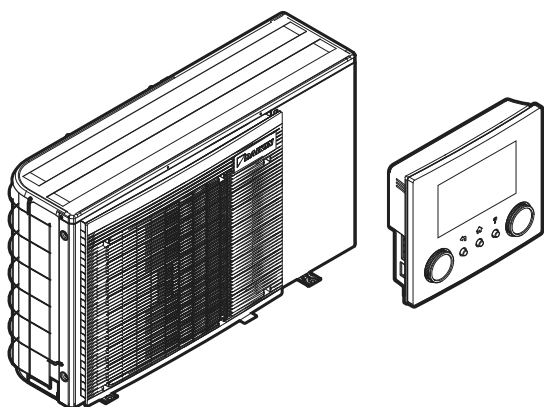




Installer reference guide
Daikin Altherma 3 M



<https://daikintechanicaldatahub.eu>



EBLA04E2V3
EBLA06E2V3
EBLA08E2V3
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EDLA06E2V3
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EDLA04E23V3
EDLA06E23V3
EDLA08E23V3

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1 About this document

Target audience

Authorised installers

Documentation set

This document is part of a documentation set. The complete set consists of:

- **General safety precautions:**

- Safety instructions that you must read before installing
- Format: Paper (in the box of the outdoor unit)

- **Operation manual:**

- Quick guide for basic usage
- Format: Paper (in the box of the outdoor unit)

- **User reference guide:**

- Detailed step-by-step instructions and background information for basic and advanced usage
- Format: Digital files on <https://www.daikin.eu>. Use the search function 🔍 to find your model.

- **Installation manual:**

- Installation instructions
- Format: Paper (in the box of the outdoor unit)

- **Installer reference guide:**

- Preparation of the installation, good practices, reference data, ...
- Format: Digital files on <https://www.daikin.eu>. Use the search function 🔍 to find your model.

- **Addendum book for optional equipment:**

- Additional info about how to install optional equipment
- Format: Paper (in the box of the outdoor unit) + Digital files on <https://www.daikin.eu>. Use the search function 🔍 to find your model.

Latest revisions of the supplied documentation may be available on the regional Daikin website or via your dealer.

The original documentation is written in English. All other languages are translations.

Technical engineering data

- A **subset** of the latest technical data is available on the regional Daikin website (publicly accessible).
- The **full set** of latest technical data is available on the Daikin Business Portal (authentication required).

Online tools

In addition to the documentation set, some online tools are available for installers:

- **Daikin Technical Data Hub**

- Central hub for technical specifications of the unit, useful tools, digital resources, and more.
- Publicly accessible via <https://daikintechdatahub.eu>.

▪ Heating Solutions Navigator

- Digital toolbox that offers a variety of tools to facilitate the installation and configuration of heating systems.
- To access Heating Solutions Navigator, registration to the Stand By Me platform is required. For more information, see <https://professional.standbyme.daikin.eu>.

▪ Daikin e-Care

- Mobile app for installers and service technicians that allows you to register, configure and troubleshoot heating systems.
- The mobile app can be downloaded for iOS and Android devices using the QR codes below. Registration to the Stand By Me platform is required to access the app.

App Store



Google Play



1.1 Meaning of warnings and symbols



DANGER

Indicates a situation that results in death or serious injury.



DANGER: RISK OF ELECTROCUTION

Indicates a situation that could result in electrocution.



DANGER: RISK OF BURNING/SCALDING

Indicates a situation that could result in burning/scalding because of extreme hot or cold temperatures.



DANGER: RISK OF EXPLOSION

Indicates a situation that could result in explosion.



WARNING

Indicates a situation that could result in death or serious injury.



WARNING: FLAMMABLE MATERIAL



CAUTION

Indicates a situation that could result in minor or moderate injury.



NOTICE

Indicates a situation that could result in equipment or property damage.

**INFORMATION**

Indicates useful tips or additional information.

Symbols used on the unit:

Symbol	Explanation
	Before installation, read the installation and operation manual, and the wiring instruction sheet.
	Before performing maintenance and service tasks, read the service manual.
	For more information, see the installer and user reference guide.
	The unit contains rotating parts. Be careful when servicing or inspecting the unit.

Symbols used in the documentation:

Symbol	Explanation
	Indicates a figure title or a reference to it. Example: "▲ 1–3 Figure title" means "Figure 3 in chapter 1".
	Indicates a table title or a reference to it. Example: "■ 1–3 Table title" means "Table 3 in chapter 1".

1.2 Installer reference guide at a glance

Chapter	Description
About the documentation	What documentation exists for the installer
General safety precautions	Safety instructions that you must read before installing
Specific installer safety instructions	
About the box	How to handle the box, unpack the units and remove their accessories
About the units and options	▪ How to identify the units ▪ Possible combinations of units and options
Application guidelines	Various installation setups of the system
Unit installation	What to do and know to install the system, including information on how to prepare for an installation
Piping installation	What to do and know to install the piping of the system, including information on how to prepare for an installation
Electrical installation	What to do and know to install the electrical components of the system, including information on how to prepare for an installation

Chapter	Description
Finishing the outdoor unit installation	What to do after unit installation, piping installation and electrical installation
Configuration	What to do and know to configure the system after it is installed
Commissioning	What to do and know to commission the system after it is configured
Hand-over to the user	What to give and explain to the user
Maintenance and service	How to maintain and service the units
Troubleshooting	What to do in case of problems
Disposal	How to dispose of the system
Technical data	Specifications of the system
Glossary	Definition of terms
Field settings table	Table to be filled in by the installer, and kept for future reference Note: There is also an installer settings table in the user reference guide. This table has to be filled in by the installer and handed over to the user.

2 General safety precautions

In this chapter

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2.1 For the installer

2.1.1 General

If you are NOT sure how to install or operate the unit, contact your dealer.



DANGER: RISK OF BURNING/SCALDING

- Do NOT touch the refrigerant piping, water piping or internal parts during and immediately after operation. It could be too hot or too cold. Give it time to return to normal temperature. If you MUST touch it, wear protective gloves.
- Do NOT touch any accidental leaking refrigerant.



WARNING

Improper installation or attachment of equipment or accessories could result in electrical shock, short-circuit, leaks, fire or other damage to the equipment. ONLY use accessories, optional equipment and spare parts made or approved by Daikin.



WARNING

Make sure installation, testing and applied materials comply with applicable legislation (on top of the instructions described in the Daikin documentation).



CAUTION

Wear adequate personal protective equipment (protective gloves, safety glasses,...) when installing, maintaining or servicing the system.



WARNING

Tear apart and throw away plastic packaging bags so that nobody, especially children, can play with them. Possible risk: suffocation.



WARNING

Provide adequate measures to prevent that the unit can be used as a shelter by small animals. Small animals that make contact with electrical parts can cause malfunctions, smoke or fire.



CAUTION

Do NOT touch the air inlet or aluminium fins of the unit.



CAUTION

- Do NOT place any objects or equipment on top of the unit.
- Do NOT sit, climb or stand on the unit.

In accordance with the applicable legislation, it might be necessary to provide a logbook with the product containing at least: information on maintenance, repair work, results of tests, stand-by periods,...

Also, at least, following information **MUST** be provided at an accessible place at the product:

- Instructions for shutting down the system in case of an emergency
- Name and address of fire department, police and hospital
- Name, address and day and night telephone numbers for obtaining service

In Europe, EN378 provides the necessary guidance for this logbook.

2.1.2 Installation site

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the weight and vibration of the unit.
- Make sure the area is well ventilated. Do NOT block any ventilation openings.
- Make sure the unit is level.

Do NOT install the unit in the following places:

- In potentially explosive atmospheres.
- In places where there is machinery that emits electromagnetic waves. Electromagnetic waves may disturb the control system, and cause malfunction of the equipment.
- In places where there is a risk of fire due to the leakage of flammable gases (example: thinner or gasoline), carbon fibre, ignitable dust.
- In places where corrosive gas (example: sulphurous acid gas) is produced. Corrosion of copper pipes or soldered parts may cause the refrigerant to leak.

2.1.3 Refrigerant — in case of R410A or R32

If applicable. See the installation manual or installer reference guide of your application for more information.



NOTICE

Make sure refrigerant piping installation complies with applicable legislation. In Europe, EN378 is the applicable standard.



NOTICE

Make sure the field piping and connections are NOT subjected to stress.



WARNING

During tests, NEVER pressurise the product with a pressure higher than the maximum allowable pressure (as indicated on the nameplate of the unit).



WARNING

Take sufficient precautions in case of refrigerant leakage. If refrigerant gas leaks, ventilate the area immediately. Possible risks:

- Excessive refrigerant concentrations in a closed room can lead to oxygen deficiency.
- Toxic gas might be produced if refrigerant gas comes into contact with fire.



DANGER: RISK OF EXPLOSION

Pump down – Refrigerant leakage. If you want to pump down the system, and there is a leak in the refrigerant circuit:

- Do NOT use the unit's automatic pump down function, with which you can collect all refrigerant from the system into the outdoor unit. **Possible consequence:** Self-combustion and explosion of the compressor because of air going into the operating compressor.
- Use a separate recovery system so that the unit's compressor does NOT have to operate.



WARNING

ALWAYS recover the refrigerant. Do NOT release them directly into the environment. Use a vacuum pump to evacuate the installation.



NOTICE

After all the piping has been connected, make sure there is no gas leak. Use nitrogen to perform a gas leak detection.



NOTICE

- To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.
- When the refrigerant system is to be opened, refrigerant MUST be treated according to the applicable legislation.



