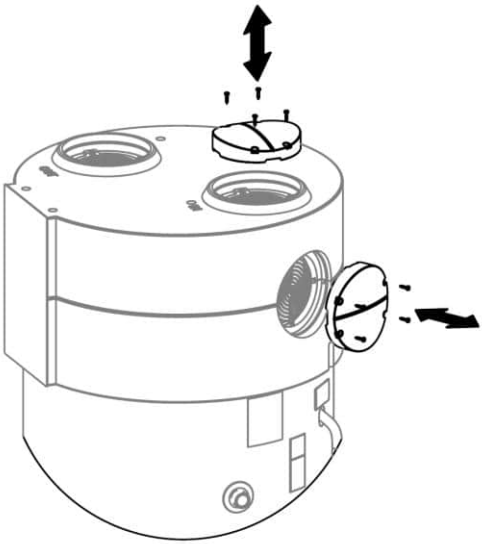


Figure 28: Adjusting air connections

CAUTION

All ventilation openings must be clear and unobstructed.
There must be no potential sources of ignition in the air ducts.

3.4.2 AIR DUCTS INSTALLATION

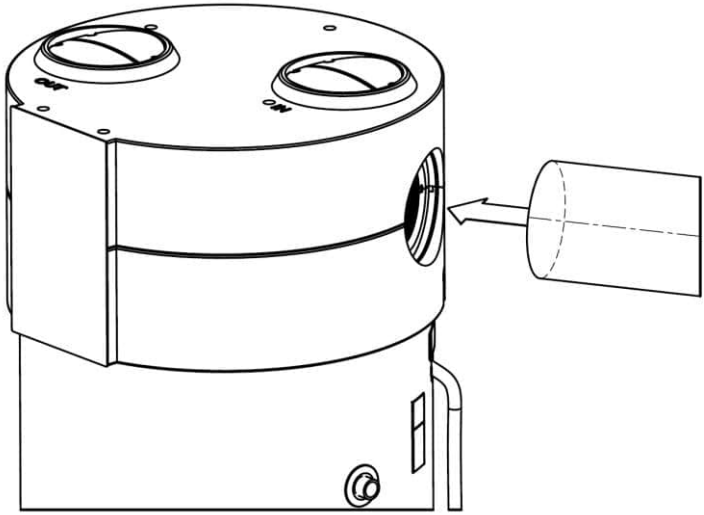


Figure 29: Duct installation

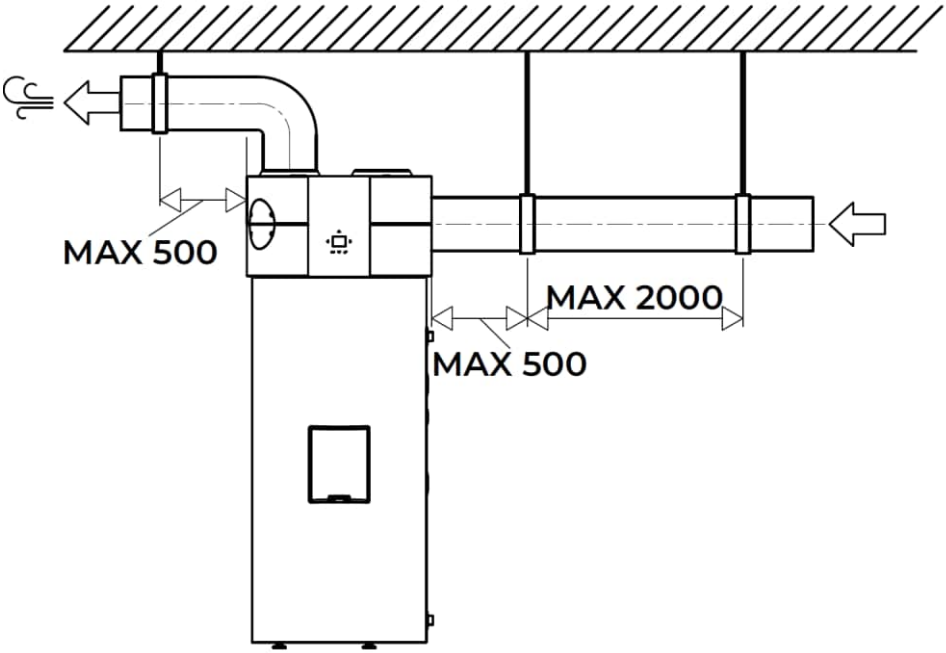


Figure 30: Installation and support of ducts

NOTE
Install and support the air ducts as shown in Figure 30.

3.5 ELECTRICAL CONNECTION

CAUTION

Connect the device to the electrical mains in accordance with the standards for connecting to the electrical mains.
Connect the device to the electrical network via the circuit breaker built into the buildings electrical installation according to the applicable national regulations.
Use a circuit breaker that separates all contacts under overvoltage category III conditions - minimum contact spacing of 3 mm.
The cross-section of the cable conductors is determined by the electrical system designer based on the method of installation, the distance of the device from the main electrical cabinet, and the electrical power of the device.
Run the communication cable between the heat pump and any building management system (BMS) separately from the power cable.

DANGER

Before commissioning the device, the connection to the mains and the electrical connections of the non-integrated elements must be checked by an authorized person from the manufacturer or the authorized distributor to ensure the correct and efficient operation of the device.
UNAUTHORISED PERSONS ARE STRICTLY FORBIDDEN TO INTERFERE WITH THE ELECTRICAL CONNECTION OF THE DEVICE.
Connect the device to the electrical supply, which is protected by a type A RCD switch.
The unit comes with a power cord. DO NOT pull, push, or manipulate the power cord in any way.

3.5.1 REMOVAL OF THE FRONT PANEL

The front panel must be removed when connecting external electrical components such as a recirculation pump or external signals, etc.
Follow the instructions below.

