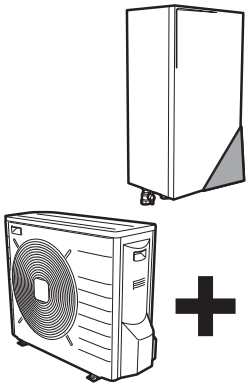
Installer reference guide

Daikin Altherma – Low temperature split



ERLQ004-006-008CA
EHBH04+08CBV

Table of contents

1 General safety precautions

1.1 About the documentation

- The original documentation is written in English. All other languages are translations.
- The precautions described in this document cover very important topics, follow them carefully.
- The installation of the system, and all activities described in the installation manual and the installer reference guide must be performed by an authorized installer.

1.1.1 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

Indicates a situation that could result in burning 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.

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.

1.2 For the installer

1.2.1 General

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

NOTICE

Improper installation or attachment of equipment or accessories could result in electric 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.

DANGER: RISK OF BURNING

- 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

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.

NOTICE

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

NOTICE

Works executed on the outdoor unit are best done under dry weather conditions to avoid water ingress.

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.

1.2.2 Installation site

- Provide sufficient space around the unit for servicing and air circulation.
- Make sure the installation site withstands the unit's weight and vibration.
- 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.

1.2.3 Refrigerant

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 pressurize 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 may 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 leakage 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.

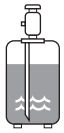
NOTICE

- 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.

- In case re-charge is required, refer to 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:

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.

1.2.4 Brine

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

WARNING

The selection of the brine MUST be in accordance with the applicable legislation.

WARNING

Take sufficient precautions in case of brine leakage. If brine leaks, ventilate the area immediately and contact your local dealer.

WARNING

The ambient temperature inside the unit can get much higher than that of the room, e.g. 70°C. In case of a brine leak, hot parts inside the unit can create a hazardous situation.

WARNING

The use and installation of the application MUST comply with the safety and environmental precautions specified in the applicable legislation.

1.2.5 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 98/83 EC.

1.2.6 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 1 minute, 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, shall 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 electric 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.

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 below.

- 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 metre away from televisions or radios to prevent interference. Depending on the radio waves, a distance of 1 metre 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.

2 About the documentation

2.1 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 indoor unit)
- **Indoor unit installation manual:**
  - Installation instructions
  - Format: Paper (in the box of the indoor unit)
- **Outdoor unit installation manual:**
  - Installation instructions
  - Format: Paper (in the box of the outdoor unit)

- **Backup heater installation manual:**
  - Installation instructions
  - Format: Paper (in the box of the backup heater)
- **Installer reference guide:**
  - Preparation of the installation, good practices, reference data,…
  - Format: Digital files on http://www.daikineurope.com/support-and-manuals/product-information/
- **Addendum book for optional equipment:**
  - Additional info about how to install optional equipment
  - Format: Paper (in the box of the indoor unit) + Digital files on http://www.daikineurope.com/support-and-manuals/product-information/

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 extranet (authentication required).

2.2 Installer reference guide at a glance

Chapter	Description
General safety precautions	Safety instructions that you must read before installing
About the documentation	What documentation exists for the installer
About the box	How to 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
Preparation	What to do and know before going on-site
Installation	What to do and know to install the system
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.

3 About the box

3.1 Overview: About the box

This chapter describes what you have to do after the boxes with the outdoor and indoor unit are delivered on-site.

It contains information about:

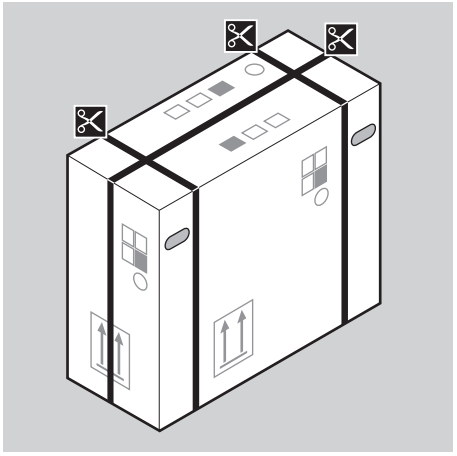
- Unpacking and handling the units
- Removing the accessories from the units

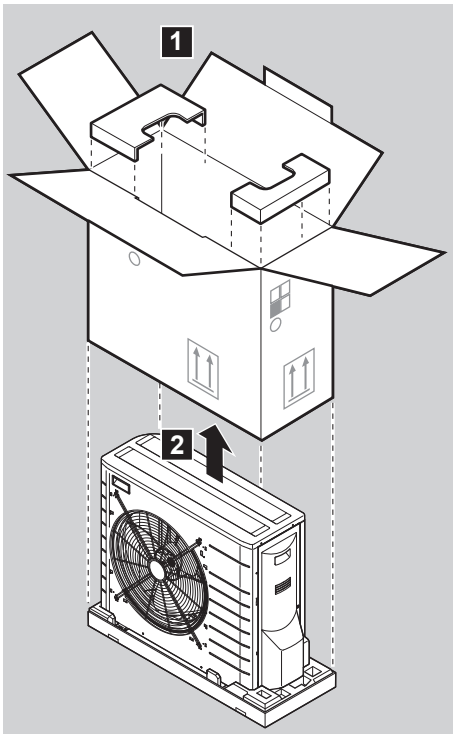
Keep the following in mind:

- At delivery, the unit must be checked for damage. Any damage must be reported immediately to the carrier's claims agent.
- Bring the packed unit as close as possible to its final installation position to prevent damage during transport.

3.2 Outdoor unit

3.2.1 To unpack the outdoor unit



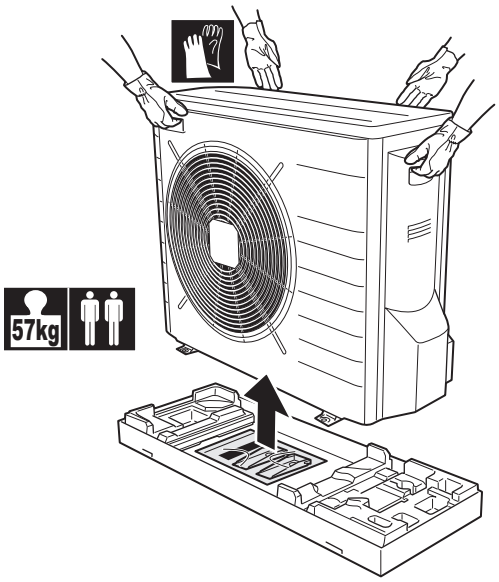


3.2.2 To remove the accessories from the outdoor unit

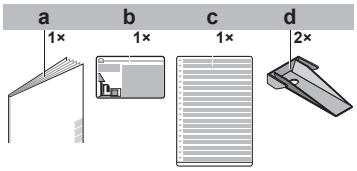
1 Lift the outdoor unit.

CAUTION

Only handle the outdoor unit as follows:



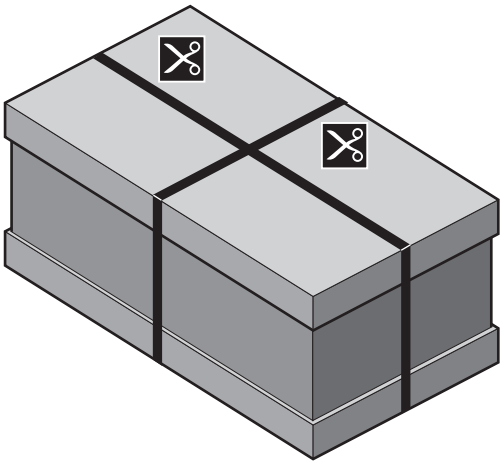
2 Remove the accessories at the bottom of the package.

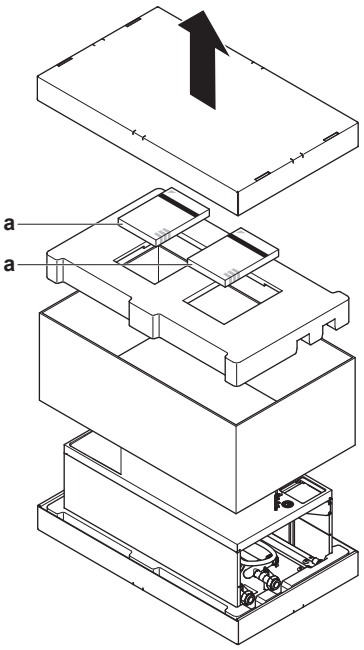


a Outdoor unit installation manual
b Fluorinated greenhouse gases label
c Multilingual fluorinated greenhouse gases label
d Unit mounting plate

3.3 Indoor unit

3.3.1 To unpack the indoor unit





a General safety precautions, indoor unit installation manual, operation manual and addendum book for optional equipment

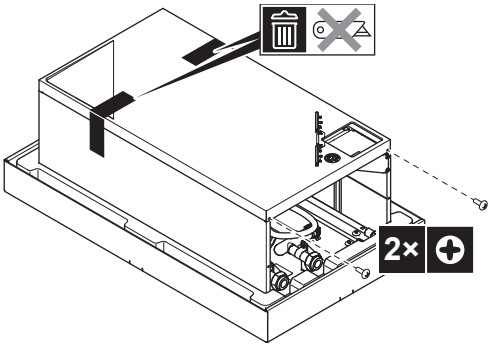
INFORMATION

Do NOT throw away the upper cardboard cover. On the outside of the cardboard cover, the installation pattern is printed.

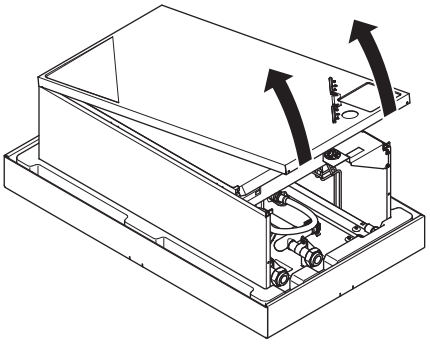
3.3.2 To remove the accessories from the indoor unit

The general safety precautions, the indoor unit installation manual, the operation manual and the addendum book for optional equipment are located in the upper part of the box. Follow the procedure below to remove the other accessories.

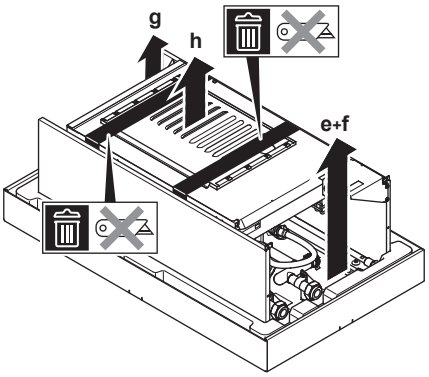
1 Remove the tape.

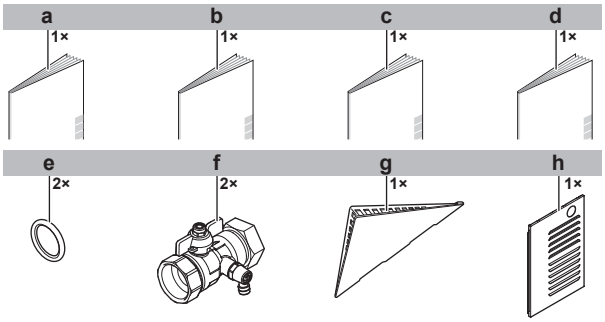


2 Tilt the bottom side of the front panel upwards and remove it.



3 Remove the accessories.





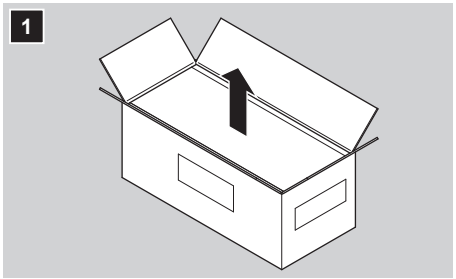
a General safety precautions
b Addendum book for optional equipment
c Indoor unit installation manual
d Operation manual
e Sealing ring for shut-off valve
f Shut-off valve
g User interface cover
h Top plate of indoor unit

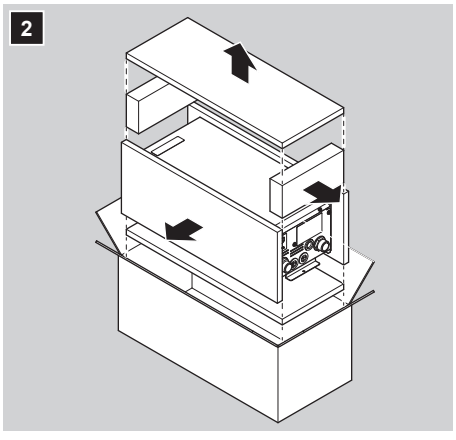
3.4 Backup heater

NOTICE

The backup heater is an option and can only be used in combination with EHBH_CBV and EHVH_S_CBV indoor units.

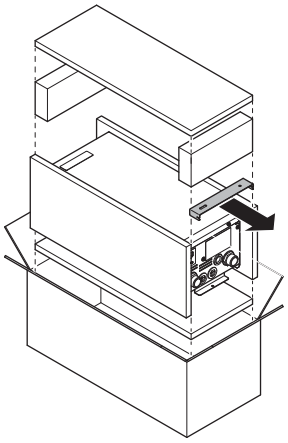
3.4.1 To unpack the backup heater





3.4.2 To remove the accessories from the backup heater

1 Remove the wall bracket from the box.



4 About the units and options

4.1 Overview: About the units and options

This chapter contains information about:

- Identifying the outdoor unit
- Identifying the indoor unit
- Identifying the backup heater (if applicable)
- Combining outdoor and indoor units
- Combining the outdoor unit with options
- Combining the indoor unit with options

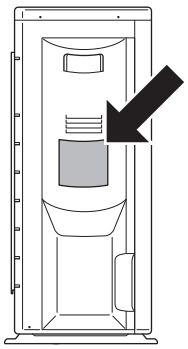
4.2 Identification

NOTICE

When installing or servicing several units at the same time, make sure NOT to switch the service panels between different models.

4.2.1 Identification label: Outdoor unit

Location



Model identification

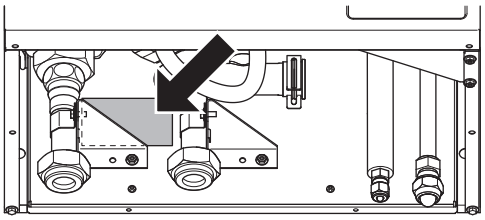
Example: ER L Q 006 CA V3

Code	Explanation
ER	European split outdoor pair heat pump

Code	Explanation
L	Low water temperature – ambient zone: −10~−20°C
Q	Refrigerant R410A
006	Capacity class
CA	Model series
V3	Power supply

4.2.2 Identification label: Indoor unit

Location



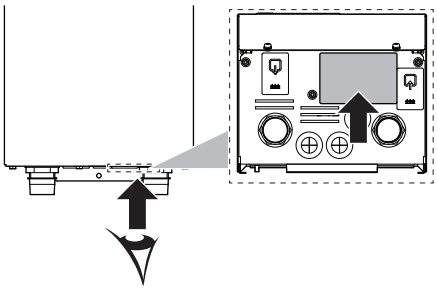
Model identification

Example: E HB H 04 CB V

Code	Description
E	European model
HB	Wall-mounted indoor unit
H	Heating only
04	Capacity class
CB	Model series
V	Model without backup heater in the space heating circuit

4.2.3 Identification label: Backup heater

Location



Model identification

Example: EK L BUH CB 6 W1

Code	Explanation
EK	European kit
L	Kit compatible with EHBH_CBV and EHVH_S_CBV indoor units
BUH	Backup heater
CB	Model series
6	Capacity of heater kit (kW)
W1	Power supply

4.3 Combining units and options

4.3.1 Possible options for the outdoor unit

Drain pan (EKDP008CA)

The drain pan is required to gather the drain from the outdoor unit. The drain pan kit consists of:

- Drain pan
- Installation brackets

For installation instructions, see the installation manual of the drain pan.

Drain pan heater (EKDPH008CA)

The drain pan heater is required to avoid freezing-up of the drain pan.

It is recommended to install this option in colder regions with possible low ambient temperatures or heavy snowfall.

For installation instructions, see the installation manual of the drain pan heater.

INFORMATION

In case the drain pan heater is used, the jumper JP_DP on the service PCB on the outdoor unit MUST be cut.

After cutting the jumper, you MUST reset the outdoor unit to activate this function.

U-beams (EKFT008CA)

The U-beams are installation brackets on which the outdoor unit can be installed.

It is recommended to install this option in colder regions with possible low ambient temperatures or heavy snowfall.

For installation instructions, see the installation manual of the outdoor unit.

4.3.2 Possible options for the indoor unit

User interface (EKRUCBL*)

The user interface and a possible additional user interface are available as an option.

The additional user interface can be connected:

- To have both:
  - control close to the indoor unit,
  - room thermostat functionality in the principal space to be heated.
- To have an interface containing other languages.

Following user interfaces are available:

- EKRUCBL1 contains following languages: German, French, Dutch, Italian.
- EKRUCBL2 contains following languages: English, Swedish, Norwegian, Finnish.
- EKRUCBL3 contains following languages: English, Spanish, Greek, Portuguese.
- EKRUCBL4 contains following languages: English, Turkish, Polish, Romanian.
- EKRUCBL5 contains following languages: German, Czech, Slovenian, Slovakian.
- EKRUCBL6 contains following languages: English, Croatian, Hungarian, Estonian.
- EKRUCBL7 contains following languages: English, German, Russian, Danish.

Languages on the user interface can be uploaded by PC software or copied from an user interface to the other.

For installation instructions, see "7.10.8 To connect the user interface" on page 44.

Simplified user interface (EKRUCBS)

- The simplified user interface can only be used in combination with the main user interface.
- The simplified user interface acts as room thermostat and needs to be installed in the room that you want it to control.

For installation instructions, see the installation and operation manual of the simplified user interface.

Room thermostat (EKRTWA, EKRTR1, RTRNETA)

You can connect an optional room thermostat to the indoor unit. This thermostat can either be wired (EKRTWA) or wireless (EKRTR1 and RTRNETA). Thermostat RTRNETA can only be used in heating-only systems.

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

Remote sensor for wireless thermostat (EKRTETS)

You can use a wireless indoor temperature sensor (EKRTETS) only in combination with the wireless thermostat (EKRTR1).

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

Digital I/O PCB (EKRP1HB)

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

- Alarm output
- Space heating 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 user interface sensor 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 (EKRSCA1)

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.

INFORMATION

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

PC configurator (EKPCCAB)

The PC cable makes a connection between the switch box of the indoor unit and a PC. It gives the possibility to upload different language files to the user interface and indoor parameters to the indoor unit. For the available language files, contact your local dealer.

The software and corresponding operating instructions are available on http://www.daikineurope.com/support-and-manuals/software-downloads/.

For installation instructions, see the installation manual of the PC cable and "8 Configuration" on page 48.

Heat pump convector (FWXV)

For providing space heating, it is possible to use heat pump convectors (FWXV).

For installation instructions, refer to the installation manual of the heat pump convectors, and the addendum book for optional equipment.

Drain pan kit (EKHBDPCA2)

The drain pan is required to drain accumulated condensation from the indoor unit. It is required during low temperature cooling operation of the indoor unit and when the leaving water temperature is <18°C.

For installation instructions, see the installation manual of the drain pan kit.

Solar kit (EKSOLHW)

The solar kit is required to connect the solar application with the domestic hot water tank.

For installation, see the installation manual of the solar kit and addendum book for optional equipment.

Domestic hot water tank

The domestic hot water tank can be connected to the indoor unit for providing domestic hot water.

Backup heater (EKLBUHCB6W1)

You can install an optional backup heater.

For installation instructions, see the installation manual of the backup heater, or this installer reference guide.

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.

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.

4.3.3 Possible combinations of indoor unit and outdoor unit

Indoor unit	Outdoor unit		
	ERLQ004CAV3	ERLQ006CAV3	ERLQ008CAV3
EHBH04CBV	O	—	—
EHBH08CBV	—	O	O

4.3.4 Possible combinations of indoor unit and domestic hot water tank

Indoor unit	Domestic hot water tank			
	EKHWS	EKHWP	EKHWE	EKHWET
EHBH04CBV	O	O	O	O
EHBH08CBV	O	O	O	O

5 Application guidelines

5.1 Overview: Application guidelines

The purpose of the application guidelines is to give a glance of the possibilities of the Daikin 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 "8 Configuration" on page 48.

This chapter contains application guidelines for:

- Setting up the space heating 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
- Setting up an external temperature sensor

5.2 Setting up the space heating system

The Daikin 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 by the Daikin heat pump system?
- Which heat emitter types are used in each room and what is their design leaving water temperature?

Once the space heating requirements are clear, Daikin recommends 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 the leaving water temperature control on the unit's user interface is turned ON.

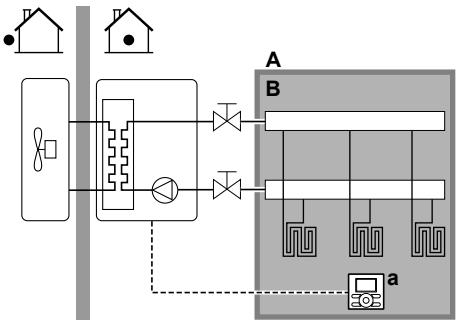
INFORMATION

In case an external room thermostat is used and room frost protection needs to be guaranteed in all conditions, then you have to set auto emergency [A.6.C] to 1.

5.2.1 Single room

Under floor heating or radiators – Wired room thermostat

Setup



A Main leaving water temperature zone
B One single room
a User interface used as room thermostat

- The under floor heating or radiators are directly connected to the indoor unit.
- The room temperature is controlled by the user interface, which is used as room thermostat. Possible installations:
  - User interface installed in the room and used as room thermostat
  - User interface installed at the indoor unit and used for control close to the indoor unit + user interface installed in the room and used as room thermostat

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

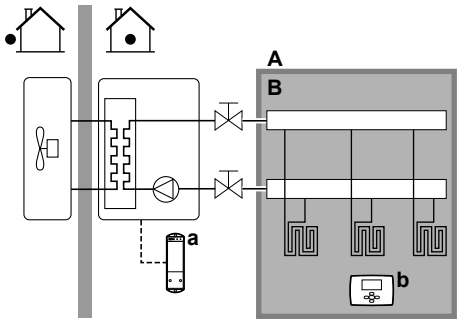
Benefits

- **Cost effective.** You do NOT need an additional external room thermostat.

- **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, use the holiday mode…

Under floor heating or radiators – Wireless room thermostat

Setup



A Main leaving water temperature zone
B One single room
a Receiver for wireless external room thermostat
b Wireless external room thermostat

- The under floor heating or radiators are directly connected to the indoor unit.
- The room temperature is controlled by the wireless external room thermostat (optional equipment EKRTR1).

Configuration

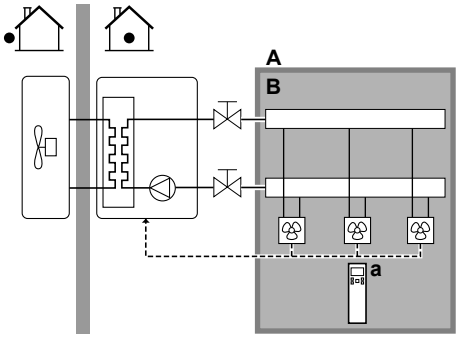
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

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.

Heat pump convectors

Setup



A Main leaving water temperature zone
B One single room
a Remote controller of the heat pump convectors

- The under floor heating or radiators are directly connected to the indoor unit.
- The desired room temperature is set via the remote controller of the heat pump convectors.
- The space heating demand signal is sent to one digital input on the indoor unit (X2M/1 and X2M/4).
- The space operation mode is sent to the heat pump convectors by one digital output on the indoor unit (X2M/32 and X2M/33).

INFORMATION

When using multiple heat pump convectors, make sure each one receives the infrared signal from the remote controller of the heat pump convectors.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

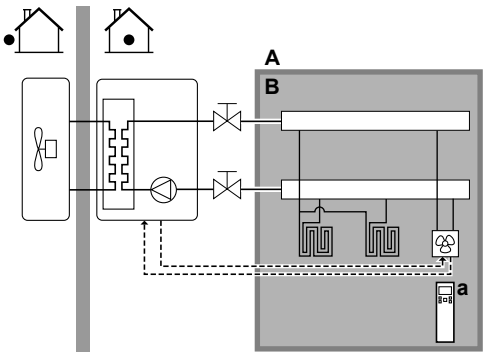
Benefits

- **Efficiency.** Optimal energy efficiency because of the interlink function.
- **Stylish.**

Combination: Under floor heating + Heat pump convectors

- Space heating is provided by:
  - The under floor heating
  - The heat pump convectors

Setup



A Main leaving water temperature zone
B One single room
a Remote controller of the heat pump convectors

- The heat pump convectors are directly connected to the indoor unit.
- The desired room temperature is set via the remote controller of the heat pump convectors.
- The space heating demand signal is sent to one digital input on the indoor unit (X2M/1 and X2M/4)
- The space operation mode is sent to the heat pump convectors by one digital output (X2M/32 and X2M/33) on the indoor unit.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [C-05]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.

Benefits

- **Efficiency**. Under floor heating has the best performance with Altherma LT.
- **Comfort.** The combination of the two heat emitter types provides excellent heating comfort of the under floor heating.

5.2.2 Multiple rooms – One LWT zone

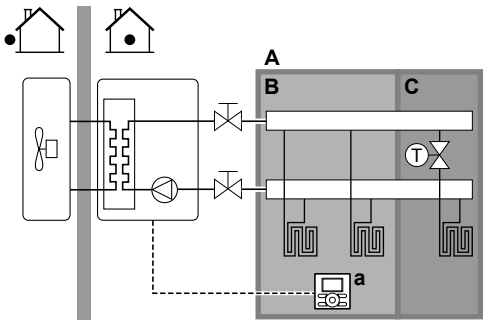
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

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

Under floor heating or radiators – Thermostatic valves

If you are heating up rooms with under floor 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 user interface 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

- The under floor heating of the main room is directly connected to the indoor unit.
- The room temperature of the main room is controlled by the user interface used as thermostat.
- A thermostatic valve is installed before the under floor heating in each of the other rooms.

INFORMATION

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

Configuration

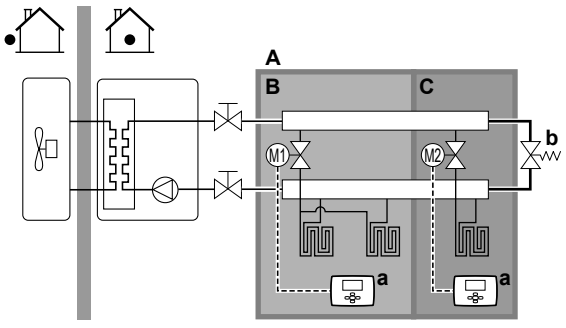
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

Benefits

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

Under floor heating or radiators – Multiple external room thermostats

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a External room thermostat
b Bypass valve

- For each room, a shut-off valve (field supplied) is installed to avoid leaving water supply when there is no heating 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 "6.4 Preparing water piping" on page 26.
- The user interface connected to the indoor unit decides the space operation mode. Mind that the operation mode on each room thermostat must be set to match the indoor unit.
- The room thermostats are connected to the shut-off valves, but do NOT have to be connected to the indoor unit. The indoor unit will supply leaving water all the time, with the possibility to program a leaving water schedule.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	0 (LWT control): Unit operation is decided based on the leaving water temperature.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

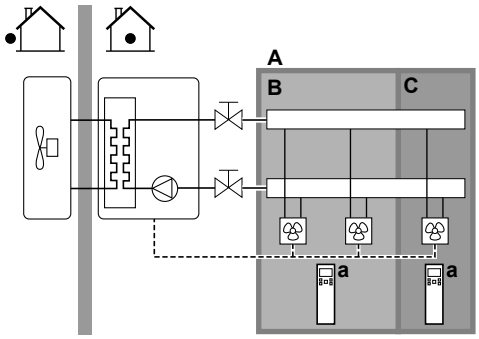
Benefits

Compared with under floor 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

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a Remote controller of the heat pump convectors

- The desired room temperature is set via the remote controller of the heat pump convectors.
- The user interface connected to the indoor unit decides the space operation mode.
- The heating demand signals of each heat pump convector are connected in parallel to the digital input on the indoor unit (X2M/1 and X2M/4). The indoor unit will only supply leaving water temperature when there is an actual demand.

INFORMATION

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

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

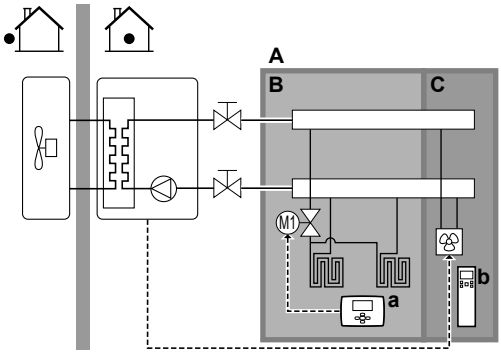
Benefits

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: Under floor heating + Heat pump convectors

Setup



A Main leaving water temperature zone
B Room 1
C Room 2
a External room thermostat
b Remote controller of the heat pump convectors

- For each room with heat pump convectors: The heat pump convectors are directly connected to the indoor unit.
- For each room with under floor heating: A shut-off valve (field supply) is installed before the under floor heating. It prevents hot water supply when the room has no heating demand.
- For each room with heat pump convectors: The desired room temperature is set via the remote controller of the heat pump convectors.
- For each room with under floor heating: The desired room temperature is set via the external room thermostat (wired or wireless).
- The user interface connected to the indoor unit decides the space operation mode. Mind that the operation mode on each external room thermostat and remote controller of the heat pump convectors must be set to match the indoor unit.

INFORMATION

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

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	0 (LWT control): Unit operation is decided based on the leaving water temperature.

Setting	Value
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

5.2.3 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
- Additional zone = The other zone

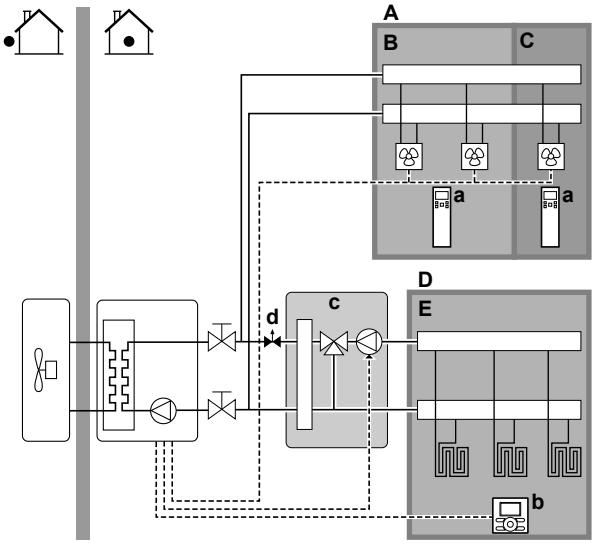
CAUTION

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

Typical example:

Room (zone)	Heat emitters: Design temperature
Living room (main zone)	Under floor heating: 35°C
Bed rooms (additional zone)	Heat pump convectors: 45°C

Setup



A Additional leaving water temperature zone
B Room 1
C Room 2
D Main leaving water temperature zone
E Room 3
a Remote controller of the heat pump convectors
b User interface
c Mixing valve station
d Pressure regulating valve

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.

- For the main zone:
  - A mixing valve station is installed before the under floor heating.
  - The pump of the mixing valve station is controlled by the ON/OFF signal on the indoor unit (X2M/5 and X2M/7; normal closed shut-off valve output).
  - The room temperature is controlled by the user interface, which is used as room thermostat.
- For the additional zone:
  - The heat pump convectors are directly connected to the indoor unit.
  - The desired room temperature is set via the remote controller of the heat pump convectors for each room.
  - The heating demand signals of each heat pump convector are connected in parallel to the digital input on the indoor unit (X2M/1 and X2M/4). The indoor unit will only supply the desired additional leaving water temperature when there is an actual demand.
- The user interface connected to the indoor unit decides the space operation mode. Mind that the operation mode on each remote controller of the heat pump convectors must be set to match the indoor unit.

Configuration

Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface. **Note:** ▪ Main room = user interface used as room thermostat functionality ▪ Other rooms = external room thermostat functionality
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	1 (2 LWT zones): Main + additional
In case of heat pump convectors: External room thermostat for the **additional** zone: ▪ #: [A.2.2.5] ▪ Code: [C-06]	1 (Thermo ON/OFF): When the used external room thermostat or heat pump convector can only send a thermo ON/OFF condition.
Shut-off valve output	Set to follow the thermo demand of the main zone.
At the mixing valve station	Set the desired main leaving water temperature.

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 under floor heating, and the rapid air heat up of the heat pump convectors (e.g., living room=under floor heating and the bedroom=convector (no continuous heating)).

- **Efficiency.**
  - Depending on the demand, the indoor unit supplies different leaving water temperature matching the design temperature of the different heat emitters.
  - Under floor heating has the best performance with Altherma LT.

5.3 Setting up an auxiliary heat source for space heating

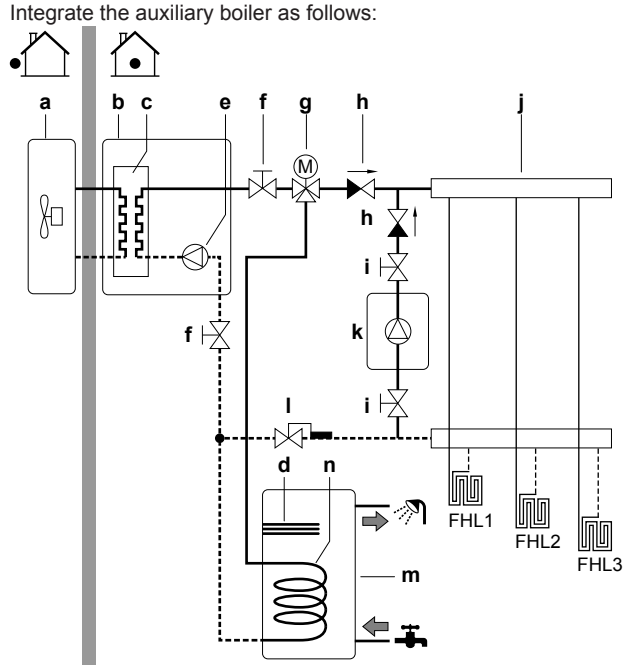
- Space heating can be done by:
  - The indoor unit
  - An auxiliary boiler (field supply) connected to the system
- When the room thermostat requests heating, the indoor unit or the auxiliary boiler starts operating depending on the outdoor temperature (status of the changeover to external heat source). When the permission is given to the auxiliary boiler, the space heating by the indoor unit is turned OFF.
- Bivalent operation is only possible for space heating, NOT for domestic hot water production. Domestic hot water is always produced by the DHW tank connected to the indoor 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 Outdoor unit
b Indoor unit
c Heat exchanger
d Anti-legionella heater
e Pump
f Shut-off valve
g Motorised 3-way valve (delivered with DHW tank)
h Non-return valve (field supply)
i Shut-off valve (field supply)
j Collector (field supply)
k Auxiliary boiler (field supply)
l Aquastat valve (field supply)
m DHW tank (option)
n Heat exchanger coil
FHL1...3 Under floor heating

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 55°C. To do so:
  - Set the desired water temperature via the auxiliary boiler controller to maximum 55°C.
  - Install an aquastat valve in the return water flow of the heat pump.
  - Set the aquastat valve to close above 55°C and to open below 55°C.
- Install non-return valves.
- Make sure to only have one expansion vessel in the water circuit. An expansion vessel is already premounted in the indoor unit.
- Install the digital I/O PCB (option EKRP1HB).
- Connect X1 and X2 (changeover to external heat source) on the PCB to the auxiliary boiler thermostat.
- To setup the heat emitters, see "5.2 Setting up the space heating system" on page 12.

Configuration

Via the user interface (quick wizard):

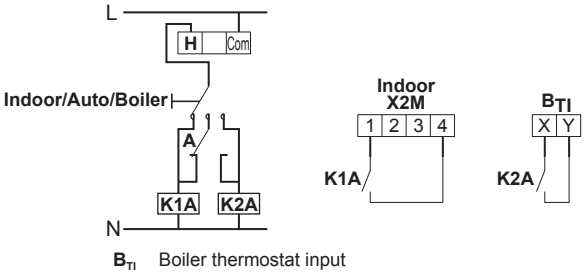
- Set the use of a bivalent system as external heat source.
- Set the bivalent temperature and hysteresis.

NOTICE

- Make sure the bivalent hysteresis has enough differential to prevent frequent changeover between indoor 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 "5.2 Setting up the space heating system" on page 12).
- The auxiliary contact can be:
  - An outdoor temperature thermostat
  - An electricity tariff contact
  - A manually operated contact
  - …
- Setup: Connect the following field wiring:



B_{TI} Boiler thermostat input

A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of indoor unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)
Indoor	Indoor unit
Auto	Automatic
Boiler	Boiler

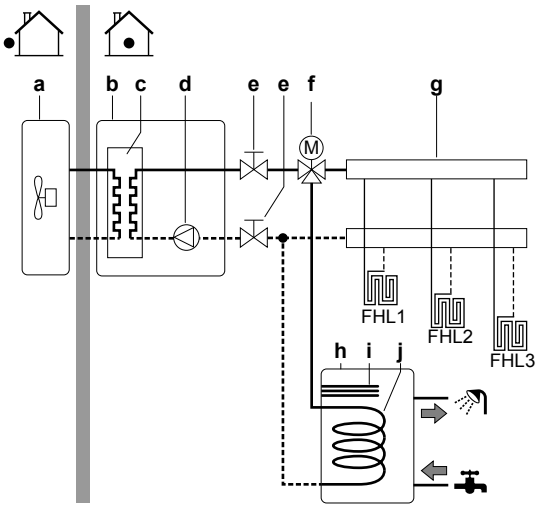
NOTICE

- Make sure the auxiliary contact has enough differential or time delay to prevent frequent changeover between indoor unit and auxiliary boiler.
- If the auxiliary contact is an outdoor temperature thermostat, install the thermostat 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.

5.4 Setting up the domestic hot water tank

The DHW tank can be installed standalone as option. It contains a 2.4 kW anti-legionella heater.

5.4.1 System layout – Standalone DHW tank



a	Outdoor unit
b	Indoor unit
c	Heat exchanger
d	Pump
e	Shut-off valve
f	Motorised 3-way valve
g	Collector (field supply)
h	DHW tank
i	Anti-legionella heater
j	Heat exchanger coil
FHL1...3	Under floor heating

5.4.2 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.