WARNING

Make sure there is no oxygen in the system. Refrigerant may ONLY be charged after performing the leak test and the vacuum drying.

Possible consequence: Self-combustion and explosion of the compressor because of oxygen going into the operating compressor.

- In case recharge is required, see the nameplate of the unit. It states the type of refrigerant and necessary amount.
- The unit is factory charged with refrigerant and depending on pipe sizes and pipe lengths some systems require additional charging of refrigerant.
- ONLY use tools exclusively for the refrigerant type used in the system, this to ensure pressure resistance and prevent foreign materials from entering into the system.
- Charge the liquid refrigerant as follows:

2 | General safety precautions

If	Then
A siphon tube is present (i.e., the cylinder is marked with "Liquid filling siphon attached")	Charge with the cylinder upright. 
A siphon tube is NOT present	Charge with the cylinder upside down. 

- Open refrigerant cylinders slowly.
- Charge the refrigerant in liquid form. Adding it in gas form may prevent normal operation.



CAUTION

When the refrigerant charging procedure is done or when pausing, close the valve of the refrigerant tank immediately. If the valve is NOT closed immediately, remaining pressure might charge additional refrigerant. **Possible consequence:** Incorrect refrigerant amount.

2.1.4 Water

If applicable. See the installation manual or installer reference guide of your application for more information.



NOTICE

Make sure water quality complies with EU directive 2020/2184.

2.1.5 Electrical



DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 10 minutes, and measure the voltage at the terminals of main circuit capacitors or electrical components before servicing. The voltage MUST be less than 50 V DC before you can touch electrical components. For the location of the terminals, see the wiring diagram.
- Do NOT touch electrical components with wet hands.
- Do NOT leave the unit unattended when the service cover is removed.



WARNING

If NOT factory installed, a main switch or other means for disconnection, having a contact separation in all poles providing full disconnection under overvoltage category III condition, MUST be installed in the fixed wiring.

**WARNING**

- ONLY use copper wires.
- Make sure the field wiring complies with the applicable legislation.
- All field wiring MUST be performed in accordance with the wiring diagram supplied with the product.
- NEVER squeeze bundled cables and make sure they do NOT come in contact with the piping and sharp edges. Make sure no external pressure is applied to the terminal connections.
- Make sure to install earth wiring. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earth may cause electrical shock.
- Make sure to use a dedicated power circuit. NEVER use a power supply shared by another appliance.
- Make sure to install the required fuses or circuit breakers.
- Make sure to install an earth leakage protector. Failure to do so may cause electrical shock or fire.
- When installing the earth leakage protector, make sure it is compatible with the inverter (resistant to high frequency electric noise) to avoid unnecessary opening of the earth leakage protector.

**CAUTION**

- When connecting the power supply: connect the earth cable first, before making the current-carrying connections.
- When disconnecting the power supply: disconnect the current-carrying cables first, before separating the earth connection.
- The length of the conductors between the power supply stress relief and the terminal block itself MUST be as such that the current-carrying wires are tightened before the earth wire is in case the power supply is pulled loose from the stress relief.

**NOTICE**

Precautions when laying power wiring:



- Do NOT connect wiring of different thicknesses to the power terminal block (slack in the power wiring may cause abnormal heat).
- When connecting wiring which is the same thickness, do as shown in the figure above.
- For wiring, use the designated power wire and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use an appropriate screwdriver for tightening the terminal screws. A screwdriver with a small head will damage the head and make proper tightening impossible.
- Over-tightening the terminal screws may break them.

Install power cables at least 1 meter away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 meter may NOT be sufficient.



WARNING

- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.



NOTICE

ONLY applicable if the power supply is three-phase, and the compressor has an ON/OFF starting method.

If there exists the possibility of reversed phase after a momentary black out and the power goes ON and OFF while the product is operating, attach a reversed phase protection circuit locally. Running the product in reversed phase can break the compressor and other parts.

3 Specific installer safety instructions

Always observe the following safety instructions and regulations.

Installation site (see "7.1 Preparing the installation site" [► 60])



WARNING

Follow the service space dimensions in this manual for correct installation of the unit. See "7.1.1 Installation site requirements of the outdoor unit" [► 60].

Special requirements for R32 (see "7.1.1 Installation site requirements of the outdoor unit" [► 60])



WARNING

- Do NOT pierce or burn refrigerant cycle parts.
- Do NOT use means to accelerate the defrosting process or to clean the equipment, other than those recommended by the manufacturer.
- Be aware that R32 refrigerant does NOT contain an odour.



WARNING

The appliance shall be stored so as to prevent mechanical damage and in a well-ventilated room without continuously operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater).



WARNING

Make sure installation, servicing, maintenance and repair comply with instructions from Daikin and with applicable legislation and are executed ONLY by authorised persons.

Mounting the outdoor unit (see "7.2 Mounting the outdoor unit" [► 64])



WARNING

Fixing method of the outdoor unit MUST be in accordance with the instructions from this manual. See "7.2 Mounting the outdoor unit" [► 64].

Opening and closing the unit (see "7.3 Opening and closing the unit" [► 68])



DANGER: RISK OF ELECTROCUTION



DANGER: RISK OF BURNING/SCALDING

Piping installation (see "8 Piping installation" [► 71])



WARNING

The field piping method MUST be in accordance with the instructions from this manual. See "8 Piping installation" [► 71].

In case of freeze protection by glycol:



WARNING

Ethylene glycol is toxic.



WARNING

Due to the presence of glycol, corrosion of the system is possible. Uninhibited glycol will turn acidic under the influence of oxygen. This process is accelerated by the presence of copper and high temperatures. The acidic uninhibited glycol attacks metal surfaces and forms galvanic corrosion cells that cause severe damage to the system. Therefore it is important that:

- the water treatment is correctly executed by a qualified water specialist,
- a glycol with corrosion inhibitors is selected to counteract acids formed by the oxidation of glycols,
- no automotive glycol is used because their corrosion inhibitors have a limited lifetime and contain silicates which can foul or plug the system,
- galvanized pipes are NOT used in glycol systems since the presence may lead to the precipitation of certain components in the glycol's corrosion inhibitor.

Electrical installation (see "9 Electrical installation" [► 86])



DANGER: RISK OF ELECTROCUTION



WARNING

Electrical wiring connection method **MUST** be in accordance with the instructions from:

- This manual. See "9 Electrical installation" [► 86].
- The wiring diagram, which is delivered with the unit, located at the inside of the service cover. For a translation of its legend, see "17.2 Wiring diagram: Outdoor unit" [► 256].



WARNING

ALWAYS use multicore cable for power supply cables.



CAUTION

Do NOT push or place redundant cable length into the unit.



WARNING

The backup heater **MUST** have a dedicated power supply and **MUST** be protected by the safety devices required by the applicable legislation.



CAUTION

To guarantee the unit is completely earthed, **ALWAYS** connect the backup heater power supply and the earth cable.



WARNING

Stripped wire. Make sure that stripped wire cannot make contact with possible water on the bottom plate.

Commissioning (see "12 Commissioning" [▶ 224])

**WARNING**

Commissioning method **MUST** be in accordance with the instructions from this manual. See "12 Commissioning" [▶ 224].

4 About the box

- Keep the following in mind:
- At delivery, the unit **MUST** be checked for damage and completeness. Any damage or missing parts **MUST** be reported immediately to the claims agent of the carrier.
 - Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
 - Prepare in advance the path along which you want to bring the unit to its final installation position.

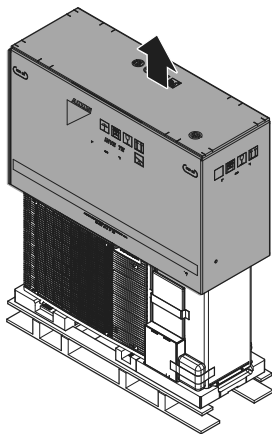
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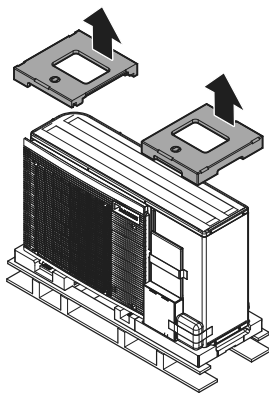
4.1 Outdoor unit

4.1.1 To unpack the outdoor unit

- 1** Cut straps and remove the cardboard.

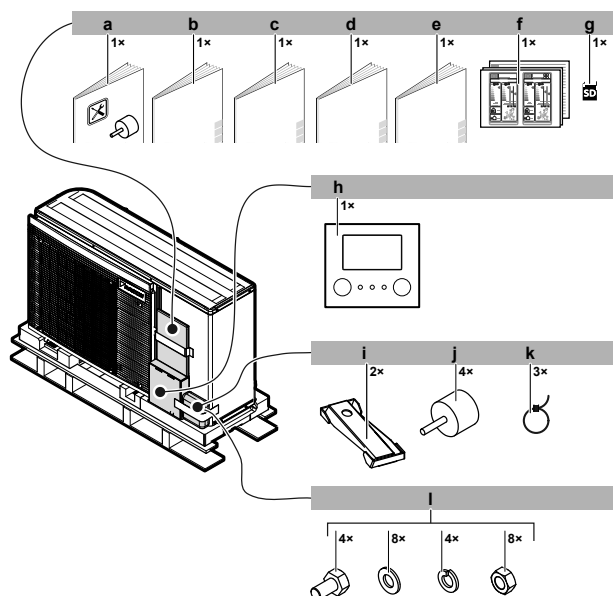


- 2** Remove the top packaging.