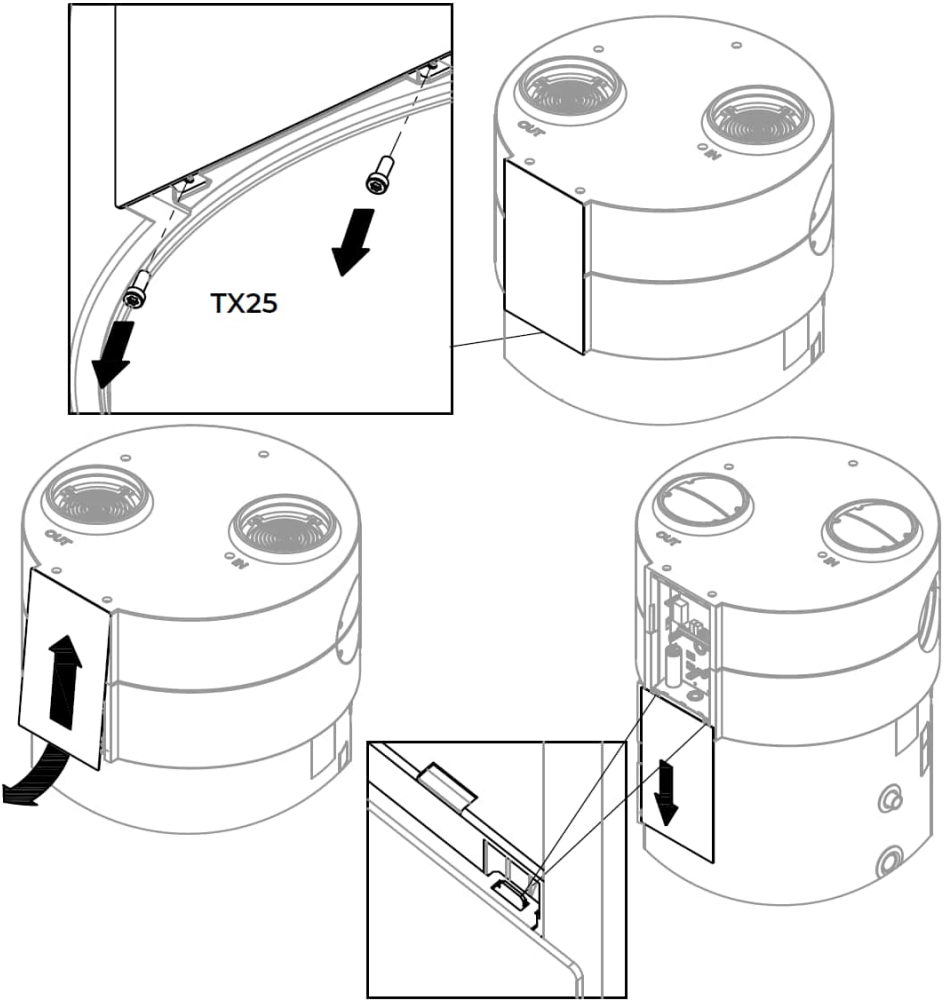


Figure 31: Removal of the front panel

3.5.2 CABLE WIRING

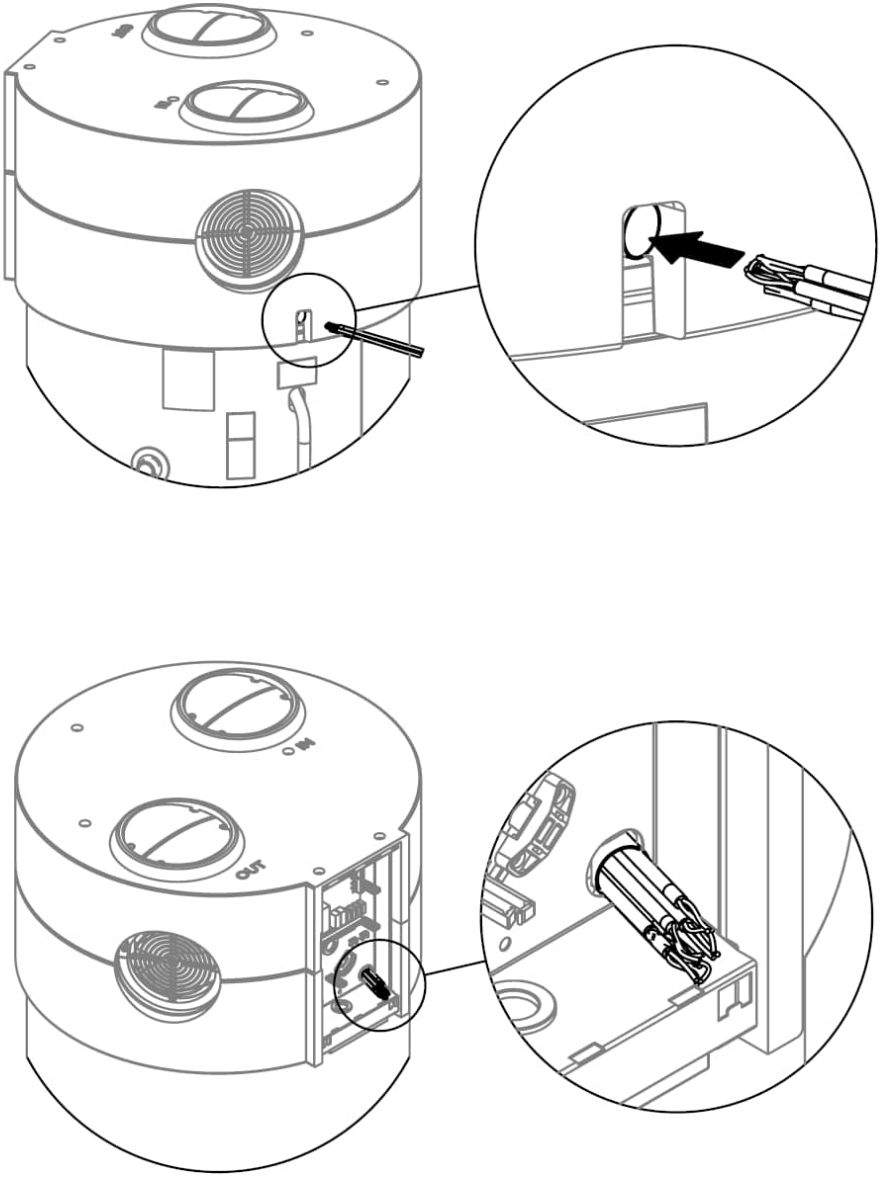


Figure 32: Wiring external electrical components (recirculation pump, external boiler, etc.)