Possible DHW tank volumes

Type	Possible volumes
Standalone DHW tank	▪ 150 l ▪ 200 l ▪ 300 l ▪ 500 l

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 (50°C if outdoor temperature is low). The electrical resistance integrated in the DHW tank (anti-legionella heater) can increase this temperature. However, this consumes more energy. Daikin recommends to set the desired DHW tank temperature below 55°C to avoid using the electrical resistance.
  The anti-legionella heater:
  - Is used as emergency heater.
  - Is used when the disinfection function for the DHW tank is active.
  - Can assist during defrost operation for the outdoor unit.
- 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, Daikin recommends to heat up the DHW tank during the day.
  - If energy prices are lower during the night, Daikin recommends to heat up the DHW tank during the night.
- When the heat pump produces domestic hot water, it cannot heat up a space. When you need domestic hot water and space heating at the same, Daikin recommends to produce the domestic hot water during the night when there is lower space heating demand.

Determining the DHW consumption

Answer the following questions and calculate the DHW consumption (equivalent hot water volume at 40°C) using the 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°C ▪ T_1=15°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°C ▪ T_1=15°C Then V_2=307 l

V_1 DHW consumption (equivalent hot water volume at 40°C)
V_2 Required DHW tank volume if only heated once
T_2 DHW tank temperature
T_1 Cold water temperature

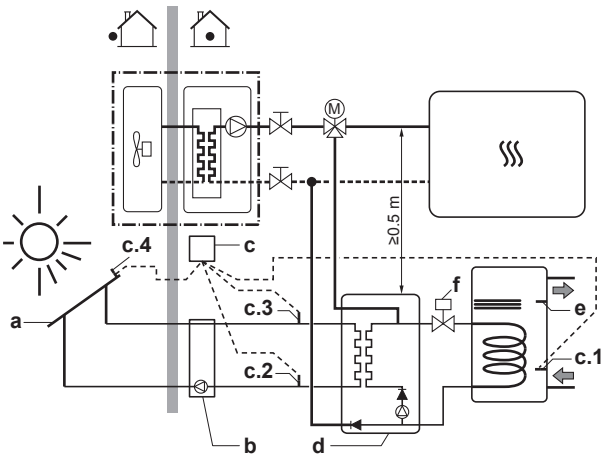
5.4.3 Setup and configuration – DHW tank

- 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
  - Anti-legionella heater
  - Solar panels
- For more information about optimizing the energy consumption for producing domestic hot water, see "8 Configuration" on page 48.

5.4.4 Combination: Standalone DHW tank + Solar panels

By connecting the DHW tank to solar panels, the DHW tank can be heated by solar energy.

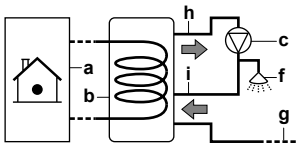
For installation instructions, see the installation manual of the solar kit and addendum book for optional equipment.



a Solar panels
b Solar pump station
c Solar pump station controller with temperature sensors
c1 Tank temperature sensor
c2 Return temperature sensor to solar panels
c3 Supply temperature with flow meter from solar panels
c4 Solar panel temperature sensor
d Solar kit
e DHW temperature sensor of the unit
f Solenoid 2-way valve (only for UK). Obligatory for compliance to UK building regulation G3.

5.4.5 DHW pump for instant hot water

Setup



a Indoor unit
b DHW tank
c DHW pump (field supply)
f Shower (field supply)
g Cold water
h Domestic hot water OUT
i Recirculation connection

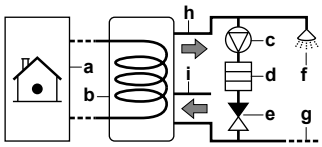
- By connecting a DHW pump, instant hot water can be available at the tap.
- The DHW pump and the installation are field supply and the responsibility of the installer.
- For more information about connecting the recirculation connection: see "7 Installation" on page 30.

Configuration

- For more information, see "8 Configuration" on page 48.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

5.4.6 DHW pump for disinfection

Setup



a Indoor unit
b DHW tank
c DHW pump (field supply)
d Heater element (field supply)
e Non-return valve (field supply)
f Shower (field supply)
g Cold water
h Domestic hot water OUT
i Recirculation connection

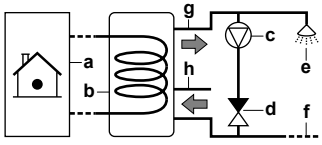
- The DHW pump is field-supplied and its installation is the responsibility of the installer.
- The temperature of the DHW tank can be set to maximum 60°C. If applicable legislation requires higher temperature for disinfection, you can connect a DHW pump and heater element as shown above.
- If applicable 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 indoor unit can control DHW pump operation. For more information, see "8 Configuration" on page 48.

5.4.7 DHW pump for tank preheating

Setup



a Indoor unit
b DHW tank
c DHW pump (field supply)

d Non-return valve (field supply)
e Shower (field supply)
f Cold water
g Domestic hot water OUT
h Recirculation connection

- The DHW pump is field-supplied and its installation is the responsibility of the installer.
- For the standalone DHW tank: If there is no electrical backup heater in the space heating circuit, you must install a DHW pump for tank preheating.

Configuration

The indoor unit can control DHW pump operation. For more information, see "8 Configuration" on page 48.

5.5 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 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.

5.5.1 Produced heat

INFORMATION

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

- Applicable for all models.
- The produced heat is calculated internally based on:
  - The leaving and entering water temperature
  - The flow rate
  - The power consumption of the anti-legionella heater in the domestic hot water tank
- Setup and configuration:
  - No additional equipment needed.
  - Measure the capacity (resistance measurement) of the anti-legionella heater and set the capacity via the user interface. **Example:** If you measure an anti-legionella heater resistance of 17.1Ω, the capacity of the heater at 230 V is 3100 W.

5.5.2 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

- Only applicable for EHBH04+08.
- 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 anti-legionella heater
  - 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 anti-legionella heater

Measuring the consumed energy

- Applicable for all models.
- 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. Consumed energy data for EHBH11+16 models will only be available if this setting is configured.

INFORMATION

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

5.5.3 Normal kWh rate power supply

General rule

One power meter that covers the entire system is sufficient.

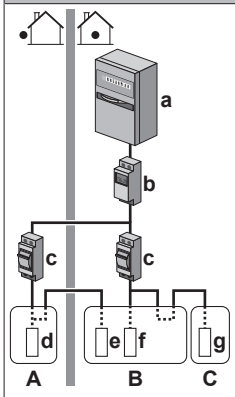
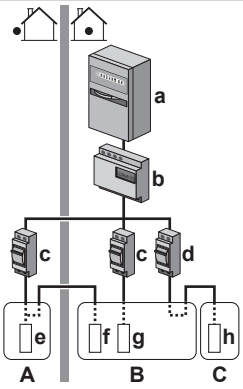
Setup

Connect the power meter to X5M/7 and X5M/8.

Power meter type

In case of…	Use a… power meter
▪ Single-phase outdoor unit ▪ No backup heater or backup heater supplied from a single-phase grid	Single-phase
In other cases (i.e. a three-phase outdoor unit and/or a backup heater connected to a three-phase grid)	Three-phase

Example

Single-phase power meter	Three-phase power meter
	
A Outdoor unit	**A** Outdoor unit
B Indoor unit	**B** Indoor unit
C DHW tank	**C** DHW tank
a Electrical cabinet (L_1/N)	**a** Electrical cabinet (L_1/L_2/L_3/N)
b Power meter (L_1/N)	**b** Power meter (L_1/L_2/L_3/N)
c Fuse (L_1/N)	**c** Fuse (L_1/L_2/L_3/N)
d Outdoor unit (L_1/N)	**d** Fuse (L_1/N)
e Indoor unit (L_1/N)	**e** Outdoor unit (L_1/L_2/L_3/N)
f Backup heater (L_1/N)	**f** Indoor unit (L_1/L_2/L_3/N)
g Anti-legionella heater (L_1/N)	**g** Backup heater (L_1/L_2/L_3/N)
	h Anti-legionella heater (L_1/N)

Exception

- You can use a second power meter if:
  - The power range of one meter is insufficient.
  - The electrical 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.
- Connection and setup:
  - Connect the second power meter to X5M/9 and X5M/10.
  - 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. You only need to set the number of pulses of each power meter.
- See "5.5.4 Preferential kWh rate power supply" on page 21 for an example with two power meters.

5.5.4 Preferential kWh rate power supply

General rule

- Power meter 1: Measures the outdoor unit.
- Power meter 2: Measures the rest (i.e. indoor unit, optional backup heater, and anti-legionella heater).

Setup

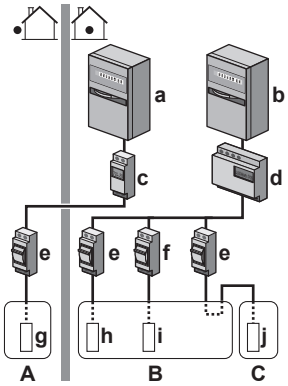
- Connect power meter 1 to X5M/7 and X5M/8.
- Connect power meter 2 to X5M/9 and X5M/10.

Power meter types

- Power meter 1: Single- or three-phase power meter according to the power supply of the outdoor unit.
- Power meter 2:
  - In case of no backup heater or a single-phase backup heater configuration, use a single-phase power meter.
  - In other cases, use a three-phase power meter.

Example

Single-phase outdoor unit with a three-phase backup heater:



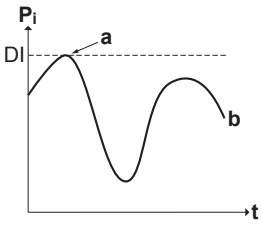
A Outdoor unit
B Indoor unit
C DHW tank
a Electrical cabinet (L_1/N): Preferential kWh rate power supply
b Electrical cabinet (L_1/L_2/L_3/N): Normal kWh rate power supply
c Power meter (L_1/N)
d Power meter (L_1/L_2/L_3/N)
e Fuse (L_1/N)
f Fuse (L_1/L_2/L_3/N)
g Outdoor unit (L_1/N)
h Indoor unit (L_1/N)
i Backup heater (L_1/L_2/L_3/N)
j Anti-legionella heater (L_1/N)

5.6 Setting up the power consumption control

- The power consumption control:
  - Is only applicable for EHBH04+08.
  - Allows you to limit the power consumption of the entire system (sum of outdoor unit, indoor unit, anti-legionella heater, and optional backup heater).
  - Configuration: Set the power limitation level and how it has to be achieved via the user interface.
- The power limitation level can be expressed as:
  - Maximum running current (in A)
  - Maximum power input (in kW)
- The power limitation level can be activated:
  - Permanently
  - By digital inputs

5.6.1 Permanent power limitation

Permanent power limitation is useful to assure a maximum power or current input of the system. In some countries, legislation limits the maximum power consumption for space heating and DHW production.



P_i Power input
t Time
DI Digital input (power limitation level)
a Power limitation active
b Actual power input

Setup and configuration

- No additional equipment needed.
- Set the power consumption control settings in [A.6.3.1] via the user interface (for the description of all settings, see "8 Configuration" on page 48):
  - Select full time limitation mode
  - Select the type of limitation (power in kW or current in A)
  - Set the desired power limitation level

NOTICE

Mind the following guidelines when selecting the desired power limitation level:

- Set a minimum power consumption of ±3.6 kW to guarantee defrost operation. Otherwise, if defrosting is interrupted several times, the heat exchanger will freeze up.
- Set a minimum power consumption of ±3 kW to guarantee space heating and DHW production by allowing at least one electrical heater.

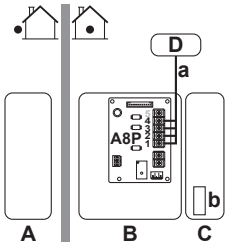
5.6.2 Power limitation activated by digital inputs

Power limitation is also useful in combination with an energy management system.

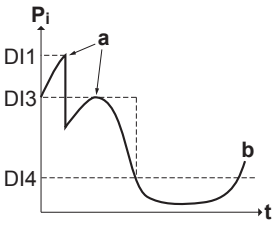
The power or current of the entire Daikin system is limited dynamically by digital inputs (maximum four steps). Each power limitation level is set via the user interface by limiting one of the following:

- Current (in A)
- Power input (in kW)

The energy management system (field supply) decides the activation of a certain power limitation level. **Example:** To limit the maximum power of the entire house (lighting, domestic appliances, space heating…).



A Outdoor unit
B Indoor unit
C DHW tank
D Energy management system
a Power limitation activation (4 digital inputs)
b Anti-legionella heater



P_i Power input
t Time
DI Digital inputs (power limitation levels)
a Power limitation active
b Actual power input

Setup

- Demand PCB (option EKRP1AHTA) needed.
- Maximum four digital inputs are used to activate the corresponding power limitation level:
  - DI1 = weakest limitation (highest energy consumption)
  - DI4 = strongest limitation (lowest energy consumption)
- For the specifications of the digital inputs, and for where to connect them, refer to the wiring diagram.

Configuration

Set the power consumption control settings in [A.6.3.1] via the user interface (for the description of all settings, see "8 Configuration" on page 48):

- Select activation by digital inputs.
- Select the type of limitation (power in kW or current in A).
- Set the desired power limitation level corresponding to each digital input.

INFORMATION

In case more than 1 digital input is closed (at the same time), the digital input priority is fixed: DI4 priority>…>DI1.

5.6.3 Power limitation process

The outdoor unit has better efficiency than the electrical heaters. Therefore, the electrical heaters are limited and turned OFF first. The system limits power consumption in the following order:

1 Limits certain electrical heaters.

If… has priority	Then set the heater priority via the user interface to…
Domestic hot water production	Anti-legionella heater. **Result:** The backup heater (if applicable) will be turned OFF first.
Space heating	Backup heater (if applicable). **Result:** The anti-legionella heater will be turned OFF first.

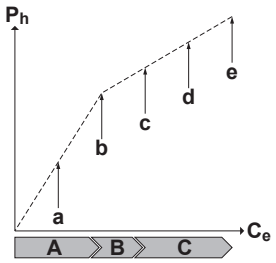
2 Turns OFF all electrical heaters.
3 Limits the outdoor unit.
4 Turns OFF the outdoor unit.

Example

If the configuration is as follows:

- Power limitation level does NOT allow operation of both anti-legionella heater and backup heater (step 1 and step 2).
- Heater priority = Anti-legionella heater.

Then power consumption is limited as follows:



P_h	Produced heat
C_e	Consumed energy
A	Outdoor unit
B	Anti-legionella heater
C	Backup heater
a	Limited outdoor unit operation
b	Full outdoor unit operation
c	Anti-legionella heater turned ON
d	Backup heater step 1 turned ON
e	Backup heater step 2 turned ON

5.7 Setting up an external temperature sensor

You can connect one external temperature sensor. It can measure the indoor or outdoor ambient temperature. Daikin recommends to use an external temperature sensor in the following cases:

Indoor ambient temperature

- In room thermostat control, the user interface is used as room thermostat and it measures the indoor ambient temperature. Therefore, the user interface must be installed on a location:
  - Where the average temperature in the room can be detected
  - That is NOT exposed to direct sunlight
  - That is NOT near a heat source
  - That is NOT affected by outside air or air draught because of, for example, door opening/closing
- If this is NOT possible, Daikin recommends to connect a remote indoor sensor (option KRCS01-1).
- Setup: For installation instructions, see the installation manual of the remote indoor sensor.
- Configuration: Select room sensor [A.2.2.B].

Outdoor ambient temperature

- In the outdoor unit, the outdoor ambient temperature is measured. Therefore, the outdoor unit must be installed on a location:
  - At the north side of the house or at the side of the house where the most heat emitters are located
  - That is NOT exposed to direct sunlight
- If this is NOT possible, Daikin recommends to connect a remote outdoor sensor (option EKRSCA1).
- Setup: For installation instructions, see the installation manual of the remote outdoor sensor.
- Configuration: Select outdoor sensor [A.2.2.B].
- During suspend (see "8 Configuration" on page 48), the outdoor unit is turned down to reduce the standby energy losses. As a result, the outdoor ambient temperature is NOT read out.
- If the desired leaving water temperature is weather dependent, the full time outdoor temperature measurement is important. This is another reason to install the optional outdoor ambient temperature sensor.

INFORMATION

The external outdoor ambient sensor data (either averaged or instantaneous) is used in the weather-dependent control curves. To protect the outdoor unit, the internal sensor of the outdoor unit is always used.

6 Preparation

6.1 Overview: Preparation

This chapter describes what you have to do and know before going on-site.

It contains information about:

- Preparing the installation site
- Preparing the refrigerant piping
- Preparing the water piping
- Preparing the electrical wiring

6.2 Preparing installation site

Do NOT install the unit in places often used as work place. In case of construction works (e.g. grinding works) where a lot of dust is created, the unit must be covered.

Choose the installation location with sufficient place for carrying the unit in and out of the site.

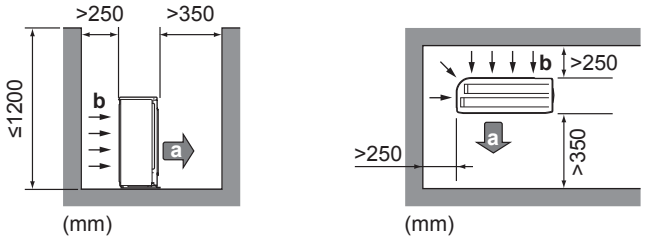
6.2.1 Installation site requirements of the outdoor unit

INFORMATION

Also read the following requirements:

- General installation site requirements. See the "General safety precautions" chapter.
- Refrigerant piping requirements (length, height difference). See further in this "Preparation" chapter.

Mind the following spacing guidelines:



a	Air outlet
b	Air inlet

NOTICE

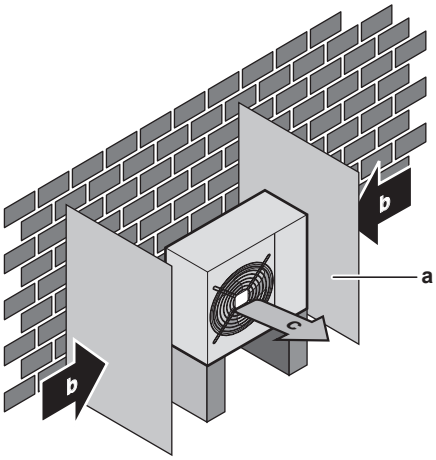
- Do NOT stack the units on each other.
- Do NOT hang the unit on a ceiling.

Strong winds (≥18 km/h) blowing against the outdoor unit's air outlet causes short circuit (suction of discharge air). This may result in:

- deterioration of the operational capacity;
- frequent frost acceleration in heating operation;
- disruption of operation due to decrease of low pressure or increase of high pressure;
- a broken fan (if a strong wind blows continuously on the fan, it may start rotating very fast, until it breaks).

It is recommended to install a baffle plate when the air outlet is exposed to wind.

It is recommended to install the outdoor unit with the air inlet facing the wall and NOT directly exposed to the wind.



a Baffle plate
b Prevailing wind direction
c Air outlet

Do NOT install the unit in the following places:

- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.
  Note: If the sound is measured under actual installation conditions, the measured value might be higher than the sound pressure level mentioned in Sound spectrum in the data book due to environmental noise and sound reflections.
- In places where a mineral oil mist, spray or vapour may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.

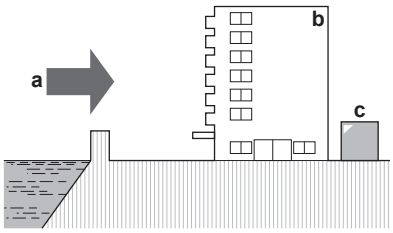
It is NOT recommended to install the unit in the following places because it may shorten the life of the unit:

- Where the voltage fluctuates a lot
- In vehicles or vessels
- Where acidic or alkaline vapour is present

Seaside installation. Make sure the outdoor unit is NOT directly exposed to sea winds. This is to prevent corrosion caused by high levels of salt in the air, which might shorten the life of the unit.

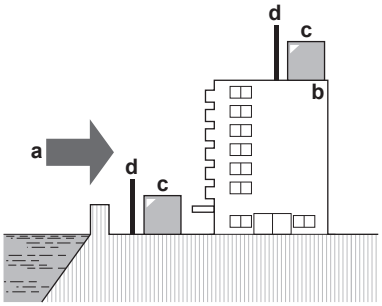
Install the outdoor unit away from direct sea winds.

Example: Behind the building.



If the outdoor unit is exposed to direct sea winds, install a windbreaker.

- Height of windbreaker≥1.5×height of outdoor unit
- Mind the service space requirements when installing the windbreaker.

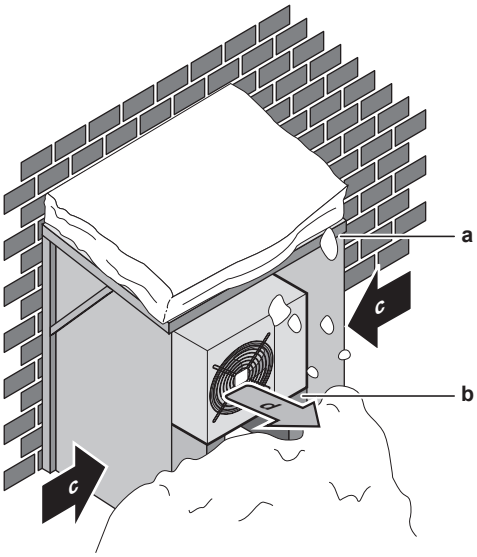


a Sea wind
b Building
c Outdoor unit
d Windbreaker

The outdoor unit is designed for outdoor installation only, and for ambient temperatures ranging 10~43°C in cooling mode and –25~25°C in heating mode.

6.2.2 Additional installation site requirements of the outdoor unit in cold climates

Protect the outdoor unit against direct snowfall and take care that the outdoor unit is NEVER snowed up.



a Snow cover or shed
b Pedestal
c Prevailing wind direction
d Air outlet

- In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow. See "7.3 Mounting the outdoor unit" on page 31 for more details.

In heavy snowfall areas it is very important to select an installation site where the snow will NOT affect the unit. If lateral snowfall is possible, make sure that the heat exchanger coil is NOT affected by the snow. If necessary, install a snow cover or shed and a pedestal.

6.2.3 Installation site requirements of the indoor unit

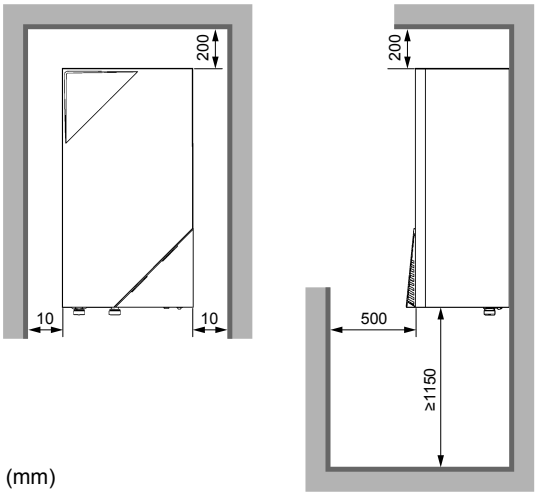
INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

- Mind the measurement guidelines:

Maximum refrigerant piping length between indoor unit and outdoor unit	30 m
Minimum refrigerant piping length between indoor unit and outdoor unit	3 m
Maximum height difference between indoor unit and outdoor unit	20 m
Maximum distance between the 3-way valve and the indoor unit (for installations with domestic hot water tank)	3 m
Maximum distance between the domestic hot water tank and the indoor unit (for installations with domestic hot water tank)	10 m

- Mind the following spacing installation guidelines:



(mm)

Do NOT install the unit in places such as:

- In places where a mineral oil mist, spray or vapour may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.
- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.
- The foundation must be strong enough to bear the weight of the unit. Take the weight of the unit with a domestic hot water tank full of water into account.
  Make sure, in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- In places with high humidity (max. RH=85%), for example a bathroom.
- In places where frost is possible. Ambient temperature around the indoor unit should be >5°C.
- The indoor unit is designed for indoor installation only and for ambient temperatures ranging from 5~35°C.

6.2.4 Installation site requirements of the backup heater

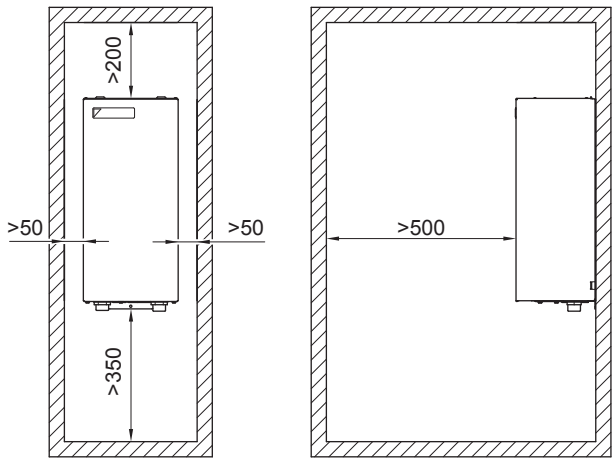
INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

- Mind the measurement guidelines:

Maximum distance between the backup heater and the indoor unit	10 m

- Mind the following spacing installation guidelines:



- The backup heater is designed to be wall-mounted in indoor locations only. Make sure the installation surface is a flat and vertical non-combustible wall.
- The backup heater is designed to operate in ambient temperatures ranging from 5~30°C.

Do NOT install the backup heater in the following places:

- Sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.
- In places with high humidity (max. RH=85%), for example a bathroom.
- In places where frost is possible.

6.3 Preparing refrigerant piping

6.3.1 Refrigerant piping requirements

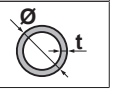
INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

- **Piping material:** Phosphoric acid deoxidised seamless copper.
- **Piping diameter:**

Liquid piping	Ø6.4 mm (1/4")
Gas piping	Ø15.9 mm (5/8")

- **Piping temper grade and thickness:**

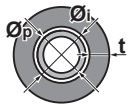
Outer diameter (Ø)	Temper grade	Thickness (t)[a]	
6.4 mm (1/4")	Annealed (O)	≥0.8 mm	
15.9 mm (5/8")	Annealed (O)	≥1.0 mm	

(a) Depending on the applicable legislation and the unit's maximum working pressure (see "PS High" on the unit name plate), larger piping thickness might be required.

6.3.2 Refrigerant piping insulation

- Use polyethylene foam as insulation material:
  - with a heat transfer rate between 0.041 and 0.052 W/mK (0.035 and 0.045 kcal/mh°C)
  - with a heat resistance of at least 120°C
- Insulation thickness

Pipe outer diameter ($Ø_p$)	Insulation inner diameter ($Ø_i$)	Insulation thickness (t)
6.4 mm (1/4")	8~10 mm	10 mm
15.9 mm (5/8")	16~20 mm	13 mm



If the temperature is higher than 30°C and the humidity is higher than RH 80%, the thickness of the insulation materials should be at least 20 mm to prevent condensation on the surface of the insulation.

6.4 Preparing water piping

6.4.1 Water circuit requirements

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

NOTICE

In case of plastic pipes, make sure they are fully oxygen diffusion tight according to DIN 4726. The diffusion of oxygen into the piping can lead to excessive corrosion.

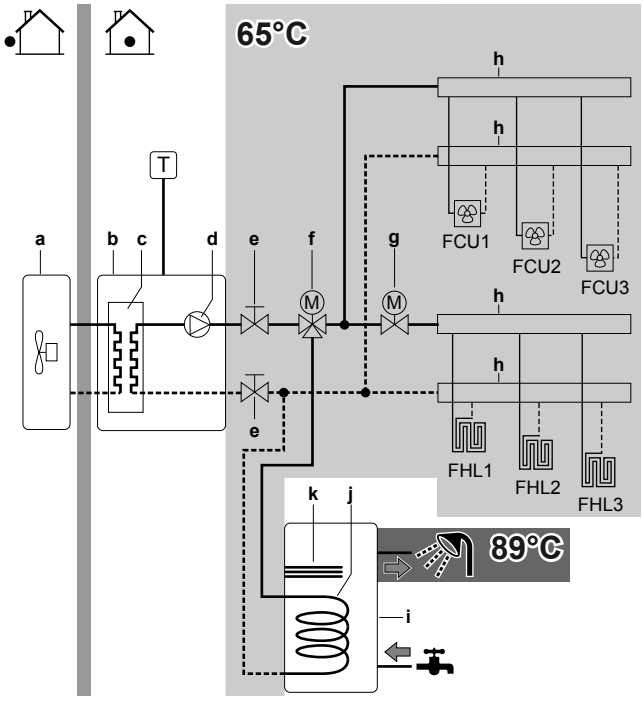
- **Connecting piping – Legislation.** Make all piping connections in accordance with the applicable legislation and the instructions in the "Installation" chapter, respecting the water inlet and outlet.
- **Connecting piping – Force.** Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
- **Connecting piping – Tools.** Only use appropriate tooling to handle brass, which is a soft material. If NOT, pipes will get damaged.
- **Connecting piping – Air, moisture, dust.** If air, moisture or dust gets into the circuit, problems may occur. To prevent this:
  - Only use clean pipes
  - Hold the pipe end downwards when removing burrs.
  - Cover the pipe end when inserting it through a wall, to prevent dust and/or particles entering the pipe.
  - Use a decent thread sealant to seal connections.
- **Closed circuit.** Use the indoor unit ONLY in a closed water system. Using the system in an open water system will lead to excessive corrosion.
- **Glycol.** For safety reasons, it is NOT allowed to add any kind of glycol to the water circuit.
- **Piping length.** It is recommended to avoid long runs of piping between the domestic hot water tank and the hot water end point (shower, bath,…) and to avoid dead ends.
- **Piping diameter.** Select the water piping diameter in relation to the required water flow and the available external static pressure of the pump. See "14 Technical data" on page 85 for the external static pressure curves of the indoor unit.
- **Water flow.** You can find the minimum required water flow for indoor unit operation in the following table. In all cases, this flow needs to be guaranteed. When the flow is lower, the indoor unit will stop operation and display error 7H.

Minimum required flow rate	
04+08 models	12 l/min
11+16 models	15 l/min

- **Field supply components – Water.** Only use materials that are compatible with water used in the system and with the materials used in the indoor unit.
- **Field supply components – Water pressure and temperature.** Check that all components in the field piping can withstand the water pressure and water temperature.
- **Water pressure.** The maximum water pressure is 4 bar. Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- **Water temperature.** All installed piping and piping accessories (valve, connections,…) MUST withstand the following temperatures:

INFORMATION

The following illustration is an example and might NOT match your system layout.

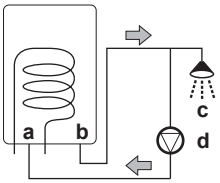


a	Outdoor unit
b	Indoor unit
c	Heat exchanger
d	Pump
e	Shut-off valve
f	Motorised 3-way valve (supplied with the domestic hot water tank)
g	Motorised 2-way valve (field supply)
h	Collector
i	Domestic hot water tank
j	Heat exchanger coil
k	Anti-legionella heater
FCU1...3	Fan coil unit (optional) (field supply)
FHL1...3	Floor heating loop (field supply)
T	Room thermostat (optional) (field supply)

- **Drainage – Low points.** Provide drain taps at all low points of the system in order to allow complete drainage of the water circuit.
- **Drainage – Pressure relief valve.** Provide a proper drain for the pressure relief valve to avoid water coming into contact with electrical parts.
- **Air vents.** Provide air vents at all high points of the system, which must also be easily accessible for servicing. An automatic air purge is provided in the indoor unit. Check that the air purge is NOT tightened too much, so that automatic release of air in the water circuit is possible.
- **Zn-coated parts.** Never use Zn-coated parts in the water circuit. Because the unit's internal water circuit uses copper piping, excessive corrosion may occur.
- **Non-brass metallic piping.** When using non-brass metallic piping, insulate the brass and non-brass properly so that they do NOT make contact with each other. This to prevent galvanic corrosion.
- **Valve – Separating circuits.** When using a 3-way valve in the water circuit make sure that the domestic hot water circuit and the floor heating circuit is fully separated.
- **Valve – Change-over time.** When using a 2-way valve or a 3-way valve in the water circuit, the maximum change-over time of the valve must be 60 seconds.
- **Filter.** It is strongly recommended to install an additional filter on the heating water circuit. Especially to remove metallic particles from foul heating piping, it is recommended to use a magnetic or

cyclone filter, which can remove small particles. Small particles may damage the unit and will NOT be removed by the standard filter of the heat pump system.

- **Domestic hot water tank – Capacity.** To avoid stagnation of water, it is important that the storage capacity of the domestic hot water tank meets the daily consumption of domestic hot water.
- **Domestic hot water tank – After installation.** Immediately after installation, the domestic hot water tank must be flushed with fresh water. This procedure must be repeated at least once a day the first 5 consecutive days after installation.
- **Domestic hot water tank – Standstills.** In cases where during longer periods of time there is no consumption of hot water, the equipment MUST be flushed with fresh water before usage.
- **Domestic hot water tank – Disinfection.** For the disinfection function of the domestic hot water tank, see "8.3.2 Domestic hot water control: advanced" on page 62.
- **Thermostatic mixing valves.** In accordance with the applicable legislation, it may be necessary to install thermostatic mixing valves.
- **Hygienic measures.** The installation must be in compliance with the applicable legislation and may require additional hygienic installation measures.
- **Recirculation pump.** In accordance with the applicable legislation, it may be required to connect a recirculation pump in between the hot water end point and the recirculation connection of the domestic hot water tank.



a Recirculation connection
b Hot water connection
c Shower
d Recirculation pump

6.4.2 Formula to calculate the expansion vessel pre-pressure

The pre-pressure (Pg) of the vessel depends on the installation height difference (H):

Pg=0.3+(H/10) (bar)

6.4.3 To check the water volume and flow rate

The indoor unit has an expansion vessel of 10 litre with a factory-set pre-pressure of 1 bar.

To make sure that the unit operates properly:

- You must check the minimum and maximum water volume.
- You might need to adjust the pre-pressure of the expansion vessel.

Minimum water volume

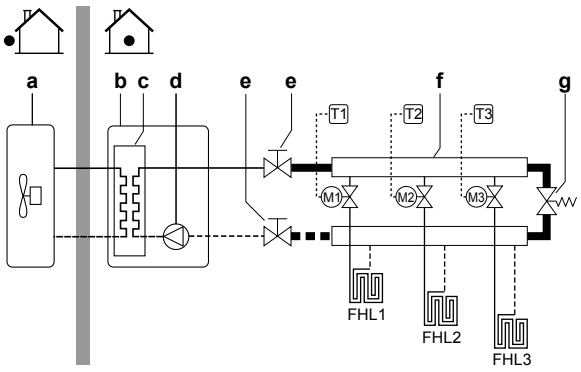
Check that the total water volume in the installation is minimum 10 litre, the internal water volume of the indoor unit NOT included.

INFORMATION

In critical processes, or in rooms with a high heat load, extra water might be required.

NOTICE

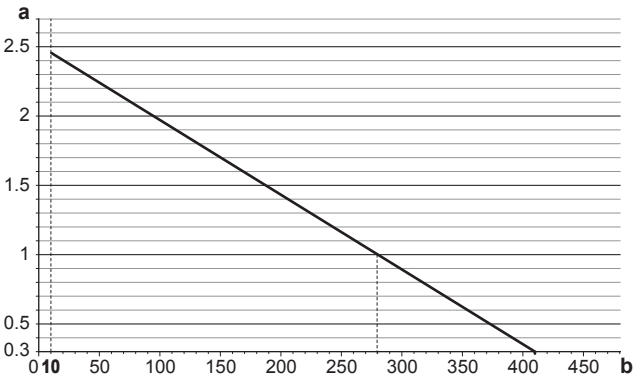
When circulation in each space heating loop is controlled by remotely controlled valves, it is important that the minimum water volume is guaranteed, even if all of the valves are closed.



a Outdoor unit
b Indoor unit
c Heat exchanger
d Pump
e Shut-off valve
f Collector (field supply)
g By-pass valve (field supply)
FHL1...3 Floor heating loop (field supply)
T1...3 Individual room thermostat (optional)
M1...3 Individual motorised valve to control loop FHL1...3 (field supply)

Maximum water volume

Use the following graph to determine the maximum water volume for the calculated pre-pressure.



a Pre-pressure (bar)
b Maximum water volume (l)

Example: Maximum water volume and expansion vessel pre-pressure

Installation height difference[(a)]	Water volume	
	≤280 l	>280 l
≤7 m	No pre-pressure adjustment is required.	Do the following: ▪ Decrease the pre-pressure. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.
>7 m	Do the following: ▪ Increase the pre-pressure. ▪ Check if the water volume does NOT exceed the maximum allowed water volume.	The expansion vessel of the indoor unit is too small for the installation. In this case, it is recommended to install an extra vessel outside the unit.

(a) This is the height difference (m) between the highest point of the water circuit and the indoor unit. If the indoor unit is at the highest point of the installation, the installation height is 0 m.

Minimum flow rate

Check that the minimum flow rate (required during defrost/backup heater operation (if applicable)) in the installation is guaranteed in all conditions.

NOTICE

When circulation in each or certain space heating loops is controlled by remotely controlled valves, it is important that the minimum flow rate is guaranteed, even if all valves are closed. In case the minimum flow rate cannot be reached, a flow error 7H will be generated (no heating/operation).

Minimum required flow rate	
04+08 models	12 l/min
11+16 models	15 l/min

See the recommended procedure as described in "9.4 Checklist during commissioning" on page 73.

6.4.4 Changing the pre-pressure of the expansion vessel

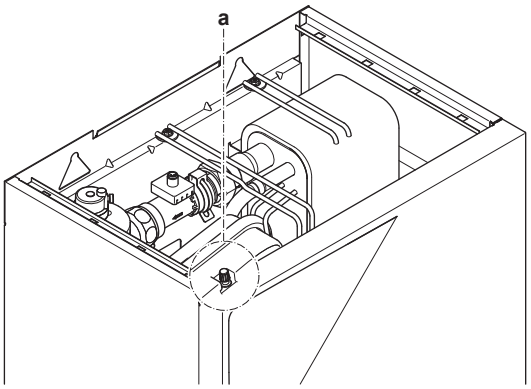
NOTICE

Only a licensed installer may adjust the pre-pressure of the expansion vessel.

When changing the default pre-pressure of the expansion vessel (1 bar) is required, take following guidelines into account:

- Only use dry nitrogen to set the expansion vessel pre-pressure.
- Inappropriate setting of the expansion vessel pre-pressure will lead to malfunction of the system.

Changing the pre-pressure of the expansion vessel should be done by releasing or increasing nitrogen pressure through the Schrader valve of the expansion vessel.



a Schrader valve

6.4.5 To check the water volume: Examples

Example 1

The indoor unit is installed 5 m below the highest point in the water circuit. The total water volume in the water circuit is 100 l.

No actions or adjustments are required.

Example 2

The indoor unit is installed at the highest point in the water circuit. The total water volume in the water circuit is 350 l.

Actions:

- Because the total water volume (350 l) is more than the default water volume (280 l), the pre-pressure must be decreased.
- The required pre-pressure is:
  Pg = (0.3+(H/10)) bar = (0.3+(0/10)) bar=0.3 bar.
- The corresponding maximum water volume at 0.3 bar is 410 l. (See the graph in the chapter above).
- Because 350 l is lower than 410 l, the expansion vessel is appropriate for the installation.

6.5 Preparing electrical wiring

6.5.1 About preparing electrical wiring

INFORMATION

Also read the precautions and requirements in the "General safety precautions" chapter.