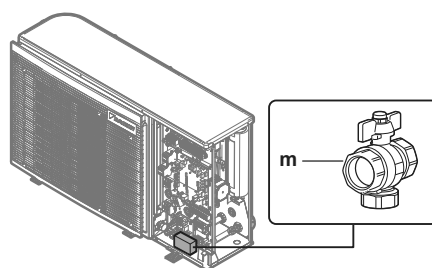
4.1.2 To remove the accessories from the outdoor unit

- 1** Remove the accessories on top and in front of the unit.



- a** Installation manual vibration dampers
- b** General safety precautions
- c** Operation manual
- d** Installation manual
- e** Addendum book for optional equipment
- f** Energy label
- g** WLAN cartridge
- h** User interface (front plate, rear plate, screws, and wall plugs)
- i** Unit mounting plate
- j** Vibration dampers
- k** Cable tie
- l** Bolts, nuts, washers, and spring washers

- 2** After opening the unit (see "7.3.2 To open the outdoor unit" [► 68]), remove the accessory inside the unit.



m Shutoff valve

5 About the units and options

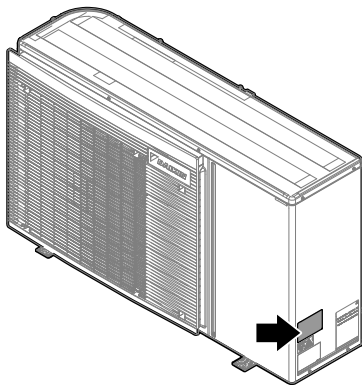
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5.1 Identification

5.1.1 Identification label: Outdoor unit

Location



Model identification

Example: E B L A 06 E2 3 V3

Code	Explanation
E	Monobloc outdoor heat pump
B	B=Reversible (heating+cooling) D=Heating only
L	Low water temperature – ambient zone 2 (see operation range)
A	Refrigerant R32
06	Capacity class
E2	Model series
3	3=Model with integrated backup heater [—]=Model without integrated backup heater
V3	Power supply: V3=1N~, 230 V AC, 50 Hz

5.2 Combining units and options



INFORMATION

Certain options may NOT be available in your country.

5.2.1 Possible options for the outdoor unit

Multi-zoning wired controls

You can connect the following multi-zoning wired controls:

- Multi-zoning base unit 230 V (EKWUFHTA1V3)
- Digital thermostat 230 V (EKWCTRD1V3)
- Analogue thermostat 230 V (EKWCTRA1V3)
- Actuator 230 V (EKWCVATR1V3)

For installation instructions, see the installation manual of the control, and the addendum book for optional equipment.

Room thermostat (EKRTWA, EKTRTB)

You can connect an optional room thermostat to the outdoor unit. This thermostat can either be wired (EKRTWA) or wireless (EKTRTB).

For installation instructions, see the installation manual of the room thermostat and addendum book for optional equipment.

Remote sensor for wireless thermostat (EKRTETSB)

You can use the remote indoor temperature sensor (EKRTETSB) only in combination with the wireless thermostat (EKTRTB).

For installation instructions, see the installation manual of the room thermostat and the addendum book for optional equipment.

Digital I/O PCB (EKRP1HBAA)

The digital I/O PCB is required to provide following signals:

- Alarm output
- Space heating/cooling ON/OFF output
- Changeover to external heat source

For installation instructions, see the installation manual of the digital I/O PCB and addendum book for optional equipment.

Demand PCB (EKRP1AHTA)

To enable the power saving consumption control by digital inputs you MUST install the demand PCB.

For installation instructions, see the installation manual of the demand PCB and addendum book for optional equipment.

Remote indoor sensor (KRCS01-1)

By default the internal sensor of the dedicated Human Comfort Interface (BRC1HHDA used as room thermostat) will be used as room temperature sensor.

As an option the remote indoor sensor can be installed to measure the room temperature on another location.

For installation instructions, see the installation manual of the remote indoor sensor and addendum book for optional equipment.



INFORMATION

- The remote indoor sensor can only be used in case the user interface is configured with room thermostat functionality.
- You can only connect either the remote indoor sensor or the remote outdoor sensor.

Remote outdoor sensor (EKRSKA1)

By default the sensor inside the outdoor unit will be used to measure the outdoor temperature.

As an option the remote outdoor sensor can be installed to measure the outdoor temperature on another location (e.g. to avoid direct sunlight) to have an improved system behaviour.

For installation instructions, see the installation manual of the remote outdoor sensor and the addendum book for optional equipment.



INFORMATION

You can only connect either the remote indoor sensor or the remote outdoor sensor.

PC cable (EKPCCAB4)

The PC cable makes a connection between the hydro PCB (A1P) of the outdoor unit and a PC. It gives the possibility to update the hydro software and EEPROM.

For installation instructions, see:

- Installation manual of the PC cable
- "11.1.2 To connect the PC cable to the switch box" [► 126]

Heat pump convector (FWX*)

For providing space heating/cooling, it is possible to use the following heat pump convectors:

- FWXV: floor-standing model
- FWXT: wall-mounted model
- FWXM: concealed model

For installation instructions, see:

- The installation manual of the heat pump convector
- The installation manual of the heat pump convector options
- The addendum book for optional equipment

External backup heater kit (EKLBUHCB6W1) + bypass valve kit (EKMBHBP1)

For models without integrated backup heater, you can install the external backup heater kit (EKLBUHCB6W1).

For installation instructions, see:

- Installation manual of the external backup heater kit
- "To connect the backup heater kit" [► 100] (this topic partially supersedes the installation manual of the backup heater)

If you install the external backup heater kit, then under certain conditions you also need to install a bypass valve kit (EKMBHBP1). See:

- "Bypass valve kit necessity" [► 105]
- "To connect the bypass valve kit" [► 106] (this topic supersedes the instruction sheet delivered with the bypass valve kit)

Universal centralised controller (EKCC8-W)

Controller for cascade control.

Bizone kit (EKMIKPOA or EKMIKPHA)

You can install an optional bizone kit.

For installation instructions, see the installation manual of the bizone kit.

See also:

- "6.2.3 Multiple rooms – Two LWT zones" [► 36]
- "Bizone kit" [► 216]

Connection kit for third-party tank (EKHY3PART)

Required when connecting a third-party tank to the system.

Contains a thermistor, a 3-way valve, and a contactor K3M – terminal X7M assembly.

For installation instructions, see the installation manual of the connection kit.

Connection kit for third-party tank with built-in thermostat (EKHY3PART2)

Kit for the connection of a third-party tank with built-in thermostat to the system. The kit converts a thermostat demand from the tank to a domestic hot water request for the outdoor unit.

Domestic hot water tank

For providing domestic hot water, a domestic hot water tank can be connected to the outdoor unit.

The following domestic hot water tanks are available:

Tank	Remark
Stainless steel tank (standard): ▪ EKHWS150D3V3 ▪ EKHWS180D3V3 ▪ EKHWS200D3V3 ▪ EKHWS250D3V3 ▪ EKHWS300D3V3	Inclusive booster heater For these tanks an optional domestic hot water tank thermistor with 30 m cable length (EKTESE1) is available.
Stainless steel tank (+ components): ▪ EKHWSU150D3V3 ▪ EKHWSU180D3V3 ▪ EKHWSU200D3V3 ▪ EKHWSU250D3V3 ▪ EKHWSU300D3V3	Inclusive: ▪ Booster heater ▪ Components to comply with the UK Building Regulation G3. For these tanks an optional domestic hot water tank thermistor with 30 m cable length (EKTESE1) is available.

Tank	Remark
Polypropylene tank: - EKHWP300B - EKHWP500B	Tank with drainback solar system. For these tanks, the booster heater option (EKBH3SD) must be installed. For these tanks an optional domestic hot water tank thermistor with 30 m cable length (EKTESE2) is available.
Polypropylene tank: - EKHWP300PB - EKHWP500PB	Tank with pressurised solar system. For these tanks, the booster heater option (EKBH3SD) must be installed. For these tanks an optional domestic hot water tank thermistor with 30 m cable length (EKTESE2) is available.

For installation instructions, see the installation manual of the domestic hot water tank, and the addendum book for optional equipment.

Human Comfort Interface (BRC1HHDA) used as room thermostat

- The Human Comfort Interface (HCI) used as room thermostat can only be used in combination with the user interface connected to the outdoor unit.
- The Human Comfort Interface (HCI) used as room thermostat needs to be installed in the room that you want to control.

For installation instructions, see the installation and operation manual of the Human Comfort Interface (HCI) as room thermostat, and the addendum book for optional equipment.

Domestic hot water tank thermistor (EKTESE1, EKTESE2)

To increase the maximum distance between the domestic hot water tank and the outdoor unit, a 30 m thermistor can be connected.

For stainless steel tanks EKTESE1 can be connected and for polypropylene tanks EKTESE2 can be connected.

For installation instructions, see the installation manual of the domestic hot water tank, and the addendum book for optional equipment.

Flow switch (EKFLSW2)

If you add glycol to the water, you also need to install a flow switch (and set [E-OD]=1).

For installation instructions, see the installation manual of the flow switch.

Smart grid relay kit (EKRELSG)

The installation of the optional Smart grid relay kit is required in case of high voltage Smart grid contacts (EKRELSG).

For installation instructions, see "9.2.14 To connect a Smart Grid" [► 117].

LAN adapter for smartphone control (BRP069A62)

You can install this LAN adapter to control the system via a smartphone app.

For installation instructions, see the installation manual of the LAN adapter.