3.5.3 WIRING DIAGRAM

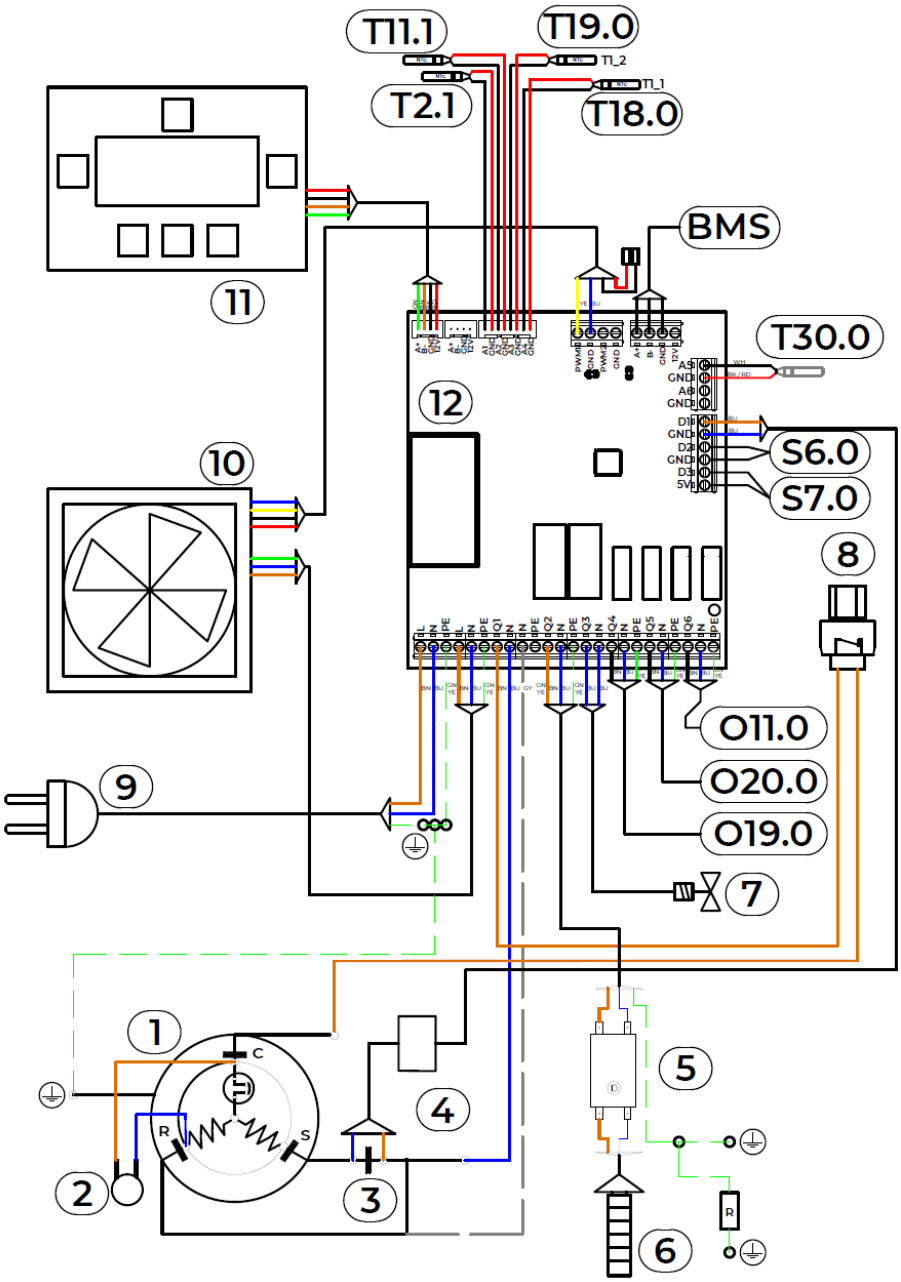


Figure 33: Circuit diagram

1	Compressor	T11.1	Evaporator temperature
2	Varistor	T2.1	Air intake temperature
3	Run capacitor	T18.0	Temperature - DHW tank - bottom
4	Optocoupler	T19.0	Temperature – DHW Tank – top
5	Safety thermostat	BMS	Communication channel for building management system – Modbus RTU, RS 485
6	Electric heater	T30.0	Temperature – solar collectors / wood-burning stove
7	Solenoid valve	S6.0	External signal 1 – SG1 (voltage-free)
8	High-pressure switch	S7.0	External signal 2 – SG2 (voltage-free)
9	Power cable	O11.0	Recirculation pump
10	Fan	O20.0	Air duct changeover
11	HMI interface	O19.0	Additional boiler / solar / wood
12	HPR controller		

3.5.4 CONNECTION FOR EXTERNAL BOILER OR SOLAR COLLECTORS

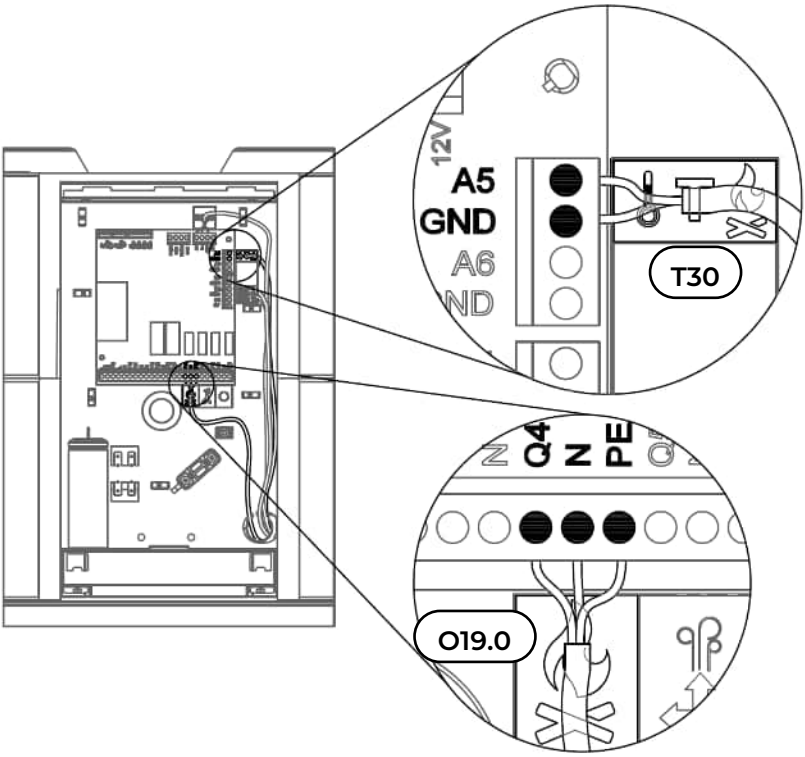


Figure 34: Connection of external boiler or solar collectors (O19.0, T30.0)

3.5.5 RECIRCULATION PUMP CONNECTION

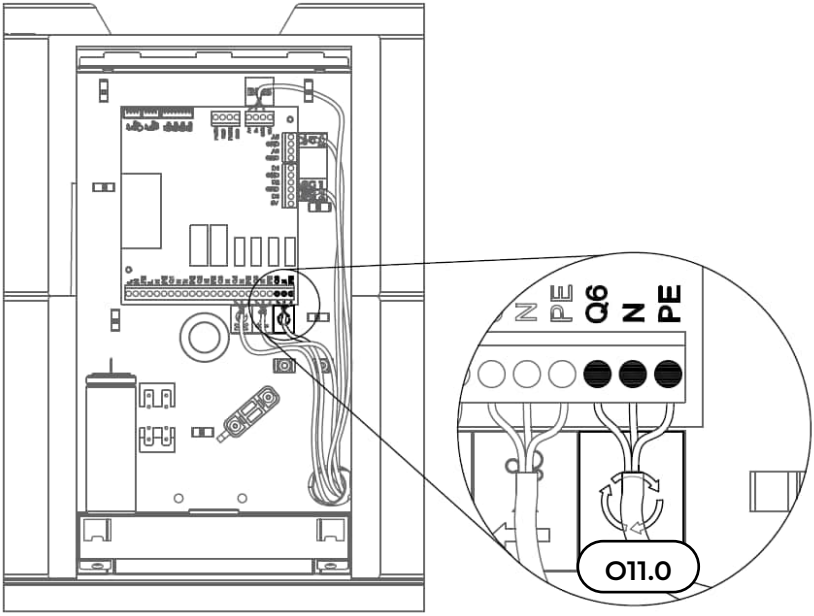


Figure 35: Recirculation pump connection (O11.0)

3.5.6 EXTERNAL SIGNALS CONNECTION

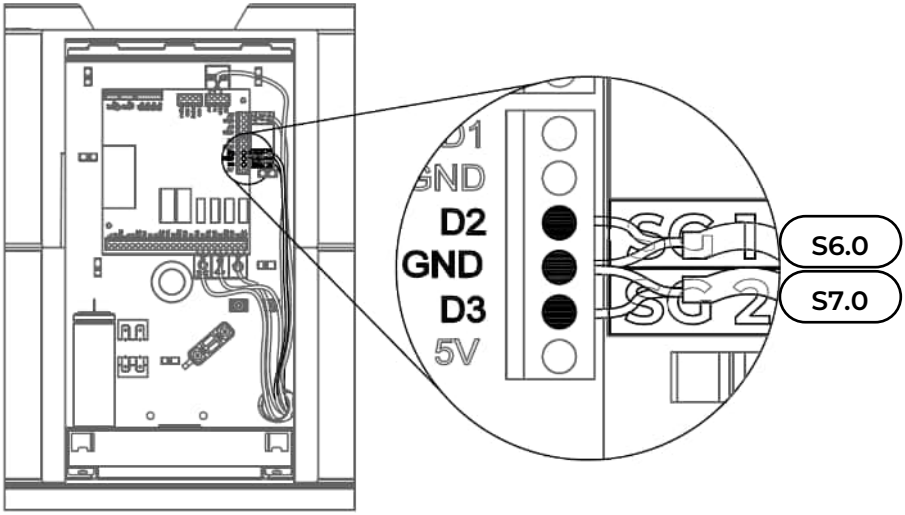


Figure 36: External signals SG1 and SG2 connection (S6.0, S7.0)