WARNING

- If the power supply has a missing or wrong N-phase, equipment might break down.
- Establish proper earthing. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shock.
- Install the required fuses or circuit breakers.
- Secure the electrical wiring with cable ties so that the cables do NOT come in contact with sharp edges or piping, particularly on the high-pressure side.
- Do NOT use taped wires, stranded conductor wires, extension cords, or connections from a star system. They can cause overheating, electrical shock or fire.
- Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.

WARNING

- All wiring must be performed by an authorized electrician and must comply with the applicable legislation.
- Make electrical connections to the fixed wiring.
- All components procured on the site and all electrical construction must comply with the applicable legislation.

WARNING

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

WARNING

ALWAYS use multicore cable for power supply cables.

6.5.2 About preferential kWh rate power supply

Electricity companies throughout the world work hard to provide reliable electric service at competitive prices and are often authorized to bill clients at benefit rates. E.g. time-of-use rates, seasonal rates, Wärmepumpentarif in Germany and Austria, ...

This equipment allows for connection to such preferential kWh rate power supply delivery systems.

Consult with the electricity company acting as provider at the site where this equipment is to be installed to know whether it is appropriate to connect the equipment in one of the preferential kWh rate power supply delivery systems available, if any.

When the equipment is connected to such preferential kWh rate power supply, the electricity company is allowed to:

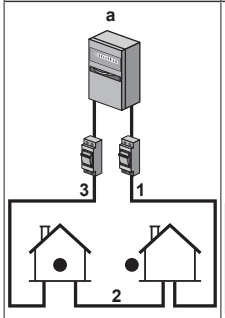
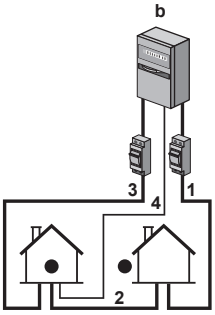
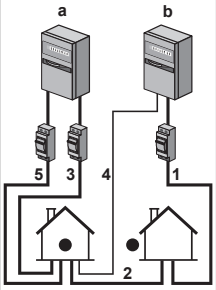
- interrupt power supply to the equipment for certain periods of time;

- demand that the equipment only consumes a limited amount of electricity during certain periods of time.

The indoor unit is designed to receive an input signal by which the unit switches into forced off mode. At that moment, the outdoor unit compressor will not operate.

Whether the power supply is interrupted or not, the wiring to the unit is different.

6.5.3 Overview of electrical connections except external actuators

Normal power supply	Preferential kWh rate power supply	
	Power supply is NOT interrupted	Power supply is interrupted
		
	During preferential kWh rate power supply activation, power supply is NOT interrupted. The outdoor unit is turned off by the control. **Remark:** The electricity company must always allow the power consumption of the indoor unit.	During preferential kWh rate power supply activation, power supply is interrupted immediately or after some time by the electricity company. In this case, the indoor unit must be powered by a separate normal power supply.

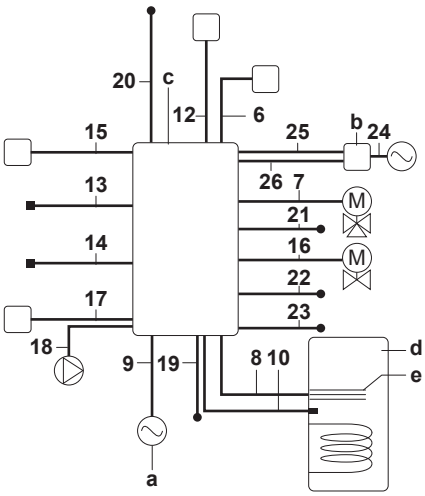
a Normal power supply
b Preferential kWh rate power supply
1 Power supply for outdoor unit
2 Power supply and interconnection cable to indoor unit
3 Power supply for backup heater
4 Preferential kWh rate power supply (voltage free contact)
5 Normal kWh rate power supply (to power the indoor unit PCB in the event of power supply interruption of the preferential kWh rate power supply)

6.5.4 Overview of electrical connections for external and internal actuators

The following illustration shows the required field wiring.

INFORMATION

The following illustration is an example and might NOT match your system layout.



a Single power supply for outdoor unit and anti-legionella heater
b Backup heater (option)
c Indoor unit
d Domestic hot water tank
e Anti-legionella heater

Item	Description	Wires	Maximum running current
Outdoor unit and indoor unit power supply			
1	Power supply for outdoor unit	2+GND or 3+GND	(a)
2	Power supply and interconnection cable to indoor unit	3	(c)
4	Preferential kWh rate power supply (voltage free contact)	2	(e)
5	Normal kWh rate power supply	2	6.3 A
User interface			
6	User interface	2	(f)
Optional equipment			
7	3-way valve	3	100 mA(b)
8	Power supply for anti-legionella heater and thermal protection (from indoor unit)	4+GND	(c)
9	Power supply for anti-legionella heater (to indoor unit)	2+GND	13 A
10	Domestic hot water tank thermistor	2	(d)
11	Power supply for bottom plate heater	2	(b)
12	Room thermostat	3 or 4	100 mA(b)
13	Outdoor ambient temperature sensor	2	(b)
14	Indoor ambient temperature sensor	2	(b)
15	Heat pump convector	4	100 mA(b)
Field supplied components			
16	Shut-off valve	2	100 mA(b)
17	Electricity meter	2 (per meter)	(b)
18	Domestic hot water pump	2	(b)
19	Alarm output	2	(b)

Item	Description	Wires	Maximum running current
20	Changeover to external heat source control	2	(b)
21	Space heating operation control	2	(b)
22	Power consumption digital inputs	2 (per input signal)	(b)
23	Safety thermostat	2	(e)

(a) Refer to name plate on outdoor unit.
(b) Minimum cable section 0.75 mm².
(c) Cable section 2.5 mm².
(d) The thermistor and connection wire (12 m) are delivered with the domestic hot water tank.
(e) Cable section 0.75 mm² till 1.25 mm²; maximum length: 50 m. Voltage-free contact shall ensure the minimum applicable load of 15 V DC, 10 mA.
(f) Cable section 0.75 mm² till 1.25 mm²; maximum length: 500 m. Applicable for both single user interface and dual user interface connection.

NOTICE

More technical specifications of the different connections are indicated on the inside of the indoor unit.

Backup heater

Item	Description	Wires	Maximum running current
Power supply			
24	Backup heater power supply	See table below.	—
Interconnection cable			
25	Backup heater thermistor	2	(a)
26	Backup heater thermal protector	2	(b)
	Backup heater connection	3	

(a) Minimum cable section: 0.75 mm²; maximum length: 10 m.
(b) Minimum cable section: 1.50 mm²; maximum length: 10 m.

Backup heater	Power supply	Wires
*6W	1× 230 V	2+GND + 2 bridges
	3× 400 V	4+GND

NOTICE

More technical specifications of the different connections are indicated on the inside of the backup heater.

7 Installation

7.1 Overview: Installation

This chapter describes what you have to do and know on-site to install the system.

Typical workflow

Installation typically consists of the following stages:

1 Mounting the outdoor unit.
2 Mounting the indoor unit.
3 Mounting the backup heater (if applicable).
4 Connecting the refrigerant piping.
5 Checking the refrigerant piping.
6 Charging refrigerant.
7 Connecting the water piping.
8 Connecting the electrical wiring.
9 Finishing the outdoor installation.
10 Finishing the indoor installation.
11 Finishing the installation of the backup heater (if applicable).

INFORMATION

Depending on the units and/or the installation conditions, it might be necessary to connect electrical wiring before you can charge refrigerant.

7.2 Opening the units

7.2.1 About opening the units

At certain times, you have to open the unit. **Example:**

- When connecting the refrigerant piping
- When connecting the electrical wiring
- When maintaining or servicing the unit

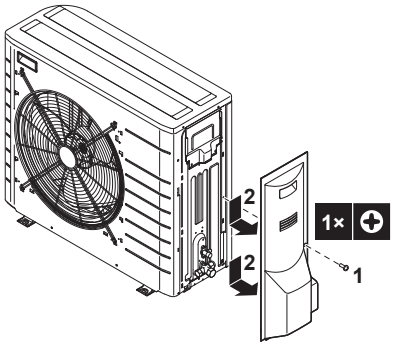
DANGER: RISK OF ELECTROCUTION

Do NOT leave the unit unattended when the service cover is removed.

7.2.2 To open the outdoor unit

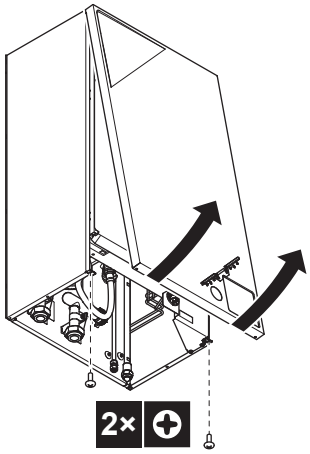
DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING



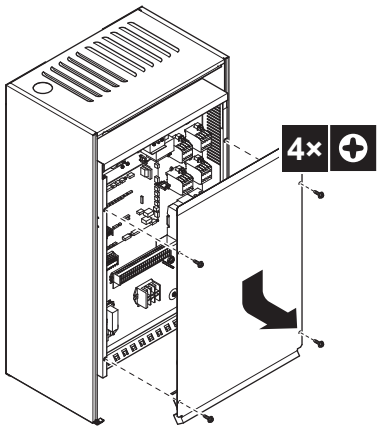
7.2.3 To open the indoor unit

1 Loosen and remove the 2 screws that fix the front panel.

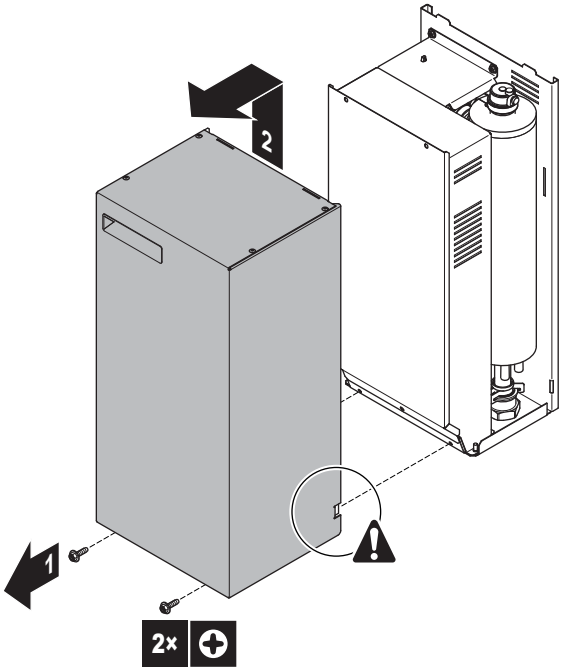


2 Tilt the front panel towards you and remove the front panel.

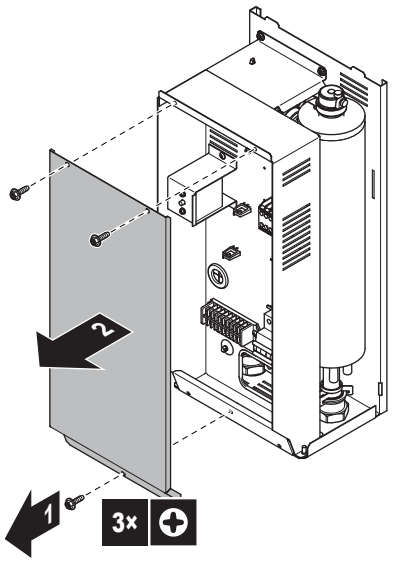
7.2.4 To open the switch box cover of the indoor unit



7.2.5 To open the backup heater



7.2.6 To open the switch box cover of the backup heater



7.3 Mounting the outdoor unit

7.3.1 About mounting the outdoor unit

When

You have to mount the outdoor and indoor unit before you can connect the refrigerant and water piping.

Typical workflow

Mounting the outdoor unit typically consists of the following stages:

1 Providing the installation structure.
2 Installing the outdoor unit.
3 Providing drainage.
4 Preventing the outdoor unit from falling over.
5 Protecting the unit against snow and wind by installing a snow cover and baffle plates. See "Preparing installation site" in "6 Preparation" on page 23.

7.3.2 Precautions when mounting the outdoor unit

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

7.3.3 To provide the installation structure

Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise.

Fix the unit securely by means of foundation bolts in accordance with the foundation drawing.

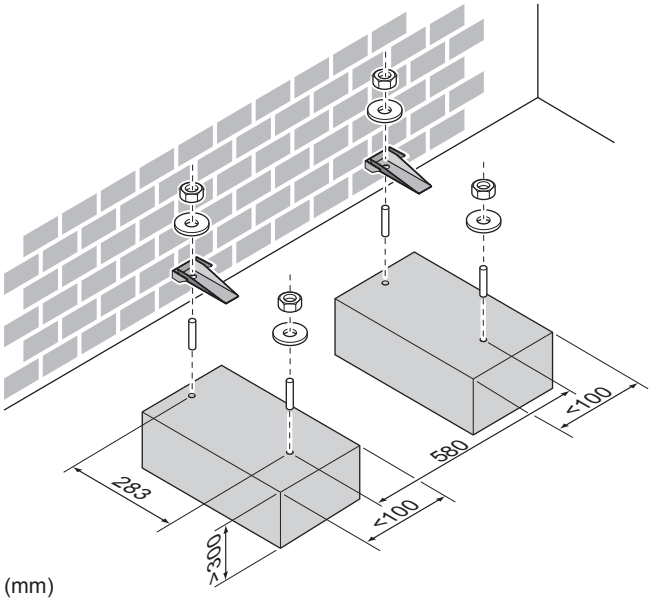
If the unit is installed directly on the floor, prepare 4 sets of M8 or M10 anchor bolts, nuts and washers (field supply) as follows:

INFORMATION

The maximum height of the upper protruding part of the bolts is 15 mm.

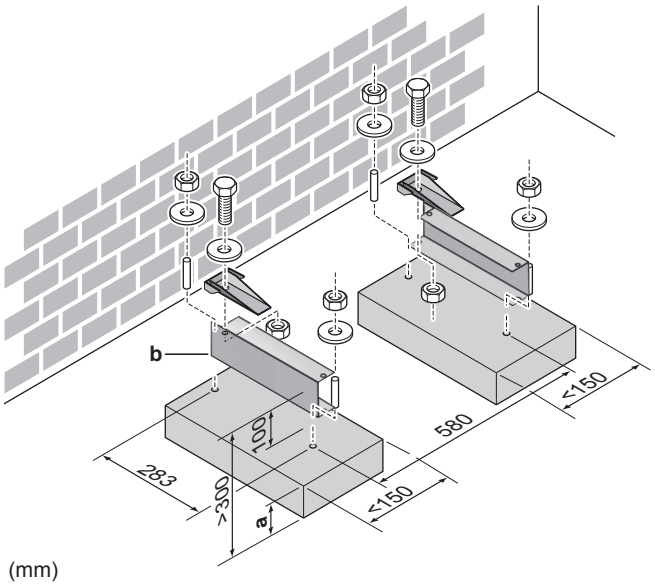
NOTICE

Fix the outdoor unit to the foundation bolts using nuts with resin washers (a). If the coating on the fastening area is stripped off, the nuts rust easily.



(mm)

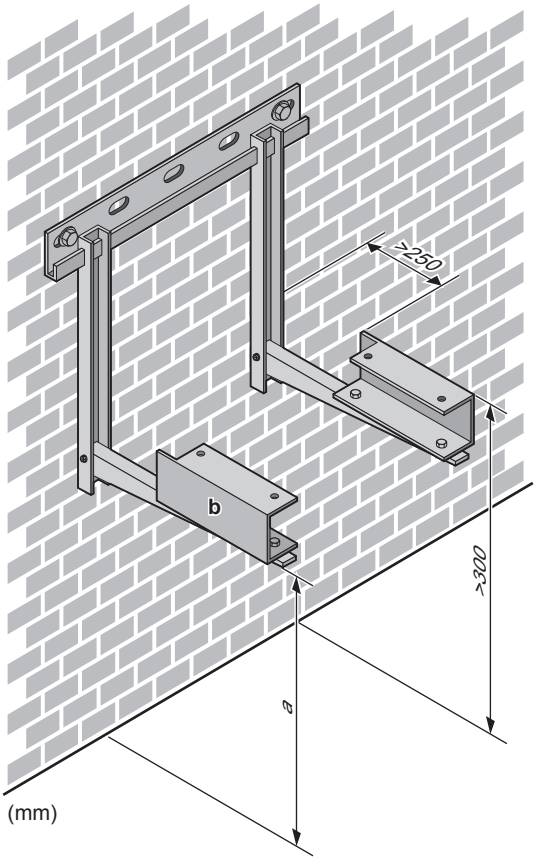
In any case, provide at least 300 mm of free space below the unit. Additionally, make sure the unit is positioned at least 100 mm above the maximum expected level of snow. In this case, it is recommended to construct a pedestal, and on this pedestal install the EKFT008CA option kit.



(mm)

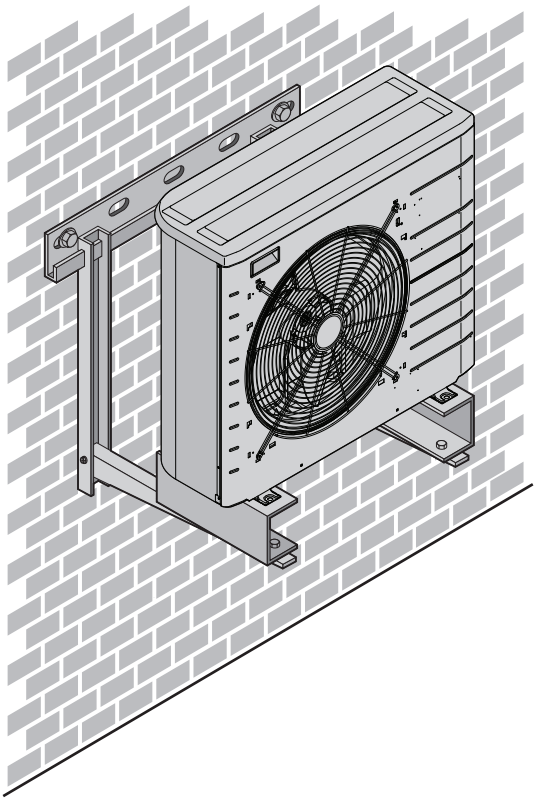
a Maximum snowfall height
b EKFT008CA option kit

If the unit is installed on brackets to the wall, it is recommended to use the EKFT008CA option kit and to install the unit as follows:



(mm)

a Maximum snowfall height
b EKFT008CA option kit



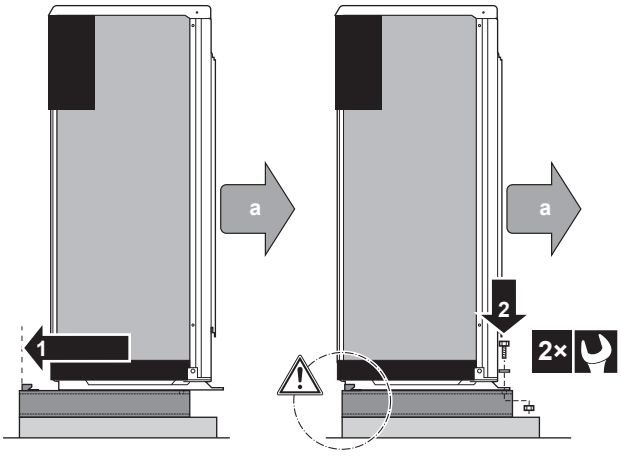
7.3.4 To install the outdoor unit

CAUTION

Do NOT remove the protective cardboard before the unit is installed properly.

1 Lift the outdoor unit as described in "3.2.2 To remove the accessories from the outdoor unit" on page 8.

2 Install the outdoor unit as follows:

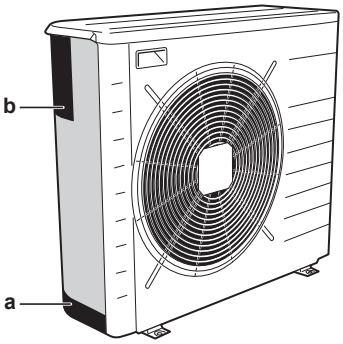


a Air outlet

NOTICE

The pedestal MUST be aligned with the backside of the U-beam.

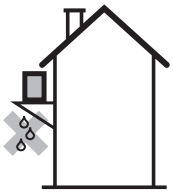
3 Remove the protective cardboard and instruction sheet.



a Protective cardboard
b Instruction sheet

7.3.5 To provide drainage

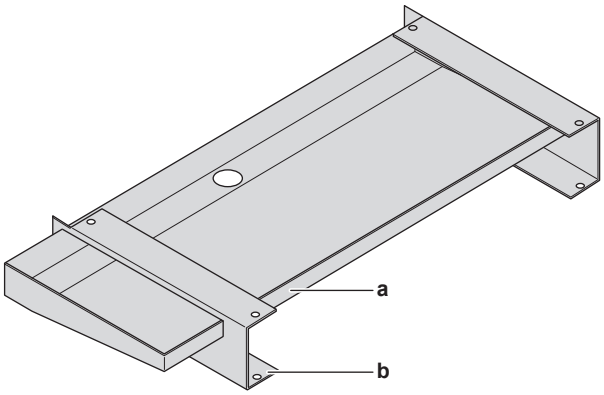
- Avoid installation places where water leaking from the unit due to a blocked drain pan, cause damage to the location.
- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is a proper drainage in order to avoid ice accumulation.
- Prepare a water drainage channel around the foundation to drain waste water surrounding the unit.
- Avoid drain water flowing over the footpath, so that it does not become slippery in case of ambient freezing temperatures.
- If you install the unit on a frame, install a waterproof plate within 150 mm of the bottom side of the unit in order to prevent the invasion of water in the unit and to avoid the drain water dripping (see the following illustration).



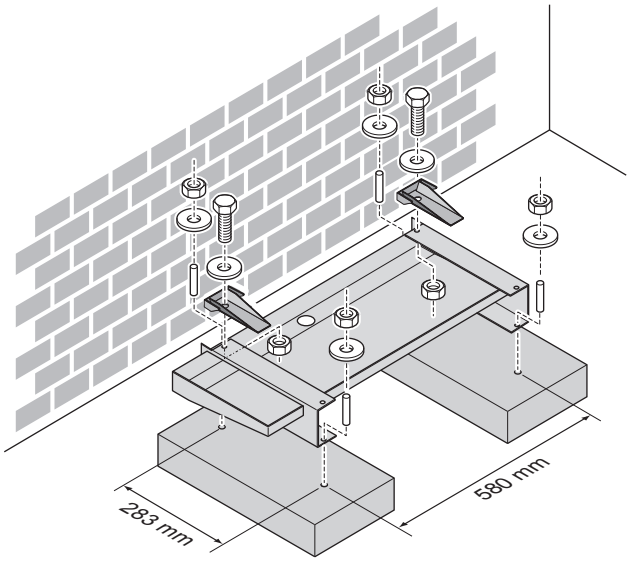
NOTICE

If the drain holes of the outdoor unit are blocked up, provide space of at least 300 mm below the outdoor unit.

An additional drain pan kit (EKDP008CA) can be used to gather the drain water. The drain pan kit consists of:



a Drain pan
b U-beams



7.3.6 To prevent the outdoor unit from falling over

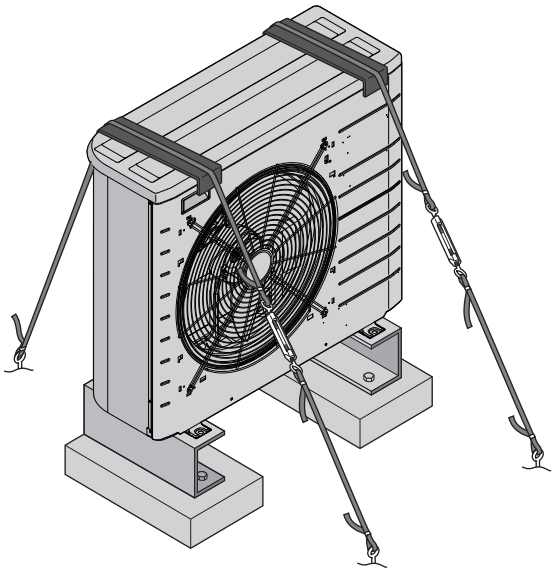
In case the unit is installed in places where strong wind can tilt the unit, take following measure:

1 Prepare 2 cables as indicated in the following illustration (field supply).

2 Place the 2 cables over the outdoor unit.

3 Insert a rubber sheet between the cables and the outdoor unit to prevent the cable from scratching the paint (field supply).

4 Attach the cable's ends. Tighten those ends.



7.4 Mounting the indoor unit

7.4.1 About mounting the indoor unit

When

You have to mount the outdoor and indoor unit before you can connect the refrigerant and water piping.

Typical workflow

Mounting the indoor unit typically consists of the following stages:

1 Installing the indoor unit.

2 Installing the drain pan kit (optional).

7.4.2 Precautions when mounting the indoor unit

INFORMATION

Also read the precautions and requirements in the following chapters:

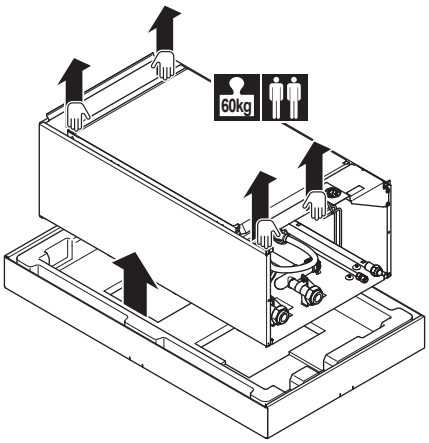
- General safety precautions
- Preparation

7.4.3 To install the indoor unit

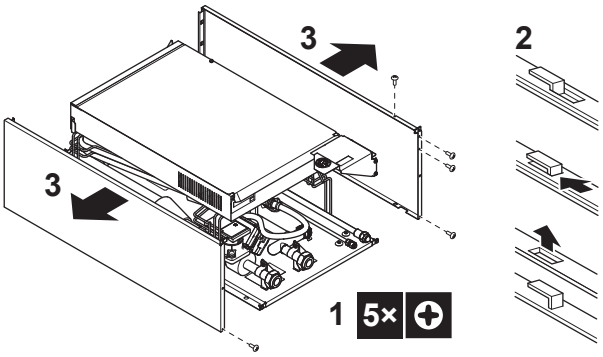
CAUTION

Do NOT grasp the piping to lift the indoor unit.

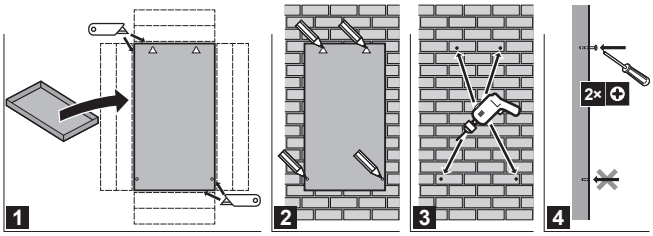
1 Lift the unit from the package.



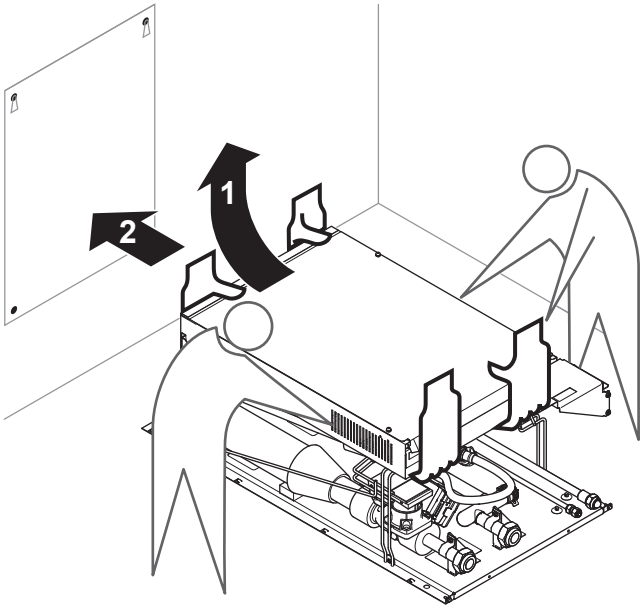
2 Remove the 4 screws from the bottom of the unit. Unhook and remove the side plates.



3 Put the installation pattern (see packing) on the wall and follow the steps as shown below.

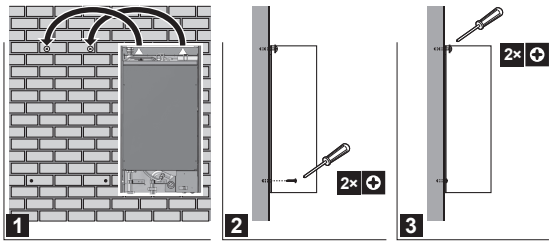


4 Lift the unit.

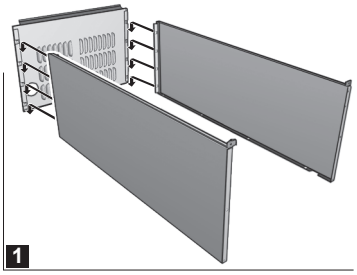


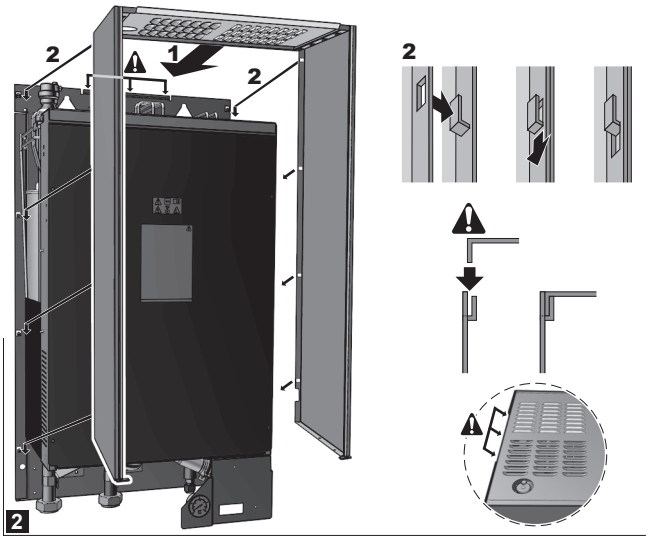
5 Tilt the top of the unit against the wall at the position of the 2 inserted screws.

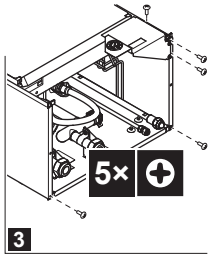
6 Hook the unit against the wall.



7 Assemble the unit.







7.4.4 To install the drain pan kit

If a drain pan kit (EKHBDPCA2) is required, install it before connecting the refrigerant and water pipes and the electrical wiring.

To install, see the installation manual of the drain pan kit.

7.5 Mounting the backup heater

7.5.1 Precautions when mounting the backup heater

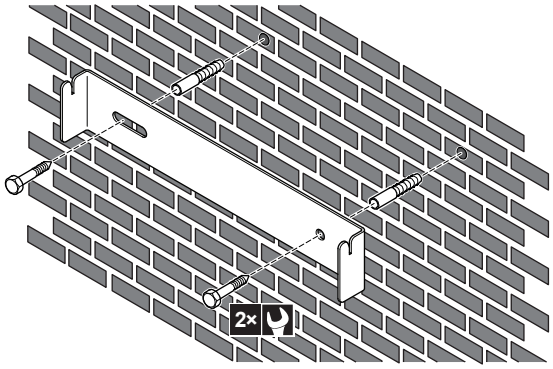
INFORMATION

Also read the precautions and requirements in the following chapters:

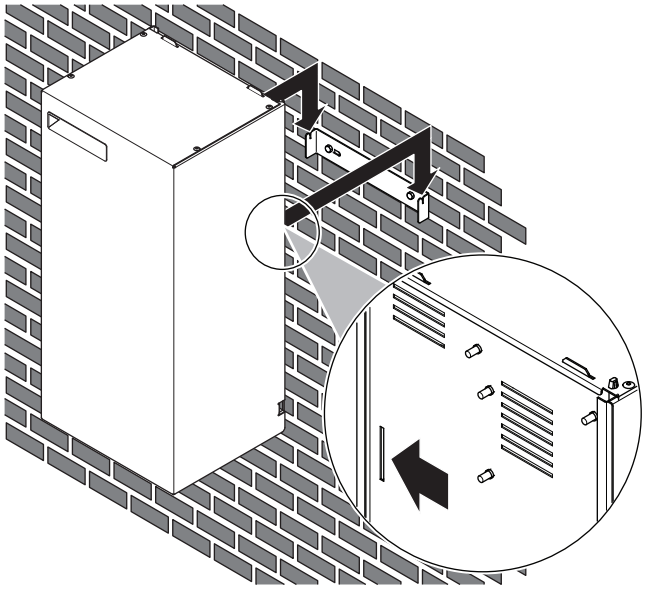
- General safety precautions
- Preparation

7.5.2 To install the backup heater

1 Fix the wall bracket to the wall with M5 screws.



2 Hang the backup heater onto the wall bracket.



3 Mark the position of the hole at the bottom of the backup heater.

4 Remove the backup heater from the wall bracket.

5 Drill a hole for the bottom screw and insert a plug.

6 Hang the backup heater onto the wall bracket. Make sure it is fixed properly.

7 Fix the bottom of the backup heater to the wall with an M5 screw.

7.6 Connecting the refrigerant piping

7.6.1 About connecting the refrigerant piping

Before connecting the refrigerant piping

Make sure the outdoor and indoor unit are mounted.

Typical workflow

Connecting the refrigerant piping involves:

- Connecting the refrigerant piping to the outdoor unit
- Connecting the refrigerant piping to the indoor unit
- Insulating the refrigerant piping
- Keeping in mind the guidelines for:
  - Pipe bending
  - Flaring pipe ends
  - Brazing
  - Using the stop valves

7.6.2 Precautions when connecting the refrigerant piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

DANGER: RISK OF BURNING

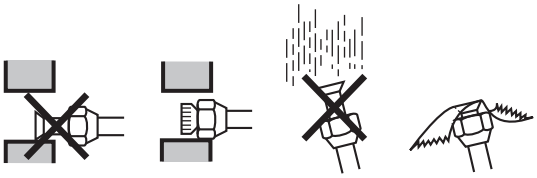
CAUTION

- Do NOT use mineral oil on flared part.
- Do NOT reuse piping from previous installations.
- NEVER install a drier to this R410A unit to guarantee its lifetime. The drying material may dissolve and damage the system.

NOTICE

Take the following precautions on refrigerant piping into account:

- Avoid anything but the designated refrigerant to get mixed into the refrigerant cycle (e.g. air).
- Only use R410A when adding refrigerant.
- Only use installation tools (e.g. manifold gauge set) that are exclusively used for R410A installations to withstand the pressure and to prevent foreign materials (e.g. mineral oils and moisture) from mixing into the system.
- Install the piping so that the flare is NOT subjected to mechanical stress
- Protect the piping as described in the following table to prevent dirt, liquid or dust from entering the piping.
- Use caution when passing copper tubes through walls (see figure below).



Unit	Installation period	Protection method
Outdoor unit	>1 month	Pinch the pipe
	<1 month	Pinch or tape the pipe
Indoor unit	Regardless of the period	

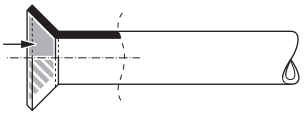
INFORMATION

Do NOT open the refrigerant stop valve before checking the refrigerant piping. When you need to charge additional refrigerant it is recommended to open the refrigerant stop valve after charging.

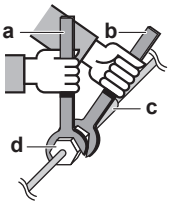
7.6.3 Guidelines when connecting the refrigerant piping

Take the following guidelines into account when connecting pipes:

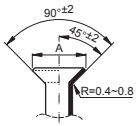
- Coat the flare inner surface with ether oil or ester oil when connecting a flare nut. Tighten 3 or 4 turns by hand, before tightening firmly.



- Always use two wrenches together when loosening a flare nut.
- Always use a spanner and torque wrench together to tighten the flare nut when connecting the piping. This to prevent nut cracking and leaks.



a Torque wrench
b Spanner
c Piping union
d Flare nut

Piping size (mm)	Tightening torque (N•m)	Flare dimensions (A) (mm)	Flare shape (mm)
Ø6.4	15~17	8.7~9.1	
Ø15.9	63~75	19.3~19.7	

7.6.4 Pipe bending guidelines

Use a pipe bender for bending. All pipe bends should be as gentle as possible (bending radius should be 30~40 mm or larger).

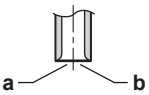
7.6.5 To flare the pipe end

CAUTION

- Incomplete flaring may cause refrigerant gas leakage.
- Do NOT re-use flares. Use new flares to prevent refrigerant gas leakage.
- Use flare nuts that are included with the unit. Using different flare nuts may cause refrigerant gas leakage.

1 Cut the pipe end with a pipe cutter.

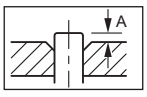
2 Remove burrs with the cut surface facing downward so that the chips do not enter the pipe.



a Cut exactly at right angles.
b Remove burrs.

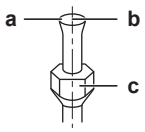
3 Remove the flare nut from the stop valve and put the flare nut on the pipe.

4 Flare the pipe. Set exactly at the position as shown in the following illustration.



	Flare tool for R410A (clutch type)	Conventional flare tool	
		Clutch type (Ridgid-type)	Wing nut type (Imperial-type)
A	0~0.5 mm	1.0~1.5 mm	1.5~2.0 mm

5 Check that the flaring is properly made.

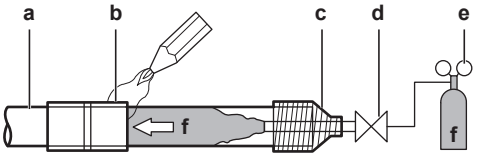


a Flare's inner surface must be flawless.
b The pipe end must be evenly flared in a perfect circle.
c Make sure the flare nut is fitted.

7.6.6 To braze the pipe end

The indoor unit and outdoor unit have flare connections. Connect both ends without brazing. If brazing should be needed, take the following into account:

- When brazing, blow through with nitrogen to prevent creation of large quantities of oxidised film on the inside of the piping. This film adversely affects valves and compressors in the refrigerating system and prevents proper operation.
- Set the nitrogen pressure to 20 kPa (0.2 bar)(just enough so it can be felt on the skin) with a pressure-reducing valve.



a Refrigerant piping
b Part to be brazed
c Taping
d Manual valve
e Pressure-reducing valve
f Nitrogen

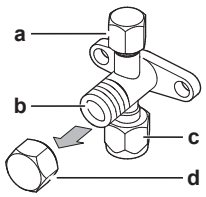
- Do NOT use anti-oxidants when brazing pipe joints.
  Residue can clog pipes and break equipment.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does not require flux.
  Flux has an extremely harmful influence on refrigerant piping systems. For instance, if chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will deteriorate the refrigerant oil.