LAN adapter for smartphone control + Smart Grid applications (BRP069A61)

You can install this LAN adapter to:

- Control the system via a smartphone app.
- Use the system in various Smart Grid applications.

For installation instructions, see the installation manual of the LAN adapter.

5.2.2 Possible combinations of outdoor unit and domestic hot water tank

Combination table

Outdoor unit	Domestic hot water tank			
	EKHWS*D*	EKHWSU*D*	EKHWP*	Third-party tank
EBLA04~08	O	O	O	O ^(a)
EDLA04~08	O	O	O	O ^(a)

^(a) When using a third-party tank, make sure it complies with the minimum requirements (see "Third-party tank requirements" [▶ 25]).

Third-party tank requirements

In case of a third-party tank, the tank shall adhere to the following requirements:

- The heat exchanger coil of the tank is $\geq 1.05 \text{ m}^2$ and $\leq 3.7 \text{ m}^2$.
- The tank thermistor must be located above the heat exchanger coil.
- The booster heater must be located above the heat exchanger coil.



NOTICE

Performance. Performance data for third-party tanks CANNOT be provided, and performance CANNOT be guaranteed.

If you have a tank in which you...	
Can insert a thermistor.	CANNOT insert a thermistor.
Use EKHY3PART.	Use EKHY3PART2.

- a** Outdoor unit
b Tank

For more detailed installation instructions, see the installation manual of the connection kit and the addendum book for optional equipment.

6 Application guidelines



INFORMATION

Cooling is only applicable in case of reversible models.

In this chapter

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6.1 Overview: Application guidelines

The purpose of the application guidelines is to give a glance of the possibilities of the heat pump system.



NOTICE

- The illustrations in the application guidelines are meant for reference only, and are NOT to be used as detailed hydraulic diagrams. The detailed hydraulic dimensioning and balancing are NOT shown, and are the responsibility of the installer.
- For more information about the configuration settings to optimize heat pump operation, see "11 Configuration" [► 123].

This chapter contains application guidelines for:

- Setting up the space heating/cooling system
- Setting up an auxiliary heat source for space heating
- Setting up the domestic hot water tank
- Setting up the energy metering
- Setting up the power consumption control
- Setting up an external temperature sensor

**NOTICE**

Certain types of fan coil units –in this document referred to as "heat pump convectors"–, are able to receive input of the outdoor unit operation mode (cooling or heating X2M/3 and X2M/4) and/or to send output of the heat pump convector thermostatic condition (main zone: X2M/30 and X2M/35; additional zone: X2M/30 and X2M/35a).

The application guidelines illustrate the possibility of receiving or sending digital input/output. This functionality can only be used in case the heat pump convector has such features and the signals meet following requirements:

- Output of outdoor unit (input to heat pump convector): cooling/heating signal=230 V (cooling=230 V, heating=0 V).
- Input to outdoor unit (output of heat pump convector): thermostat ON/OFF signal=voltage-free contact (closed contact=thermo ON, open contact=thermo OFF).

6.2 Setting up the space heating/cooling system

The heat pump system supplies leaving water to heat emitters in one or more rooms.

Because the system offers a wide flexibility to control the temperature in each room, you need to answer the following questions first:

- How many rooms are heated or cooled by the heat pump system?
- Which heat emitter types are used in each room and what is their design leaving water temperature?

Once the space heating/cooling requirements are clear, we recommend to follow the setup guidelines below.

**NOTICE**

If an external room thermostat is used, the external room thermostat will control the room frost protection. However, the room frost protection is only possible if [C.2] **Space heating/cooling=On**.

**INFORMATION**

In case an external room thermostat is used and room frost protection needs to be guaranteed in all conditions, then you have to set **Emergency** [9.5.1] to one of the following:

- Automatic
- auto SH reduced/DHW on
- auto SH reduced/DHW off
- auto SH normal/DHW off

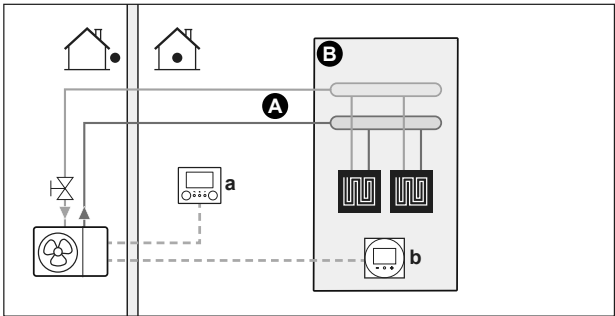
**NOTICE**

An overpressure bypass valve can be integrated in the system. Keep in mind that this valve might not be shown on the illustrations.

6.2.1 Single room

Underfloor heating or radiators – Wired room thermostat

Setup



- A Main leaving water temperature zone
- B One single room
- a User interface (delivered as accessory)
- b Dedicated Human Comfort Interface (BRC1HHDA used as room thermostat)

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- The underfloor heating or radiators are directly connected to the outdoor unit – or to the external backup heater kit, if there is one.
- The room temperature is controlled by the dedicated Human Comfort Interface (BRC1HHDA used as room thermostat).

Configuration

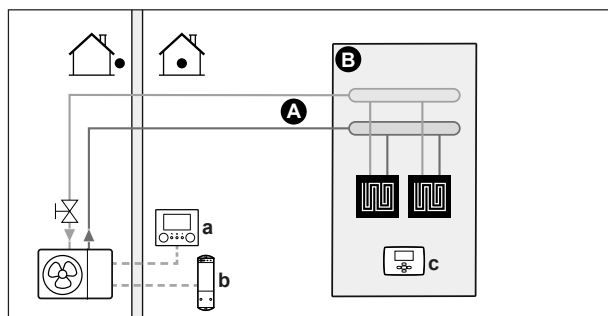
Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	2 (Room thermostat): Unit operation is decided based on the ambient temperature of the dedicated Human Comfort Interface.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main

Benefits

- **Highest comfort and efficiency.** The smart room thermostat functionality can decrease or increase the desired leaving water temperature based on the actual room temperature (modulation). This results in:
 - Stable room temperature matching the desired temperature (higher comfort)
 - Less ON/OFF cycles (more quiet, higher comfort and higher efficiency)
 - Lowest possible leaving water temperature (higher efficiency)
- **Easy.** You can easily set the desired room temperature via the user interface:
 - For your daily needs, you can use preset values and schedules.
 - To deviate from your daily needs, you can temporarily overrule the preset values and schedules, or use the holiday mode.

Underfloor heating or radiators – Wireless room thermostat

Setup



- A** Main leaving water temperature zone
- B** One single room
- a** User interface (delivered as accessory)
- b** Receiver for wireless external room thermostat
- c** Wireless external room thermostat

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- The underfloor heating or radiators are directly connected to the outdoor unit – or to the external backup heater kit, if there is one.
- The room temperature is controlled by the wireless external room thermostat (optional equipment EKRTTB).

Configuration

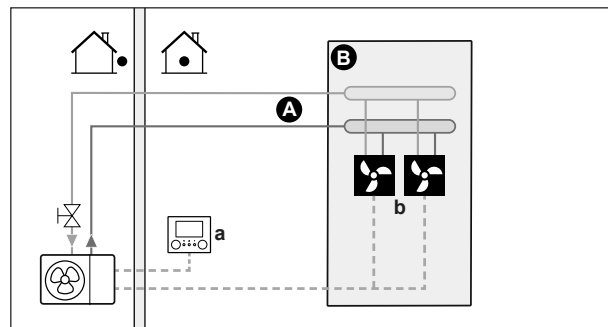
Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	1 (External room thermostat): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main
External room thermostat for the main zone: ▪ #: [2.A] ▪ Code: [C-05]	1 (1 contact): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition. No separation between heating or cooling demand.

Benefits

- **Wireless.** The Daikin external room thermostat is available in a wireless version.
- **Efficiency.** Although the external room thermostat only sends ON/OFF signals, it is specifically designed for the heat pump system.
- **Comfort.** In case of underfloor heating, the wireless external room thermostat prevents condensation on the floor during cooling operation by measuring the room humidity.

Heat pump convectors

Setup



- A** Main leaving water temperature zone
- B** One single room
- a** User interface (delivered as accessory)
- b** Heat pump convectors (+ controllers)

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- The heat pump convectors are directly connected to the outdoor unit – or to the external backup heater kit, if there is one.
- The desired room temperature is set via the controller of the heat pump convectors. There are different controllers and setups possible for the heat pump convectors. For more information, see:
 - The installation manual of the heat pump convectors
 - The installation manual of the heat pump convector options
 - The addendum book for optional equipment
- The space heating/cooling demand signal is sent to one digital input on the outdoor unit (X2M/35 and X2M/30).
- The space operation mode is sent to the heat pump convectors by one digital output on the outdoor unit (X2M/4 and X2M/3).

Configuration

Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	1 (External room thermostat): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main
External room thermostat for the main zone: ▪ #: [2.A] ▪ Code: [C-05]	1 (1 contact): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition. No separation between heating or cooling demand.

Benefits

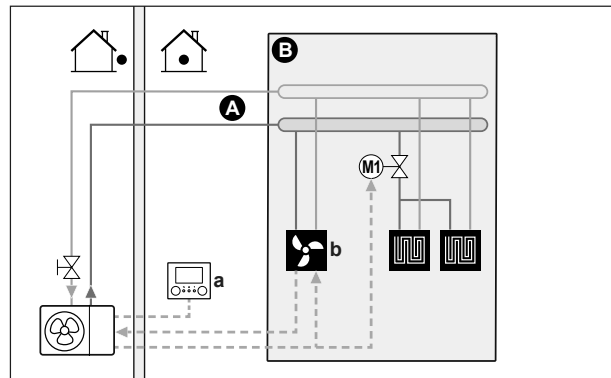
- **Cooling.** The heat pump convector offers, besides heating capacity, also excellent cooling capacity.
- **Efficiency.** Optimal energy efficiency because of the interlink function.