3.5.7 AIR DUCT DAMPERS CONNECTION

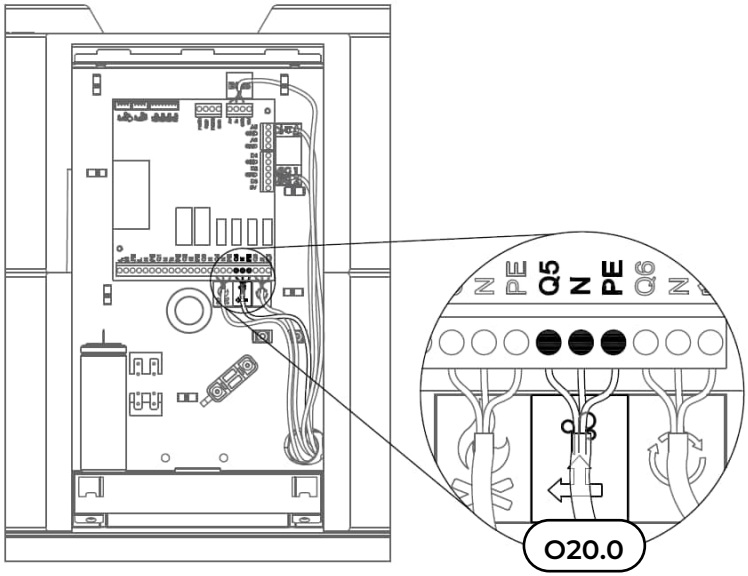


Figure 37: Air duct dampers connection (O20.0)

3.5.8 COMMUNICATION CONNECTION BMS

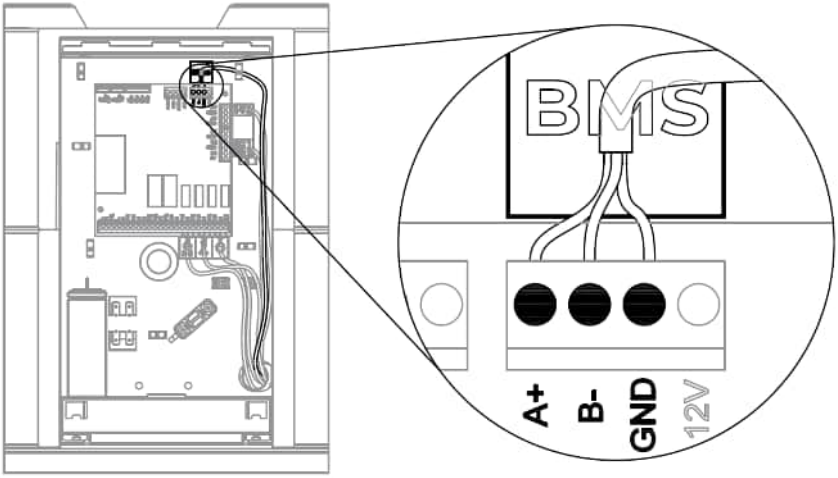


Figure 38: RS485 Communication connection for BMS

3.5.9 EXTERNAL CONTROL SENSOR INSTALLATION

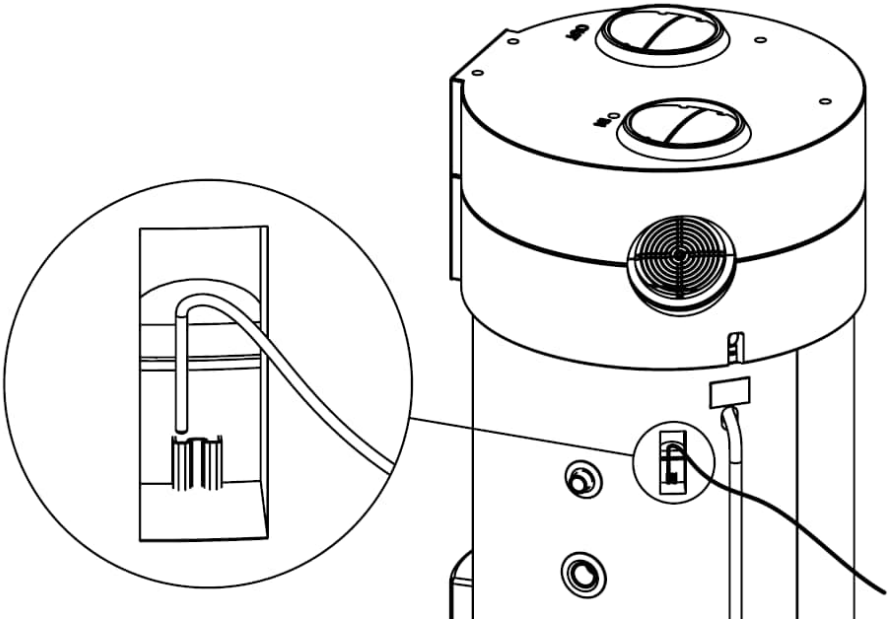


Figure 39: Installation of the external regulation sensor into the DHW Tank channel

CAUTION

To ensure the safe and efficient operation of na additional heat source for the preparation of domestic hot water (wood boiler, solar collectors), it is necessary to set the temperature limit for heating water on the heat pump to a maximum of 75°C. The recommended temperature setting is 65°C or lower.

4 FILLING THE SYSTEM

4.1 REQUIREMENTS FOR DOMESTIC HOT WATER QUALITY

DANGER

The quality of tap water must meet the requirements of DIRECTIVE (EU) 2020/2184 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL and the requirements listed in Table 6.
Failure to comply with these criteria may negatively affect the system's operation and compromise user safety. Failure to comply with the requirements may result in the loss of warranty.

Table 6: Quality parameters of domestic hot water

PARAMETERS	UNIT	VALUE
Nitrates	mg/L	<50
Nitrides	mg/L	<0,1
Chloride	mg/L	<200
Iron	mg/L	<0,2
Sulphates	mg/L	<250
pH	/	6,5≤x≤9,5
Conductivity	mS/m	≥150
Water hardness	°dH	8≤x≤12

4.2 WATER QUALITY REQUIREMENTS FOR HEATING WITH AN EXTERNAL BOILER

CAUTION

The water quality requirements for filling the heating system are listed in Table 7. The water you use in the heating system must be in accordance with the requirements of standard VDI 2035 and must not contain microorganisms. Fill the heating system with soft water, to which you add anticorrosive and antibacterial agents.
Thoroughly clean the heating system before filling.
Completely air out the heating system. Prevent air from getting into the heating system.

Table 7: The allowed limits of various substances in the heating water in the heating system

SUBSTANCE	UNIT	ALLOWED LIMITS
Organic sediment	mg/L	0
Ammonia NH3	mg/L	< 2
Chloride	mg/L	< 10
Allowed water hardness	°dH	< 3
Electrical conductivity	µS/cm	50–100
Iron (Fe) secreted	mg/L	< 0,1
Free carbonic acid	mg/L	< 5
Copper	Mg/L	<0,02
Manganese (Mn) secreted	mg/L	< 0,1
Nitrates (NO3) secreted	mg/L	< 100
pH		8,2–10
Oxygen	mg/L	< 0,1
Hydrogen sulfide (H_2S)	mg/L	< 0,05
HCO_3- / SO_4^{2-}	mg/L	> 1
Hydrogen carbonate (HCO_3-)	mg/L	70–300
Aluminium (Al) secreted	mg/L	< 0,2
Sulphates	mg/L	< 70
Sulphite (SO_3)	mg/L	< 1
Chlorine (gas) (Cl_2)	mg/L	< 1

4.3 REQUIREMENTS FOR HEATING FLUID WITH SOLAR COLLECTORS

CAUTION

For heating domestic hot water with solar collectors, only use a non-toxic mixture of water and propylene glycol with high-temperature inhibitors for solar systems.
Recommended concentration: 40 vol. %.
The fluid must be compatible with the materials used.