7.6.7 Using the stop valve and service port

To handle the stop valve

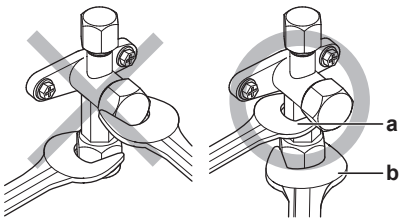
Take the following guidelines into account:

- The stop valves are factory closed.
- The following illustration shows each part required in handling the valve.



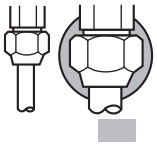
a Service port and service port cap
b Valve stem
c Field piping connection
d Stem cap

- Keep both stop valves open during operation.
- Do NOT apply excessive force to the valve stem. Doing so may break the valve body.
- Always make sure to secure the stop valve with a spanner, then loosen or tighten the flare nut with a torque wrench. Do NOT place the spanner on the stem cap, as this could cause a refrigerant leak.



a Spanner
b Torque wrench

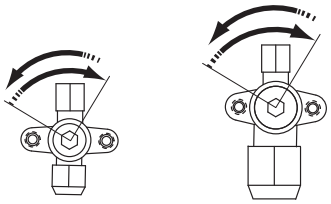
- When it is expected that the operating pressure will be low (e.g. when cooling will be performed while the outside air temperature is low), sufficiently seal the flare nut in the stop valve on the gas line with silicon sealant to prevent freezing.



Silicon sealant, make sure there is no gap.

To open/close the stop valve

1 Remove the valve cover.
2 Insert a hexagon wrench (liquid side: 4 mm, gas side: 6 mm) into the valve stem and turn the valve stem:

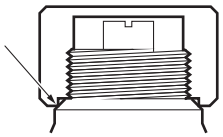


Counterclockwise to open.
Clockwise to close.

3 When the valve stem cannot be turned any further, stop turning. The valve is now opened/closed.

To handle the stem cap

- The stem cap is sealed where indicated with the arrow. Do NOT damage it.



- After handling the stop valve, tighten the stem cap, and check for refrigerant leaks.

Item	Tightening torque (N·m)
Stem cap, liquid side	13.5~16.5
Stem cap, gas side	22.5~27.5

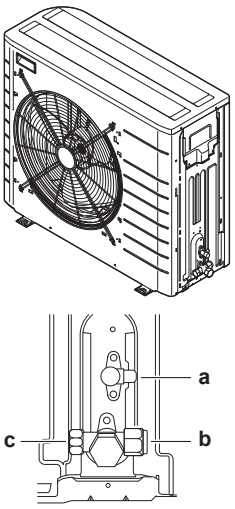
To handle the service cap

- Always use a charge hose equipped with a valve depressor pin, since the service port is a Schrader type valve.
- After handling the service port, tighten the service port cap, and check for refrigerant leaks.

Item	Tightening torque (N·m)
Service port cap	11.5~13.9

7.6.8 To connect the refrigerant piping to the outdoor unit

1 Connect the liquid refrigerant connection from the indoor unit to the liquid stop valve of the outdoor unit.

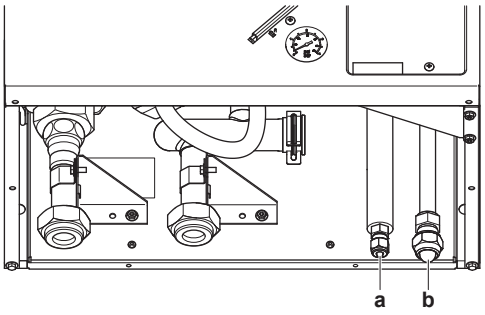


a Liquid stop valve
b Gas stop valve
c Service port

2 Connect the gas refrigerant connection from the indoor unit to the refrigerant stop valve of the outdoor unit.

7.6.9 To connect the refrigerant piping to the indoor unit

1 Connect the liquid stop valve from the outdoor unit to the refrigerant liquid connection of the indoor unit.



a Refrigerant liquid connection
b Refrigerant gas connection

2 Connect the gas stop valve from the outdoor unit to the refrigerant gas connection of the indoor unit.

NOTICE

It is recommended that the refrigerant piping between indoor and outdoor unit is installed in a ducting or the refrigerant piping is wrapped with finishing tape.

7.7 Checking the refrigerant piping

7.7.1 About checking the refrigerant piping

The outdoor unit's **internal** refrigerant piping has been factory tested for leaks. You only have to check the outdoor unit's **external** refrigerant piping.

Before checking the refrigerant piping

Make sure the refrigerant piping is connected between the outdoor unit and the indoor unit.

Typical workflow

Checking the refrigerant piping typically consists of the following stages:

1 Checking for leaks in the refrigerant piping.
2 Performing vacuum drying to remove all moisture, air or nitrogen from the refrigerant piping.

If there is a possibility of moisture being present in the refrigerant piping (for example, water may have entered the piping), first carry out the vacuum drying procedure below until all moisture has been removed.

7.7.2 Precautions when checking the refrigerant piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

NOTICE

Use a 2-stage vacuum pump with a non-return valve that can evacuate to a gauge pressure of −100.7 kPa (−1.007 bar)(5 Torr absolute). Make sure the pump oil does not flow oppositely into the system while the pump is not working.

NOTICE

Use this vacuum pump for R410A exclusively. Using the same pump for other refrigerants may damage the pump and the unit.

NOTICE

- Connect the vacuum pump to the service port of the gas stop valve.
- Make sure that the gas stop valve and liquid stop valve are firmly closed before performing the leak test or vacuum drying.

7.7.3 To check for leaks

NOTICE

Do NOT exceed the unit's maximum working pressure (see "PS High" on the unit name plate).

NOTICE

Make sure to use a recommended bubble test solution from your wholesaler. Do not use soap water, which may cause cracking of flare nuts (soap water may contain salt, which absorbs moisture that will freeze when the piping gets cold), and/or lead to corrosion of flared joints (soap water may contain ammonia which causes a corrosive effect between the brass flare nut and the copper flare).

1 Charge the system with nitrogen gas up to a gauge pressure of at least 200 kPa (2 bar). It is recommended to pressurize to 3000 kPa (30 bar) in order to detect small leaks.

2 Check for leaks by applying the bubble test solution to all connections.

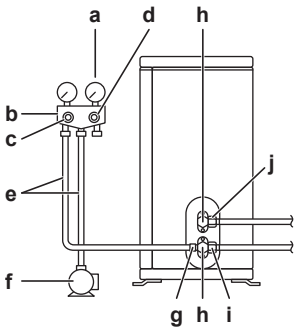
3 Discharge all nitrogen gas.

INFORMATION

After opening the stop valve, it is possible that the pressure in the refrigerant piping does NOT increase. This might be caused by e.g. the closed state of the expansion valve in the outdoor unit circuit, but does NOT present any problem for correct operation of the unit.

7.7.4 To perform vacuum drying

Connect the vacuum pump and manifold as follows:



a Pressure meter
b Gauge manifold
c Low-pressure valve (Lo)
d High-pressure valve (Hi)
e Charging hoses
f Vacuum pump
g Service port
h Valve lids
i Gas stop valve
j Liquid stop valve

1 Vacuum the system until the pressure on the manifold indicates −0.1 MPa (−1 bar).

2 Leave as is for 4-5 minutes and check the pressure:

If the pressure…	Then…
Does not change	There is no moisture in the system. This procedure is finished.
Increases	There is moisture in the system. Go to the next step.

3 Evacuate for at least 2 hours to a pressure on the manifold of −0.1 MPa (−1 bar).

4 After turning OFF the pump, check the pressure for at least 1 hour.

5 If you do NOT reach the target vacuum or cannot maintain the vacuum for 1 hour, do the following:

- Check for leaks again.
- Perform vacuum drying again.

NOTICE

Be sure to open the gas stop valve after piping installation and vacuuming. Running the system with the valve closed, the compressor may break down.

7.8 Charging refrigerant

7.8.1 About charging refrigerant

The outdoor unit is factory charged with refrigerant, but in some cases the following might be necessary:

What	When
Charging additional refrigerant	When the total liquid piping length is more than specified (see later).
Completely recharging refrigerant	**Example:** ▪ When relocating the system. ▪ After a leak.

Charging additional refrigerant

Before charging additional refrigerant, make sure the outdoor unit's **external** refrigerant piping is checked (leak test, vacuum drying).

INFORMATION

Depending on the units and/or the installation conditions, it might be necessary to connect electrical wiring before you can charge refrigerant.

Typical workflow – Charging additional refrigerant typically consists of the following stages:

1 Determining if and how much you have to charge additionally.
2 If necessary, charging additional refrigerant.
3 Filling in the fluorinated greenhouse gases label, and fixing it to the inside of the outdoor unit.

Completely recharging refrigerant

Before completely recharging refrigerant, make sure the following is done:

1 The system is pumped down.
2 The outdoor unit's **external** refrigerant piping is checked (leak test, vacuum drying).
3 Vacuum drying on the outdoor unit's **internal** refrigerant piping is performed.

NOTICE

Before completely recharging, perform vacuum drying on the outdoor unit's **internal** refrigerant piping as well.

Typical workflow – Completely recharging refrigerant typically consists of the following stages:

1 Determining how much refrigerant to charge.
2 Charging refrigerant.
3 Filling in the fluorinated greenhouse gases label, and fixing it to the inside of the outdoor unit.

7.8.2 Precautions when charging refrigerant

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

7.8.3 To determine the additional refrigerant amount

If the total liquid piping length is…	Then…
≤10 m	Do NOT add additional refrigerant.
>10 m	R=(total length (m) of liquid piping–10 m)×0.020 R=Additional charge (kg)(rounded in units of 0.1 kg)

INFORMATION

Piping length is the one way length of liquid piping.

7.8.4 To determine the complete recharge amount

INFORMATION

If a complete recharge is necessary, the total refrigerant charge is: the factory refrigerant charge (see unit name plate) + the determined additional amount.

7.8.5 To charge refrigerant

WARNING

- Only use R410A as refrigerant. Other substances may cause explosions and accidents.
- R410A contains fluorinated greenhouse gases. Its global warming potential (GWP) value is 2087.5. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, always use protective gloves and safety glasses.

CAUTION

To avoid compressor breakdown, do NOT charge more than the specified amount of refrigerant.

Prerequisite: Before charging refrigerant, make sure the refrigerant piping is connected and checked (leak test and vacuum drying).

1 Connect the refrigerant cylinder to the service port.

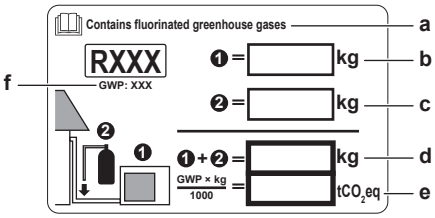
2 Charge the additional refrigerant amount.

3 Open the gas stop valve.

If pump down is needed in case of dismantling or relocating the system, see "13.2 To pump down" on page 83 for more details.

7.8.6 To fix the fluorinated greenhouse gases label

1 Fill in the label as follows:



a If a multilingual fluorinated greenhouse gases label is delivered with the unit (see accessories), peel off the applicable language and stick it on top of **a**.
b Factory refrigerant charge: see unit name plate
c Additional refrigerant amount charged
d Total refrigerant charge
e **Greenhouse gas emissions** of the total refrigerant charge expressed as tonnes CO_2-equivalent
f GWP = Global warming potential

NOTICE

In Europe, the **greenhouse gas emissions** of the total refrigerant charge in the system (expressed as tonnes CO_2-equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

Formula to calculate the greenhouse gas emissions: GWP value of the refrigerant × Total refrigerant charge [in kg] / 1000

2 Fix the label on the inside of the outdoor unit near the gas and liquid stop valves.

7.9 Connecting the water piping

7.9.1 About connecting the water piping

Before connecting the water piping

Make sure the outdoor and indoor unit are mounted. If applicable, also make sure the backup heater is mounted.

Typical workflow

Connecting the water piping typically consists of the following stages:

1 Connecting the water piping to the indoor unit.
2 Connecting the water piping to the backup heater (if applicable).
3 Filling the water circuit.
4 Filling the domestic hot water tank.
5 Insulating the water piping.

7.9.2 Precautions when connecting the water piping

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

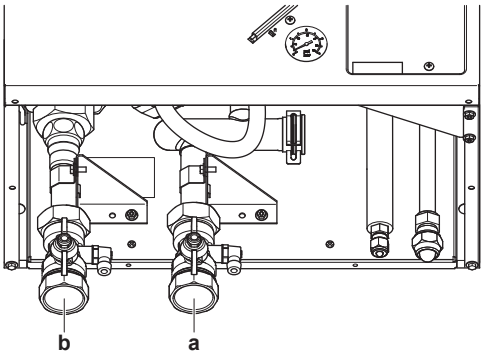
7.9.3 To connect the water piping

NOTICE

Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.

To facilitate service and maintenance, 2 shut-off valves are provided. Mount the valves on the water inlet and on the water outlet. Mind their position: the integrated drain valves will only drain the side of the circuit on which they are located. To be able to only drain the unit, make sure the drain valves are positioned between the shut-off valves and the unit.

1 Install the shut-off valves on the water pipes.



a Water inlet
b Water outlet

NOTICE

To avoid damage to the surroundings in case of water leakage, it is recommended to close the cold water inlet shut-off valves during periods of absence.

2 Screw the indoor unit nuts on the shut-off valves.

3 Connect the field piping on the shut-off valves.

4 In case of connection with the optional domestic hot water tank, see the installation manual of the domestic hot water tank.

NOTICE

Install air purge valves at all local high points.

NOTICE

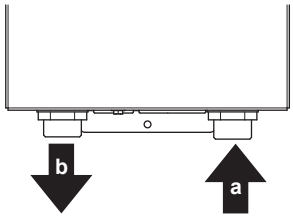
- A drain device and pressure relief device should be installed on the cold water inlet connection of the domestic hot water cylinder.
- To avoid back siphonage, it is recommended to install a non-return valve on the water inlet of the domestic hot water tank in accordance with the applicable legislation.
- It is recommended to install a pressure reducing valve on the cold water inlet in accordance with the applicable legislation.
- An expansion vessel should be installed on the cold water inlet in accordance with the applicable legislation.
- It is recommended to install the pressure relief valve on a higher position than the top of the domestic hot water tank. Heating of the domestic hot water tank causes water to expand and without pressure relief valve the water pressure inside the tank can rise above the tank design pressure. Also the field installation (piping, tapping points, etc.) connected to the tank is subjected to this high pressure. To prevent this, a pressure relieve valve needs to be installed. The overpressure prevention depends on the correct operation of the field installed pressure relief valve. If this is NOT working correctly, overpressure will deform the tank and water leakage may occur. To confirm good operation, regular maintenance is required.

7.9.4 To connect the water piping to the backup heater

NOTICE

Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit. Make sure that the tightening torque does NOT exceed 30 N•m.

1 Connect the water piping (field supply) to the water in- and outlet of the backup heater.



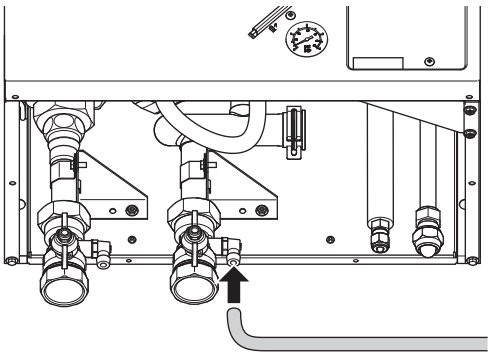
a Water inlet
b Water outlet

INFORMATION

Inside the backup heater, an automatic air purge valve is installed. For instructions on how to perform an air purge, refer to "9.4.2 Air purge function" on page 74.

7.9.5 To fill the water circuit

1 Connect the water supply hose to the drain and fill valve.



2 Open the drain and fill valve.
3 Make sure that the automatic air purge valve is open (at least 2 turns).
4 Fill the circuit with water until the manometer indicates a pressure of ±2.0 bar.
5 Purge as much air as possible from the water circuit. For instructions, see "9 Commissioning" on page 73.
6 Close the drain and fill valve.
7 Disconnect the water supply hose from the drain and fill valve.

NOTICE

The water pressure indicated on the manometer will vary depending on the water temperature (higher pressure at higher water temperature).

However, at all times water pressure shall remain above 1 bar to avoid air entering the circuit.

7.9.6 To fill the domestic hot water tank

For installation instructions, see the installation manual of the domestic hot water tank.

7.9.7 To insulate the water piping

The piping in the complete water circuit MUST be insulated to prevent condensation and reduction of the heating capacity.

If the temperature is higher than 30°C and the humidity is higher than RH 80%, the thickness of the insulation materials should be at least 20 mm to prevent condensation on the surface of the insulation.

7.10 Connecting the electrical wiring

7.10.1 About connecting the electrical wiring

Before connecting the electrical wiring

Make sure:

- The refrigerant piping is connected and checked
- The water piping is connected

Typical workflow

Connecting the electrical wiring typically consists of the following stages:

1 Making sure the power supply system complies with the electrical specifications of the heat pump.
2 Connecting the electrical wiring to the outdoor unit.
3 Connecting the electrical wiring to the indoor unit.
4 Connecting the main power supply.
5 Connecting the user interface.
6 Connecting the shut–off valves.
7 Connecting the electrical meters.
8 Connecting the domestic hot water pump.
9 Connecting the alarm output.
10 Connecting the space heating ON/OFF output.
11 Connecting the changeover to an external heat source.
12 Connecting the power consumption digital inputs.
13 Connecting the safety thermostat.
14 Connecting the backup heater (if applicable).

7.10.2 About electrical compliance

Only for indoor units

See "7.10.18 To connect the backup heater power supply" on page 47.

7.10.3 Precautions when connecting the electrical wiring

INFORMATION

Also read the precautions and requirements in the following chapters:

- General safety precautions
- Preparation

DANGER: RISK OF ELECTROCUTION

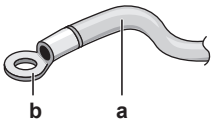
WARNING

ALWAYS use multicore cable for power supply cables.

7.10.4 Guidelines when connecting the electrical wiring

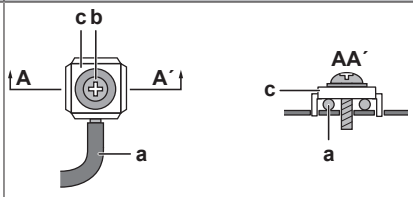
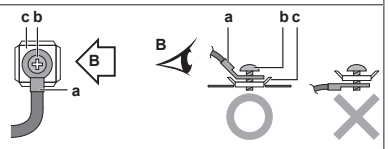
Keep the following in mind:

- If stranded conductor wires are being used, install a round crimp-style terminal on the tip. Place the round crimp-style terminal on the wire up to the covered part and fasten the terminal with the appropriate tool.



a Stranded conductor wire
b Round crimp-style terminal

- Use the following methods for installing wires:

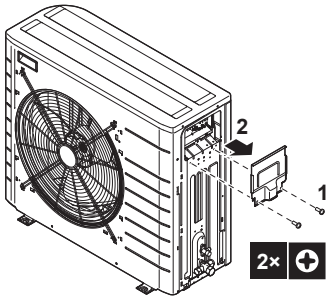
Wire type	Installation method
Single core wire	 **a** Curled single core wire **b** Screw **c** Flat washer
Stranded conductor wire with round crimp-style terminal	 **a** Terminal **b** Screw **c** Flat washer

Tightening torques

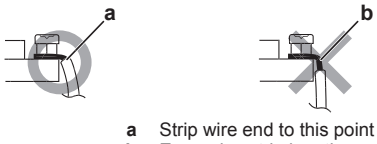
Item	Tightening torque (N•m)
M4 (X1M)	1.2~1.5
M4 (earth)	

7.10.5 To connect the electrical wiring on the outdoor unit

1 Remove the 2 switch box cover screws.
2 Remove the switch box cover.

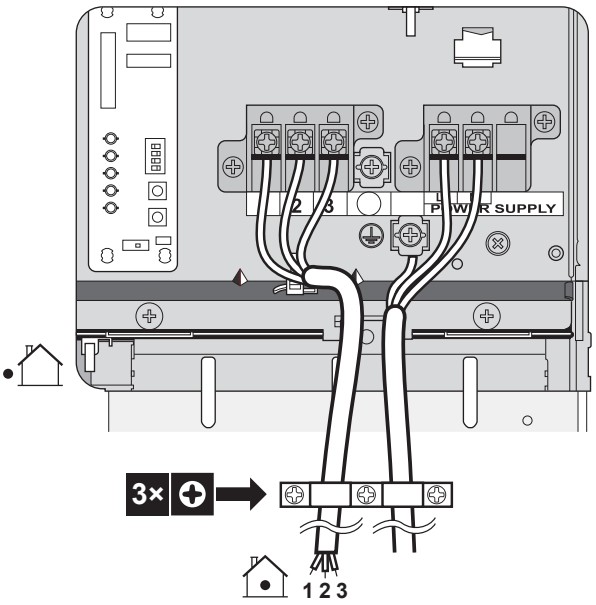


3 Strip insulation (20 mm) from the wires.



a Strip wire end to this point
b Excessive strip length may cause electrical shock or leakage.

4 Open the wire clamp.
5 Connect the interconnection cable and power supply as follows:



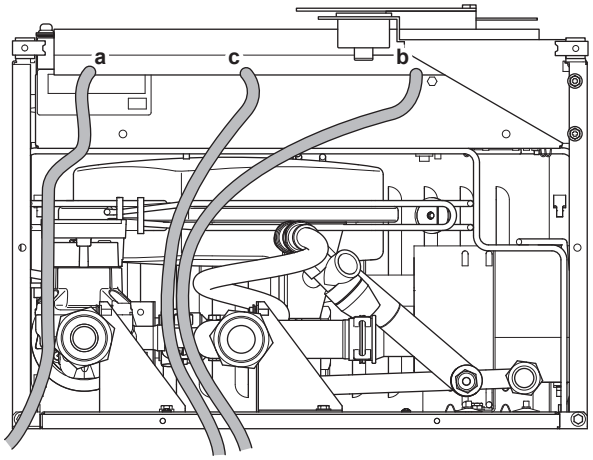
6 Install the switch box cover.

7.10.6 To connect the electrical wiring on the indoor unit

1 To open the indoor unit, see "7.2.3 To open the indoor unit" on page 30.

2 Wiring should enter the unit from the bottom.

3 Routing of the wiring inside the unit should be as follows:



INFORMATION

When installing field supply or option cables, foresee sufficient cable length. This will make it possible to remove/reposition the switch box and gain acces to other components during service.

Routing	Possible cables (depending on unit type and installed options)
a Low voltage	▪ Preferential power supply contact ▪ User interface ▪ Domestic hot water tank thermistor (option) ▪ Power consumption digital inputs (field supply) ▪ Outdoor ambient temperature sensor (option) ▪ Indoor ambient temperature sensor (option) ▪ Electrical meters (field supply) ▪ Safety thermostat (field supply)
b High voltage power supply	▪ Interconnection cable ▪ Normal kWh rate power supply ▪ Preferential kWh rate power supply ▪ Power supply for anti-legionella heater (to indoor unit) ▪ Power supply for anti-legionella heater and thermal protection (from indoor unit) ▪ Power supply for bottom plate heater (option)
c High voltage control signal	▪ Heat pump convector (option) ▪ Room thermostat (option) ▪ 3-way valve ▪ Shut-off valve (field supply) ▪ Domestic hot water pump (field supply) ▪ Alarm output ▪ Changeover to external heat source control ▪ Space heating operation control

4 Fix the cable with cable ties to the cable tie mountings to ensure strain relief and to make sure that it does NOT come in contact with the piping and sharp edges.

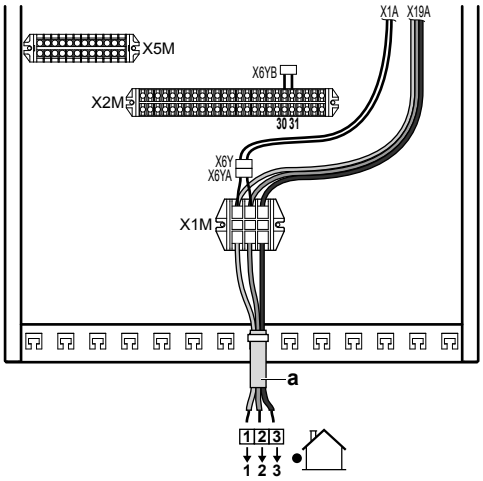
CAUTION

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

7.10.7 To connect the main power supply

1 Connect the main power supply.

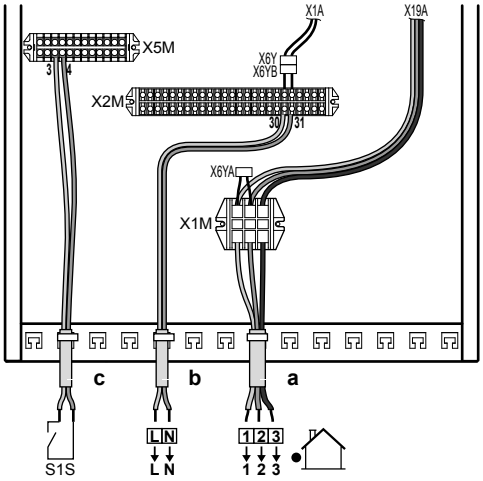
In case of normal kWh rate power supply



Legend: see illustration below.

In case of preferential kWh rate power supply

Connect X6Y to X6YB.



a Interconnection cable (=main power supply)
b Normal kWh rate power supply
c Preferential power supply contact

2 Fix the cable with cables ties to the cable tie mountings.

INFORMATION

In case of preferential kWh rate power supply, connect X6Y to X6YB. The necessity of separate normal kWh rate power supply to indoor unit (b) X2M30/31 depends on the type of preferential kWh rate power supply.

Separate connection to the indoor unit is required:

- if preferential kWh rate power supply is interrupted when active, OR
- if no power consumption of the indoor unit is allowed at the preferential kWh rate power supply when active.

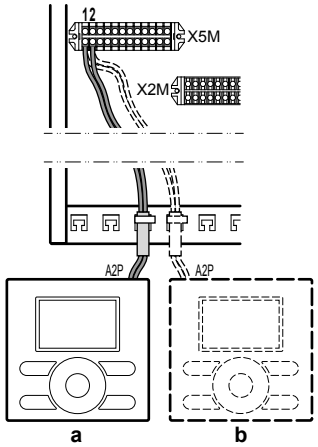
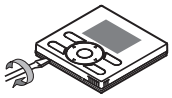
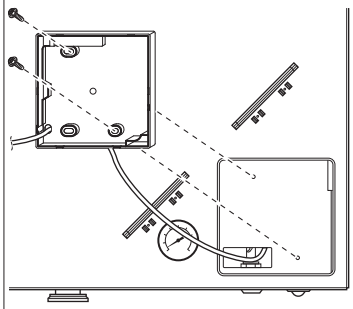
INFORMATION

The preferential kWh rate power supply contact is connected to the same terminals (X5M/3+4) as the safety thermostat. It is only possible for the system to have EITHER preferential kWh rate power supply OR a safety thermostat.

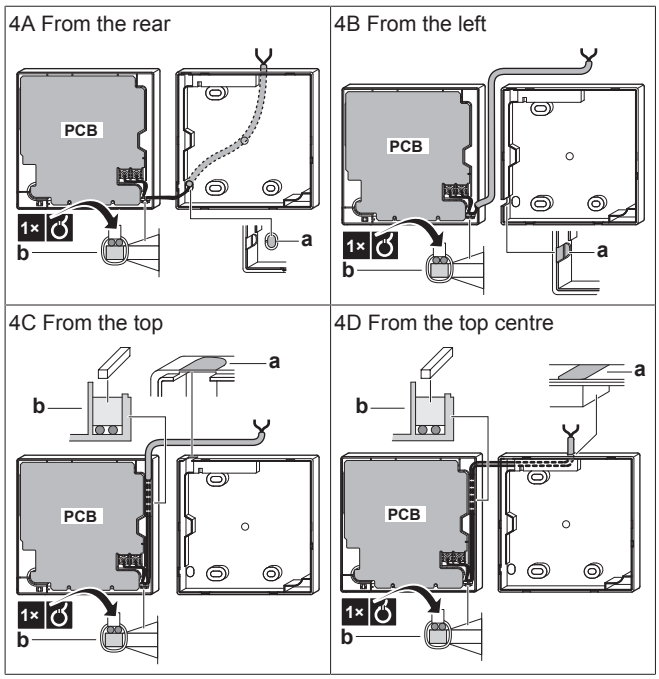
7.10.8 To connect the user interface

- If you use 1 user interface, you can install it at the indoor unit (for control close to the indoor unit), or in the room (when used as room thermostat).
- If you use 2 user interfaces, you can install 1 user interface at the indoor unit (for control close to the indoor unit) + 1 user interface in the room (used as room thermostat).

The procedure differs slightly depending on where you install the user interface.

#	At the indoor unit	In the room
1	Connect the user interface cable to the indoor unit. Fix the cable with cable ties to the cable tie mountings.  **a** Main user interface[a] **b** Optional user interface	
2	Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate. The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it. 	
3	Use the 2 screws in the accessory bag to fix the wallplate of the user interface to the sheet metal of the unit. Be careful NOT to distort the shape of the backside of the user interface by overtightening the mounting screws. 	Fix the wallplate of the user interface to the wall.
4	Connect as shown in 4A.	Connect as shown in 4A, 4B, 4C or 4D.
5	Reinstall the faceplate onto the wallplate. Be careful NOT to pinch the wiring when attaching the frontplate to the unit.	

(a) The main user interface is required for operation, but has to be ordered separately (mandatory option).



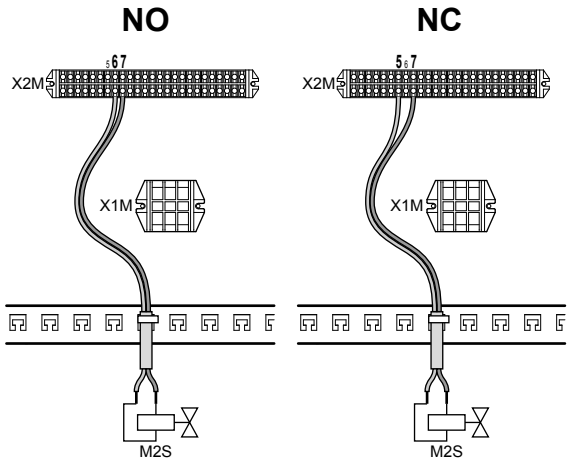
a Notch this part for the wiring to pass through with nippers etc.
b Secure the wiring to the front part of the casing using the wiring retainer and clamp.

7.10.9 To connect the shut-off valve

1 Connect the valve control cable to the appropriate terminals as shown in the illustration below.

NOTICE

Wiring is different for a NC (normal closed) valve and a NO (normal open) valve.



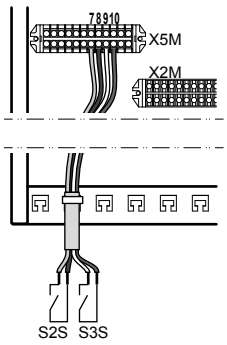
2 Fix the cable with cable ties to the cable tie mountings.

7.10.10 To connect the electrical meters

INFORMATION

In case of an electrical meter with transistor output, check the polarity. The positive polarity MUST be connected to X5M/7 and X5M/9; the negative polarity to X5M/8 and X5M/10.

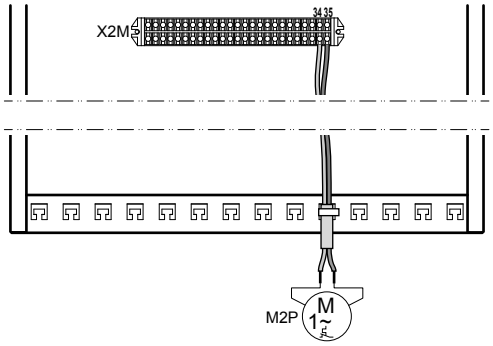
1 Connect the electrical meters cable to the appropriate terminals as shown in the illustration below.



2 Fix the cable with cable ties to the cable tie mountings.

7.10.11 To connect the domestic hot water pump

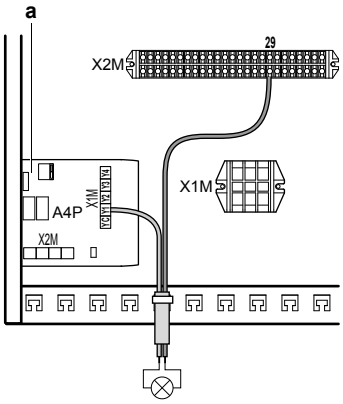
1 Connect the domestic hot water pump cable to the appropriate terminals as shown in the illustration below.



2 Fix the cable with cable ties to the cable tie mountings.

7.10.12 To connect the alarm output

1 Connect the alarm output cable to the appropriate terminals as shown in the illustration below.

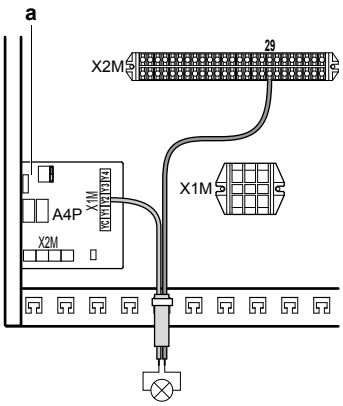


a Installation of EKRP1HB is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.10.13 To connect the space heating ON/OFF output

1 Connect the space heating ON/OFF output cable to the appropriate terminals as shown in the illustration below.

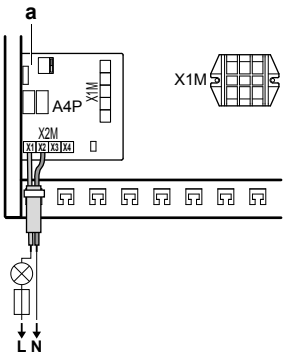


a Installation of EKRP1HB is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.10.14 To connect the changeover to external heat source

1 Connect the changeover to external heat source cable to the appropriate terminals as shown in the illustration below.

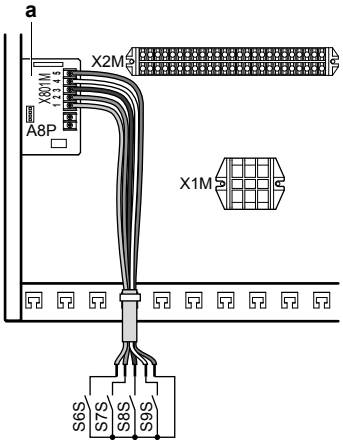


a Installation of EKRP1HB is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.10.15 To connect the power consumption digital inputs

1 Connect the power consumption digital inputs cable to the appropriate terminals as shown in the illustration below.

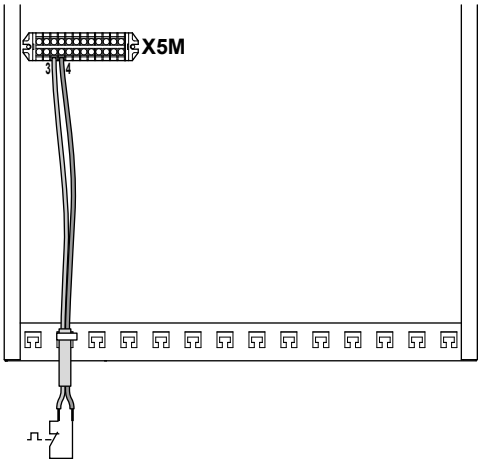


a Installation of EKRP1AHTA is required.

2 Fix the cable with cable ties to the cable tie mountings.

7.10.16 To connect the safety thermostat (normal closed contact)

1 Connect the safety thermostat (normal closed) cable to the appropriate terminals as shown in the illustration below.



2 Fix the cable with cable ties to the cable tie mountings.

INFORMATION

After it is installed, do NOT forget to configure the safety thermostat. Without configuration, the indoor unit will ignore the safety thermostat contact.

INFORMATION

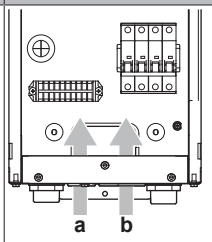
The preferential kWh rate power supply contact is connected to the same terminals (X5M/3+4) as the safety thermostat. It is only possible for the system to have EITHER preferential kWh rate power supply OR a safety thermostat.

7.10.17 To connect the electrical wiring on the backup heater

Routing	Cables
a Low voltage	Interconnection cable (backup heater thermistor)
b High voltage	▪ Backup heater power supply ▪ Interconnection cable (backup heater thermal protector + backup heater connection)

1 Insert the wiring from the bottom of the backup heater.

2 Inside the backup heater, route the wiring as follows:

Backup heater type	Routing
*6W	 **a** Low voltage wiring **b** High voltage wiring

3 Fix the wiring with cable ties to the cable tie mountings.

NOTICE

The distance between the high voltage and low voltage cables should be at least 50 mm.

7.10.18 To connect the backup heater power supply

CAUTION

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

WARNING

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

Depending on the model, the backup heater capacity can vary. Make sure that the power supply is in accordance with the backup heater capacity, as listed in the table below.

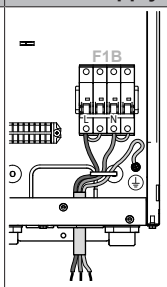
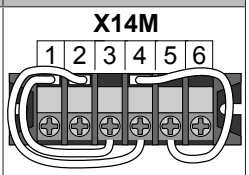
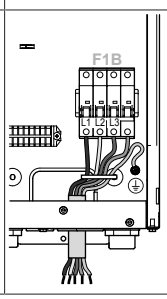
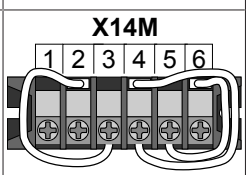
Backup heater type	Power supply	Backup heater capacity	Maximum running current	Z_{max}(Ω)
*6W	1~ 230 V	3 kW	13 A	—
		6 kW	26 A[(a)(b)]	—
	3N~ 400 V	3 kW	4.3 A	—
		6 kW	8.6 A	—

(a) Equipment complying with EN/IEC 61000-3-12 (European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.).

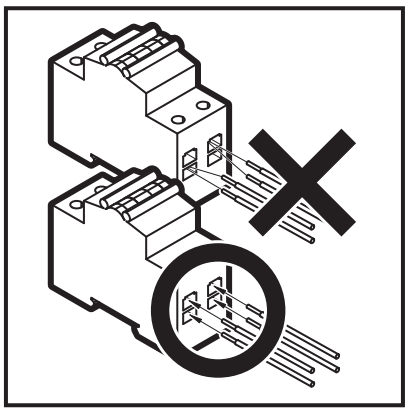
(b) This equipment complies with EN/IEC 61000-3-11 (European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤75 A) provided that the system impedance Z_{sys} is less than or equal to Z_{max} at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a system impedance Z_{sys} less than or equal to Z_{max}.