▪ **Stylish.**

Combination: Underfloor heating + Heat pump convectors

- Space heating is provided by:
 - The underfloor heating
 - The heat pump convectors
- Space cooling is provided by the heat pump convectors only. The underfloor heating is shut off by the shut-off valve.

Setup



- A** Main leaving water temperature zone
- B** One single room
- a** User interface (delivered as accessory)
- b** Heat pump convectors (+ controllers)

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- The heat pump convectors are directly connected to the outdoor unit – or to the external backup heater kit, if there is one.
- A shut-off valve (field supply) is installed before the underfloor heating to prevent condensation on the floor during cooling operation.
- The desired room temperature is set via the controller of the heat pump convectors. There are different controllers and setups possible for the heat pump convectors. For more information, see:
 - The installation manual of the heat pump convectors
 - The installation manual of the heat pump convector options
 - The addendum book for optional equipment
- The space heating/cooling demand signal is sent to one digital input on the outdoor unit (X2M/35 and X2M/30).
- The space operation mode is sent by one digital output (X2M/4 and X2M/3) on the outdoor unit to:
 - The heat pump convectors
 - The shut-off valve

Configuration

Setting	Value
Unit temperature control:	1 (External room thermostat):
▪ #: [2.9]	Unit operation is decided by the external thermostat.
▪ Code: [C-07]	

Setting	Value
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main
External room thermostat for the main zone: ▪ #: [2.A] ▪ Code: [C-05]	1 (1 contact): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition. No separation between heating or cooling demand.

Benefits

- **Cooling.** Heat pump convectors provide, besides heating capacity, also excellent cooling capacity.
- **Efficiency.** Underfloor heating has the best performance with the heat pump system.
- **Comfort.** The combination of the two heat emitter types provides:
 - The excellent heating comfort of the underfloor heating
 - The excellent cooling comfort of the heat pump convectors

6.2.2 Multiple rooms – One LWT zone

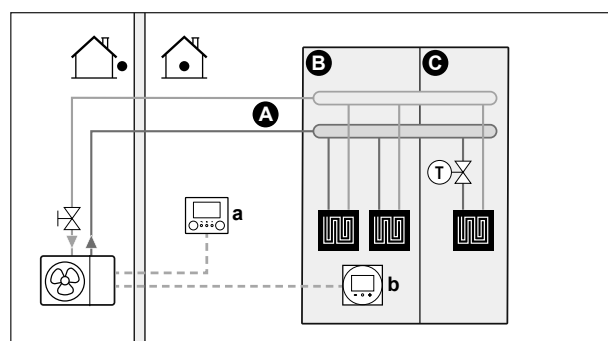
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

Example: If the heat pump system is used to heat up one floor where all the rooms have the same heat emitters.

Underfloor heating or radiators – Thermostatic valves

If you are heating up rooms with underfloor heating or radiators, a very common way is to control the temperature of the main room by using a thermostat (this can either be the dedicated Human Comfort Interface (BRC1HHDA) or an external room thermostat), while the other rooms are controlled by so-called thermostatic valves, which open or close depending on the room temperature.

Setup



- A Main leaving water temperature zone
- B Room 1
- C Room 2
- a User interface (delivered as accessory)
- b Dedicated Human Comfort Interface (BRC1HHDA used as room thermostat)

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [▶ 90].

- The underfloor heating of the main room is directly connected to the outdoor unit – or to the external backup heater kit, if there is one.
- The room temperature of the main room is controlled by the dedicated Human Comfort Interface (BRC1HHDA used as room thermostat).
- A thermostatic valve is installed before the underfloor heating in each of the other rooms.

**INFORMATION**

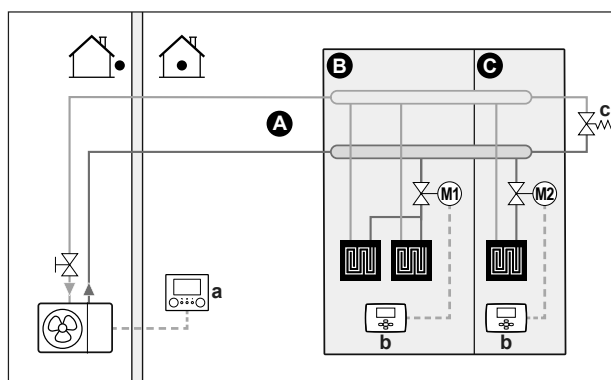
Mind situations where the main room can be heated by another heating source.
Example: Fireplaces.

Configuration

Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	2 (Room thermostat): Unit operation is decided based on the ambient temperature of the dedicated Human Comfort Interface.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main

Benefits

- **Easy.** Same installation as for one room, but with thermostatic valves.

Underfloor heating or radiators – Multiple external room thermostats**Setup**

- A** Main leaving water temperature zone
- B** Room 1
- C** Room 2
- a** User interface (delivered as accessory)
- b** External room thermostat
- c** Bypass valve

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating or cooling demand.
- A bypass valve must be installed to make water recirculation possible when all shut-off valves are closed. To guarantee reliable operation, provide a minimum water flow as described in table "To check the water volume and flow rate" in "8.1 Preparing water piping" [► 71].

- The user interface connected to the outdoor unit decides the space operation mode. Mind that the operation mode on each room thermostat must be set to match the outdoor unit.
- The room thermostats are connected to the shut-off valves, and do NOT have to be connected to the outdoor unit. The outdoor unit will supply leaving water all the time, with the possibility to program a leaving water schedule.

Configuration

Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	0 (Leaving water): Unit operation is decided based on the leaving water temperature.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main

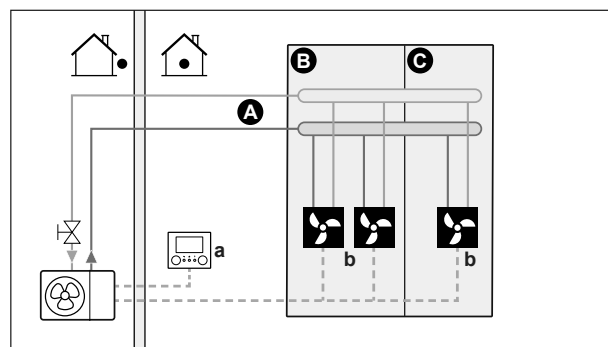
Benefits

Compared with underfloor heating or radiators for one room:

- **Comfort.** You can set the desired room temperature, including schedules, for each room via the room thermostats.

Heat pump convectors – Multiple rooms

Setup



- A Main leaving water temperature zone
- B Room 1
- C Room 2
- a User interface (delivered as accessory)
- b Heat pump convectors (+ controllers)

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- The desired room temperature is set via the controller of the heat pump convectors. There are different controllers and setups possible for the heat pump convectors. For more information, see:
 - The installation manual of the heat pump convectors
 - The installation manual of the heat pump convector options
 - The addendum book for optional equipment
- The user interface connected to the outdoor unit decides the space operation mode.

- The heating or cooling demand signals of each heat pump convector are connected in parallel to the digital input on the outdoor unit (X2M/35 and X2M/30). The outdoor unit will only supply leaving water temperature when there is an actual demand.



INFORMATION

To increase comfort and performance, we recommend to install the valve kit option EKVKHPC on each heat pump convector.

Configuration

Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	1 (External room thermostat): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main

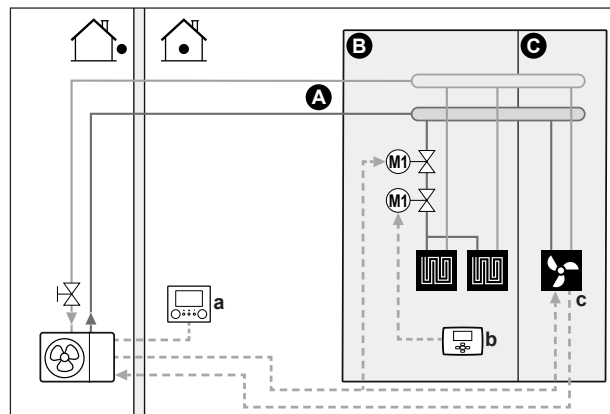
Benefits

Compared with heat pump convectors for one room:

- **Comfort.** You can set the desired room temperature, including schedules, for each room via the remote controller of the heat pump convectors.

Combination: Underfloor heating + Heat pump convectors – Multiple rooms

Setup



- A Main leaving water temperature zone
- B Room 1
- C Room 2
- a User interface (delivered as accessory)
- b External room thermostat
- c Heat pump convectors (+ controllers)

- For more information about connecting the electrical wiring to the unit, see "9.2 Connections to the outdoor unit" [► 90].
- For each room with heat pump convectors: The heat pump convectors are directly connected to the outdoor unit – or to the external backup heater kit, if there is one.

- For each room with underfloor heating: Two shut-off valves (field supply) are installed before the underfloor heating:
 - A shut-off valve to prevent hot water supply when the room has no heating demand
 - A shut-off valve to prevent condensation on the floor during cooling operation of the rooms with heat pump convectors.
- For each room with heat pump convectors: The desired room temperature is set via the controller of the heat pump convectors. There are different controllers and setups possible for the heat pump convectors. For more information, see:
 - The installation manual of the heat pump convectors
 - The installation manual of the heat pump convector options
 - The addendum book for optional equipment
- For each room with underfloor heating: The desired room temperature is set via the external room thermostat (wired or wireless).
- The user interface connected to the outdoor unit decides the space operation mode. Mind that the operation mode on each external room thermostat and controller of the heat pump convectors must be set to match the outdoor unit.