4.4 FILLING PROCESS

4.4.1 DHW

Fill the DHW tank by opening all the hot water faucets in the building. The system is properly filled when water flows continuously from all faucets.

CAUTION

The device must never operate without water in the DHW tank.

Water from the unit is drained through the inlet pipe of the water heater. For this purpose, it is recommended to install a special fitting or drain valve between the safety valve and the inlet pipe.

4.4.2 Heating system

Use an appropriate filling device in accordance with VDI 2035 to fill the heating system, as shown in Figure 40.

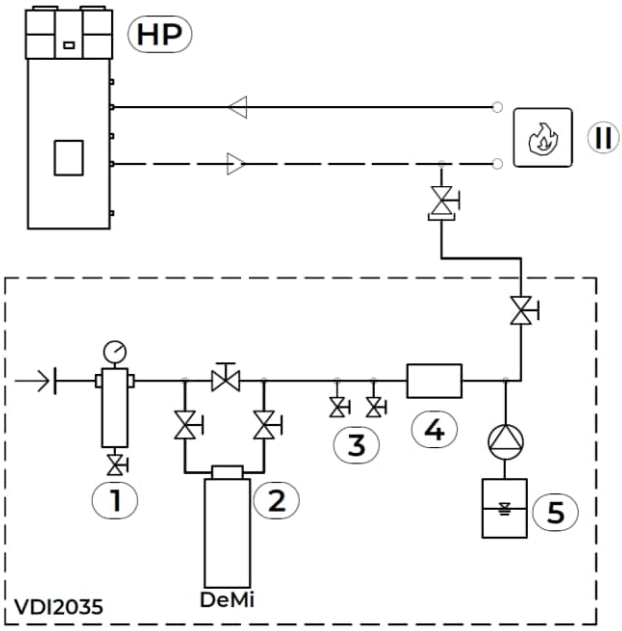


Figure 40: Heating system filling diagram

HP	ESSENTA
II	Heating System
1	Filter with pressure regulator
2	Demineralization cartridge
3	Connection for measuring conductivity and pH
4	Check valve
5	Corrosion inhibitor fluid and dosing pump

5 SYSTEM COMMISSIONING

NOTE

Before starting the DHW heating, the system must be properly set up. Follow the instructions on the heat pump display. Refer to the User manual for assistance.

FURTHER INFORMATION

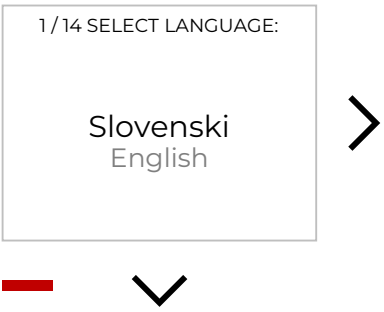
USER MANUAL

Hello

Press — to start.

Press — to start commissioning.

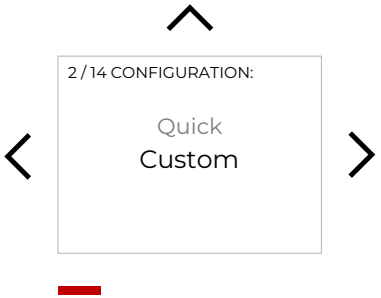
STEP 1 - LANGUAGE



Use the ⌄ ⌃ keys to select the language.

Continue with the key ›

STEP 2 – CONFIGURATION TYPE



Use the ⌄ ⌃ keys to select the configuration mode.

Quick – press the › key to proceed to STEP 14.

Custom– press the › key to proceed to STEP 3.

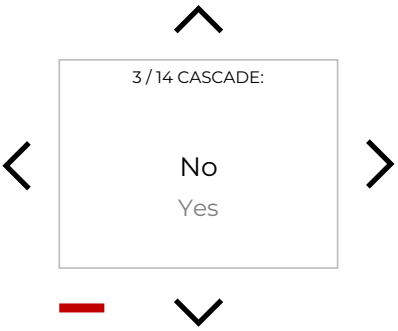
NOTE

By selecting Quick configuration, skip to step 14 to review the settings.

In Quick configuration, the following settings are chosen:

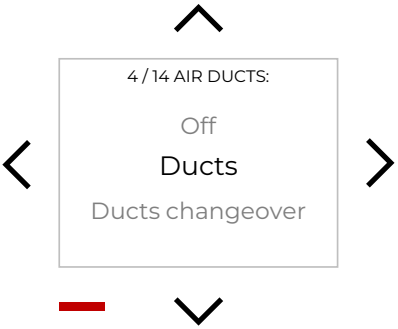
Cascade:	**'No'**
Air ducts:	**None**
External heater:	**None**
External signals:	**SG**
Recirculation:	**'No'**

STEP 3 – CASCADE



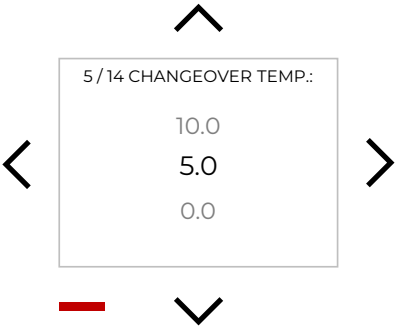
Select using the keys ⌄ ⌃
YES– multiple devices are connected in parallel to the air ducts
NO– there is only one heat pump in the system
Continue with the key ›

STEP 4 – DUCT TYPES



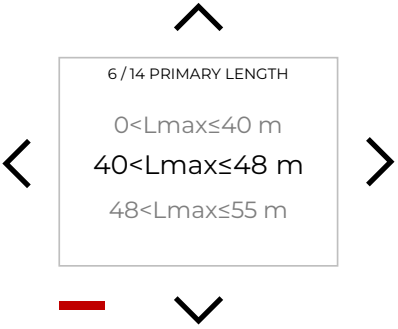
Select using the keys ⌄ ⌃
None– no air ducts are connected to the heat pump – proceed to STEP 8
Switchable ducts– the heat pump is connected to air ducts with a changeover function– proceed to STEP 5
Ducts– the heat pump is connected to air ducts – proceed to STEP 6
Continue with the key ›

STEP 5 – CHANGEOVER TEMPERATURE



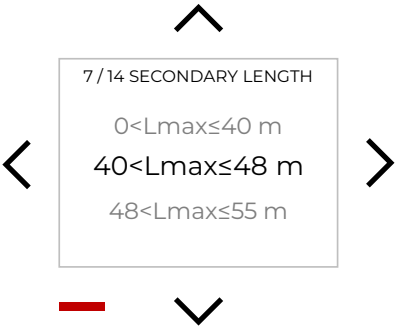
Use the keys ⌄ ⌃ to select the temperature for switching the ducts.
Continue with the key ›

STEP 6 – LENGTH OF PRIMARY DUCTS



Use the keys ⌄ ⌃ to select the length **of the primary** ducts. Refer to the instructions for determining the length of the channels (**section 2.4.5**).
Continue with the key ›

STEP 7 – LENGTH OF SECONDARY DUCTS

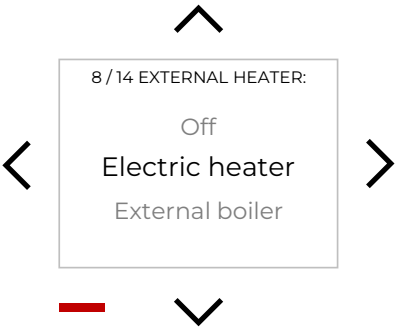


Use the keys ⌄ ⌃ to select the length **of the secondary** ducts. Refer to the instructions for determining the length of the channels (**section 2.4.5**).
Continue with the key ›

NOTE

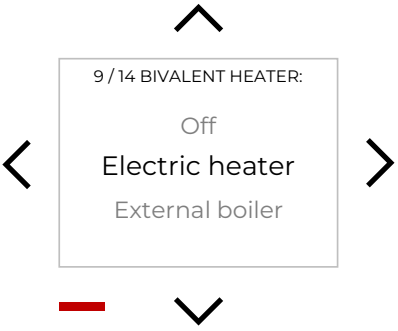
To determine the length of the ducts, add the lengths of the supply and exhaust ducts. See section 2.4.5 on page 26.