1 Connect the backup heater power supply. A 4-pole fuse is used for F1B.

2 If required, modify the connection on terminal X14M.

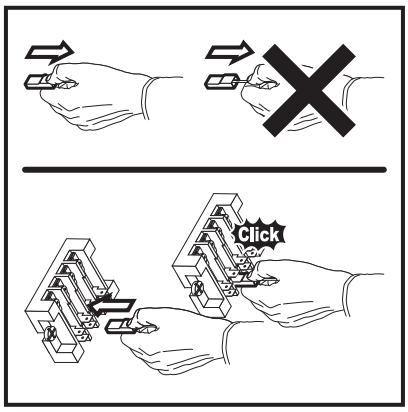
Backup heater type	Connections to backup heater power supply	Connections to terminals
3 kW 1~ 230 V (*6W) 6 kW 1~ 230 V (*6W)		
3 kW 3N~ 400 V (*6W) 6 kW 3N~ 400 V (*6W)		

Special remark for fuses:



Special remark for terminals:

As mentioned on the table above, the connections on the terminals X6M and X7M need to be changed to configure a backup heater. Refer to the illustration below as a caution about handling the terminals.



3 Fix the cable with cable ties to the cable tie mountings.

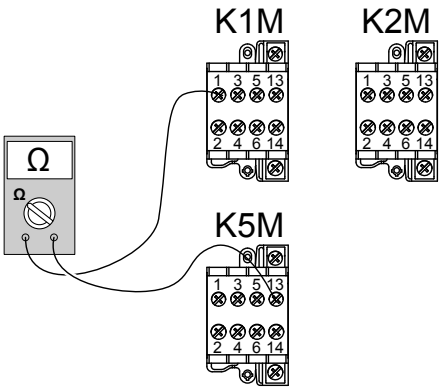
INFORMATION

For more information on the backup heater types, and for how to configure the backup heater, refer to the "Configuration" chapter of the installation manual of the indoor unit.

During connection of the backup heater, miswiring is possible. To detect possible miswiring, it is highly recommended to measure the resistance value of the heater elements. Depending on the different backup heater types, following resistance values (see table below) should be measured. ALWAYS measure the resistance on the contactor clamps K1M, K2M, and K5M.

		3/6 kW 1~ 230 V	3/6 kW 3N~ 400 V
K1M/1	K5M/13	52.9Ω	∞
	K1M/3	105.8Ω	105.8Ω
	K1M/5	158.7Ω	105.8Ω
K1M/3	K1M/5	52.9Ω	105.8Ω
K2M/1	K5M/13	26.5Ω	∞
	K2M/3	∞	52.9Ω
	K2M/5	∞	52.9Ω
K2M/3	K2M/5	52.9Ω	52.9Ω
K1M/5	K2M/1	132.3Ω	∞

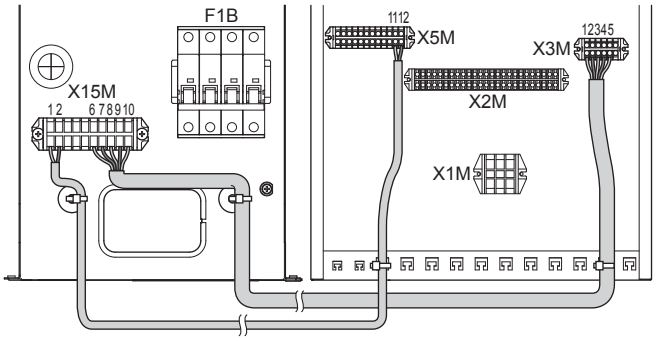
Example measure resistance between K1M/1 and K5M/13:



7.10.19 To connect the backup heater to the indoor unit

1 Connect backup heater terminals X15M/1+2 to indoor unit terminals X5M/11+12.

2 Connect backup heater terminals X15M/6+7+8+9+10 to indoor unit terminals X3M/1+2+3+4+5.



3 Fix the cable with cable ties to the cable tie mountings.

NOTICE

The distance between the high voltage and low voltage cables should be at least 50 mm.

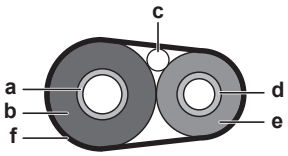
INFORMATION

- For details about the connections, refer to the wiring diagram.
- Use multi-core cables.

7.11 Finishing the outdoor unit installation

7.11.1 To finish the outdoor unit installation

1 Insulate and fix the refrigerant piping and interconnection cable as follows:



a Gas pipe
b Gas pipe insulation
c Interconnection cable
d Liquid pipe
e Liquid pipe insulation
f Finishing tape

2 Install the service cover.

7.11.2 To close the outdoor unit

1 Close the switch box cover.

2 Close the service cover.

NOTICE

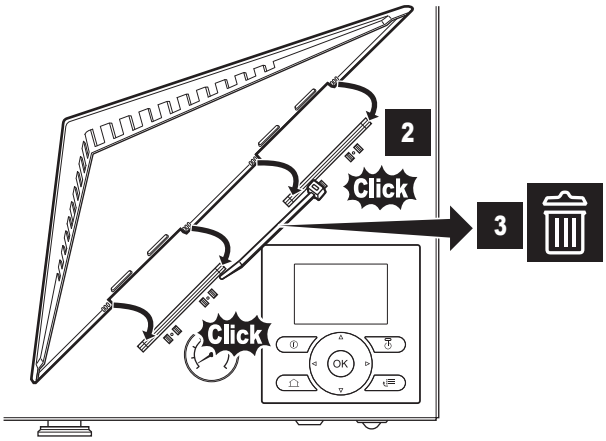
When closing the outdoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N•m.

7.12 Finishing the indoor unit installation

7.12.1 To fix the user interface cover to the indoor unit

1 Make sure that the front panel is removed from the indoor unit. See "7.2.3 To open the indoor unit" on page 30.

2 Plug the user interface cover into the hinges.



3 Mount the front panel to the indoor unit.

7.12.2 To close the indoor unit

1 Close the switch box cover.

2 Reinstall the front panel.

NOTICE

When closing the indoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N•m.

7.13 Finishing the backup heater installation

7.13.1 To close the backup heater

1 Close the switch box cover.

2 Close the front plate.

8 Configuration

8.1 Overview: Configuration

This chapter describes what you have to do and know to configure the system after it is installed.

Why

If you do NOT configure the system correctly, it might NOT work as expected. The configuration influences the following:

- The calculations of the software
- What you can see on and do with the user interface

How

You can configure the system using two different methods.

Method	Description
Configuring via the user interface	**First time – Quick wizard.** When you turn ON the user interface for the first time (via the indoor unit), a quick wizard starts to help you configure the system. **Afterwards.** If necessary, you can make changes to the configuration afterwards.
Configuring via the PC configurator	You can prepare the configuration off-site on PC and afterwards upload the configuration to the system with the PC configurator. See also: "8.1.1 To connect the PC cable to the switch box" on page 49.

INFORMATION

When the installer settings are changed, the user interface will request to confirm. When confirmed, the screen will shortly turn OFF and "busy" will be displayed for several seconds.

Accessing settings – Legend for tables

You can access the installer settings using two different methods. However, NOT all settings are accessible via both methods. If so, the corresponding table columns in this chapter are set to N/A (not applicable).

Method	Column in tables
Accessing settings via the breadcrumb in the **menu structure**.	**#**
Accessing settings via the code in the **overview settings**.	**Code**

See also:

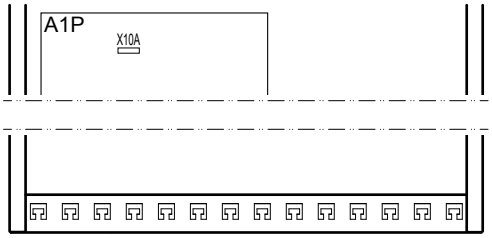
- "To access the installer settings" on page 49
- "8.5 Menu structure: Overview installer settings" on page 72

8.1.1 To connect the PC cable to the switch box

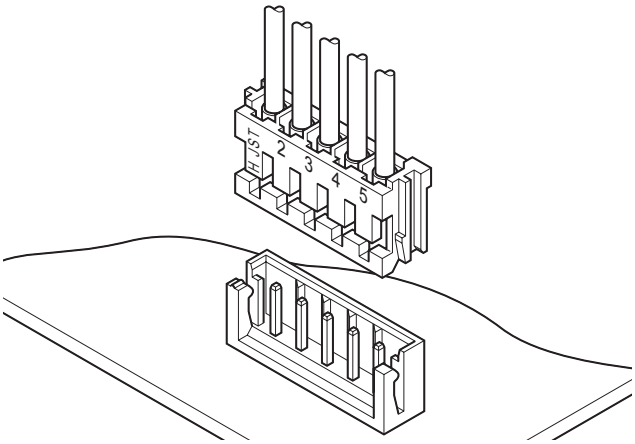
Prerequisite: The EKPCCAB kit is required.

1 Connect the cable with USB connection to your PC.

2 Connect the plug of the cable to X10A on A1P of the switch box of the indoor unit.



3 Pay special attention to the position of the plug!



NOTICE

Another cable is already connected to X10A. To connect the PC cable to X10A, therefore temporarily disconnect this other cable. Do NOT forget to reconnect it afterwards.

8.1.2 To access the most used commands

To access the installer settings

1 Set the user permission level to Installer.

2 Go to [A]: ☰ > Installer settings.

To access the overview settings

1 Set the user permission level to Installer.

2 Go to [A.8]: ☰ > Installer settings > Overview settings.

To set the user permission level to Installer

1 Set the user permission level to Adv. end user.

2 Go to [6.4]: ☰ > Information > User permission level.

3 Press ☰ for more than 4 seconds.

Result: 🔧 is displayed on the home pages.

4 If you do NOT press any button for more than 1 hour or press ⓘ again for more than 4 seconds, the installer permission level switches back to End user.

To set the user permission level to Advanced end user

1 Go to the main menu or any of its submenus: ☰.

2 Press ⓘ for more than 4 seconds.

Result: The user permission level switches to Adv. end user. Additional information is displayed and "+" is added to the menu title. The user permission level will stay in Adv. end user until set otherwise.

To set the user permission level to End user

1 Press ⓘ for more than 4 seconds.

Result: The user permission level switches to End user. The user interface will return to the default home screen.

To modify an overview setting

Example: Modify [1-01] from 15 to 20.

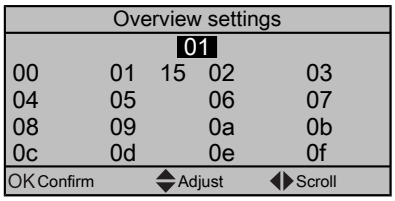
1 Go to [A.8]: ☰ > Installer settings > Overview settings.

2 Go to the corresponding screen of the first part of the setting by using the ▲ and ▼ button.

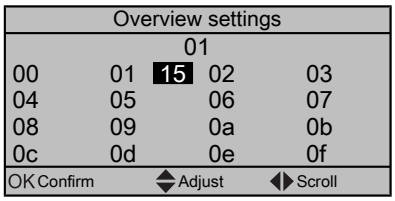
INFORMATION

An additional 0-digit is added to the first part of the setting when you access the codes in the overview settings.

Example: [1-01]: "1" will result in "**0**1".

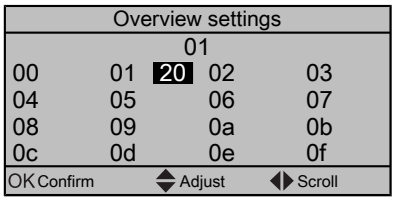


3 Go to the corresponding second part of the setting by using the ◀ and ▶ button.



Result: The value to be modified is now highlighted.

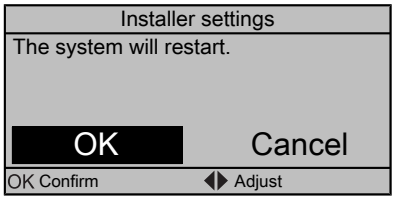
4 Modify the value by using the ▲ and ▼ button.



5 Repeat previous steps if you have to modify other settings.

6 Push OK to confirm the modification of the parameter.

7 At installer settings menu, press OK to confirm the settings.



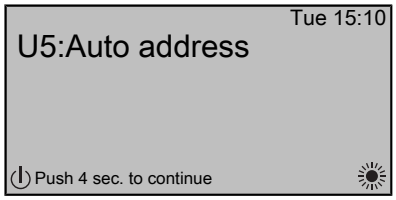
Result: The system will restart.

8.1.3 To copy the system settings from the first to the second user interface

If a second user interface is connected, the installer must first proceed below instructions for the proper configuration of the 2 user interfaces.

This procedure offers you also the possibility to copy the language set from one user interface to the other one: e.g. from EKRUCBL2 to EKRUCBL1.

1 When power is turned on for the first time, both user interfaces display:



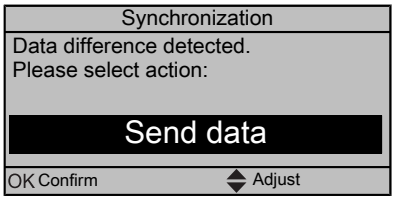
2 Push ⏻ for 4 seconds on the user interface on which you want to proceed to the quick wizard. This user interface is now the main user interface.

INFORMATION

During the quick wizard, the second user interface displays Busy and will NOT be possible to operate.

3 The quick wizard will guide you.

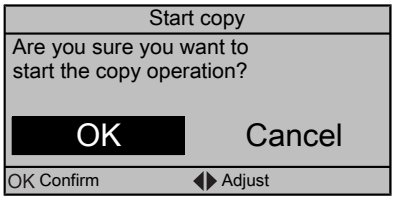
4 For proper operation of the system, the local data on the two user interfaces must be the same. If this is NOT the case, both user interfaces will display:



5 Select the required action:

- Send data: the user interface you are operating contains the correct data and the data on the other user interface will be overwritten.
- Receive data: the user interface you are operating does NOT contain the correct data and the data on the other user interface will be used to overwrite.

6 The user interface requests confirmation if you are sure to proceed.



7 Confirm the selection on the screen by pushing OK and all data (languages, schedules etc.) will be synchronised from the selected source user interface to the other one.

INFORMATION

- During the copying, both controllers will NOT allow operation.
- The copy operation can take up until 90 minutes.
- It is recommended to change installer settings, or the configuration of the unit, on the main user interface. If not, it can take up to 5 minutes before these changes are visible in the menu structure.

8 Your system is now set to be operated by the 2 user interfaces.

8.1.4 To copy the language set from the first to the second user interface

See "8.1.3 To copy the system settings from the first to the second user interface" on page 50.

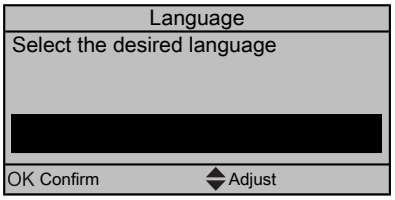
8.1.5 Quick wizard: Set the system layout after first power ON

After first power ON of the system, you are guided on the user interface to do initial settings:

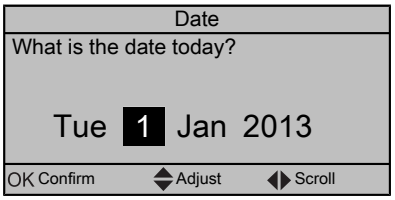
- language,
- date,
- time,
- system layout.

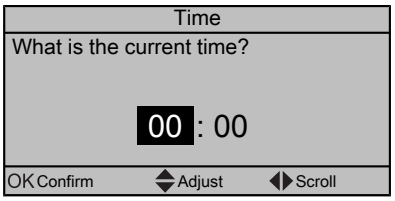
By confirming the system layout, you can proceed with the installation and commissioning of the system.

1 At power ON, the quick wizard starts as long as the system layout was NOT confirmed yet, by setting the language.

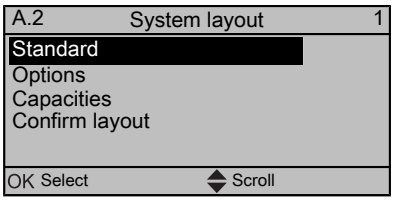


2 Set the current date and time.

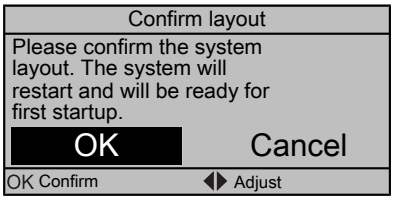




3 Set the system layout settings: Standard, Options, Capacities. For more details, see "8.2 Basic configuration" on page 51.



4 After configuration, select Confirm layout and press OK.



5 The user interface re-initialises and you can proceed the installation by setting the other applicable settings and commissioning of the system.

When the installer settings are changed, the system will request to confirm. When confirmation is complete, the screen will shortly turn OFF and "busy" will be displayed for several seconds.

8.2 Basic configuration

8.2.1 Quick wizard: Language / time and date

#	Code	Description
[A.1]	N/A	Language
[1]	N/A	Time and date

8.2.2 Quick wizard: Standard

Backup heater configuration

The optional backup heater is adapted to be connected to most common European electricity grids. Besides hardware configuration, the grid type and the relay setting must be set on the user interface.

#	Code	Description
[A.2.1.4]	[E-03]	Backup heater steps: ▪ 0 (default) ▪ 1 ▪ 2
[A.2.1.5]	[5-0D]	BUH type: ▪ 1 (1P,(1/1+2)): 6 kW 1~ 230 V (*6W) ▪ 4 (3PN,(1/2)): 6 kW 3N~ 400 V (*6W)

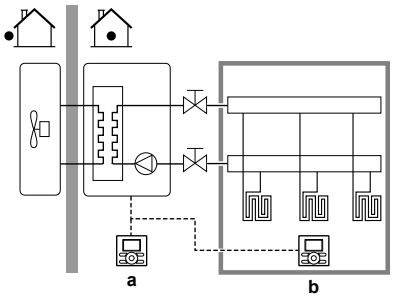
Relay setting

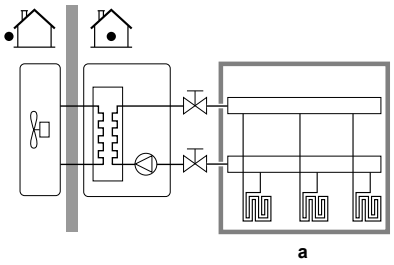
Relay setting	Backup heater operation	
	If backup heater step 1 is active:	If backup heater step 2 is active:
1/1+2	Relay 1 ON	Relays 1+2 ON
1/2	Relay 1 ON	Relay 2 ON

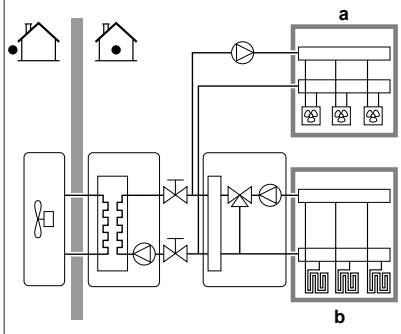
Space heating settings

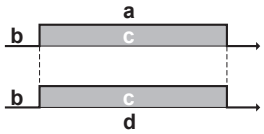
The system can heat up a space. Depending on the type of application, the space heating settings must be made accordingly.

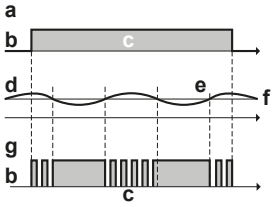
#	Code	Description
[A.2.1.7]	[C-07]	Unit control method: ▪ 0 (LWT control): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating demand of the room. ▪ 1 (Ext RT control): Unit operation is decided by the external thermostat or equivalent (e.g. heat pump convector). ▪ 2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.

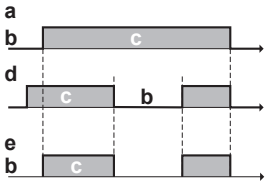
#	Code	Description
[A.2.1.B]	N/A	Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):  ▪ a: At unit ▪ b: In room as room thermostat User interface location: ▪ At unit: the other user interface is automatically set to In room and if RT control is selected act as room thermostat. ▪ In room (default): the other user interface is automatically set to At unit and if RT control is selected to act as room thermostat.

#	Code	Description
[A.2.1.8]	[7-02]	The system can supply leaving water to up to 2 water temperature zones. During configuration, the number of water zones must be set. Number of LWT zones: ▪ 0 (1 LWT zone)(default): Only 1 leaving water temperature zone. This zone is called the main leaving water temperature zone.  ▪ a: Main LWT zone continued >>

#	Code	Description
[A.2.1.8]	[7-02]	<< continuation ▪ 1 (2 LWT zones): 2 leaving water temperature zones. The zone with the lowest leaving water temperature (in heating) is called the main leaving water temperature zone. The zone with the highest leaving water temperature (in heating) is called the additional leaving water temperature zone. In practice, the main leaving water temperature zone consists of the higher load heat emitters and a mixing station is installed to achieve the desired leaving water temperature.  ▪ a: Add LWT zone ▪ b: Main LWT zone

#	Code	Description
[A.2.1.9]	[F-0D]	When the space heating control is OFF by the user interface, the pump is always OFF. When the space heating control is On, you can select the desired pump operation mode (only applicable during space heating) Pump operation mode: ▪ 0 (Continuous): Continuous pump operation, regardless of thermo ON or OFF condition. **Remark:** continuous pump operation requires more energy than sample or request pump operation.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: On ▪ d: Pump operation continued >>

#	Code	Description
[A.2.1.9]	[F-0D]	<< continuation ▪ 1 (Sample)(default): The pump is ON when there is heating demand and the leaving water temperature has NOT reached the desired temperature yet. When thermo OFF condition occurs, the pump runs every 5 minutes to check the water temperature and demand heating if necessary. **Remark:** Sample is NOT available in external room thermostat control or room thermostat control.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: On ▪ d: LWT temperature ▪ e: Actual ▪ f: Desired ▪ g: Pump operation continued >>

#	Code	Description
[A.2.1.9]	[F-0D]	<< continuation ▪ 2 (Request): Pump operation based on request. **Example:** Using a room thermostat creates thermo ON/OFF condition. When there is no such demand, the pump is OFF. **Remark:** Request is NOT available in leaving water temperature control.  ▪ a: Space heating control (user interface) ▪ b: OFF ▪ c: On ▪ d: Heating demand (by ext RT or RT) ▪ e: Pump operation

8.2.3 Quick wizard: Options

Domestic hot water settings

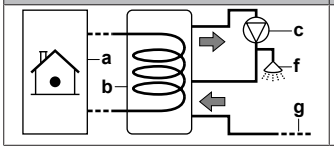
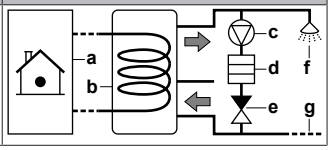
This chapter only applies if the optional domestic hot water tank is installed.

INFORMATION

- If there is no optional backup heater installed, you must install a domestic hot water tank ([E-05]=1). Otherwise an error code (UA-17) will occur.
- If domestic hot water tank EKHWS, EKHWE or EKHWET is installed ([E-07]=0), you must install a domestic hot water pump ([D-02]=3 or 4).

Following settings must be made accordingly.

#	Code	Description
[A.2.2.1]	[E-05]	DHW operation: Can the system prepare domestic hot water? ▪ 0 (No)(default): NOT installed. ▪ 1 (Yes): Installed.
[A.2.2.3]	[E-07]	During domestic hot water preparation, the heat pump can be assisted by an electrical heater to ensure the domestic hot water preparation even for high desired tank temperatures. DHW tank type: ▪ 0 (Type 1)(default): Tank with anti-legionella heater installed at the side of the tank. ▪ 5 (Type 6): Tank with anti-legionella heater installed at the top of the tank. Range: 0~6. However, values 1~4 and 6 are not applicable for this setting. If the setting is set to 6, an error code will appear and the system will NOT operate.
[A.2.2.A]	[D-02]	The indoor unit offers the possibility to connect a field supplied domestic hot water pump (On/OFF type). Depending on the installation and configuration on the user interface, we distinguish its functionality. DHW pump: ▪ 0 (No)(default): NOT installed. ▪ 1 (Secondary rtrn): Installed for instant hot water when water is tapped. The end-user sets the operation timing (weekly schedule time) of the domestic hot water pump when it should run. Control of this pump is possible through the indoor unit. ▪ 2 (Disinf. shunt): Installed for disinfection. It runs when the disinfection function of the domestic hot water tank is running. No further settings are needed. ▪ 3 (Circul. Pump): Installed for tank preheating. Necessary for EHBH_CBV without backup heater. It runs when the domestic hot water tank is being preheated. No further settings are needed. ▪ 4 (CP & disinf. Sh): Combination of 2 and 3. It runs when the disinfection function of the domestic hot water tank is running, or when the domestic hot water tank is being preheated. No further settings are needed. See also illustrations below.

Domestic hot water pump installed for…	
Instant hot water	Disinfection/Tank preheating
	

a Indoor unit
b Tank
c Domestic hot water pump (field supply)
d Heater element (field supply)
e Non-return valve (field supply)
f Shower (field supply)
g Cold water

Thermostats and external sensors

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 the leaving water temperature control on the unit's user interface is turned ON.

See "5 Application guidelines" on page 12.

#	Code	Description
[A.2.2.4]	[C-05]	Contact type main In external room thermostat control, the contact type of the optional room thermostat or heat pump convector for the main leaving water temperature zone must be set. See "5 Application guidelines" on page 12. ▪ 1 (Thermo ON/OFF): The connected external room thermostat or heat pump convector sends the heating demand to the indoor unit (X2M/1). Select this value in case of a connection to the heat pump convector (FWXV). ▪ 2 (H/C request)(default): The connected external room thermostat sends a heating demand and is connected to the digital input (preserved for the main leaving water temperature zone) on the indoor unit (X2M/1). Select this value in case of connection with the wired (EKRTWA) or wireless (EKRTR1) room thermostat.
[A.2.2.5]	[C-06]	Contact type add. In external room thermostat control with 2 leaving water temperature zones, the type of the optional room thermostat for the additional leaving water temperature zone must be set. See "5 Application guidelines" on page 12. ▪ 1 (Thermo ON/OFF): See Contact type main. Connected on the indoor unit (X2M/1a). ▪ 2 (H/C request)(default): See Contact type main. Connected on the indoor unit (X2M/1a).
[A.2.2.B]	[C-08]	External sensor When an optional external ambient sensor is connected, the type of the sensor must be set. See "5 Application guidelines" on page 12. ▪ 0 (No)(default): NOT installed. The thermistor in the user interface and in the outdoor unit are used for measurement. ▪ 1 (Outdoor sensor): Installed. The outdoor sensor will be used to measure the outdoor ambient temperature. **Remark:** For some functionality, the temperature sensor in the outdoor unit is still used. ▪ 2 (Room sensor): Installed. The temperature sensor in the user interface is NOT used anymore. **Remark:** This value has only meaning in room thermostat control.

Digital I/O PCB

Modification of these settings is only needed when the optional digital I/O PCB is installed. The digital I/O PCB has multiple functionality which need to be configured. See "5 Application guidelines" on page 12.

#	Code	Description
[A.2.2.6.1]	[C-02]	Ext. backup heat src Indicates if the space heating is also performed by means of another heat source than the system. ▪ 0 (No)(default): NOT installed. ▪ 1 (Bivalent): Installed. The auxiliary boiler (gasboiler, oil burner) will operate when the outdoor ambient temperature is low. During the bivalent operation, the heat pump is turned OFF. Set this value in case an auxililary boiler is used. See "5 Application guidelines" on page 12.
[A.2.2.6.2]	[D-07]	Solar kit Only applicable for EHBH. Indicates if the domestic hot water tank is also heated by thermal solar panels. ▪ 0 (No)(default): NOT installed. ▪ 1 (Yes): Installed. The domestic hot water tank can –besides by the heat pump– also be heated by thermal solar panels. Set this value if thermal solar panels are installed. See "5 Application guidelines" on page 12.

#	Code	Description
[A.2.2.6.3]	[C-09]	Alarm output Indicates the logic of the alarm output on the digital I/O PCB during malfunctioning. ▪ 0 (Normally open)(default): The alarm output will be powered when an alarm occurs. By setting this value, a distinction is made between malfunctioning and detection of a power failure of the unit. ▪ 1 (Normally closed): The alarm output will NOT be powered when an alarm occurs. This installer setting allows for a distinction between the detection of an alarm, and the detection of a power failure. Also see the table below (Alarm output logic).
[A.2.2.6.4]	[F-04]	Bottom plate heater Only applicable for EHBH11+16. Indicates if an optional bottom plate heater is installed on the outdoor unit. The power of the bottom plate heater is in this case supplied by the indoor unit. ▪ 0 (No)(default): NOT installed. ▪ 1 (Yes): Installed. **Remark:** If this value is set, the output on the digital I/O PCB cannot be used for space heating output. See "5 Application guidelines" on page 12.

Alarm output logic

[C-09]	Alarm	No alarm	No power supply to unit
0 (default)	Closed output	Open output	Open output
1	Open output	Closed output	

Demand PCB

The demand PCB is used to enable the power consumption control by digital inputs. See "5 Application guidelines" on page 12.

#	Code	Description
[A.2.2.7]	[D-04]	Demand PCB Only applicable for EHBH04+08. Indicates if the optional demand PCB is installed. ▪ 0 (No)(default) ▪ 1 (Pwr consmp ctrl)

Energy metering

When energy metering is performed by the use of external power meters, configure the settings as described below. Select the pulse frequency output of each power meter in accordance with the power meter specifications. It is possible to connect (up to 2) power meters with different pulse frequencies. When only 1 or no power meter is used, select No to indicate the corresponding pulse input is NOT used.

#	Code	Description
[A.2.2.8]	[D-08]	Optional external kWh meter 1: ▪ 0 (No): NOT installed ▪ 1: Installed (0.1 pulse/kWh) ▪ 2: Installed (1 pulse/kWh) ▪ 3: Installed (10 pulse/kWh) ▪ 4: Installed (100 pulse/kWh) ▪ 5: Installed (1000 pulse/kWh)
[A.2.2.9]	[D-09]	Optional external kWh meter 2: ▪ 0 (No): NOT installed ▪ 1: Installed (0.1 pulse/kWh) ▪ 2: Installed (1 pulse/kWh) ▪ 3: Installed (10 pulse/kWh) ▪ 4: Installed (100 pulse/kWh) ▪ 5: Installed (1000 pulse/kWh)

8.2.4 Quick wizard: Capacities (energy metering)

The capacities of all electrical heaters must be set for the energy metering and/or power consumption control feature to work properly. When measuring the resistance value of each heater, you can set the exact heater capacity and this will lead to more accurate energy data.

#	Code	Description
[A.2.3.1]	[6-02]	Anti-legionella heater: Only applies to domestic hot water tanks with an internal anti-legionella heater (EKHW). The capacity of the anti-legionella heater at nominal voltage. Default: 3 kW. Range: 0~10 kW (in steps of 0.2 kW)
[A.2.3.2]	[6-03]	BUH: step 1: The capacity of the first step of the backup heater at nominal voltage. Default: 3 kW. Range: 0~10 kW (in steps of 0.2 kW)
[A.2.3.3]	[6-04]	BUH: step 2: The capacity difference between the second and first step of the backup heater at nominal voltage. Default: 3 kW. Range: 0~10 kW (in steps of 0.2 kW)
[A.2.3.6]	[6-07]	Bottom plate heater: Only applies to an optional bottom plate heater (EKBPHTH16A). The capacity of the optional bottom plate heater at nominal voltage. Default: 0 W. Range: 0~200 W (in steps of 10 W)

8.2.5 Space heating control

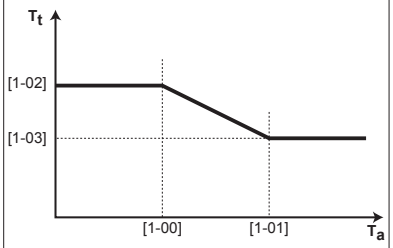
The basic required settings in order to configure the space heating of your system are described in this chapter. The weather-dependent installer settings define the parameters for the weather-dependent operation of the unit. When weather-dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature. Low outdoor temperatures will result in warmer water and vice versa. During weather-dependent operation, the user has the possibility to shift up or down the target water temperature by a maximum of 5°C.

See the user reference guide and/or operation manual for more details about this function.

Leaving water temperature: Main zone

#	Code	Description
[A.3.1.1.1]	N/A	LWT setpoint mode: ▪ Fixed The desired leaving water temperature is: ▪ NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ Weather dep. (default): The desired leaving water temperature is: ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) continued >>

#	Code	Description
[A.3.1.1.1]	N/A	<< continuation ▪ Fixed/scheduled: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e., does NOT depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired shift actions, either preset or custom. **Remark:** This value can only be set in leaving water temperature control. ▪ WD/scheduled: The desired leaving water temperature is: ▪ weather-dependent (i.e., does depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions consists of desired leaving water temperatures either preset or custom. **Remark:** This value can only be set in leaving water temperature control.

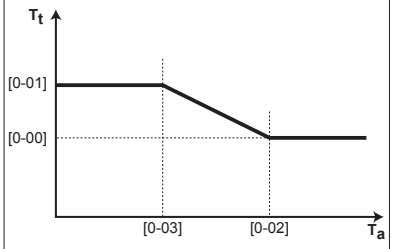
#	Code	Description
[7.7.1.1]	[1-00] [1-01] [1-02] [1-03]	Set weather-dependent heating:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>

#	Code	Description
[7.7.1.1]	[1-00] [1-01] [1-02] [1-03]	<< continuation ▪ [1-00]: Low outdoor ambient temperature. –40°C~+5°C (default: –10°C) ▪ [1-01]: High outdoor ambient temperature. 10°C~25°C (default: 15°C) ▪ [1-02]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. [9-01]°C~[9-00]°C (default: 35°C). **Note:** This value should be higher than [1-03] as for low outdoor temperatures warmer water is required. ▪ [1-03]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. [9-01]°C~min(45, [9-00])°C (default: 25°C). **Note:** This value should be lower than [1-02] as for high outdoor temperatures less warm water is required.

Leaving water temperature: Additional zone

Only applicable if 2 leaving water temperature zones are present.

#	Code	Description
[A.3.1.2.1]	N/A	LWT setpoint mode: ▪ Fixed: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e. does NOT depend on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ Weather dep. (default): The desired leaving water temperature is: ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., NOT scheduled) ▪ Fixed/scheduled: The desired leaving water temperature is: ▪ NOT weather-dependent (i.e., does NOT depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions are On or OFF. **Remark:** This value can only be set in leaving water temperature control. ▪ WD/scheduled: The desired leaving water temperature is: ▪ weather-dependent (i.e., does depend on the outdoor ambient temperature) ▪ according a schedule. The scheduled actions are On or OFF. **Remark:** This value can only be set in leaving water temperature control.

#	Code	Description
[7.7.2.1]	[0-00] [0-01] [0-02] [0-03]	Set weather-dependent heating:  ▪ T_t: Target leaving water temperature (additional) ▪ T_a: Outdoor temperature continued >>

#	Code	Description
[7.7.2.1]	[0-00] [0-01] [0-02] [0-03]	<< continuation ▪ [0-03]: Low outdoor ambient temperature. –40°C~+5°C (default: –10°C) ▪ [0-02]: High outdoor ambient temperature. 10°C~25°C (default: 15°C) ▪ [0-01]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. [9-05]°C~[9-06]°C (default: 45°C). **Note:** This value should be higher than [0-00] as for low outdoor temperatures warmer water is required. ▪ [0-00]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. [9-05]°C~min(45, [9-06])°C (default: 35°C). **Note:** This value should be lower than [0-01] as for high outdoor temperatures less warm water is required.

Leaving water temperature: Delta T source

Temperature difference for entering and leaving water. The unit is designed to support under floor loops operation. The recommended leaving water temperature (set by the user interface) for under floor loops is 35°C. In such case, the unit will be controlled to realize a temperature difference of 5°C which means that the entering water to the unit is around 30°C. Depending on the installed application (radiators, heat pump convector, under floor loops) or situation, it can be possible to change the difference between entering and leaving water temperature. Note that the pump will regulate its flow to keep the Δt.

#	Code	Description
[A.3.1.3.1]	[9-09]	Heating: required temperature difference between entering and leaving water. Range: 3°C~10°C (in steps of 1°C; default value: 5°C).

Leaving water temperature: Modulation

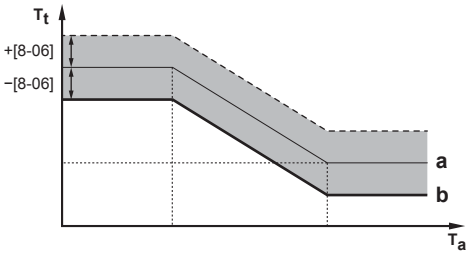
Only applicable in case of room thermostat control. When using the room thermostat functionality, the customer needs to set the desired room temperature. The unit will supply hot water to the heat emitters and the room will be heated. Additionally, also the desired leaving water temperature must be configured: when turning on the modulation, the desired leaving water temperature will be calculated automatically by the unit (based on the preset temperatures, if weather-dependent is selected, modulation will be done based on the desired weather-dependent temperatures); when turning off the modulation, you can set the desired leaving water temperature on the user interface. Moreover, with the modulation turned on, the desired leaving water temperature is lowered or raised in function of the desired room temperature and the difference between the actual and the desired room temperature. This results in:

- stable room temperatures exactly matching the desired temperature (higher comfort level)
- less On/OFF cycles (lower noise level, higher comfort and higher efficiency)
- water temperatures as low as possible to match the desired temperature (higher efficiency)

#	Code	Description
[A.3.1.1.5]	[8-05]	Modulated LWT: ▪ No (default): disabled. **Note:** The desired leaving water temperature needs to be set on the user interface. ▪ Yes: enabled. The leaving water temperature is calculated according to the difference between the desired and the actual room temperature. This creates a better match between the capacity of the heat pump and the actual required capacity, and results in less start/stop cycles and a more economic operation. **Note:** The desired leaving water temperature can only be read out on the user interface
N/A	[8-06]	Leaving water temperature maximum modulation: 0°C~10°C (default: 3°C) Requires modulation to be enabled. This is the value by which the desired leaving water temperature is increased or lowered.

INFORMATION

When leaving water temperature modulation is enabled, the weather-dependent curve needs to be set to a higher position than [8-06] plus the minimum leaving water temperature setpoint required to reach a stable condition on the comfort setpoint for the room. To increase efficiency, modulation can lower the leaving water setpoint. By setting the weather-dependent curve to a higher position, it cannot drop below the minimum setpoint. Refer to the illustration below.



a Weather-dependent curve
b Minimum leaving water temperature setpoint required to reach a stable condition on the comfort setpoint for the room.

Leaving water temperature: Emitter type

Only applicable in case of room thermostat control. Depending on the system water volume and the heat emitters type, the heat up of a space can take longer. This setting can compensate for a slow or a quick heating system during the heat up cycle.

Note: The setting of the emitter type will influence the maximum modulation of the desired leaving water temperature.

Therefore it is important to set this correctly.

#	Code	Description
[A.3.1.1.7]	[9-0B]	Emitter type: Reaction time of the system: ▪ Quick **Example:** Small water volume and fan coils. ▪ Slow **Example:** Large water volume, floor heating loops.