**INFORMATION**

To increase comfort and performance, we recommend to install the valve kit option EKVHPC on each heat pump convector.

Configuration

Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	0 (Leaving water): Unit operation is decided based on the leaving water temperature.
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	0 (Single zone): Main

6.2.3 Multiple rooms – Two LWT zones

If the heat emitters selected for each room are designed for different leaving water temperatures, you can use different leaving water temperature zones (maximum 2).

In this document:

- Main zone = Zone with the lowest design temperature in heating, and the highest design temperature in cooling
- Additional zone = Zone with the highest design temperature

**CAUTION**

If there is more than one leaving water zone, ALWAYS install a mixing valve station in the main zone to decrease (in heating)/increase (in cooling) the leaving water temperature when the additional zone has demand.

Typical example:

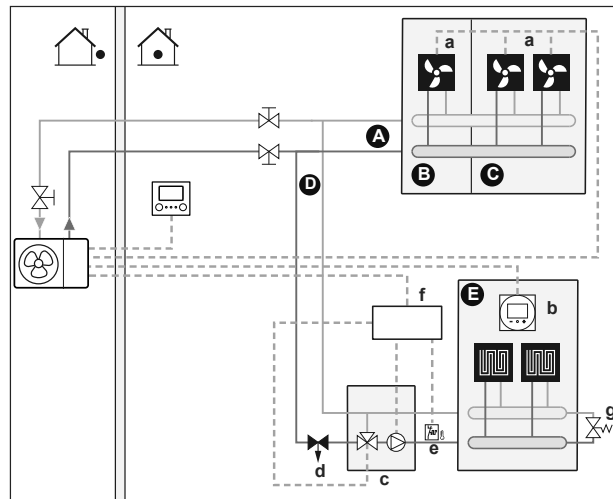
Room (zone)	Heat emitters: Design temperature
Living room (main zone)	Underfloor heating: ▪ In heating: 35°C ▪ In cooling^(a): 20°C (only refreshment, no real cooling allowed)
Bed rooms (additional zone)	Heat pump convectors: ▪ In heating: 45°C ▪ In cooling: 12°C

^(a) In cooling mode, you can allow the underfloor heating (main zone) to provide refreshment (no real cooling), or NOT allow it. See setup below.

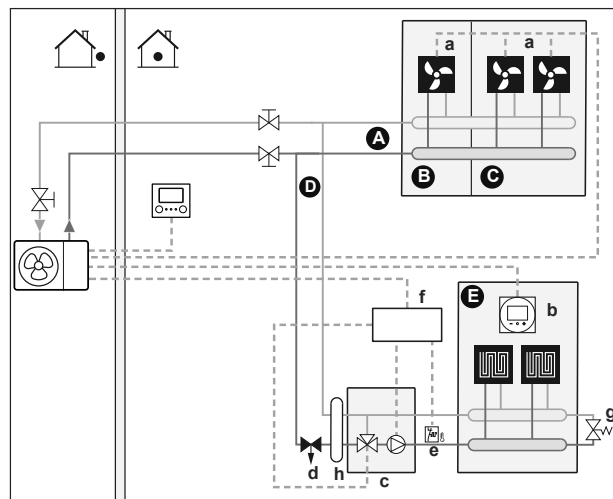
Setup

Three bizon kit system variations are possible:

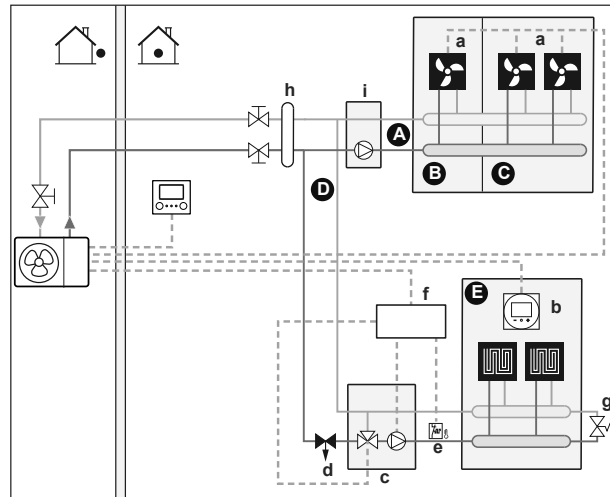
- 1 System without hydraulic separator:



- 2 System with hydraulic separator for main zone:



- 3 System with hydraulic separator for both zones:
For this system, a direct pump is required for the additional zone.



- A** Additional leaving water temperature zone
- B** Room 1
- C** Room 2
- D** Main leaving water temperature zone
- E** Room 3
- a** Heat pump convectors (+ controllers)
- b** Dedicated Human Comfort Interface (BRC1HHDA used as room thermostat)
- c** Mixing valve station
- d** Pressure regulating valve (field supply)
- e** Safety thermostat (field supply)
- f** Bizone kit control box (EKMIKPOA)
- g** Bypass valve
- h** Hydraulic separator (balancing bottle)
- i** Direct pump (for additional zone) (e.g. unmixed pump group EKMIKHUA)



INFORMATION

A pressure regulating valve should be implemented before the mixing valve station. This is to guarantee the correct water flow balance between the main leaving water temperature zone and the additional leaving water temperature zone in relation to the required capacity of both water temperature zones.

- A bypass valve must be installed to make water recirculation possible when all shut-off valves are closed. To guarantee reliable operation, provide a minimum water flow as described in table "To check the water volume and flow rate" in "8.1 Preparing water piping" [► 71].
- For the additional zone:
 - The heat pump convectors are directly connected to the outdoor unit – or to the backup heater, if there is one
 - The desired room temperature is set via the controller of the heat pump convectors. There are different controllers and setups possible for the heat pump convectors. For more information, see:
 - The installation manual of the heat pump convectors
 - The installation manual of the heat pump convector options
 - The addendum book for optional equipment
 - The heating or cooling demand signals of each heat pump convector are connected in parallel to the digital input on the outdoor unit (X2M/35a and X2M/30). The outdoor unit will only supply the desired additional leaving water temperature when there is an actual demand.

- The user interface connected to the outdoor unit decides the space operation mode. Mind that the operation mode on each controller of the heat pump convectors must be set to match the outdoor unit.

Configuration

Setting	Value
Unit temperature control: ▪ #: [2.9] ▪ Code: [C-07]	2 (Room thermostat): Unit operation is decided based on the ambient temperature of the dedicated Human Comfort Interface. Note: ▪ Main room = dedicated Human Comfort Interface used as room thermostat functionality ▪ Other rooms = external room thermostat functionality
Number of water temperature zones: ▪ #: [4.4] ▪ Code: [7-02]	1 (Dual zone): Main + additional
In case of heat pump convectors: External room thermostat for the additional zone: ▪ #: [3.A] ▪ Code: [C-06]	1 (1 contact): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition. No separation between heating or cooling demand.
Bizone kit installed: ▪ #: [9.P.1] ▪ Code: [E-0B]	2 (Yes): A bizone kit is installed in order to add an additional temperature zone.
Bizone system type: ▪ #: [9.P.2] ▪ Code: [E-0C]	0 (Without hydraulic separator / no direct pump) 1 (With hydraulic separator / no direct pump) 2 (With hydraulic separator / with direct pump) (See 3 system variations described above)
Shut-off valve output	Set to follow the thermo demand of the main zone.
Shut-off valve	If the main zone must be shut off during cooling mode to prevent condensation on the floor, set it accordingly.

See "Bizone kit" [► 216] for more information on configuration of the bizone kit.

Benefits

▪ **Comfort.**

- The smart room thermostat functionality can decrease or increase the desired leaving water temperature based on the actual room temperature (modulation).
- The combination of the two heat emitter systems provides the excellent heating comfort of the underfloor heating, and the excellent cooling comfort of the heat pump convectors.

▪ **Efficiency.**

- Depending on the demand, the outdoor unit supplies different leaving water temperature matching the design temperature of the different heat emitters.
- Underfloor heating has the best performance with the heat pump system.

6.3 Setting up an auxiliary heat source for space heating



INFORMATION

Bivalent is only possible in case of 1 leaving water temperature zone with:

- room thermostat control, OR
- external room thermostat control.

- Space heating can be done by:
 - The outdoor unit
 - An auxiliary boiler (field supply) connected to the system
- When there is a heating request, the outdoor unit or the auxiliary boiler starts operating depending on the outdoor temperature (status of the changeover to external heat source). When the permission is given to the auxiliary boiler, the space heating by the outdoor unit is turned OFF.
- Bivalent operation is only possible if
 - Space heating is turned ON, and
 - DHW tank operation is turned OFF.
- Domestic hot water is always produced by the DHW tank connected to the outdoor unit.