STEP 8 – EXTERNAL HEATER



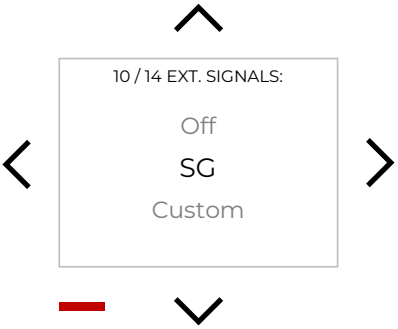
Use the keys ⌄ ⌃ to select the external heater:
None– no external heater
Electric heater – an electric flow heater is connected to the heat exchanger
External boiler– a gas, oil, or pellet boiler is connected to the heat exchanger
Wood boiler – you have connected a wood-fired boiler to the heat exchanger
Solar– solar collectors are connected to the heat exchanger
Continue with the key ›

STEP 9 – BIVALENT HEATER



Use the keys ⌄ ⌃ to select the heater that will automatically turn on below a certain bivalent air intake temperature
None – the unit will operate without an additional heater
Electric Heater – the built-in electric heater will activate as needed
External Heater – the configured external heater will activate as needed
Both Heaters – the integrated electric heater and the configured external heater will activate as needed
Continue with the key ›

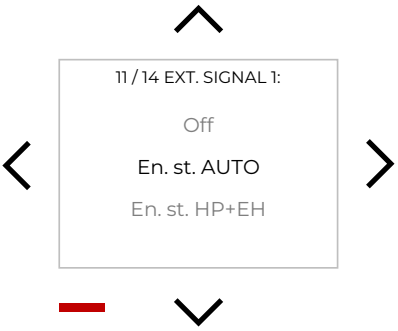
STEP 10 – EXTERNAL SIGNALS



Use the keys ⌄ ⌃ to select the configuration of external signals:
None – no external signals are connected – proceed to **STEP 13**.
SG – external signals operate based on SG Ready logic – proceed to **STEP 13**
Custom – custom signal configuration – proceed to **STEP 11**

Continue with the key ›

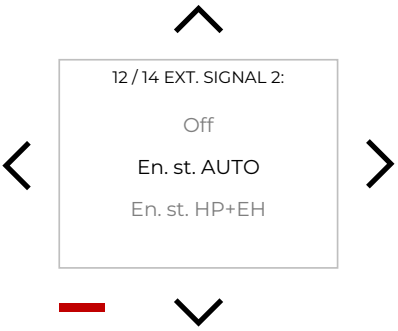
STEP 11 – SIGNAL 1



Use the keys ⌄ ⌃ to select how the heat pump should operate when signal 1 is active:
None – signal 1 will not be used
Energy storage AUTO
Energy storage HP+EH
Energy storage HP+EH+EB G.
Ventilation
'OFF'

Continue with the key ›

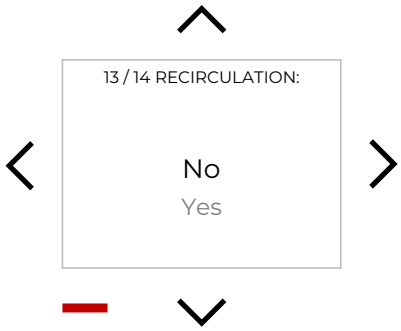
STEP 12 – SIGNAL 2



Using the keys ⌄ ⌃ select how the heat pump should operate when signal 2 is active:
None – signal 2 will not be used
Energy storage AUTO
Energy storage HP+EH
Energy storage HP+EH+EB G.
Ventilation
'OFF'

Continue with the key ›

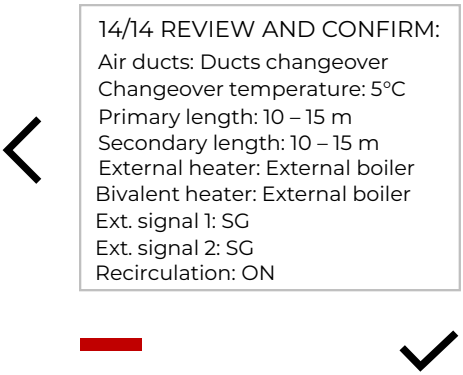
STEP 13 – RECIRCULATION



Using the keys ⌄ ⌃ select if you have connected the recirculation pump.

Continue with the key ›

STEP 14 – CONFIGURATION OVERVIEW



1. Review to ensure you have set everything as intended. If necessary, use the key ‹ to return to the desired step and choose the correct setting.
2. Confirm the configuration by holding the key ✓.

STEP 15:

Press — to start operation.

6 MAINTENANCE

6.1 HEAT PUMP MAINTENANCE

CAUTION

Once a year, order a service and maintenance inspection at an authorized service centre.
Regulate the domestic hot water pressure using the pressure regulator at the inlet to the DHW tank. Check the settings and operation. The pressure in the heating system should be between 1,2 and 2,0 bar. Refill the pressure if necessary.
Before any intervention in the device, disconnect the power supply of the device, check the surroundings of the device with an electronic detector for R290 refrigerant. Ensure that the atmosphere is not contaminated with flammable refrigerant. Ensure that the area around the device is well ventilated. Use only electronic leak detectors for leak detection that are suitable for potentially flammable atmospheres and are not potential sources of ignition. The usage of flame gas detectors is prohibited. In case of intervention in the refrigerant system of a heat pump, a powder or CO2 fire extinguisher must be prepared next to the device. You must place a no smoking sign in the designated area. Make sure that your clothes do not generate static electricity buildup. Before entering the device area, discharge by touching the grounded part. Follow the service instructions.

DANGER

If a leakage of refrigerant is found that requires brazing, all refrigerant must be recovered from the system. The removal process for refrigerant is explained later in the manual.

6.1.1 CLEANING

CAUTION

Use only clean water and a soft cloth for cleaning. The use of detergents, solvents, and/or cleaners containing surfactants is prohibited and may damage the device.

6.1.2 REGULAR INSPECTIONS

MONITOR	CHECK ESPECIALLY		
HEAT PUMP DISPLAY	Notifications and errors	✓	✓
DHW SUPPLY PRESSURE	The value should be between 3 and 4 bar	✓	✓

We recommend inspecting the heat pump **ONCE A YEAR**.