8.2.6 Domestic hot water control

Only applicable in case an optional domestic hot water tank is installed.

Configuring the desired tank temperature

The domestic hot water can be prepared in 3 different ways. They differ from each other by the way the desired tank temperature is set and how the unit acts upon it.

#	Code	Description
[A.4.1]	[6-0D]	Domestic hot water Type: ▪ 0 (Reheat only): Only reheat operation is allowed. ▪ 1 (Reheat + sched.): The domestic hot water tank is heated according to a schedule and between the scheduled heatup cycles, reheat operation is allowed. ▪ 2 (Scheduled only): The domestic hot water tank can ONLY be heated according to a schedule.

See "8.3.2 Domestic hot water control: advanced" on page 62 for more details.

INFORMATION

There is a risk of space heating capacity shortage/comfort problem (in case of frequent domestic hot water operation, frequent and long space heating interruption will happen) when selecting [6-0D]=0 ([A.4.1] Domestic hot water Type=Reheat only).

Maximum DHW temperature setpoint

The maximum temperature that users can select for the domestic hot water. You can use this setting to limit the temperatures at the hot water taps.

INFORMATION

During disinfection of the domestic hot water tank, the DHW temperature can exceed this maximum temperature.

INFORMATION

Limit the maximum hot water temperature according to the applicable legislation.

#	Code	Description
[A.4.5]	[6-0E]	Maximum setpoint The maximum temperature that users can select for the domestic hot water. You can use this setting to limit the temperature at the hot water taps. Range: 40°C~80°C (default: 60°C). The maximum temperature is NOT applicable during disinfection function. See disinfection function.

8.2.7 Contact/helpdesk number

#	Code	Description
[6.3.2]	N/A	Number that users can call in case of problems.

8.3 Advanced configuration/ optimization

8.3.1 Space heating operation: advanced

Preset leaving water temperature

You can define preset leaving water temperatures:

- economic (denotes the desired leaving water temperature which results in the lowest energy consumption)
- comfort (denotes the desired leaving water temperature which results in the highest energy consumption).

Preset values make it easy to use the same value in the schedule or to adjust the desired leaving water temperature according to the room temperature (see modulation). If you later want to change the value, you ONLY have to do it in one place. Depending on whether the desired leaving water temperature is weather dependent or NOT, the desired shift values or the absolute desired leaving water temperature should be specified.

NOTICE

The preset leaving water temperatures are ONLY applicable for the main zone, as the schedule for the additional zone consists of On/OFF actions.

NOTICE

Select preset leaving water temperatures in accordance with the design and selected heat emitters to ensure the balance between desired room and leaving water temperatures.

#	Code	Description
Preset leaving water temperature for the main leaving water temperature zone in case of NOT weather dependent		
[7.4.2.1]	[8-09]	Comfort (heating) [9-01]°C~[9-00]°C (default: 35°C)
[7.4.2.2]	[8-0A]	Eco (heating) [9-01]°C~[9-00]°C (default: 33°C)
Preset leaving water temperature (shift value) for the main leaving water temperature zone in case of weather dependent		
[7.4.2.5]	N/A	Comfort (heating) –10°C~+10°C (default: 0°C)
[7.4.2.6]	N/A	Eco (heating) –10°C~+10°C (default: –2°C)

Temperature ranges (leaving water temperatures)

The purpose of this setting is to prevent selecting a wrong (i.e. too hot) leaving water temperature. Therefore the available desired heating temperature range can be configured.

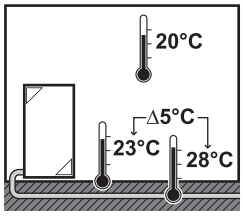
NOTICE

In case of a floor heating application it is important to limit the maximum leaving water temperature at heating operation according to the specifications of the floor heating installation.

NOTICE

- When adjusting the leaving water temperature ranges, all desired leaving water temperatures are also adjusted to guarantee they are between the limits.
- Always balance between the desired leaving water temperature with the desired room temperature and/or the capacity (according to the design and selection of the heat emitters). The desired leaving water temperature is the result of several settings (preset values, shift values, weather dependent curves, modulation). As a result, too high or too low leaving water temperatures could occur which lead to overtemperatures or capacity shortage. By limiting the leaving water temperature range to adequate values (depending on the heat emitter), such situations can be avoided.

Example: Set the minimum leaving water temperature to 28°C to avoid NOT to be able to heat up the room: leaving water temperatures MUST be sufficiently higher than the room temperatures (in heating).



#	Code	Description
Leaving water temperature range for the main leaving water temperature zone (= the leaving water temperature zone with the lowest leaving water temperature in heating operation)		
[A.3.1.1.2.2]	[9-00]	Maximum temp (heating) 37°C~depending on outdoor unit (default: 55°C)
[A.3.1.1.2.1]	[9-01]	Minimum temp (heating) 15°C~37°C (default: 25°C)
Leaving water temperature range for the additional leaving water temperature zone (= the leaving water temperature zone with the highest leaving water temperature in heating operation)		
[A.3.1.2.2.2]	[9-06]	Maximum temp (heating) 37°C~depending on outdoor unit (default: 55°C)
[A.3.1.2.2.1]	[9-05]	Minimum temp (heating) 15°C~37°C (default: 25°C)

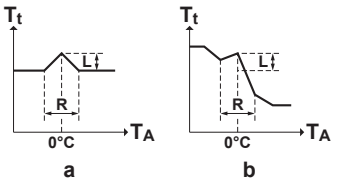
Leaving water temperature overshoot temperature

This function defines how much the water temperature may rise above the desired leaving water temperature before the compressor stops. The compressor will startup again when the leaving water temperature drops below the desired leaving water temperature. This function is ONLY applicable in heating mode.

#	Code	Description
N/A	[9-04]	1°C~4°C (default: 1°C)

Leaving water temperature compensation around 0°C

In heating operation, the desired leaving water temperature is locally increased around an outdoor temperature of 0°C. This compensation can be selected when using an absolute or a weather dependent desired temperature (see illustration below). Use this setting to compensate for possible heat losses of the building due to the evaporation of melted ice or snow (e.g. in cold region countries).



a Absolute desired LWT
b Weather dependent desired LWT

#	Code	Description
N/A	[D-03]	▪ 0 (disabled) (default) ▪ 1 (enabled) L=2°C, R=4°C (−2°C<T_A<2°C) ▪ 2 (enabled) L=4°C, R=4°C (−2°C<T_A<2°C) ▪ 3 (enabled) L=2°C, R=8°C (−4°C<T_A<4°C) ▪ 4 (enabled) L=4°C, R=8°C (−4°C<T_A<4°C)

Leaving water temperature maximum modulation

ONLY applicable in room thermostat control and when modulation is enabled. The maximum modulation (=variance) on the desired leaving water temperature decided on the difference between the actual and desired room temperature, e.g. 3°C modulation means the desired leaving water temperature can be increased or lowered by 3°C. Increasing the modulation results in better performance (less On/OFF, faster heat up), but note that depending on the heat emitter, there MUST ALWAYS be a balance (refer to the design and selection of the heat emitters) between the desired leaving water temperature and the desired room temperature.

#	Code	Description
N/A	[8-06]	0°C~10°C (default: 3°C)

Temperature ranges (room temperature)

ONLY applicable in room thermostat control. In order to save energy by preventing overheating the room, you can limit the range of the room temperature.

NOTICE

When adjusting the room temperature ranges, all desired room temperatures are also adjusted to guarantee they are between the limits.

#	Code	Description
Room temp. range		
[A.3.2.1.2]	[3-06]	Maximum temp (heating) 18°C~30°C (default: 30°C)
[A.3.2.1.1]	[3-07]	Minimum temp (heating) 12°C~18°C (default: 12°C)

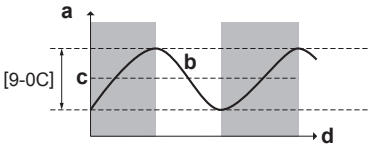
Room temperature step

ONLY applicable in room thermostat control and when the temperature is displayed in °C.

#	Code	Description
[A.3.2.4]	N/A	Room temp. step ▪ 1°C (default). The desired room temperature on the user interface is settable per 1°C. ▪ 0.5°C. The desired room temperature on the user interface is settable per 0.5°C. The actual room temperature is displayed with an accuracy of 0.1°C.

Room temperature hysteresis

ONLY applicable in case of room thermostat control. The hysteresis band around the desired room temperature is settable. It is recommended NOT to change the room temperature hysteresis as it is set for an optimal use of the system.



a Room temperature
b Actual room temperature
c Desired room temperature
d Time

#	Code	Description
N/A	[9-0C]	1°C~6°C (default: 1°C)

Room temperature offset

ONLY applicable in case of room thermostat control. You can calibrate the (external) room temperature sensor. It is possible to give an offset to the room thermistor value measured by the user interface or by the external room sensor. The settings can be used to compensate for situations where the user interface or external room sensor CANNOT be installed on the ideal installation location (see installation manual and/or installer reference guide).

#	Code	Description
Room temp. offset: Offset on the actual room temperature measured on the user interface sensor.		
[A.3.2.2]	[2-0A]	–5°C~5°C, step 0.5°C (default: 0°C)
Ext. room sensor offset: ONLY applicable if the external room sensor option is installed and configured (see [C-08])		
[A.3.2.3]	[2-09]	–5°C~5°C, step 0.5°C (default: 0°C)

Room frost protection

Room frost protection prevents the room from getting too cold. This setting behaves differently depending on the set unit control method ([C-07]). Perform actions according to the table below:

Unit control method ([C-07])	Room frost protection
Room thermostat control ([C-07]=2)	Allow for the room thermostat to take care of room frost protection: ▪ Set [2-06] to "1" ▪ Set the room antifrost temperature ([2-05]).
External room thermostat control ([C-07]=1)	Allow for the external room thermostat to take care of room frost protection: ▪ Turn ON the leaving water temperature home page.
Leaving water temperature control ([C-07]=0)	Room frost protection is NOT guaranteed.

NOTICE

If the system does NOT contain a backup heater, do NOT change the default room antifrost temperature.

INFORMATION

If a U4 error occurs, room frost protection is NOT guaranteed.

Refer to the sections below for detailed information on room frost protection in relation to the applicable unit control method.

[C-07]=2: room thermostat control

Under room thermostat control, room frost protection is guaranteed, even if the room temperature home page is OFF on the user interface. When room frost protection ([2-06]) is enabled and the room temperature drops below the room antifrost temperature ([2-05]), the unit will supply leaving water to the heat emitters to heat up the room again.

#	Code	Description
N/A	[2-06]	Room frost protection ▪ 0: disabled ▪ 1: enabled (default)
N/A	[2-05]	Room antifrost temperature 4°C~16°C (default: 16°C)

INFORMATION

If a U5 error occurs:

- when 1 user interface is connected, room frost protection is NOT guaranteed,
- when 2 user interfaces are connected and the second user interface used for room temperature control is disconnected (due to miswiring, damage of the cable), then room frost protection is NOT guaranteed.

NOTICE

If Emergency is set to Manual ([A.6.C]=0), and the unit is triggered to start emergency operation, the user interface will ask confirmation before starting. Room frost protection is active even if the user does NOT confirm emergency operation.

[C-07]=1: external room thermostat control

Under external room thermostat control, room frost protection is guaranteed by the external room thermostat, provided that the leaving water temperature home page is ON on the user interface, and the auto emergency setting ([A.6.C]) is set to "1".

Additionally, limited frost protection by the unit is possible:

In case of…	…then the following applies:
One leaving water temperature zone	▪ When the leaving water temperature home page is OFF and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered. ▪ When the leaving water temperature home page is ON, the external room thermostat is "Thermo OFF" and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again and the leaving water temperature setpoint will be lowered. ▪ When the leaving water temperature home page is ON and the external room thermostat is "Thermo ON", then room frost protection is guaranteed by the normal logic.
Two leaving water temperature zones	▪ When the leaving water temperature home page is OFF, and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered. ▪ When the leaving water temperature home page is ON, the operation mode is "heating", and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered.

[C-07]=0: leaving water temperature control

Under leaving water temperature control, room frost protection is NOT guaranteed. However, if [2-06] is set to "1", limited frost protection by the unit is possible:

- When the leaving water temperature home page is OFF and the outdoor ambient temperature drops below 4°C, then the unit will supply leaving water to the heat emitters to heat up the room again, and the leaving water temperature setpoint will be lowered.
- When the leaving water temperature home page is ON and the operation mode is "heating", then the unit will supply leaving water to the heat emitters to heat up the room according to normal logic.

Shut-off valve

The following is only applicable in case of 2 leaving water temperature zones. In case of 1 leaving water temperature zone, connect the shut-off valve to the heating output.

The shut-off valve, which is in the main leaving water temperature zone, output is configurable.

INFORMATION

During defrost operation, the shut-off valve is ALWAYS opened.

Thermo On/OFF: the valve closes, depending on [F-0B] when there is no heating demand from the main zone. Enable this setting to:

- avoid leaving water supply to the heat emitters in the main LWT zone (through the mixing valve station) when there is request from the additional LWT zone.
- activate the On/OFF pump of the mixing valve station ONLY when there is demand. See "5 Application guidelines" on page 12.

#	Code	Description
[A.3.1.1.6.1]	[F-0B]	The shut-off valve: ▪ 0 (No)(default): is NOT influenced by heating demand. ▪ 1 (Yes): closes when there is NO heating demand.

INFORMATION

The setting [F-0B] is only valid when there is a thermostat or external room thermostat request setting (NOT in case of leaving water temperature setting).

Operation range

Depending on the average outdoor temperature, the operation of the unit in space heating is prohibited.

Space heating OFF temp: When the averaged outdoor temperature raises above this value, space heating is turned OFF to avoid overheating.

#	Code	Description
[A.3.3.1]	[4-02]	▪ EHBH04+08: 14°C~35°C (default: 25°C) ▪ EHBH11+16: 14°C~35°C (default: 35°C)

8.3.2 Domestic hot water control: advanced

Preset tank temperatures

Only applicable when domestic hot water preparation is scheduled or scheduled + reheat.

You can define preset tank temperatures:

- storage economic
- storage comfort
- reheat
- reheat hysteresis

Preset values make it easy to use the same value in the schedule. If you later want to change the value, you only have to do it in 1 place (see also operation manual and/or user reference guide).

Storage comfort

When programming the schedule, you can make use of the tank temperatures set as preset values. The tank will then heat up until these setpoint temperatures have been reached. Additionally, a storage stop can be programmed. This feature puts a stop to tank heating even if the setpoint has NOT been reached. Only program a storage stop when tank heating is absolutely undesirable.

#	Code	Description
[7.4.3.1]	[6-0A]	30°C~[6-0E]°C (default: 60°C)

Storage eco

The storage economic temperature denotes the lower desired tank temperature. It is the desired temperature when a storage economic action is scheduled (preferably during day).

#	Code	Description
[7.4.3.2]	[6-0B]	30°C~min(50, [6-0E])°C (default: 45°C)

Reheat

The desired reheat tank temperature is used:

- in reheat mode of scheduled + reheat mode: The guaranteed minimum tank temperature is set by $T_{HP\ OFF}$–[6-08], which is either [6-0C] or the weather dependent setpoint, minus the reheat hysteresis. If the tank temperature drops below this value, the tank is heated up.

#	Code	Description
[7.4.3.3]	[6-0C]	30°C~min(50, [6-0E])°C (default: 45°C)

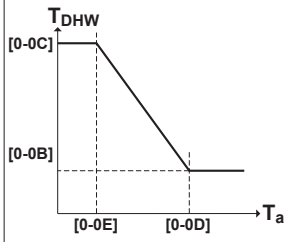
Reheat hysteresis

Only applicable when domestic hot water preparation is scheduled + reheat.

#	Code	Description
N/A	[6-08]	2°C~20°C (default: 10°C)

Weather dependent

The weather dependent installer settings define the parameters for the weather dependent operation of the unit. When weather dependent operation is active the desired tank temperature is determined automatically depending on the averaged outdoor temperature: low outdoor temperatures will result in higher desired tank temperatures as the cold water tap is colder and vice versa. In case of scheduled or scheduled+reheat domestic hot water preparation, the storage comfort temperature is weather dependent (according to the weather dependent curve), the storage economic and reheat temperature are NOT weather dependent. In case of reheat only domestic hot water preparation, the desired tank temperature is weather dependent (according to the weather dependent curve). During weather dependent operation, the end-user cannot adjust the desired tank temperature on the user interface.

#	Code	Description
[A.4.6]	N/A	Weather dependent desired tank temperature is: ▪ Fixed (default): disabled. All desired tank temperature are NOT weather dependent. ▪ Weather dep.: enabled. In scheduled or scheduled+reheat mode, the storage comfort temperature is weather dependent. Storage economic and reheat temperatures are NOT weather dependent. In reheat mode, the desired tank temperature is weather dependent. **Note:** When the displayed tank temperature is weather dependent, it cannot be adjusted on the user interface.
[A.4.7]	[0-0E] [0-0D] [0-0C] [0-0B]	Weather-dependent curve  ▪ T_{DHW}: The desired tank temperature. ▪ T_a: The (averaged) outdoor ambient temperature ▪ [0-0E]: low outdoor ambient temperature: –40°C~5°C (default: –10°C) ▪ [0-0D]: high outdoor ambient temperature: 10°C~25°C (default: 15°C) ▪ [0-0C]: desired tank temperature when the outdoor temperature equals or drops below the low ambient temperature: 45°C~[6-0E]°C (default: 60°C) ▪ [0-0B]: desired tank temperature when the outdoor temperature equals or rises above the high ambient temperature: 35°C~[6-0E]°C (default: 55°C)

Heat pump operation

#	Code	Description
N/A	[6-00]	The temperature difference determining the heat pump ON temperature. Range: 2°C~20°C (default: 2°C)
N/A	[6-01]	The temperature difference determining the heat pump OFF temperature. Range: 0°C~10°C (default: 2°C)

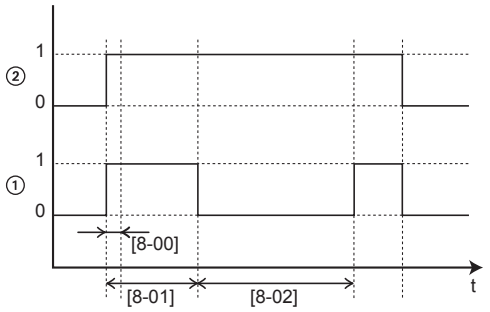
INFORMATION

The maximum heat pump temperature depends on the ambient temperature. For more information, see the operation range.

Timers for simultaneous request space and domestic hot water operation

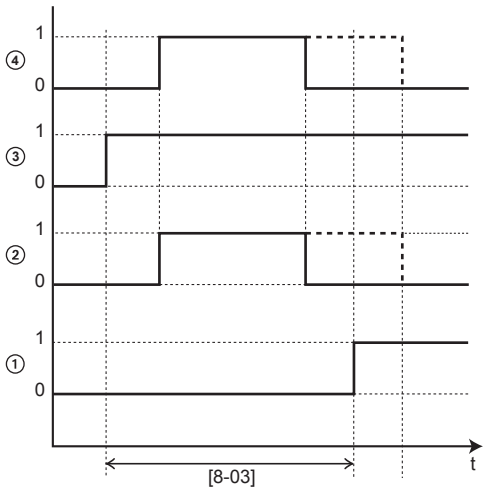
#	Code	Description
N/A	[8-00]	Do not change. (default: 1)
N/A	[8-01]	Maximum running time for domestic hot water operation. Domestic hot water heating stops even when the target domestic hot water temperature is NOT reached. The actual maximum running time also depends on setting [8-04]. ▪ When system layout = Room thermostat control: This preset value is only taken into account if there is a request for space heating. If there is NO request for space heating, the tank is heated until the setpoint has been reached. ▪ When system layout ≠ Room thermostat control: This preset value is always taken into account. Range: 5~95 minutes (default: 30)
N/A	[8-02]	Anti-recycling time. Minimum time between two cycles for domestic hot water. The actual anti-recycling time also depends on setting [8-04]. Range: 0~10 hours (default: 3) (step: 0.5 hour). **Remark:** The minimum time is 1/2 hour even when the selected value is 0.
N/A	[8-03]	Anti-legionella heater delay timer. Only for EKHW Start-up delay time for the anti-legionella heater when domestic hot water mode is active. ▪ When domestic hot water mode is NOT active, the delay time is 20 minutes. ▪ The delay time starts from anti-legionella heater ON temperature. ▪ By adapting the anti-legionella heater delay time versus the maximum running time, you can find an optimal balance between the energy efficiency and the heat up time. ▪ If the anti-legionella heater delay time is set too high, it might take a long time before the domestic hot water reaches its set temperature. ▪ The setting [8-03] is only meaningful if setting [4-03]=1. Setting [4-03]=0/2/3/4 limits the anti-legionella heater automatically in relation to heat pump operation time in domestic water heating mode. ▪ Make sure that [8-03] is always in relation with the maximum running time [8-01]. Range: 20~95 minutes (default: 50).
N/A	[8-04]	Additional running time for the maximum running time depending on the outdoor temperature [4-02] or [F-01]. Range: 0~95 minutes (default: 95).

[8-02]: Anti-recycling time



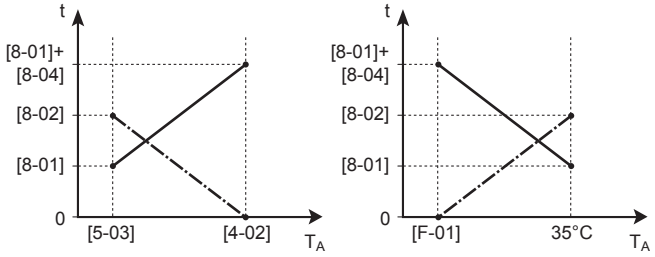
1 Heat pump domestic water heating mode (1=active, 0=not active)
2 Hot water request for heat pump (1=request, 0=no request)
t Time

[8-03]: Anti-legionella heater delay timer



1 Anti-legionella heater operation (1=active, 0=not active)
2 Heat pump domestic water heating mode (1=active, 0=not active)
3 Hot water request for anti-legionella heater (1=request, 0=no request)
4 Hot water request for heat pump (1=request, 0=no request)
t Time

[8-04]: Additional running time at [4-02]/[F-01]



T_A Ambient (outdoor) temperature
t Time
Anti-recycle time
Maximum running time domestic hot water

Disinfection

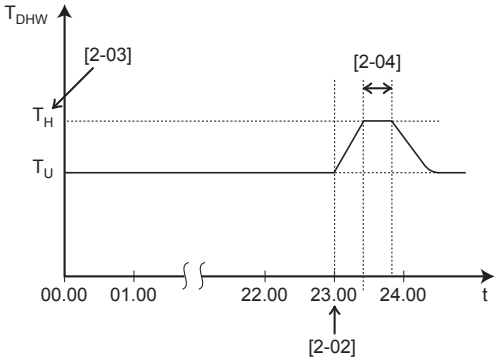
Applies only to installations with a domestic hot water tank.

The disinfection function disinfects the domestic hot water tank by periodically heating the domestic hot water to a specific temperature.

CAUTION

The disinfection function settings MUST be configured by the installer according to the applicable legislation.

#	Code	Description
[A.4.4.2]	[2-00]	Operation day: ▪ 0: Each day ▪ 1: Monday ▪ 2: Tuesday ▪ 3: Wednesday ▪ 4: Thursday ▪ 5: Friday ▪ 6: Saturday ▪ 7: Sunday
[A.4.4.1]	[2-01]	Disinfection ▪ 0: No ▪ 1: Yes
[A.4.4.3]	[2-02]	Start time: 00~23:00, step: 1:00.
[A.4.4.4]	[2-03]	Temperature target: 55°C~80°C, default: 70°C.
[A.4.4.5]	[2-04]	Duration: 5~60 minutes, default: 10 minutes.



T_{DHW} Domestic hot water temperature
T_U User set point temperature
T_H High set point temperature [2-03]
t Time

WARNING

Be aware that the domestic hot water temperature at the hot water tap will be equal to the value selected in field setting [2-03] after a disinfection operation.

When the high domestic hot water temperature can be a potential risk for human injuries, a mixing valve (field supply) shall be installed at the hot water outlet connection of the domestic hot water tank. This mixing valve shall secure that the hot water temperature at the hot water tap never rise above a set maximum value. This maximum allowable hot water temperature shall be selected according to the applicable legislation.

CAUTION

Be sure that the disinfection function start time [A.4.4.3] with defined duration [A.4.4.5] is NOT interrupted by possible domestic hot water demand.

CAUTION

The booster heater permission schedule is used to restrict or allow anti-legionella heater operation based on a weekly program. Advice: In order to avoid unsuccessful disinfection function, at least allow the anti-legionella heater (by the weekly program) for minimum 4 hours starting from the scheduled start-up of disinfection. If the anti-legionella heater is restricted during disinfection, this function will NOT be successful and the applicable warning AH will be generated.

INFORMATION

In case of error code AH and no interruption of the disinfection function occurred due to domestic hot water tapping, following actions are recommended:

- When the Domestic hot water > Type > Reheat or Reheat + sched. is selected, it is recommended to program the start-up of the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set by installer settings (disinfection function).
- When the Domestic hot water > Type > Scheduled only is selected, it is recommended to program a Storage eco 3 hours before the scheduled start-up of the disinfection function to preheat the tank.

INFORMATION

Disinfection function is restarted in case the domestic hot water temperature drops 5°C below the disinfection target temperature within the duration time.

INFORMATION

An AH error occurs if you do the following during disinfection:

- Set the user permission level to Installer.
- Go to the DHW tank temperature home page (Tank).
- Press ⏻ to interrupt the disinfection.

8.3.3 Heat source settings

Backup heater

Backup heater operation mode: defines when backup heater operation is enabled or disabled. This setting is only overruled when backup heating is required during defrost operation or malfunctioning of the outdoor unit (when [A.6.C] is enabled).

#	Code	Description
[A.5.1.1]	[4-00]	Backup heater operation: ▪ 0: Disabled ▪ 1 (default): Enabled
[A.5.1.3]	[4-07]	Defines whether backup heater second step is: ▪ 1: Allowed ▪ 0: NOT allowed In this way it is possible to limit the backup heater capacity.
N/A	[5-00]	Is backup heater operation allowed above equilibrium temperature during space heating operation? ▪ 1: NOT allowed ▪ 0: Allowed
[A.5.1.4]	[5-01]	Equilibrium temperature. Outdoor temperature below which operation of the backup heater is allowed. Range: –15°C~35°C (default: 0°C) (step: 1°C)

Auto emergency

When the heat pump fails to operate, the backup heater and anti-legionella heater can serve as an emergency heater and either automatically or non-automatically take over the heat load.

- When auto emergency is set to Automatic and a heat pump failure occurs:
  - The backup heater will automatically take over the heat load.
  - The anti-legionella heater will automatically take over the domestic hot water production.
- When auto emergency is set to Manual and a heat pump failure occurs, the domestic hot water and space heating operations will stop and need to be recovered manually. The user interface will then ask you to confirm whether the backup heater or anti-legionella heater can take over the heat load or not.

When the heat pump fails, ⓘ will appear on the user interface. If the house is unattended for longer periods, we recommend to set [A.6.C] Emergency to Automatic.

#	Code	Description
[A.6.C]	N/A	Emergency: ▪ 0: Manual (default) ▪ 1: Automatic

INFORMATION

If [4-03]=1 or 3, then Emergency=Manual is not applicable for the anti-legionella heater.

INFORMATION

The auto emergency setting can be set in the menu structure of the user interface only.

INFORMATION

If a heat pump failure occurs and [A.6.C] is set to Manual, the room frost protection function, the underfloor heating screed dryout function, and the water pipe antifreeze function will remain active even if the user does NOT confirm emergency operation.

Bivalent

Applies only to installations with an auxiliary boiler (alternating operation, parallel connected). The purpose of this function is to determine — based on the outdoor temperature (possibility 1) or on energy prices (possibility 2) — which heating source can/will provide the space heating, either the indoor unit or an auxiliary boiler.

The field setting "bivalent operation" applies only the indoor unit space heating operation and the permission signal for the auxiliary boiler.

Possibility 1

The installer can set a temperature below which the boiler will always operate when electric prices (High, Medium, Low) are "0" in the menu structure.

NOTICE

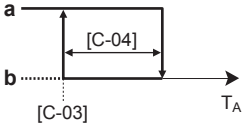
Do NOT use overview settings!

When the "bivalent operation" function is enabled, the indoor unit will stop automatically in space heating operation when the outdoor temperature drops below "bivalent ON temperature" and the permission signal for the auxiliary boiler becomes active.

When the bivalent operation function is disabled, the space heating by indoor unit is possible at all outdoor temperatures (see operation ranges) and permission signal for auxiliary boiler is ALWAYS deactivated.

- [C-03] Bivalent ON temperature: defines the outdoor temperature below which the permission signal for the auxiliary boiler will be active (closed, KCR on EKRP1HB) and space heating by indoor unit will be stopped.
- [C-04] Bivalent hysteresis: defines the temperature difference between bivalent ON temperature and bivalent OFF temperature.

Permission signal X1–X2 (EKRP1HB**)**



T_A Outdoor temperature
a Closed
b Open

#	Code	Description
N/A	[C-03]	Range: –25°C~25°C (default: 0°C) (step: 1°C)
N/A	[C-04]	Range: 2°C~10°C (default: 3°C) (step: 1°C)

Possibility 2

The installer can set a temperature range ([C-04]). Depending on the energy prices, a calculated point T_{calc} changes between this range.

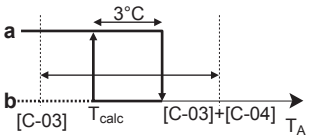
#	Code	Description
[7.4.5.1]	N/A	What is the high electricity price?
[7.4.5.2]	N/A	What is the medium electricity price?
[7.4.5.3]	N/A	What is the low electricity price?
[7.4.6]	N/A	What is the fuel price?

NOTICE

Do NOT use overview settings!

When T_A reaches the T_{calc} point, then the bivalent heat source permission will be active. To prevent too much switching, there is a hysteresis of 3°C.

- [C-03] ON temperature. Below this temperature, bivalent will always be ON. T_{calc} is ignored.
- [C-04] Operation range between which T_{calc} is calculated.



T_A Outdoor temperature
T_{calc} Calculated temperature
a Closed
b Open

#	Code	Description
N/A	[C-03]	Range: –25°C~25°C (default: 0°C) (step: 1°C)
N/A	[C-04]	Range: 2°C~10°C (default: 3°C) (step: 1°C)

It is recommended to choose [C-04] bigger than the default value to have an optimal operation when choosing possibility 2. Depending on the used boiler, the boiler efficiency should be chosen as follows:

#	Code	Description
[A.6.A]	[7-05]	▪ 0: Very high ▪ 1: High ▪ 2: Medium ▪ 3: Low ▪ 4: Very low

INFORMATION

Electricity price can only be set when bivalent is ON ([A.2.2.6.1] or [C-02]). These values can only be set in menu structure [7.4.5.1], [7.4.5.2] and [7.4.5.3]. Do NOT use overview settings.

INFORMATION

Boiler efficiency [A.6.A] or [7-05] becomes visible when bivalent is ON ([A.2.2.6.1] or [C-02]).

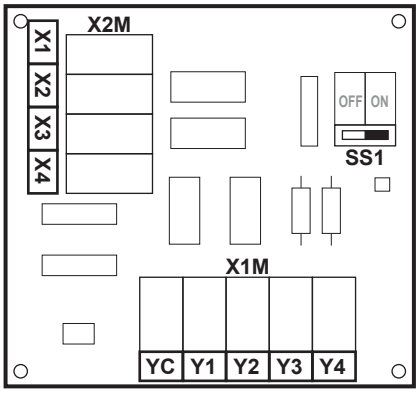
CAUTION

Make sure to observe all rules mentioned in application guideline 5 when bivalent operation function is enabled.

Daikin shall NOT be held liable for any damage resulting from failure to observe this rule.

INFORMATION

- The combination of setting [4-03]=0/2 with bivalent operation at low outdoor temperature can result in domestic hot water shortage.
- The bivalent operation function has no impact on the domestic water heating mode. The domestic hot water is still and only heated by the indoor unit.
- The permission signal for the auxiliary boiler is located on the EKRP1HB (digital I/O PCB). When it is activated, the contact X1, X2 is closed and open when it is deactivated. See illustration below for the schematic location of this contact.

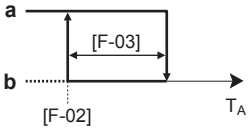


Bottom plate heater

Applies only to installation with an outdoor unit ERHQ and the option bottom plate heater kit is installed.

- [F-02] Bottom plate heater ON temperature: defines the outdoor temperature below which the bottom plate heater will be activated by indoor unit in order to prevent ice build-up in the bottom plate of the outdoor unit at lower outdoor temperatures.
- [F-03] Bottom plate heater hysteresis: defines the temperature difference between bottom plate heater ON temperature and the bottom plate heater OFF temperature.

Bottom plate heater



T_A Outdoor temperature
a On
b OFF

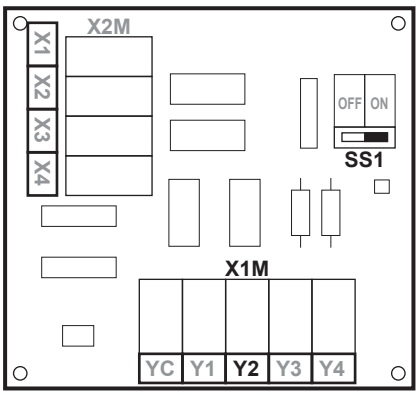
CAUTION

The bottom plate heater is controlled via EKRP1HB.

#	Code	Description
N/A	[F-02]	Bottom plate heater ON temperature: 3°C~10°C (default: 3°C)
N/A	[F-03]	Hysteresis: 2°C~5°C (default: 5°C)

INFORMATION

Depending on setting [F-04], contact Y2, located on digital I/O PCB EKRP1HB, controls the optional bottom plate heater. See the illustration below for the schematic location of this contact. For the complete wiring, see the wiring diagram.



8.3.4 System settings

Priorities

#	Code	Description
N/A	[5-02]	Space heating priority. Defines whether domestic hot water is made by anti-legionella heater only when outdoor temperature is below space heating priority temperature. It is recommended to enable this function to shorten tank heating operation time and guaranteed domestic hot water comfort. ▪ 0: disabled ▪ 1: enabled [5-01] Equilibrium temperature and [5-03] Space heating priority temperature are related to backup heater. So, you must set [5-03] equal or a few degrees higher than [5-01].
N/A	[5-03]	Space heating priority temperature. Defines the outdoor temperature which below the domestic hot water will be heated by anti-legionella heater only. Range: –15°C~35°C (default: 0°C).
N/A	[5-04]	Set point correction for domestic hot water temperature: set point correction for the desired domestic hot water temperature, to be applied at low outdoor temperature when space heating priority is enabled. The corrected (higher) set point will make sure that the total heat capacity of the water in the tank remains approximately unchanged, by compensating for the colder bottom water layer of the tank (because the heat exchanger coil is not operational) with a warmer top layer. Range: 0°C~20°C (default: 10°C).
N/A	[C-00]	If a solar kit is installed, what has priority to heat up the tank? ▪ 0: Solar kit ▪ 1: Heat pump

Auto-restart

When power returns after a power supply failure, the auto restart function reapplies the remote controller settings at the time of the power failure. Therefore, it is recommended to always enable the function.

If the preferential kWh rate power supply is of the type that power supply is interrupted, always enable the auto restart function. Continuous indoor unit control can be guaranteed independent of the preferential kWh rate power supply status, by connecting the indoor unit to a normal kWh rate power supply.

#	Code	Description
[A.6.1]	[3-00]	Is the auto restart function of the unit allowed? ▪ 0: No ▪ 1 (default): Yes

Preferential kWh rate power supply

INFORMATION

The preferential kWh rate power supply contact is connected to the same terminals (X5M/3+4) as the safety thermostat. It is only possible for the system to have EITHER preferential kWh rate power supply OR a safety thermostat.

#	Code	Description
[A.2.1.6]	[D-01]	Connection to a preferential kWh rate power supply: ▪ 0 (default): The outdoor unit is connected to a normal power supply. ▪ 1: The outdoor unit is connected to a preferential kWh rate power supply. When the preferential kWh rate signal is sent by the electricity company, the contact will open and the unit will go in forced off mode. When the signal is released again, the voltage-free contact will close and the unit will restart operation. Therefore, always enable the auto restart function. ▪ 2: The outdoor unit is connected to a preferential kWh rate power supply. When the preferential kWh rate signal is sent by the electricity company, the contact will close and the unit will go in forced off mode. When the signal is released again, the voltage-free contact will open and the unit will restart operation. Therefore, always enable the auto restart function. **Remark:** 3 is related to safety thermostat.
[A.6.2.1]	[D-00]	Which heaters are allowed to operate during preferential kWh rate power supply? ▪ 0 (default): None ▪ 1: Anti-legionella heater only ▪ 2: Backup heater only ▪ 3: All heaters See table below. Setting 2 is only meaningful if the preferential kWh rate power supply is of type 1 or indoor unit is connected to a normal kWh rate power supply (via X2M/30-31) and the backup heater is NOT connected to the preferential kWh rate power supply.

[D-00]	Anti-legionella heater	Backup heater	Compressor
0 (default)	Forced OFF	Forced OFF	Forced OFF
1	Permitted		
2	Forced OFF	Permitted	
3	Permitted		

Safety thermostat

INFORMATION

The preferential kWh rate power supply contact is connected to the same terminals (X5M/3+4) as the safety thermostat. It is only possible for the system to have EITHER preferential kWh rate power supply OR a safety thermostat.

#	Code	Description
[A.2.1.6]	[D-01]	Connection to a safety thermostat voltage free contact: ▪ 0 (default): No safety thermostat. ▪ 3: Safety thermostat normal closed contact. **Remark:** 1+2 are related to preferential kWh rate power supply.

Power saving function

INFORMATION

Only applicable for ERLQ004~008CAV3.

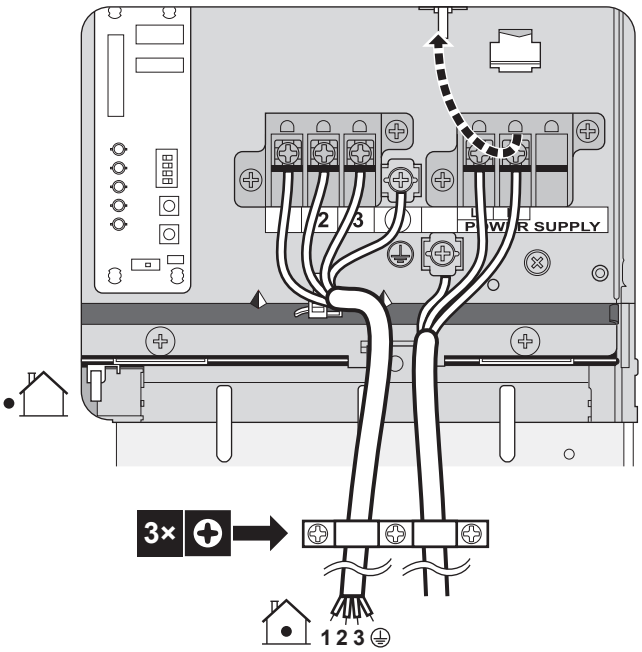
Defines whether the outdoor unit power supply can be interrupted (internally by indoor unit control) during stand-still conditions (no space heating nor domestic hot water demand). The final decision to allow power interruption of the outdoor unit during standstill depends on the ambient temperature, compressor conditions and minimum internal timers.