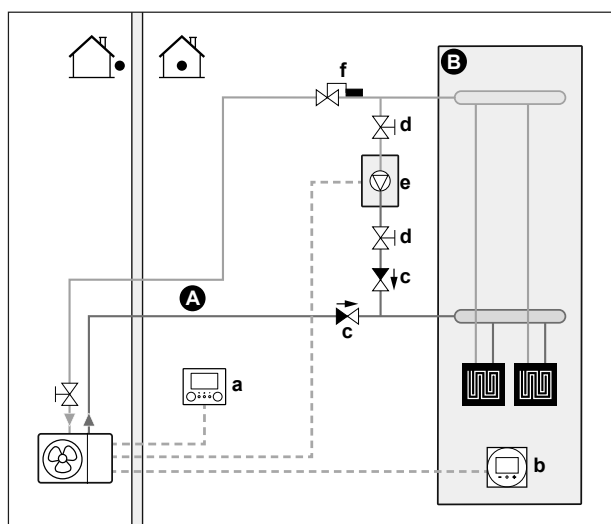


INFORMATION

- During heating operation of the heat pump, the heat pump operates to achieve the desired temperature set via the user interface. When weather-dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.
- During heating operation of the auxiliary boiler, the auxiliary boiler operates to achieve the desired water temperature set via the auxiliary boiler controller.

Setup

- Integrate the auxiliary boiler as follows:



- A** Main leaving water temperature zone
- B** One single room
- a** User interface (delivered as accessory)
- b** Dedicated Human Comfort Interface (BRC1HHDA used as room thermostat)
- c** Non-return valve (field supply)
- d** Shut-off valve (field supply)
- e** Auxiliary boiler (field supply)
- f** Aquastat valve (field supply)



NOTICE

- Make sure the auxiliary boiler and its integration in the system complies with applicable legislation.
- Daikin is NOT responsible for incorrect or unsafe situations in the auxiliary boiler system.

- Make sure the return water to the heat pump does NOT exceed 60°C. To do so:
 - Set the desired water temperature via the auxiliary boiler controller to maximum 60°C.
 - Install an aquastat valve in the return water flow of the heat pump. Set the aquastat valve to close above 60°C and to open below 60°C.
- Install non-return valves.
- An expansion vessel is already pre-mounted in the outdoor unit. But for bivalent operation, also make sure that there is an expansion vessel in the auxiliary boiler loop. Otherwise when bivalent operation is running and if the Aquastat valve would close, there would be no expansion vessel in the water circuit anymore.
- Install the digital I/O PCB (option EKR1HBAA).
- Connect X1 and X2 (changeover to external heat source) on the digital I/O PCB to the auxiliary boiler. See "9.2.11 To connect the changeover to external heat source" [► 114].
- To setup the heat emitters, see "6.2 Setting up the space heating/cooling system" [► 27].

Configuration

Via the user interface (configuration wizard):

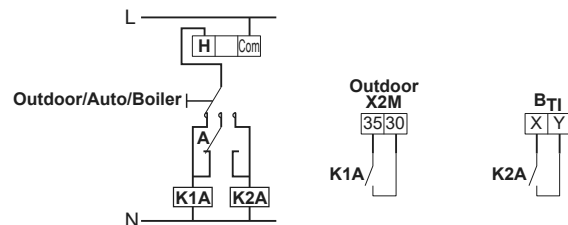
- Set the use of a bivalent system as external heat source.
- Set the bivalent temperature and hysteresis.
- Set the operation mode to space heating only (no tank operation).

**NOTICE**

- Make sure the bivalent hysteresis has enough differential to prevent frequent changeover between outdoor unit and auxiliary boiler.
- Because the outdoor temperature is measured by the outdoor unit air thermistor, install the outdoor unit in the shadow so that it is NOT influenced or turned ON/OFF by direct sunlight.
- Frequent changeover may cause corrosion of the auxiliary boiler. Contact the manufacturer of the auxiliary boiler for more information.

Changeover to external heat source decided by an auxiliary contact

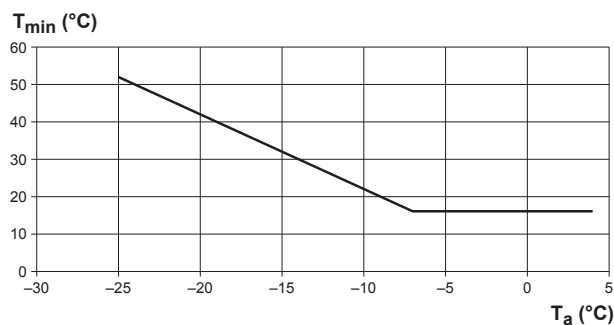
- Only possible in external room thermostat control AND one leaving water temperature zone (see "6.2 Setting up the space heating/cooling system" [► 27]).
- The auxiliary contact can be:
 - An outdoor temperature thermostat
 - An electricity tariff contact
 - A manually operated contact
 - ...
- Setup: Connect the following field wiring:



- B_{TH}** Boiler thermostat input
A Auxiliary contact (normally closed)
H Heating demand room thermostat (optional)
K1A Auxiliary relay for activation of outdoor unit (field supply)
K2A Auxiliary relay for activation of boiler (field supply)
Outdoor Outdoor unit
Auto Automatic
Boiler Boiler

Setpoint of the auxiliary gas boiler

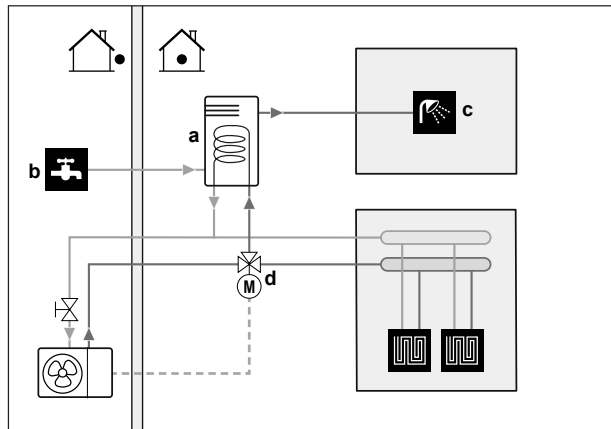
To prevent freeze-up of the water piping, the auxiliary gas boiler must have a fixed setpoint $\geq 55^{\circ}\text{C}$, or a weather-dependent setpoint $\geq T_{\min}$.



- T_a** Outdoor temperature
 $T_{\min}$ Minimum weather-dependent setpoint for auxiliary gas boiler

6.4 Setting up the domestic hot water tank

6.4.1 System layout – Standalone DHW tank



6.4.2 Selecting the volume and desired temperature for the DHW tank

People experience water as hot when its temperature is 40°C. Therefore, the DHW consumption is always expressed as equivalent hot water volume at 40°C. However, you can set the DHW tank temperature at a higher temperature (example: 53°C), which is then mixed with cold water (example: 15°C).

Selecting the volume and desired temperature for the DHW tank consists of:

- 1 Determining the DHW consumption (equivalent hot water volume at 40°C).
- 2 Determining the volume and desired temperature for the DHW tank.

Determining the DHW consumption

Answer the following questions and calculate the DHW consumption (equivalent hot water volume at 40°C) using typical water volumes:

Question	Typical water volume
How many showers are needed per day?	1 shower = 10 min×10 l/min = 100 l
How many baths are needed per day?	1 bath = 150 l
How much water is needed at the kitchen sink per day?	1 sink = 2 min×5 l/min = 10 l
Are there any other domestic hot water needs?	—

Example: If the DHW consumption of a family (4 persons) per day is as follows:

- 3 showers
- 1 bath
- 3 sink volumes

Then the DHW consumption = (3×100 l)+(1×150 l)+(3×10 l)=480 l

Determining the volume and desired temperature for the DHW tank

Formula	Example
$V_1 = V_2 + V_2 \times (T_2 - 40) / (40 - T_1)$	If: ▪ $V_2 = 180$ l ▪ $T_2 = 54^\circ\text{C}$ ▪ $T_1 = 15^\circ\text{C}$ Then $V_1 = 280$ l
$V_2 = V_1 \times (40 - T_1) / (T_2 - T_1)$	If: ▪ $V_1 = 480$ l ▪ $T_2 = 54^\circ\text{C}$ ▪ $T_1 = 15^\circ\text{C}$ Then $V_2 = 307$ l

V₁ DHW consumption (equivalent hot water volume at 40°C)

V₂ Required DHW tank volume if only heated once

T₂ DHW tank temperature

T₁ Cold water temperature

Possible DHW tank volumes

Type	Possible volumes
Standalone DHW tank	▪ 150 l ▪ 180 l ▪ 200 l ▪ 250 l ▪ 300 l^(a) (polypropylene tank is compatible with solar kit) ▪ 500 l^(a) (compatible with solar kit)

^(a) For these models, check the equivalent hot water volume at 40°C in the databook of the storage tank.

Energy saving tips

- If the DHW consumption differs from day to day, you can program a weekly schedule with different desired DHW tank temperatures for each day.
- The lower the desired DHW tank temperature, the more cost effective. By selecting a larger DHW tank, you can lower the desired DHW tank temperature.
- The heat pump itself can produce domestic hot water of maximum 55°C (lower if the outdoor temperature is low). The electrical resistance integrated in the heat pump can increase this temperature. However, this consumes more energy. We recommend to set the desired DHW tank temperature below 55°C to avoid using the electrical resistance.
- The higher the outdoor temperature, the better the performance of the heat pump.
 - If energy prices are the same during the day and the night, we recommend to heat up the DHW tank during the day.
 - If energy prices are lower during the night, we recommend to heat up the DHW tank during the night.

- When the heat pump produces domestic hot water, depending on total heating demand and the scheduled priority setting, it might not be able to heat up a space. In case you need domestic hot water and space heating at the same time, we recommend to produce the domestic hot water during the night when there is lower space heating demand or during the time when occupants are not present.