INSPECT	CHECK ESPECIALLY		
ENTIRE DEVICE AND SYSTEM	General inspection, tightness	✓	✓
CORROSION PROTECTION OF THE BUFFER TANK	Inspect the magnesium anode and replace if necessary		✓
THE REFRIGERANT SYSTEM TIGHTNESS – INSPECTION WITH ELECTRONIC DETECTOR	Oil stains, warnings, and malfunctions		✓
DEVICE	Signs of corrosion	✓	✓
VAPOUR-BARRIER THERMAL INSULATION	Damage, signs of wear	✓	✓
PIPES AND CONNECTIONS	Signs of wear, damage, non-tightness		✓
CABLE CONNECTIONS	Wear, damage		✓
SOFTWARE (KSM Lite)	Software update		✓

6.1.3 HANDLING OF REFRIGERANT

6.1.4 REMOVAL OF REFRIGERANT

DANGER

When removing flammable refrigerant from the system, in addition to the normal procedure, it is mandatory to adhere to the following procedure:
•capture the refrigerant in appropriate recovery cylinders,

DANGER

•purge (clean) the refrigeration circuit with an inert gas (e.g., oxygen-free nitrogen – N_2),
•evacuate the system,
•open the refrigeration system (brazing or cutting only after complete removal of refrigerant).
To remove all the flammable refrigerant from the system, the refrigeration circuit must be thoroughly purged several times *with oxygen-free nitrogen*. The use of compressed air or oxygen is not permitted.

Thorough cleaning is achieved as follows:

1. **evacuate the system,**
2. **stop the evacuation and fill the system with oxygen-free nitrogen to operating pressure,**
3. **release the gas into the atmosphere,**
4. **evacuate the system again.**

Repeat the process until there is no more refrigerant in the system. During the final nitrogen filling, reduce the system to atmospheric pressure so that you can safely start working on the refrigeration system (e.g., brazing). This procedure is mandatory when brazing is planned.
Ensure that the vacuum pump exhaust is not directed towards any potential ignition source and that adequate ventilation is provided.

6.1.5 FILLING PROCESS

DANGER

When filling the system with flammable refrigerant, in addition to the usual filling procedure, you must also consider the following:

- **Ensure that the charging equipment does not mix (contaminate) different refrigerants. Keep the pipes of the charging equipment as short as possible to minimize the amount of refrigerant in them.**
- **Cylinders shall be kept in an appropriate position according to the instructions.**
- **Ensure that the refrigerating system is earthed during charging the system with refrigerant.**

DANGER

- **After filling, properly label the refrigeration system (in case of a change in filling mass).**
- **Extreme care shall be taken not to overfill the refrigerating system.**

Prior to recharging the refrigeration system, it shall be pressure-tested with the appropriate purging gas (nitrogen). The system shall be leak-tested on completion of charging but prior to commissioning.

A follow up leak test shall be carried out prior to leaving the charging site.

6.1.6 REFRIGERANT RECOVERY

DANGER

When servicing or decommissioning the device, remove all refrigerant safely into a cylinder. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Before starting the evacuation, make sure you have a sufficient number of cylinders based on the amount of refrigerant in the device.
Cylinders shall be complete with pressure-relief valve and a corresponding shut-off valves in good condition. Before starting the recovery, you must evacuate the refrigerant cylinders and, if possible, cool them.
The refrigerant recovery equipment must be in perfect working condition, with the operating instructions available. Only use equipment suitable for flammable refrigerants. Keep a calibrated weighing scale nearby. Pipes shall be complete with leakfree disconnect couplings and in good condition.
To prevent refrigerant ignition in case of a leak, check the recovery equipment before use: ensure it is in good condition, properly maintained, and all electrical parts are sealed. If in doubt, consult the manufacturer.
The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder. Arrange the necessary documentation accordingly. Do not mix recovered refrigerants in recovery units, especially not in cylinders.
To ensure no flammable refrigerant remains in the oil, evacuate the compressor or compressor oil to an acceptable level before removal.

The evacuation process shall be carried out prior to returning the compressor to the suppliers. To accelerate this process, you may use only an electric heater for the compressor. Drain the oil from the compressor safely.

6.1.7 DISASSEMBLY

DANGER

Before performing this procedure, it is essential that you are fully familiar with the equipment and all its details. It is recommended as good practice to safely process all refrigerants. Before performing the task, take a sample of the oil and refrigerant if an analysis is required before reusing the captured refrigerant. It is essential that electrical power is available before starting the task.

- **Familiarize yourself with the equipment and its operation.**
- **Electrically isolate the system.**
- **Before starting the procedure, ensure that:**
- **if necessary, mechanical equipment for handling containers (cylinders) is at hand;**
- **all personal protective equipment is available and used correctly;**
- **the recovery process is continuously monitored by a competent person;**
- **the recovery equipment and containers (cylinders) meet the relevant standards.**
- **If possible, perform a pump-down procedure of the refrigeration system.**
- **If a vacuum is not possible, create a manifold so that the refrigerant can be removed from different parts of the refrigeration system.**
- **Place the container (cylinder) on the scale before starting the recovery.**
- **Turn on the recovery device and perform the recovery according to the instructions.**
- **Do not overfill the container (cylinder) to more than 80% of the liquid refrigerant volume.**
- **Do not exceed the maximum allowable pressure of the container (cylinder), even temporarily.**
- **Once the cylinders are properly filled and the procedure is completed, ensure that the cylinders and equipment are immediately removed from the site and all shut-off valves on the equipment are closed.**
- **The captured refrigerant must not be filled into another refrigeration system unless it has been cleaned and checked.**

6.2 HEATING SYSTEM MAINTENANCE

In addition to a quality system and good implementation, the correct use of the system is crucial. Only in this way will the operation of the system be long-lasting, smooth and economical.

6.2.1 REGULAR INSPECTION OF THE DHW AND HEATING SYSTEM

We recommend inspecting the DHW and heating system **ONCE A YEAR**.

INSPECT	**CHECK ESPECIALLY**		
VENTS	Leakage	✓	✓
Heating system	Presence of air	✓	✓
Heating system	Material compatibility, grounding		✓
PIPES AND CONNECTIONS	Non-tightness		✓
PIPES AND CONNECTIONS	Signs of corrosion	✓	✓
CABLE CONNECTIONS	Wear, damage	✓	✓
GROUNDING	Ensure proper grounding of the heating and DHW system	✓	✓
EL. FUSES (ELECTRICAL DISTRIBUTION CABINET)	Operation	✓	✓
WATER IN THE HEATING SYSTEM	Quality (section 0)		✓
DHW	Quality (section 4.1)		✓
DHW safety valve	Operation		✓
DHW expansion tank	Operation		✓
HEATING SYSTEM SAFETY VALVE	Operation		✓
HEATING SYSTEM EXPANSION TANK	Operation		✓

CAUTION

Air in the system reduces comfort and efficiency, and can cause corrosion, leading to malfunctions or leaks.

To ensure proper operation of the safety valve, perform regular annual inspections of the valve. Remove any limescale if necessary and check that the safety valve is not blocked.