To enable the power saving function setting, [E-08] needs to be enabled on the user interface in combination with the removal of the power saving connector at the outdoor unit.

NOTICE

The power saving connector at the outdoor unit shall only be removed when the main power supply to the application is switched OFF.

In case of ERLQ004~008CAV3



#	Code	Description
N/A	[E-08]	Power saving function for outdoor unit: ▪ 0: Disabled ▪ 1 (default): Enabled

In case of ERHQ011~016BAV3, ERHQ011~016BAW1, ERLQ011~016CAV3, **and** ERLQ011~016CAW1

Do NOT change the default setting.

#	Code	Description
N/A	[E-08]	Power saving function for outdoor unit: ▪ 0 (default): Disabled ▪ 1: Enabled

Power consumption control

Only applicable for EHBH04+08. See "5 Application guidelines" on page 12 for detailed information about this functionality.

Pwr consumpt. control

#	Code	Description
[A.6.3.1]	[4-08]	Mode: ▪ 0 (No limitation)(default): Disabled. ▪ 1 (Continuous): Enabled: You can set one power limitation value (in A or kW) to which the system power consumption will be limited for all the time. ▪ 2 (Digital inputs): Enabled: You can set up to four different power limitation values (in A or kW) to which the system power consumption will be limited when the corresponding digital input asks.
[A.6.3.2]	[4-09]	Type: ▪ 0 (Current): The limitation values are set in A. ▪ 1 (Power)(default): The limitation values are set in kW.
[A.6.3.3]	[5-05]	Value: Only applicable in case of full time power limitation mode. 0 A~50 A, step: 1 A (default: 50 A)

#	Code	Description
[A.6.3.4]	[5-09]	Value: Only applicable in case of full time power limitation mode. 0 kW~20 kW, step: 0.5 kW (default: 20 kW)
Amp. limits for DI: Only applicable in case of power limitation mode based on digital inputs and based on current values.		
[A.6.3.5.1]	[5-05]	Limit DI1 0 A~50 A, step: 1 A (default: 50 A)
[A.6.3.5.2]	[5-06]	Limit DI2 0 A~50 A, step: 1 A (default: 50 A)
[A.6.3.5.3]	[5-07]	Limit DI3 0 A~50 A, step: 1 A (default: 50 A)
[A.6.3.5.4]	[5-08]	Limit DI4 0 A~50 A, step: 1 A (default: 50 A)
kW limits for DI: Only applicable in case of power limitation mode based on digital inputs and based on power values.		
[A.6.3.6.1]	[5-09]	Limit DI1 0 kW~20 kW, step: 0.5 kW (default: 20 kW)
[A.6.3.6.2]	[5-0A]	Limit DI2 0 kW~20 kW, step: 0.5 kW (default: 20 kW)
[A.6.3.6.3]	[5-0B]	Limit DI3 0 kW~20 kW, step: 0.5 kW (default: 20 kW)
[A.6.3.6.4]	[5-0C]	Limit DI4 0 kW~20 kW, step: 0.5 kW (default: 20 kW)
Priority: Only applicable in case of an optional EKHW.		
[A.6.3.7]	[4-01]	**Power consumption control DISABLED [4-08]=0** ▪ 0 (None)(default): Backup heater and anti-legionella heater can operate simultaneously. ▪ 1 (BSH): The anti-legionella heater is prioritized. ▪ 2 (BUH): The backup heater is prioritized. **Power consumption control ENABLED [4-08]=1 or 2** ▪ 0 (None)(default): Depending on the power limitation level, the anti-legionella heater will be limited first, before the backup heater is limited. ▪ 1 (BSH): Depending on the power limitation level, the backup heater will be limited first, before the anti-legionella heater is limited. ▪ 2 (BUH): Depending on the power limitation level, the anti-legionella heater will be limited first, before the backup heater is limited.

Note: In case of power consumption control is DISABLED (for all models) the setting [4-01] defines whether backup heater and anti-legionella heater can operate simultaneously, or if the anti-legionella heater/backup heater has priority over the backup heater/anti-legionella heater.

In case of power consumption control is ENABLED (only for EHBH04+08), the setting [4-01] defines the priority of the electrical heaters depending on applicable limitation.

Average timer

The average timer corrects the influence of ambient temperature variations. The weather-dependent set point calculation is done on the average outdoor temperature.

The outdoor temperature is averaged over the selected time period.

#	Code	Description
[A.6.4]	[1-0A]	Outdoor average timer: ▪ 0: No averaging (default) ▪ 1: 12 hours ▪ 2: 24 hours ▪ 3: 48 hours ▪ 4: 72 hours

Offset temperature external outdoor ambient sensor

Only applicable in case of an external outdoor ambient sensor is installed and configured.

You can calibrate the external outdoor ambient temperature sensor. It is possible to give an offset to the thermistor value. The setting can be used to compensate for situations where the external outdoor ambient sensor cannot be installed on the ideal installation location (see installation).

#	Code	Description
[A.6.5]	[2-0B]	–5°C~5°C, step: 0.5°C (default: 0°C)

Forced defrost

You can manually start a defrost operation.

The decision to execute the manual defrost operation is made by the outdoor unit and depends on ambient and heat exchanger conditions. When the outdoor unit accepted the forced defrost operation, ☃ will be displayed on the user interface. If ☃ is NOT displayed within 6 minutes after forced defrost operation was enabled, the outdoor unit ignored the forced defrost request.

#	Code	Description
[A.6.6]	N/A	Do you want to start a defrost operation?

Pump operation

When the pump operation function is disabled the pump will stop if the outdoor temperature is higher than the value set by [4-02] or if the outdoor temperature drops below the value set by [F-01]. When the pump operation is enabled, the pump operation is possible at all outdoor temperatures.

#	Code	Description
N/A	[F-00]	Pump operation: ▪ 0: Disabled if outdoor temperature is higher than [4-02]. ▪ 1: Possible at all outdoor temperatures.

Pump operation during flow abnormality [F-09] defines whether the pump stops at flow abnormality or allow to continue operation when flow abnormality occurs. This functionality is only valid in specific conditions where it is preferable to keep the pump active when T_a<4°C (pump will be activated for 10 minutes and deactivated after 10 minutes). Daikin shall NOT be held liable for any damage resulting this functionality.

#	Code	Description
N/A	[F-09]	Pump continue operation when flow abnormality: ▪ 0: Pump will be deactivated. ▪ 1: Pump will be activated when T_a<4°C (10 minutes ON – 10 minutes OFF)

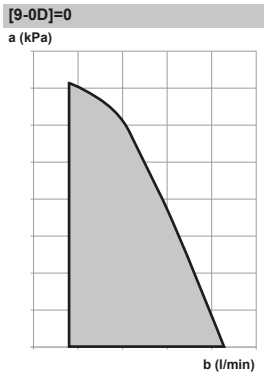
Pump speed limitation

Pump speed limitation [9-0D] defines the maximum pump speed. In normal conditions, the default setting should NOT be modified. The pump speed limitation will be overruled when the flow rate is in the range of the minimum flow (error 7H).

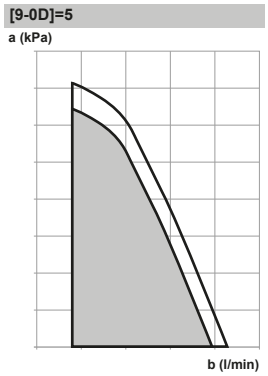
#	Code	Description
N/A	[9-0D]	Pump speed limitation ▪ 0: No limitation. ▪ 1~4: General limitation. There is limitation in all conditions. The required delta T control and comfort are **NOT** guaranteed. ▪ 5~8 (default: 6): Limitation when no actuators. When there is no heating output, the pump speed limitation is applicable. When there is heating output, the pump speed is only determined by delta T in relation to the required capacity. With this limitation range, delta T is possible and the comfort is guaranteed.

The maximum values depend on the unit type:

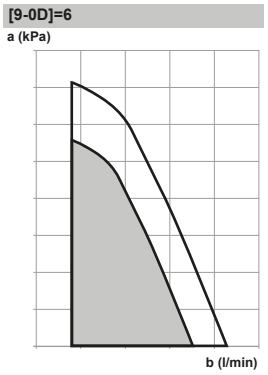
[9-0D]=0



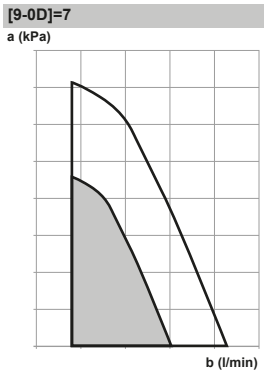
[9-0D]=5



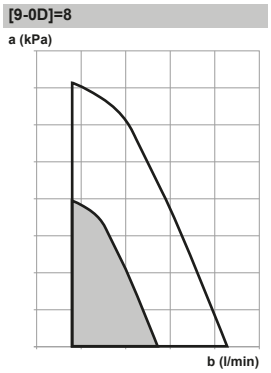
[9-0D]=6



[9-0D]=7

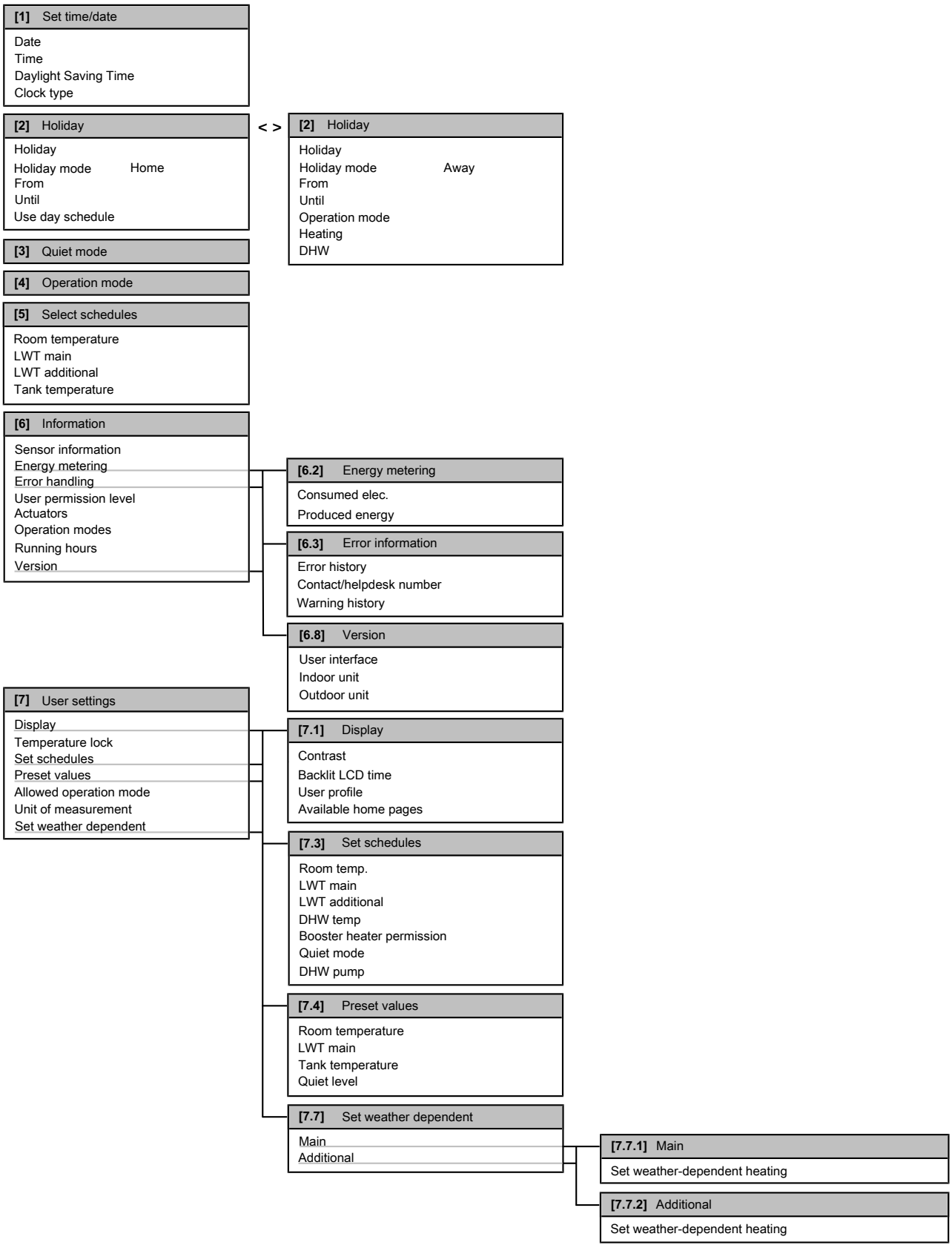


[9-0D]=8



a External static pressure
b Water flow rate

8.4 Menu structure: Overview user settings



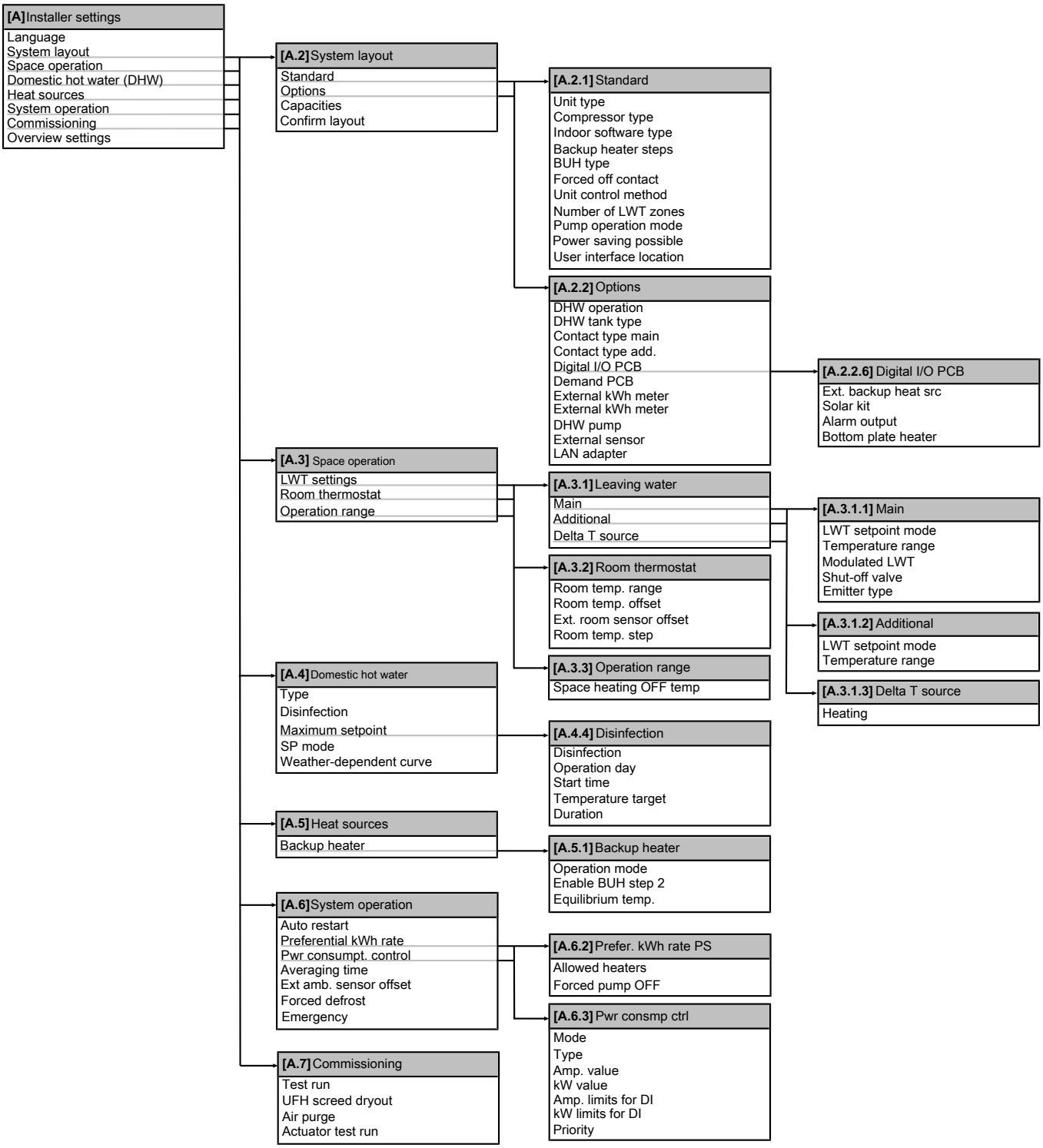
INFORMATION

Depending on the selected installer settings, settings will be visible/invisible.

INFORMATION

Anti-legionella heater. In the menu structure the term "Booster heater" is used. However, this is actually an anti-legionella heater.

8.5 Menu structure: Overview installer settings



INFORMATION

Depending on the selected installer settings, settings will be visible/invisible.

INFORMATION

Anti-legionella heater. In the menu structure the term "Booster heater" is used. However, this is actually an anti-legionella heater.

9 Commissioning

9.1 Overview: Commissioning

This chapter describes what you have to do and know to commission the system after it is configured.

Typical workflow

Commissioning typically consists of the following stages:

1 Checking the "Checklist before commissioning".
2 Performing an air purge.
3 Performing a test run for the system.
4 If necessary, performing a test run for one or more actuators.
5 If necessary, performing an underfloor heating screed dryout.

9.2 Precautions when commissioning

INFORMATION

During the first running period of the unit, the required power may be higher than stated on the nameplate of the unit. This phenomenon is caused by the compressor, that needs a continuous run time of 50 hours before reaching smooth operation and stable power consumption.

NOTICE

Before starting up the system, the unit MUST be energised for at least 2 hours. The crankcase heater needs to heat up the compressor oil to avoid oil shortage and compressor breakdown during startup.

NOTICE

NEVER operate the unit without thermistors and/or pressure sensors/switches. Burning of the compressor might result.

NOTICE

Do NOT operate the unit until the refrigerant piping is complete (when operated this way, the compressor will break).

9.3 Checklist before commissioning

Do NOT operate the system before the following checks are OK:

☐	You read the complete installation instructions, as described in the **installer reference guide**.
☐	The **indoor unit** is properly mounted.
☐	Only if you use the optional backup heater: The **backup heater** is properly mounted.
☐	The **outdoor unit** is properly mounted.
☐	The following **field wiring** has been carried out according to this document and the applicable legislation: ▪ Between the local supply panel and the outdoor unit ▪ Between indoor unit and outdoor unit ▪ Between the local supply panel and the indoor unit ▪ Between the indoor unit and the valves (if applicable) ▪ Between the indoor unit and the room thermostat (if applicable) ▪ Between the indoor unit and the domestic hot water tank (if applicable) ▪ Between the gas boiler and the local supply panel (only applicable in case of hybrid system)
☐	The system is properly **earthed** and the earth terminals are tightened.
☐	The **fuses** or locally installed protection devices are installed according to this document, and have not been bypassed.
☐	The **power supply voltage** matches the voltage on the identification label of the unit.
☐	There are NO **loose connections** or damaged electrical components in the switch box.
☐	There are NO **damaged components** or **squeezed pipes** on the inside of the indoor and outdoor units.
☐	Only if you use the optional backup heater: Depending on the backup heater type, **backup heater circuit breaker** F1B (on the switch box of the backup heater) is turned ON.
☐	Only for tanks with built-in anti-legionella heater: The **anti-legionella heater circuit breaker** F2B on the switch box is turned ON.
☐	There are NO **refrigerant leaks**.
☐	The **refrigerant pipes** (gas and liquid) are thermally insulated.
☐	The correct pipe size is installed and the **pipes** are properly insulated.
☐	There is NO **water leak** inside the indoor unit.
☐	The **shut-off valves** are properly installed and fully open.
☐	The **stop valves** (gas and liquid) on the outdoor unit are fully open.
☐	The **air purge** valve is open (at least 2 turns).
☐	The **pressure relief valve** purges water when opened.
☐	The **minimum water volume** is guaranteed in all conditions. See "To check the water volume" in "6.4 Preparing water piping" on page 26.

INFORMATION

The software is equipped with an "installer-on-site" mode ([4-0E]), that disables automatic operation by the unit. At first installation, setting [4-0E] is by default set to "1", meaning automatic operation is disabled. All protective functions are then disabled. If the user interface home pages are off, the unit will NOT operate automatically. To enable automatic operation and the protective functions, set [4-0E] to "0".

12 hours after the first power-on, the unit will automatically set [4-0E] to "0", ending "installer-on-site" mode and enabling the protective functions. If – after first installation – the installer returns to the site, the installer has to set [4-0E] to "1" manually.

9.4 Checklist during commissioning

☐	The **minimum flow rate** during backup heater/defrost operation is guaranteed in all conditions. See "To check the water volume and flow rate" in "6.4 Preparing water piping" on page 26.
☐	To perform an **air purge**.
☐	To perform a **test run**.
☐	To perform an **actuator test run**.

☐	**Underfloor screed dryout function** The underfloor screed dryout function is started (if necessary).

9.4.1 To check the minimum flow rate

1 Confirm according to the hydraulic configuration which space heating loops can be closed due to mechanical, electronic, or other valves.

2 Close all space heating loops that can be closed (see previous step).

3 Start the pump test run operation (see "9.4.4 To perform an actuator test run" on page 75).

4 Go to [6.1.8]: ☰ > Information > Sensor information > Flow rate to check the flow rate. During pump test run operation, the unit can operate below this minimum required flow rate.

Bypass valve foreseen?	
Yes	**No**
Modify the bypass valve setting to reach the minimum required flow rate + 2 l/min	In case the actual flow rate is below the minimum flow rate, modifications at the hydraulic configuration are required. Increase the space heating loops that can NOT be closed or install a pressure-controlled bypass valve.

Minimum required flow rate	
04+08 models	12 l/min
11+16 models	15 l/min

9.4.2 Air purge function

When commissioning and installing the unit, it is very important to remove all air in the water circuit. When the air purge function is running, the pump operates without actual operation of the unit and the removal of air in the water circuit will start.

NOTICE

Before starting the air purge, open the safety valve and check if the circuit is sufficiently filled with water. Only if water escapes the valve after opening it, you can start the air purge procedure.

There are 2 modes for purging air:

- Manually: the unit will operate with a fixed pump speed and in a fixed or custom position of the 3-way valve. The custom position of the 3-way valve is a helpful feature to remove all air from the water circuit in the space heating or the domestic hot water heating mode. The operation speed of the pump (slow or quick) can also be set.
- Automatic: the unit automatically changes the pump speed and the position of the 3-way valve between the space heating or the domestic hot water heating mode.

Typical workflow

Purging the air from the system should consist of:

1 Performing a manual air purge

2 Performing an automatic air purge

INFORMATION

Start by performing a manual air purge. When almost all the air is removed, perform an automatic air purge. If necessary, repeat performing the automatic air purge until you are sure that all air is removed from the system. During air purge function, pump speed limitation [9-0D] is NOT applicable.

Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

The air purge function automatically stops after 30 minutes.

To perform a manual air purge

Prerequisite: Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

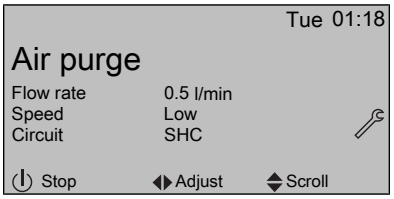
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 49.

2 Set the air purge mode: go to [A.7.3.1] ☰ > Installer settings > Commissioning > Air purge > Type.

3 Select Manual and press OK.

4 Go to [A.7.3.4] ☰ > Installer settings > Commissioning > Air purge > Start air purge and press OK to start the air purge function.

Result: The manual air purge starts and the following screen appears.



5 Use the ◂ and ▸ buttons to scroll to Speed.

6 Use the ▲ and ▼ buttons to set the desired pump speed.

Result: Low

Result: High

7 If applicable, set the desired position of the 3-way valve (space heating/domestic hot water)(space heating/domestic hot water). Use the ◂ and ▸ buttons to scroll to Circuit.

8 Use the ▲ and ▼ buttons to set the desired position of the 3-way valve (space heating/domestic hot water).

Result: SHC

Result: Tank

To perform an automatic air purge

Prerequisite: Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

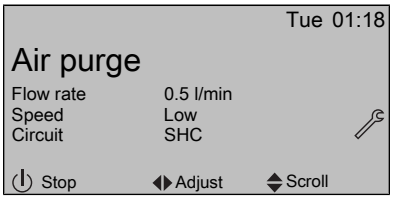
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 49.

2 Set the air purge mode: go to [A.7.3.1] ☰ > Installer settings > Commissioning > Air purge > Type.

3 Select Automatic and press OK.

4 Go to [A.7.3.4] ☰ > Installer settings > Commissioning > Air purge > Start air purge and press OK to start the air purge function.

Result: Air purging will start and the following screen will be shown.



To interrupt air purge

1 Press ⏻ and press OK to confirm the interruption of the air purge function.

9.4.3 To perform a test run

Prerequisite: Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 49.

2 Go to [A.7.1]: ☰ > Installer settings > Commissioning > Test run.

3 Select a test and press OK. **Example:** Heating.

4 Select OK and press OK.

Result: The test run starts. It stops automatically when done (±30 min). To stop it manually, press ⏻, select OK and press OK.

INFORMATION

When starting up the system in a cold climate, and NO backup heater kit was installed, it may be required to start up with a small water volume. To do this, gradually open the heat emitters. As a result, the water temperature will gradually rise. Monitor the inlet water temperature ([6.1.6] in the menu structure) and make sure it does NOT drop below 15°C.

INFORMATION

If 2 user interfaces are present, you can start a test run from both user interfaces.

- The user interface used to start the test run displays a status screen.
- The other user interface displays a "busy" screen. You cannot use the user interface as long as the "busy" screen is shown.

If the installation of the unit has been done correctly, the unit will start up during test operation in the selected operation mode. During the test mode, the correct operation of the unit can be checked by monitoring leaving water temperature and tank temperature (domestic hot water mode).

To monitor the temperature, go to [A.6] and select the information you want to check.

9.4.4 To perform an actuator test run

Purpose of the actuator test run is to confirm the operation of the different actuators (e.g., when you select pump operation, a test run of the pump will start).

Prerequisite: Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 49.

2 Make sure the room temperature control, the leaving water temperature control and the domestic hot water control are turned OFF via the user interface.

3 Go to [A.7.4]: ☰ > Installer settings > Commissioning > Actuator test run.

4 Select an actuator and press OK. **Example:** Pump.

5 Select OK and press OK.

Result: The actuator test run starts. It automatically stops when finished. To stop it manually, press ⏻, select OK and press OK.

Possible actuator test runs

- Backup heater (step 1) test
- Backup heater (step 2) test
- Pump test

INFORMATION

Make sure that all air is purged before executing the test run. Also avoid disturbances in the water circuit during the test run.

- Solar pump test
- 2-way valve test
- 3-way valve test
- Bottom plate heater test
- Bivalent signal test
- Alarm output test
- Cooling/heating signal
- Quick heat-up test
- Circulation pump test

9.4.5 Underfloor heating screed dryout

This function is used for drying out the screed of an underfloor heating system very slowly during the construction of a house. It allows the installer to program and execute this program.

Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

If a backup heater kit is part of the system, this function can be executed without finishing the outdoor installation. In this case, the backup heater will perform the screed dryout and supply the leaving water without heat pump operation.

When no outdoor unit is installed yet, then connect the main power supply cable to the indoor unit via X2M/30 and X2M/31. See "7.10.7 To connect the main power supply" on page 43.

INFORMATION

- If Emergency is set to Manual ([A.6.C]=0), and the unit is triggered to start emergency operation, the user interface will ask confirmation before starting. The underfloor heating screed dryout function is active even if the user does NOT confirm emergency operation.
- During underfloor heating screed dryout, pump speed limitation [9-0D] is NOT applicable.

NOTICE

The installer is responsible for:

- contacting the screed manufacturer for the initial heating instructions to avoid cracking the screed,
- programming the underfloor heating screed dryout schedule according to the above instruction of the screed manufacturer,
- checking the proper functioning of the setup on a regular basis,
- selecting the correct program complying with the type of the used screed of the floor.

NOTICE

To perform an underfloor heating screed dryout, room frost protection needs to be disabled ([2-06]=0). By default, it is enabled ([2-06]=1). However, due to the "installer-on-site" mode (see "Checklist before commissioning"), room frost protection will be automatically disabled for 12 hours after the first power-on.

If the screed dryout still needs to be performed after the first 12 hours of power-on, manually disable room frost protection by setting [2-06] to "0", and KEEP it disabled until the screed dryout has finished. Ignoring this notice will result in cracking of the screed.

NOTICE

For the underfloor heating screed dryout to be able to start, make sure the following settings are met:

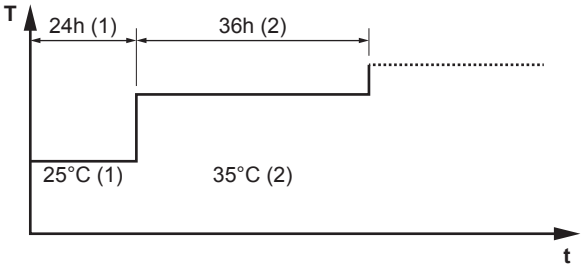
- [4-00]=1
- [C-02]=0
- [D-01]=0
- [4-08]=0
- [4-01]≠1

The installer can program up to 20 steps. For each step he needs to enter:

1 the duration in hours, up to 72 hours,

2 the desired leaving water temperature.

Example:



T Desired leaving water temperature (15~55°C)
t Duration (1~72 h)
(1) Action step 1
(2) Action step 2

To program an underfloor heating screed dryout schedule

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 49.

2 Go to [A.7.2]: ☰ > Installer settings > Commissioning > UFH screed dryout > Set dryout schedule.

3 Use the ◄, ►, ▲, and ▼ to program the schedule.
- Use ◄ and ► to scroll through the schedule.
- Use ▲ and ▼ to adjust the selection.
  If a time is selected, you can set the duration between 1 and 72 hours.
  If a temperature is selected, you can set the desired leaving water temperature between 15°C and 55°C.

4 To add a new step, select "–h" or "–" on an empty line and press ▲ ▼.

5 To delete a step, set the duration to "–" by pressing ▲ ▼.

6 Press OK to save the schedule.

It is important that there is no empty step in the program. The schedule will stop when a blank step is programmed OR when 20 consecutive steps have been executed.

To perform an underfloor heating screed dryout

INFORMATION

Preferential kWh rate power supply cannot be used in combination with underfloor heating screed dryout.

Prerequisite: Make sure there is ONLY 1 user interface connected to your system to perform an underfloor heating screed dryout.

Prerequisite: Make sure that the leaving water temperature home page, room temperature home page, and domestic hot water home page are turned OFF.

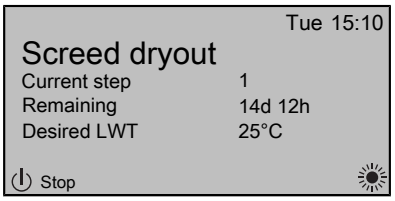
1 Go to [A.7.2]: ☰ > Installer settings > Commissioning > UFH screed dryout.

2 Set a dryout program.

3 Select Start dryout and press OK.

4 Select OK and press OK.

Result: The underfloor heating screed dryout starts and following screen will be shown. It stops automatically when done. To stop it manually, press ⏻, select OK and press OK.



To readout the status of an underfloor heating screed dryout

1 Press ⌂.

2 The current step of the program, the total remaining time, and the current desired leaving water temperature will be displayed.

INFORMATION

There is limited access to the menu structure. Only the following menus can be accessed:
- Information.
- Installer settings > Commissioning > UFH screed dryout.

To interrupt an underfloor heating screed dryout

When the program is stopped by an error, an operation switch off, or a power failure, the U3 error will be displayed on the user interface. To resolve the error codes, see "12.4 Solving problems based on error codes" on page 80. To reset the U3 error, your User permission level needs to be Installer.

1 Go to the underfloor heating screed dryout screen.

2 Press ⌂.

3 Press ⏻ to interrupt the program.

4 Select OK and press OK.

Result: The underfloor heating screed dryout program is stopped.

When the program is stopped due to an error, an operation switch-off, or a power failure, you can read out the underfloor heating screed dryout status.

5 Go to [A.7.2]: ☰ > Installer settings > Commissioning > UFH screed dryout > Dryout status > Stopped at and followed by the last executed step.

6 Modify and restart the execution of the program.

10 Hand-over to the user

Once the test run is finished and the unit operates properly, please make sure the following is clear for the user:

- Fill in the installer setting table (in the operation manual) with the actual settings.
- Make sure that the user has the printed documentation and ask him/her to keep it for future reference. Inform the user that he can find the complete documentation on the url as earlier described in this manual.
- Explain the user how to properly operate the system and what to do in case of problems.
- Show the user what to do in relation to maintaining the unit.
- Explain the user about energy saving tips as described in the operation manual.

11 Maintenance and service

NOTICE

Maintenance must be done by an authorised installer or service agent.

We recommend to do maintenance at least once a year. However, applicable legislation might require shorter maintenance intervals.

NOTICE

In Europe, the **greenhouse gas emissions** of the total refrigerant charge in the system (expressed as tonnes CO_2-equivalent) is used to determine the maintenance intervals. Follow the applicable legislation.

Formula to calculate the greenhouse gas emissions: GWP value of the refrigerant × Total refrigerant charge [in kg] / 1000

11.1 Overview: Maintenance and service

This chapter contains information about:

- The yearly maintenance of the outdoor unit
- The yearly maintenance of the indoor unit

11.2 Maintenance safety precautions

DANGER: RISK OF ELECTROCUTION

DANGER: RISK OF BURNING

NOTICE: Risk of electrostatic discharge

Before performing any maintenance or service work, touch a metal part of the unit in order to eliminate static electricity and to protect the PCB.

11.2.1 Opening the indoor unit

See "7.2.4 To open the switch box cover of the indoor unit" on page 31.

11.2.2 Opening the backup heater

See "7.2.5 To open the backup heater" on page 31 and "7.2.6 To open the switch box cover of the backup heater" on page 31.

11.3 Checklist for yearly maintenance of the outdoor unit

Check the following at least once a year:

- Outdoor unit heat exchanger.

The heat exchanger of the outdoor unit can get blocked up due to dust, dirt, leaves, etc. It is recommended to clean the heat exchanger yearly. A blocked heat exchanger can lead to too low pressure or too high pressure leading to worse performance.

11.4 Checklist for yearly maintenance of the indoor unit

Check the following at least once a year:

- Water pressure
- Water filter
- Water pressure relief valve
- Pressure relief valve of the domestic hot water tank
- Switch box
- Anti-legionella heater of the domestic hot water tank

Water pressure

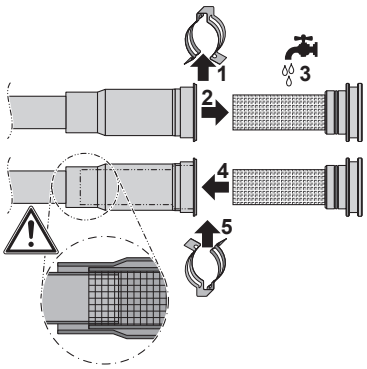
Check whether the water pressure is above 1 bar. If it is lower, add water.

Water filter

Clean the water filter.

NOTICE

Handle the water filter with care. Do NOT use excessive force when you reinsert the water filter so as NOT to damage the water filter mesh.



Water pressure relief valve

Open the valve and check if it operates correctly. **The water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does NOT contain dirt anymore
  - flush the system and install an additional water filter (a magnetic cyclone filter is preferable).

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

Relief valve of the domestic hot water tank (field supply)

Open the valve and check the correct operation. **Water may be very hot!**

Checkpoints are:

- The water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Dirty water coming out of the relief valve:
  - open the valve until the discharged water does not contain dirt anymore
  - flush and clean the complete tank, including the piping between the relief valve and cold water inlet.

To make sure this water originates from the tank, check after a tank heat up cycle.

It is recommended to do this maintenance more frequently.

Switch box

- Carry out a thorough visual inspection of the switch box and look for obvious defects such as loose connections or defective wiring.
- Using an ohmmeter, check if contactors K1M, K2M, K3M and K5M (depending on your installation) operate correctly. All contacts of these contactors must be in open position when the power is turned OFF.

WARNING

If the internal wiring is damaged, it has to be replaced by the manufacturer, its service agent or similarly qualified persons.

Anti-legionella heater of the domestic hot water tank

It is recommended to remove lime buildup on the anti-legionella heater to extend its life span, especially in regions with hard water. To do so, drain the domestic hot water tank, remove the anti-legionella heater from the domestic hot water tank and immerse in a bucket (or similar) with lime-removing product for 24 hours.

12 Troubleshooting

12.1 Overview: Troubleshooting

This chapter describes what you have to do in case of problems.

It contains information about:

- Solving problems based on symptoms
- Solving problems based on error codes

Before troubleshooting

Carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

12.2 Precautions when troubleshooting

WARNING

- When carrying out an inspection on the switch box of the unit, always make sure that the unit is disconnected from the mains. Turn off the respective circuit breaker.
- When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. NEVER bridge safety devices or change their values to a value other than the factory default setting. If you are unable to find the cause of the problem, call your dealer.

DANGER: RISK OF ELECTROCUTION

WARNING

Prevent hazard due to the inadvertent resetting of the thermal cut-out: this appliance must NOT be supplied through an external switching device, such as a timer, or connected to a circuit that is regularly turned ON and OFF by the utility.

DANGER: RISK OF BURNING

12.3 Solving problems based on symptoms

12.3.1 Symptom: The unit is NOT heating as expected

Possible causes	Corrective action
The temperature setting is NOT correct	Check the temperature setting on the remote controller. Refer to the operation manual.
The water flow is too low	Check and make sure that: ▪ All shut-off valves of the water circuit are completely open. ▪ The water filter is clean. Clean if necessary. ▪ There is no air in the system. Purge air if necessary. You can purge air manually (see "To perform a manual air purge" on page 74) or use the automatic air purge function (see "To perform an automatic air purge" on page 74). ▪ The water pressure is >1 bar. ▪ The expansion vessel is NOT broken. ▪ The resistance in the water circuit is NOT too high for the pump (see the ESP curve in the "Technical data" chapter). If the problem persists after you have conducted all of the above checks, contact your dealer. In some cases, it is normal that the unit decides to use a low water flow.
The water volume in the installation is too low	Make sure that the water volume in the installation is above the minimum required value (see "6.4.3 To check the water volume and flow rate" on page 27).