6.4.3 Setup and configuration – DHW tank

- For large DHW consumptions, you can heat up the DHW tank several times during the day.
- To heat up the DHW tank to the desired DHW tank temperature, you can use the following energy sources:
 - Thermodynamic cycle of the heat pump
 - Electrical booster heater
- For more information about:
 - Optimising the energy consumption for producing domestic hot water, see "11 Configuration" [► 123].
 - Connecting the electrical wiring of the standalone DHW tank to the outdoor unit, see the installation manual of the DHW tank, and the addendum book for optional equipment.
 - Connecting the water piping of the standalone DHW tank to the outdoor unit, see the installation manual of the DHW tank.
 - Optimising the minimum water volume requirement by using the tank preheating function:
See "8.1.3 To check the water volume and flow rate" [► 74] for water circuit requirements.
For stainless steel tanks (EKHWS*D*), the additional components described in "6.4.6 DHW pump for tank preheating" [► 47] must be installed.
For polypropylene tanks (EKHWP*), the booster heater option (EKBH3S) must be installed.

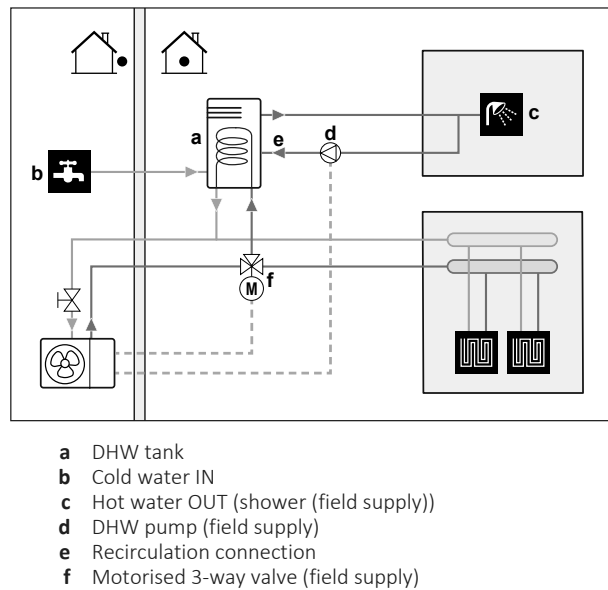
6.4.4 DHW pump for instant hot water



INFORMATION

This topic shows an application example in case of stainless steel tanks (EKHWS*D*).

Setup



- By connecting a DHW pump, instant hot water can be available at the tap.
- The DHW pump and the installation are field supply and the responsibility of the installer. For the electrical wiring, see "9.2.8 To connect the domestic hot water pump" [► 112].
- For more information about connecting the recirculation connection, see the installation manual of the domestic hot water tank.

Configuration

- For more information, see "11 Configuration" [► 123].
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

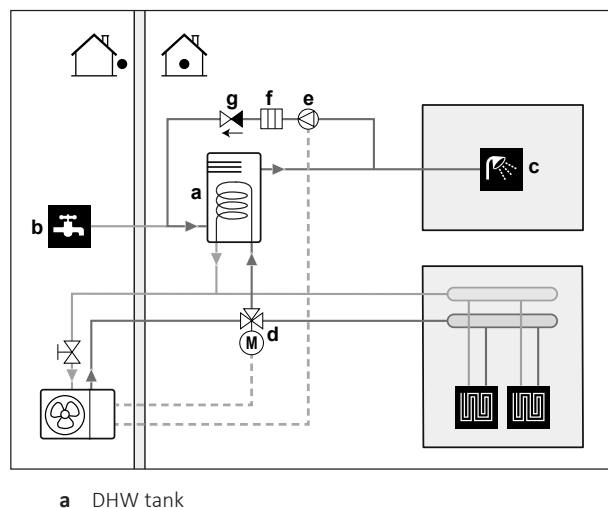
6.4.5 DHW pump for disinfection



INFORMATION

Restriction: Only applicable in case of stainless steel tanks (EKHWS*D*).

Setup



- b** Cold water IN
- c** Hot water OUT (shower (field supply))
- d** Motorised 3-way valve (field supply)
- e** DHW pump (field supply)
- f** Heater element (field supply)
- g** Non-return valve (field supply)

- The DHW pump is field-supplied and its installation is the responsibility of the installer. For the electrical wiring, see "9.2.8 To connect the domestic hot water pump" [► 112].
- If the applicable legislation requires a higher temperature than the maximum tank setpoint during disinfection (see [2-03] in the field settings table), you can connect a DHW pump and heater element as shown above.
- If applicable legislation requires disinfection of the water piping until the tapping point, you can connect a DHW pump and heater element (if needed) as shown above.

Configuration

The outdoor unit can control DHW pump operation. For more information, see "11 Configuration" [► 123].

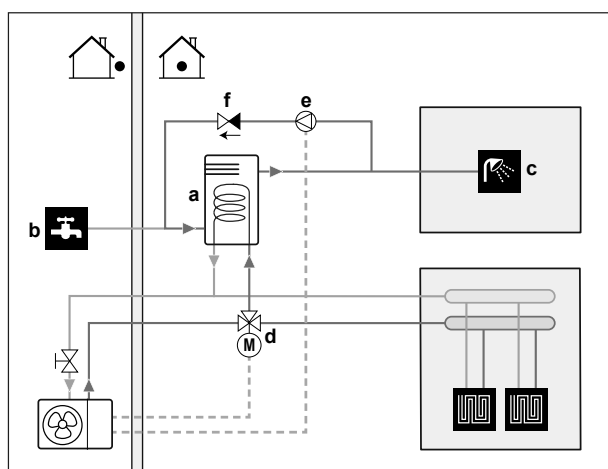
6.4.6 DHW pump for tank preheating



INFORMATION

Restriction: Only applicable in case of stainless steel tanks (EKHWS*D*).

Setup



- a** DHW tank
- b** Cold water IN
- c** Hot water OUT (shower (field supply))
- d** Motorised 3-way valve (field supply)
- e** DHW pump (field supply)
- f** Non-return valve (field supply)

- The DHW pump is field-supplied and its installation is the responsibility of the installer. For the electrical wiring, see "9.2.8 To connect the domestic hot water pump" [► 112].

Configuration

The outdoor unit can control DHW pump operation. For more information, see "11 Configuration" [► 123].

6.5 Setting up the energy metering

- Via the user interface, you can read out the following energy data:
 - Produced heat
 - Consumed energy
- You can read out the energy data:
 - For space heating
 - For space cooling
 - For domestic hot water production
- You can read out the energy data:
 - Per month
 - Per year



INFORMATION

The calculated produced heat and consumed energy are an estimation, the accuracy cannot be guaranteed.

6.5.1 Produced heat



INFORMATION

The sensors used to calculate the produced heat are calibrated automatically.



INFORMATION

If glycol is present in the system ([E-OD]=1)), then the produced heat will NOT be calculated, nor will it be displayed on the user interface.

- The produced heat is calculated internally based on:
 - The leaving and entering water temperature
 - The flow rate
 - The power consumption of the booster heater (if applicable) in the domestic hot water tank
- Setup and configuration:
 - No additional equipment needed.
 - Only in case a booster heater is present in the system, measure its capacity (resistance measurement) and set the capacity via the user interface. **Example:** If you measure a booster heater resistance of 17.1Ω, the capacity of the heater at 230 V is 3100 W.

6.5.2 Consumed energy

You can use the following methods to determine the consumed energy:

- Calculating
- Measuring

**INFORMATION**

You cannot combine calculating the consumed energy (example: for backup heater (if applicable)) and measuring the consumed energy (example: for outdoor unit). If you do so, the energy data will be invalid.

Calculating the consumed energy

- The consumed energy is calculated internally based on:
 - The actual power input of the outdoor unit
 - The set capacity of the backup heater (if applicable) and booster heater (if applicable)
 - The voltage
- Setup and configuration: To get accurate energy data, measure the capacity (resistance measurement) and set the capacity via the user interface for:
 - The backup heater (step 1 and step 2) (if applicable)
 - The booster heater (if applicable)

Measuring the consumed energy

- Preferred method because of higher accuracy.
- Requires external power meters.
- Setup and configuration: When using electrical power meters, set the number of pulses/kWh for each power meter via the user interface.

**INFORMATION**

When measuring the electrical power consumption, make sure ALL power input of the system is covered by the electrical power meters.

6.5.3 Power supply layouts with power meters

1 power meter. You only need 1 power meter that measures the entire system (compressor module, hydro module, backup heater and booster heater) in the following cases:

- Normal kWh rate power supply
- Preferential kWh rate power supply WITHOUT separate normal kWh rate power supply

Power meter	Description
1	Measures: Entire system Connection: X5M/5+6 Power meter type: ▪ Three-phase power meter in case one of the following conditions is met: - Power supply of the external backup heater kit (if any) is 3N~ ▪ Single-phase power meter in other cases.

2 power meters. You need 2 power meters in case of preferential kWh rate power supply WITH separate normal kWh rate power supply.

Power meter	Description
1	Measures^(a): Hydro module, backup heater (if any), and booster heater (if any) Connection: X5M/5+6 Power meter type: ▪ Three-phase power meter in case the external backup heater kit is installed and configured to use 3N~ power supply. ▪ Single-phase power meter in other cases.
2	Measures^(a): Compressor module Connection: X5M/3+4 Power meter type: Single-phase power meter according to the power supply of the outdoor unit.

^(a) In the software the power consumption data of both meters is added so you do NOT have to set which meter covers which power consumption.

Exceptional cases. You can also use a second power meter if:

- The power range of one meter is insufficient.
- The power meter cannot easily be installed in the electrical cabinet.
- 230 V and 400 V three-phase grids are combined (very uncommon), because of technical limitations of power meters.