7 TECHNICAL DATA

DEVICE	UNIT	ESSENTA 303
Heat source		Air
Controller		KSM Lite
Defrosting		Active (hot gas defrosting) and passive (air)
El. heater [KW]	kW	1,5
Air duct fittings	DN	160
Air flow – nominal (indoor installation, ambient air)	m^3/h	400
Airflow – nominal (connection to outdoor air – duct connection)	m^3/h	400
Maximum available external pressure drop - nominal flow (duct connection)	Pa	207

EFFICIENCY - INFORMATION CAPACITY BASED ON EN 16147 IN DELEGATED REGULATION (EU) 812/2013

Load profile hot sanitary water		XL
PERFORMANCE DATA FOR INDOOR AIR OPERATION A20/W10-53,5 (AIR INLET AND AMBIENT TEMPERATURE 20 °C) - AVERAGE, COLDER AND WARMER CLIMATE ZONE		
Coefficient of Performance (COPdhw)	-	4,16
Heating time	h : min	8 : 45
Consumption electricity heating	kWh	3,38
Standby Power Input (Pes)	W	27
Maximum volume of usable water at 40 °C	l	393
Reference hot water temperature	°C	53,2
Energy efficiency of heating water (ηwh)	%	172
Annual consumption of electricity (AEC)	kWh/year	975
Rated heating capacity	kW	1,57
PERFORMANCE DATA FOR INDOOR AIR OPERATION A20/W10-53,5 (EXHAUST AIR AND AMBIENT TEMPERATURE 20 °C) - AVERAGE, COLDER AND WARMER CLIMATE ZONE		
Coefficient of Performance (COPdhw)	-	3,97
Heating time	h : min	9 : 08
Consumption electricity heating	kWh	3,48
Standby Power Input (Pes)	W	25
Maximum volume of usable water at 40 °C	l	399
Reference hot water temperature	°C	53,3
Energy efficiency of heating water (ηwh)	%	163
Annual consumption of electricity (AEC)	kWh/year	1025
Rated heating capacity	kW	1,52
PERFORMANCE DATA FOR OUTDOOR AIR OPERATION A7/W10-53,5 (AIR INLET 7°C AND AMBIENT TEMPERATURE 20 °C) - AVERAGE CLIMATE ZONE		
Coefficient of Performance (COPdhw)	-	3,61
Heating time	h : min	10 : 19
Consumption electricity heating	kWh	3,87
Standby Power Input (Pes)	W	28
Maximum volume of usable water at 40 °C	l	399
Reference hot water temperature	°C	53,3
Energy efficiency of heating water (ηwh)	%	149
Annual consumption of electricity (AEC)	kWh/year	1127
Rated heating capacity	kW	1,35

PERFORMANCE DATA FOR OUTDOOR AIR OPERATION A2/W10-53,5 (AIR INLET 2°C AND AMBIENT TEMPERATURE 20 °C) – COLDER CLIMATE ZONE		
Coefficient of Performance (COPdhw)	-	2,9
Heating time	h : min	14 : 29
Consumption electricity heating	kWh	4,87
Standby Power Input (Pes)	W	30
Maximum volume of usable water at 40 °C	l	386
Reference hot water temperature	°C	53,3
Energy efficiency of heating water (ηwh)	%	119
Annual consumption of electricity (AEC)	kWh/year	1408
Rated heating capacity	kW	0,94
PERFORMANCE DATA FOR OUTDOOR AIR OPERATION A14/W10-53,5 (AIR INLET 14°C AND AMBIENT TEMPERATURE 20 °C) – WARMER CLIMATE ZONE		
Coefficient of Performance (COPdhw)	-	3,97
Heating time	h : min	08:56
Consumption electricity heating	kWh	3,46
Standby Power Input (Pes)	W	25
Maximum volume of usable water at 40 °C	l	398
Reference hot water temperature	°C	53,3
Energy efficiency of heating water (ηwh)	%	163
Annual consumption of electricity (AEC)	kWh/year	1025
Rated heating capacity	kW	1,56
ENERGY EFFICIENCY CLASS IN ACCORDANCE WITH REGULATION (EU) NO. 812/2013		
Energy efficiency class for indoor air condition	-	A++
Energy efficiency class for exhaust air condition	-	A++
Energy efficiency class for outdoor air condition	-	A+

DEVICE	UNIT	ESSENTA 303
ELECTRICAL DATA		
Rated voltage	V/Hz	230/50
Max operating current	A	10,5
Rated electrical power	W	500*
Max electrical power	W	2170
Electrical power – Electric heater	W	1500
Additional electrical load	W	100
Fuses	A	16
Power supply cable	mm^2	/
Protection class	-	IP X1

* max power (without el. heater) at A2W53

COMMUNICATION		
Connection to BMS		Modbus RTU, RS 485
Mobile Application		Additional equipment*
Internet connection		Additional equipment*

* Available soon

COOLING SYSTEM		
Refrigerant - type		R290
Refrigerant - industrial designation		HC-290 (R290)
GWP refrigerant (refrigerant heating global warming potential)		0,02
Total CO_2 equivalent of charged refrigerant		0,003
Refrigerant - quantity	kg	0,149
Max refrigerant system operating pressure	MPa	3,1

DIMENSIONS AND WEIGHT - GROSS		
Dimensions (W x H x D)	mm	755 x 1975 x 735
Weight	kg	166

DIMENSIONS AND WEIGHT - NET		
Dimensions (W x H x D)	mm	710 x 1813 x 740
Weight	kg	148

RANGE OF OPERATION

Water (heat pump only)	°C	65
Water (heat pump + additional electric heater)	°C	75
Air	°C	-10 / 45

DHW TANK INFORMATION

Volume	l	290
Max allowable operating pressure in the heat exchanger (at 110 °C)	MPa	1,0 (10 bar)
Heat exchanger volume	l	8
Heat exchanger surface area	m^2	1,2
Maximal thermal power of the heat exchanger*	Kw	48,9
Max operating pressure of the DHW tank	MPa	1,0 (10 bar)
Standby heat losses according to EN12897	kWh/day	2,08

Max heating capacity of heat exchanger at supply temperature 90 °C, return temperature 55 °C and DHW temperature 45 °C.

DHW TANK CONNECTIONS

Cold and hot water (CW, HW)	"	G 1
DHW recirculation (RC)	"	G ¾
Flow and return connections, external boiler (FS, RS)	"	G 1
Condensate drain (Φ)	mm	16

SOUND POWER LEVEL MEASUREMENT BASED ON EN 12102 / EN ISO 9614-2, ACCURACY CLASS 2

SOUND POWER UNDER INDOOR AIR CONDITION		
Sound power level LW under indoor air condition	dB(A)	55
Sound pressure level Lp under indoor air condition (with directivity factor Q = 2 and distance 2 m)	dB(A)	40

SOUND POWER UNDER OUTDOOR AIR CONDITION (DUCT CONNECTION)		
Sound power level LW under outdoor air conditions - indoor	dB(A)	56
Sound pressure level Lp under outdoor air condition (with directivity factor Q = 2 and distance 2 m) - indoor	dB(A)	41
Sound power level LW under outdoor air condition - outdoor	dB(A)	59
Sound pressure level Lp under outdoor air condition (with directivity factor Q = 2 and distance 2 m) - outdoor	dB(A)	44
Sound power level LW under outdoor air condition - outdoor*	dB(A)	52
Sound pressure level Lp under outdoor air condition (with directivity factor Q = 2 and distance 2 m) - outdoor*	dB(A)	37
SOUND POWER UNDER EXHAUST AIR CONDITION (DUCT CONNECTION)		
Sound power level LW under exhaust air condition - indoor	dB(A)	53
Sound pressure level Lp under exhaust air condition (with directivity factor Q = 2 and distance 2 m) - indoor	dB(A)	38
Sound power level LW under exhaust air condition - outdoor	dB(A)	48
Sound pressure level Lp under exhaust air condition (with directivity factor Q = 2 and distance 2 m) - outdoor	dB(A)	33
Sound power level LW under exhaust air condition - outdoor*	dB(A)	33
Sound pressure level Lp pri demand exhaust air (s faktorjem usmerjenosti Q=2 in distance 2 m) – outdoor*	dB(A)	17

* By using a duct silencer on the air discharge duct.

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