12.3.2 Symptom: The compressor does NOT start (space heating or domestic water heating)

Possible causes	Corrective action
The unit must start up out of its operation range (the water temperature is too low)	**If the system contains a backup heater:** If the water temperature is too low, the unit uses the backup heater to reach the minimum water temperature first (15°C). Check and make sure that: ▪ The power supply to the backup heater is correctly wired. ▪ The backup heater thermal protector is NOT activated. ▪ The backup heater contactors are NOT broken. If the problem persists after you have conducted all of the above checks, contact your dealer. **If the system does NOT contain a backup heater**: The unit is able to perform an automatic start-up sequence: if the space heating circuit is too cold and defrost operation is required, the unit will try to perform defrost operation on the domestic hot water tank. If this is NOT possible because the domestic hot water tank is too cold, the unit will first preheat the tank. If this start-up sequence does NOT solve the problem, it may be required to manually start up with a small water volume. To do this, gradually open the heat emitters. As a result, the water temperature will gradually rise. Monitor the inlet water temperature ([6.1.6] in the menu structure) and make sure it does NOT drop below 15°C. If the problem persists after you have conducted all of the above checks, contact your dealer.
The preferential kWh rate power supply settings and electrical connections do NOT match	This should match with the connections as explained in "6.5 Preparing electrical wiring" on page 28 and "7.10.7 To connect the main power supply" on page 43.
The preferential kWh rate signal was sent by the electricity company	Wait for the power to return (2 hours max.).

12.3.3 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see "To perform a manual air purge" on page 74) or use the automatic air purge function (see "To perform an automatic air purge" on page 74).
The water pressure at the pump inlet is too low	Check and make sure that: ▪ The water pressure is >1 bar. ▪ The manometer is not broken. ▪ The expansion vessel is NOT broken. ▪ The pre-pressure setting of the expansion vessel is correct (see "6.4.4 Changing the pre-pressure of the expansion vessel" on page 28).

12.3.4 Symptom: The pressure relief valve opens

Possible causes	Corrective action
The expansion vessel is broken	Replace the expansion vessel.
The water volume in the installation is too high	Make sure that the water volume in the installation is below the maximum allowed value (see "6.4.3 To check the water volume and flow rate" on page 27 and "6.4.4 Changing the pre-pressure of the expansion vessel" on page 28).
The water circuit head is too high	The water circuit head is the difference in height between the indoor unit and the highest point of the water circuit. If the indoor unit is located at the highest point of the installation, the installation height is considered 0 m. The maximum water circuit head is 10 m. Check the installation requirements.

12.3.5 Symptom: The water pressure relief valve leaks

Possible causes	Corrective action
Dirt is blocking the water pressure relief valve outlet	Check whether the pressure relief valve works correctly by turning the red knob on the valve counterclockwise: ▪ If you do NOT hear a clacking sound, contact your dealer. ▪ If the water keeps running out of the unit, close both the water inlet and outlet shut-off valves first and then contact your dealer.

12.3.6 Symptom: The space is NOT sufficiently heated at low outdoor temperatures

Possible causes	Corrective action
If the system contains a backup heater: backup heater operation is not activated	Check and make sure that: ▪ The backup heater operation mode is enabled. Go to: ▪ [A.5.1.1] > Installer settings > Heat sources > Backup heater > Operation mode [4-00] ▪ The backup heater overcurrent fuse has not been turned off. If it has, check the fuse and turn it back on. ▪ The thermal protector of the backup heater has not been activated. If it has, check the following, and then press the reset button in the switch box: ▪ The water pressure ▪ Whether there is air in the system ▪ The air purge operation
If the system contains a backup heater: the backup heater equilibrium temperature has not been configured correctly	Increase the "equilibrium temperature" to activate the backup heater operation at a higher outdoor temperature. Go to: ▪ [A.5.1.4] > Installer settings > Heat sources > Backup heater > Equilibrium temp. OR ▪ [A.8] > Installer settings > Overview settings [5-01]
There is air in the system.	Purge air manually or automatically. See the air purge function in the "Commissioning" chapter.
Too much heat pump capacity is used for heating domestic hot water (applies only to installations with a domestic hot water tank)	Check and make sure that the "space heating priority" settings have been configured appropriately: ▪ Make sure that the "space heating priority status" has been enabled. Go to [A.8] > Installer settings > Overview settings [5-02] ▪ Increase the "space heating priority temperature" to activate backup heater operation at a higher outdoor temperature. Go to [A.8] > Installer settings > Overview settings [5-03]

12.3.7 Symptom: The pressure at the tapping point is temporarily unusually high

Possible causes	Corrective action
Failing or blocked pressure relief valve.	▪ Flush and clean the complete tank including the piping between pressure relief valve and the cold water inlet. ▪ Replace the pressure relief valve.

12.3.8 Symptom: Decoration panels are pushed away due to a swollen tank

Possible causes	Corrective action
Failing or blocked pressure relief valve.	Contact your local dealer.

12.3.9 Symptom: Tank disinfection function is NOT completed correctly (AH-error)

Possible causes	Corrective action
The disinfection function was interrupted by domestic hot water tapping	Program the start-up of the disinfection function when the coming 4 hours NO domestic hot water tapping is expected.
Large domestic hot water tapping happened recently before the programmed start-up of the disinfection function	When the Domestic hot water > Type > Reheat or Reheat + sched. is selected, it is recommended to program the start-up the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set by installer settings (disinfection function). When the Domestic hot water > Type > Scheduled only is selected, it is recommended to program a Storage eco 3 hours before the scheduled start-up of the disinfection function to preheat the tank.
The disinfection operation was stopped manually: with the user interface displaying the DHW home page and its user permission level set to Installer, the ⏻ button was pressed during disinfection operation.	Do NOT press the ⏻ button while the disinfection function is active.

12.4 Solving problems based on error codes

When a problem happens, an error code appears on the user interface. It is important to understand the problem and to take countermeasure before resetting the error code. This should be done by a licensed installer or by your local dealer.

This chapter gives you an overview of all error codes and the content of the error code as it appears on the user interface.

For a more detailed troubleshooting guideline for each error, please see the service manual.

12.4.1 Error codes: Overview

Error codes of the outdoor unit

Error code	Detailed error code	Description
A5	00	OU: High pressure cooling/Peak cut/ freeze protection problem. Please contact your dealer.
E1	00	OU: PCB defect. Power reset required. Please contact your dealer.

Error code	Detailed error code	Description
E3	00	OU: Actuation of high pressure switch (HPS). Please contact your dealer.
E5	00	OU: Overheat of inverter compressor motor. Please contact your dealer.
E6	00	OU: Compressor startup defect. Please contact your dealer.
E7	00	OU: Malfunction of outdoor unit fan motor. Please contact your dealer.
E8	00	OU: Power input overvoltage. Please contact your dealer.
EA	00	OU: Cool/heat switchover problem. Please contact your dealer.
H0	00	OU: Voltage/current sensor problem. Please contact your dealer.
H3	00	OU: Malfunction of high pressure switch (HPS) Please contact your dealer.
H6	00	OU: Malfunction of position detection sensor. Please contact your dealer.
H8	00	OU: Malfunction of compressor input (CT) system. Please contact your dealer.
H9	00	OU: Malfunction of outdoor air thermistor. Please contact your dealer.
F3	00	OU: Malfunction of discharge pipe temperature. Please contact your dealer.
F6	00	OU: Abnormal high pressure in cooling. Please contact your dealer.
FA	00	OU: Abnormal high pressure, actuation of HPS. Please contact your dealer.
JA	00	OU: Malfunction of high pressure sensor. Please contact your dealer.
J3	00	OU: Malfunction of discharge pipe thermistor. Please contact your dealer.
J6	00	OU: Malfunction of heat exchanger thermistor. Please contact your dealer.
L3	00	OU: Electrical box temperature rise problem. Please contact your dealer.
L4	00	OU: Malfunction of inverter radiating fin temperature rise. Please contact your dealer.
L5	00	OU: Inverter instantaneous overcurrent (DC). Please contact your dealer.
P4	00	OU: Malfunction of radiating fin temperature sensor. Please contact your dealer.
U0	00	OU: Shortage of refrigerant. Please contact your dealer.
U2	00	OU: Defect of power supply voltage. Please contact your dealer.
U7	00	OU: Transmission malfunction between main CPU- INV CPU. Please contact your dealer.
UA	00	OU: Indoor/outdoor combination problem. Power reset required.

Error codes of the indoor unit

Error code	Detailed error code	Description
7H	01	Water flow problem.
7H	04	Water flow problem during domestic hot water production. Manual reset. Check the domestic hot water circuit.
7H	05	Water flow problem during heating/sampling. Manual reset. Check the space heating/cooling circuit.
7H	06	Water flow problem during cooling/defrost. Manual reset. Check the plate heat exchanger.
80	00	Returning water temperature sensor problem. Please contact your dealer.

Error code	Detailed error code	Description
81	00	Leaving water temperature sensor problem. Please contact your dealer.
89	01	Heat exchanger frozen.
89	02	Heat exchanger frozen.
89	03	Heat exchanger frozen.
8F	00	Abnormal increase outlet water temperature (DHW).
8H	00	Abnormal increase outlet water temperature.
8H	03	Overheating water circuit (thermostat).
A1	00	Zero cross detection problem. Power reset required. Please contact your dealer.
A1	01	EEPROM reading error.
AA	01	Backup heater overheated. Power reset required. Please contact your dealer.
AC	00	Booster heater overheated. Please contact your dealer.
AH	00	Tank disinfection function not completed correctly.
AJ	03	Too long DHW heat-up time required.
C0	00	Flow sensor/switch malfunction. Please contact your dealer.
C4	00	Heat exchanger temperature sensor problem. Please contact your dealer.
CJ	02	Room temperature sensor problem. Please contact your dealer.
EC	00	Abnormal increase tank temperature.
EC	04	Tank preheating
H1	00	External temperature sensor problem. Please contact your dealer.
HC	00	Tank temperature sensor problem. Please contact your dealer.
U3	00	Under floor heating screed dryout function not completed correctly.
U4	00	Indoor/outdoor unit communication problem.
U5	00	User interface communication problem.
U8	01	Connection with adapter lost Please contact your dealer.
UA	00	Indoor unit, outdoor unit matching problem. Power reset required.
UA	17	Tank type problem (for more information, see below)

INFORMATION

In case of error code AH and no interruption of the disinfection function occurred due to domestic hot water tapping, following actions are recommended:

- When the Domestic hot water > Type > Reheat or Reheat + sched. is selected, it is recommended to program the start-up of the disinfection function at least 4 hours later than the last expected large hot water tapping. This start-up can be set by installer settings (disinfection function).
- When the Domestic hot water > Type > Scheduled only is selected, it is recommended to program a Storage eco 3 hours before the scheduled start-up of the disinfection function to preheat the tank.

NOTICE

When the minimum water flow is lower than described in the table below, the unit will temporarily stop operation and the user interface will display error 7H-01. After some time, this error will reset automatically and the unit will resume operation.

Minimum required flow during heat pump operation	
04+08 models	6 l/min

Minimum required flow during heat pump operation	
11+16 models	10 l/min

Minimum required flow during defrost operation	
04+08 models	12 l/min
11+16 models	15 l/min

Minimum required flow during backup heater operation	
All models	12 l/min

If the 7H-01 error persists, the unit will stop operation and the user interface will display an error code that needs to be reset manually. Depending on the problem, this error code is different:

Error code	Detailed error code	Description
7H	04	The water flow problems mainly occurred during domestic hot water operation. Check the domestic hot water circuit.
7H	05	The water flow problems mainly occurred during space heating operation. Check the space heating circuit.
7H	06	The water flow problems mainly occurred during defrost operation. Check the space heating circuit. Additionally, this error code might be an indication of frost damage to the plate heat exchanger. In that case, contact your local dealer.

INFORMATION

Error AJ-03 is reset automatically from the moment there is a normal tank heat-up.

INFORMATION

Error EC-04 is reset automatically from the moment the domestic hot water tank is preheated to a sufficiently high temperature.

Error code UA 17: Tank type problem

Possible causes	Corrective action
No backup heater is installed, and [E-05] is set to "0".	Set [E-05] to "1".
[E-07] is set to "1", "3", "4", or "6", which is NOT allowed.	Set [E-07] correctly, according to the system setup.
[E-07] is set to "0", while [D-02] is NOT set to "3" or "4" (NO recirculation pump and NO backup heater installed).	Install a recirculation pump and set [D-02] correctly, according to the system setup.
[E-07] is set to "5", while [D-02] is NOT set to "3" or "4" (NO recirculation pump and NO backup heater installed).	Install a recirculation pump and set [D-02] correctly, according to the system setup.

13 Disposal

13.1 Overview: Disposal

Typical workflow

Disposing of the system typically consists of the following stages:

1 Pumping down the system.
2 Dismantling the system according to the applicable legislation.
3 Treating the refrigerant, oil and other parts according to the applicable legislation.

INFORMATION

For more details, see the service manual.

13.2 To pump down

Example: To protect the environment, pump down when relocating the unit or when disposing of the unit.

DANGER: RISK OF EXPLOSION

Pump down – Refrigerant leakage. If you want to pump down the system, and there is a leakage 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.

NOTICE

During pump down operation, stop the compressor before removing the refrigerant piping. If the compressor is still running and the stop valve is open during pump down, air will be sucked into the system. Compressor breakage and other injury will be the result due to abnormal pressure in the refrigerant cycle.

Pump down operation will extract all refrigerant from the system into the outdoor unit.

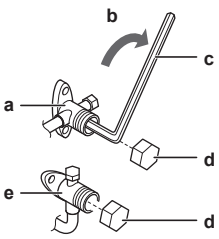
1 Remove the valve lid from liquid stop valve and gas stop valve.

2 Carry out the forced cooling operation.

3 After 5 to 10 minutes (after only 1 or 2 minutes in case of very low ambient temperatures (<−10°C)), close the liquid stop valve with a hexagonal wrench.

4 Check with the manifold if the vacuum is reached.

5 After 2-3 minutes, close the gas stop valve and stop forced cooling operation.



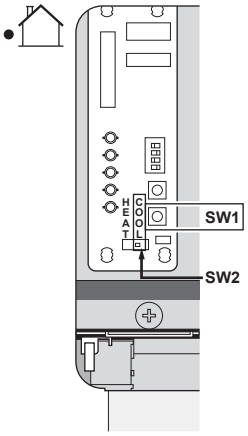
a Gas stop valve
b Closing direction
c Hexagonal wrench
d Valve lid
e Liquid stop valve

13.3 To start and stop forced cooling

Confirm that DIP switch SW2 is in COOL mode.

1 Press the forced cooling operation switch SW1 to begin forced cooling.

2 Press the forced cooling operation switch SW1 to stop forced cooling.



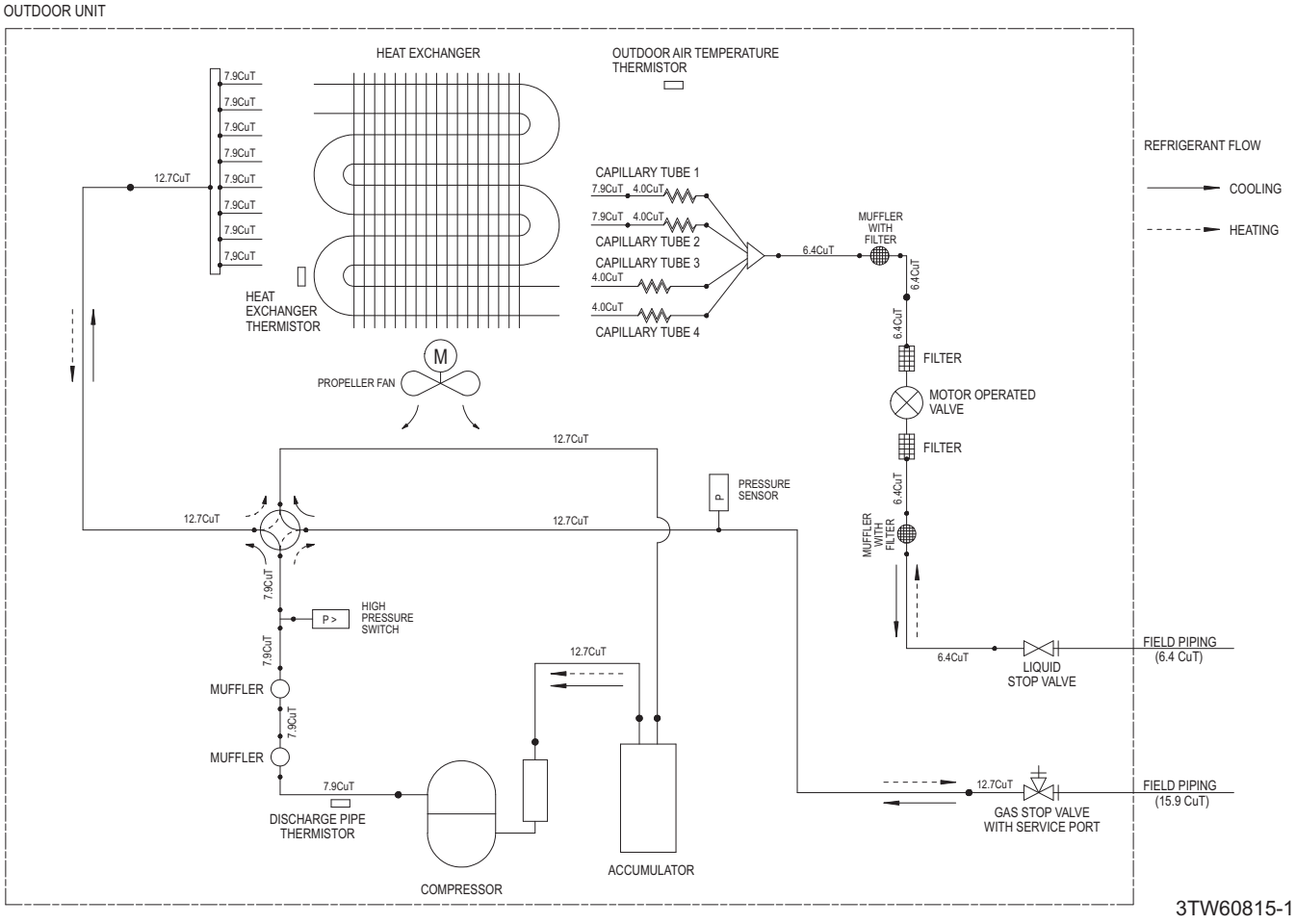
NOTICE

Take care that while running forced cooling operation, the water temperature remains higher than 5°C (see temperature read out of the indoor unit). You can achieve this, for example, by activating all fans of the fan coil units.

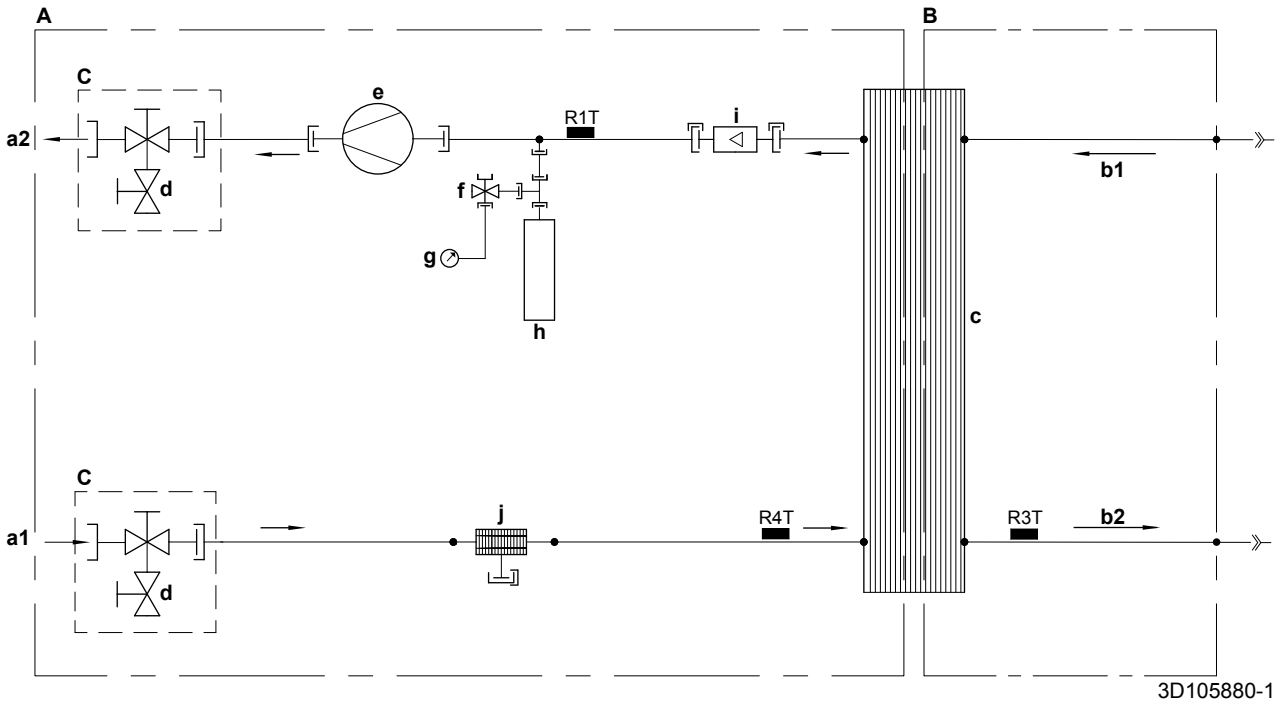
14 Technical data

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 extranet (authentication required).

14.1 Piping diagram: Outdoor unit



14.2 Piping diagram: Indoor unit



A	Water side
B	Refrigerant side
C	Field installed
a1	Space heating water IN
a2	Space heating water OUT
b1	Refrigerant IN
b2	Refrigerant OUT
c	Plate heat exchanger
d	Shut-off valve with drain/fill valve
e	Pump
f	Safety valve
g	Manometer
h	Expansion vessel
i	Flow sensor
j	Filter
R1T	Thermistor (heat exchanger – water OUT)
R3T	Thermistor (liquid refrigerant)
R4T	Thermistor (heat exchanger – water IN)

Screw connection
Flare connection
Quick coupling
Brazed connection

14.3 Wiring diagram: Outdoor unit

See the internal wiring diagram supplied with the unit (on the inside of the top plate). The abbreviations used are listed below.

C110~C112	Capacitor
DB1, DB2, DB401	Rectifier bridge
DC_N1, DC_N2	Connector
DC_P1, DC_P2	Connector
DCP1, DCP2,	Connector
DCM1, DCM2	Connector
DP1, DP2	Connector
E1, E2	Connector
E1H	Drain pan heater
FU1~FU5	Fuse
HL1, HL2, HL402	Connector
HN1, HN2, HN402	Connector
IPM1	Intelligent power module
L	Live
LED 1~LED 4	Indication lamps
LED A, LED B	Pilot lamp
M1C	Compressor motor
M1F	Fan motor
MR30, MR306, MR307, MR4	Magnetic relay
MRM10, MRM20	Magnetic relay
MR30_A, MR30_B	Connector
N	Neutral
PCB1	Printed circuit board (main)
PCB2	Printed circuit board (inverter)
PCB3	Printed circuit board (service)
Q1DI	Earth leakage circuit breaker
Q1L	Overload protector
R1T	Thermistor (discharge)
R2T	Thermistor (heat exchanger)
R3T	Thermistor (air)
S1NPH	Pressure sensor
S1PH	High pressure switch
S2~S503	Connector
SA1	Surge arrestor
SHEET METAL	Terminal strip on fixed plate
SW1, SW3	Push buttons
SW2, SW5	DIP switches
U	Connector
V	Connector
V2, V3, V401	Varistor
W	Connector
X11A, X12A	Connector
X1M, X2M	Terminal strip
Y1E	Electronic expansion valve coil
Y1R	Reversing solenoid valve coil
Z1C~Z4C	Ferrite core
⊏⊏■■■⊏⊏	Field wiring
□□□□	Terminal strip
⊠	Connector
–o–	Terminal
⏚	Protective earth
BLK	Black
BLU	Blue
BRN	Brown
GRN	Green
ORG	Orange
PPL	Purple
RED	Red
WHT	White
YLW	Yellow

14.4 Wiring diagram: Indoor unit

See the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

Notes to go through before starting the unit

English	Translation
Notes to go through before starting the unit	Notes to go through before starting the unit
X1M	Main terminal
X2M	Field wiring terminal for AC
X3M	Backup heater terminal
X4M	Anti-legionella heater terminal
X5M	Field wiring terminal for DC
—·—·—·—	Earth wiring
15	Wire number 15
– – – – – – –	Field supply
—> **/12.2	Connection ** continues on page 12 column 2
①	Several wiring possibilities
	Option
	Not mounted in switch box
	Wiring depending on model
	PCB
User installed options	User installed options
☐ Anti-legionella heater	☐ Anti-legionella heater
☐ Backup heater	☐ Backup heater
☐ Bottom plate heater	☐ Bottom plate heater
☐ Domestic hot water tank	☐ Domestic hot water tank
☐ Domestic hot water tank with solar connection	☐ Domestic hot water tank with solar connection
☐ Remote user interface	☐ Remote user interface
☐ Ext. indoor thermistor	☐ External indoor thermistor
☐ Ext outdoor thermistor	☐ External outdoor thermistor
☐ Digital I/O PCB	☐ Digital I/O PCB
☐ Demand PCB	☐ Demand PCB
☐ Solar pump and control station	☐ Solar pump and control station
Main LWT	Main leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector
Add LWT	Additional leaving water temperature
☐ On/OFF thermostat (wired)	☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)	☐ On/OFF thermostat (wireless)
☐ Ext. thermistor	☐ External thermistor
☐ Heat pump convector	☐ Heat pump convector

Position in switch box

English	Translation
Position in switch box	Position in switch box

Legend

A1P		Main PCB
A2P		User interface PCB
A3P	*	Solar pump station PCB
A3P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A4P	*	Receiver PCB (Wireless On/OFF thermostat)
A5P		Anode driver PCB
A8P	*	Demand PCB
BSK	*	Solar pump station relay
DS1(A8P)	*	DIP switch
F2B	(*)	Overcurrent fuse anti-legionella heater
F1U, F2U	*	Fuse 5 A 250 V for digital I/O PCB
K1	*	Terminal strip
K3M	(*)	Contactor anti-legionella heater
K*R		Relay on PCB
M2P	#	Domestic hot water pump
M2S	#	Shut-off valve
M3S	(*)	3-way valve for floor heating/domestic hot water
PHC1 (A4P)	*	Optocoupler input circuit
Q*DI	#	Earth leakage circuit breaker
Q*L	(*)	Thermal protector anti-legionella heater
R1T (A3P)	*	Ambient sensor On/OFF thermostat
R2T	*	External sensor (floor or ambient)
R5T	(*)	Domestic hot water thermistor
R6T	*	External indoor or outdoor ambient thermistor
R1H (A3P)	*	Humidity sensor
S1S	#	Preferential kWh rate power supply contact
S2S	#	Electrical meter pulse input 1
S3S	#	Electrical meter pulse input 2
S4S	#	Safety thermostat
S6S~S9S	#	Digital power limitation inputs
SS1 (A4P)	*	Selector switch
TR1		Power supply transformer
X*M		Terminal strip
X*Y		Connector
	* =	Optional
	(*) =	Standard for EHVH*, optional for EHBH*
	# =	Field supply

Translation of text on wiring diagram

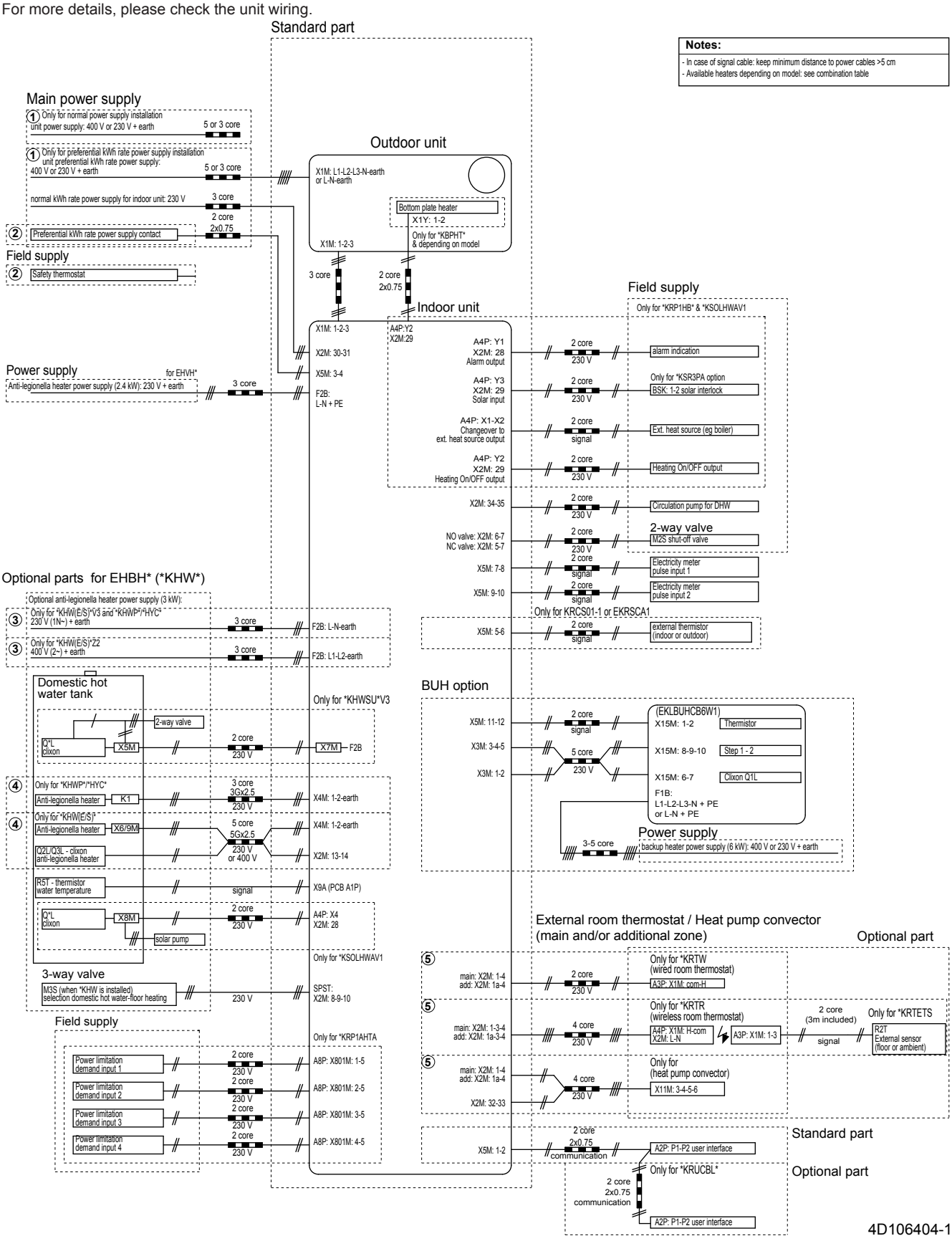
English	Translation
(1) Main power connection	(1) Main power connection
For preferential kWh rate power supply	For preferential kWh rate power supply
Indoor unit supplied from outdoor	Indoor unit supplied from outdoor
Normal kWh rate power supply	Normal kWh rate power supply
Only for normal power supply (standard)	Only for normal power supply (standard)
Only for preferential kWh rate power supply (outdoor)	Only for preferential kWh rate power supply (outdoor)
Outdoor unit	Outdoor unit

English	Translation
Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)	Preferential kWh rate power supply contact: 16 V DC detection (voltage supplied by PCB)
Use normal kWh rate power supply for indoor unit	Use normal kWh rate power supply for indoor unit
(2) User interface	(2) User interface
Only for remote user interface option	Only for remote user interface option
SWB	Switch box
(3) Ext. thermistor	(3) External thermistor
SWB	Switch box
(4) Field supplied options	(4) Field supplied options
230 V AC supplied by PCB	230 V AC supplied by PCB
5 V DC pulse detection (voltage supplied by PCB)	5 V DC pulse detection (voltage supplied by PCB)
Continuous	Continuous current
DHW pump	Domestic hot water pump
DHW pump output	Domestic hot water pump output
Electrical meters	Electrical meters
For safety thermostat	For safety thermostat
Inrush	Inrush current
Max. load	Maximum load
Normally closed	Normally closed
Normally open	Normally open
Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)	Safety thermostat contact: 16 V DC detection (voltage supplied by PCB)
Shut-off valve	Shut-off valve
SWB	Switch box
(5) Domestic hot water tanks	(5) Domestic hot water tanks
3 wire type SPST	3 wire type SPST
Anti-legionella heater power supply	Anti-legionella heater power supply
For ***	For ***
For *** or ***	For *** or ***
SWB	Switch box
(6) Optional BUH	(6) Optional backup heater
SWB	Switch box

English	Translation
(7) Anti-legionella heater power supply	(7) Anti-legionella heater power supply
For ***	For ***
(8) Option PCBs	(8) Option PCBs
Alarm output	Alarm output
Changeover to ext. heat source	Changeover to external heat source
For digital I/O PCB option	For digital I/O PCB option
For solar pump station	For solar pump station
Max. load	Maximum load
Min. load	Minimum load
Only for ***	Only for ***
Only for demand PCB option	Only for demand PCB option
Only if no ***	Only if no ***
Options: boiler output, solar pump connection (only EHBH*), alarm output	Options: boiler output, solar pump connection (only EHBH*), alarm output
Options: bottom plate heater OR On/OFF output	Options: bottom plate heater OR On/OFF output
Outdoor unit	Outdoor unit
Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)	Power limitation digital inputs: 12 V DC / 12 mA detection (voltage supplied by PCB)
Refer to operation manual	Refer to operation manual
Solar pump connection	Solar pump connection
Space C/H On/OFF output	Space cooling/heating On/OFF output
Switch box	Switch box
To bottom plate heater	To bottom plate heater
(9) External On/OFF thermostats and heat pump convector	(9) External On/OFF thermostats and heat pump convector
Additional LWT zone	Additional leaving water temperature zone
For external sensor (floor/ ambient)	For external sensor (floor or ambient)
For heat pump convector	For heat pump convector
For wired thermostat	For wired thermostat
For wireless thermostat	For wireless thermostat
Main LWT zone	Main leaving water temperature zone

Electrical connection diagram

For more details, please check the unit wiring.



14.5 Wiring diagram: Backup heater

See the internal wiring diagram supplied with the unit (on the inside of the backup heater cover). The abbreviations used are listed below.

Notes to go through before starting the unit

English	Translation
Notes to go through before starting the unit	Notes to go through before starting the unit
X14M, X15M	Main terminal
—·—·—·—	Earth wiring
15	Wire number 15
– – – – – – –	Field supply
①	Several wiring possibilities
	Option
	Switch box
	Wiring depending on model
	PCB
Optional backup heater configuration (only for EKLBUHCB6W1)	Optional backup heater configuration (only for EKLBUHCB6W1)
☐ 1N~, 230 V, 6 kW	☐ 1N~, 230 V, 6 kW
☐ 3N~, 400 V, 6 kW	☐ 3N~, 400 V, 6 kW

Position in switch box

English	Translation
Position in switch box	Position in switch box

Legend

E1H		Backup heater element (1 kW)
E2H		Backup heater element (2 kW)
F1B		Overcurrent fuse backup heater
F1T		Thermal fuse backup heater
F1U		Fuse
K1M		Contactor backup heater (step 1)
K2M		Contactor backup heater (step 2)
K5M		Safety contactor backup heater (only for *6W)
Q3DI	#	Earth leakage circuit breaker
Q1L		Thermal protector backup heater
R2T		Outlet backup heater thermistor
X*M		Terminal strip
	# =	Field supply

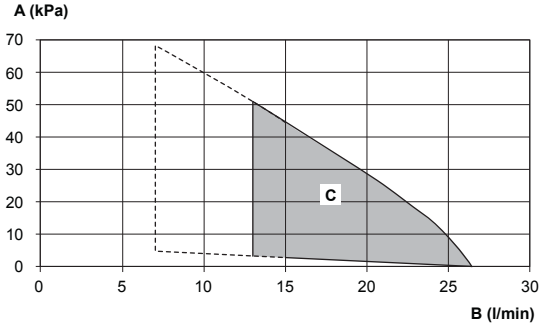
Translation of text on wiring diagram

English	Translation
BUH option	Backup heater option
Indoor unit	Indoor unit

14.6 ESP curve: Indoor unit

Note: A flow error will occur when the minimum water flow rate is not reached.

EHBH/X04=EHBH/X04



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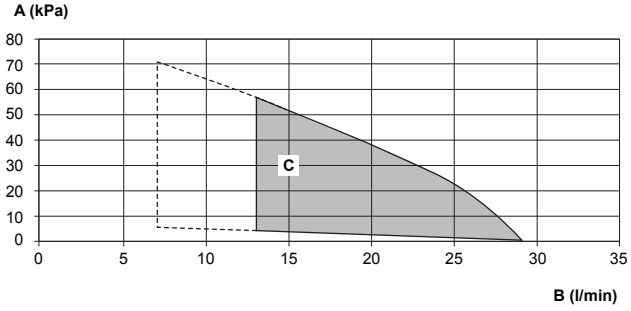
EHBH/X08=EHBH/X08



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A External static pressure
B Water flow rate
C Operation range

Operation area is extended to lower flow rates only in case the unit operates with heat pump only. (Not in startup, no backup heater operation, no defrost operation).

ESP=External static pressure [kPa] in the space heating/cooling circuit.

Flow=Water flow through the unit in the space heating/cooling circuit.

Notes:

- Selecting a flow outside the area of operation can cause damage or malfunction of the unit. See also the minimum and maximum allowed water flow range in the technical specifications.
- Water quality MUST be according to EN directive EC98/83EC.

15 Glossary

Dealer

Sales distributor for the product.

Authorized installer

Technical skilled person who is qualified to install the product.

User

Person who is owner of the product and/or operates the product.

Applicable legislation

All international, European, national and local directives, laws, regulations and/or codes that are relevant and applicable for a certain product or domain.

Service company

Qualified company which can perform or coordinate the required service to the product.

Installation manual

Instruction manual specified for a certain product or application, explaining how to install, configure and maintain it.

Operation manual

Instruction manual specified for a certain product or application, explaining how to operate it.

Accessories

Labels, manuals, information sheets and equipment that are delivered with the product and that need to be installed according to the instructions in the accompanying documentation.

Optional equipment

Equipment made or approved by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

Field supply

Equipment not made by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

Field settings table

Applicable indoor units

EHBH04CBV
EHBH08CBV
EHBH11CBV
EHBH16CBV
EHVH04S18CBV
EHVH08S18CBV
EHVH08S26CBV
EHVH11S26CBV
EHVH16S26CBV

Notes

(*1) EHBH*
(*2) EHVH*
(*3) *04/08*
(*4) *11/16*

Field settings table

Breadcrumb	Field code	Setting name			Range, step **Default value**	Installer setting at variance with default value Date	Value
User settings							
└ Preset values							
└ Room temperature							
7.4.1.1		Comfort (heating)		R/W	[3-07]~[3-06], step: A.3.2.4 **21°C**		
7.4.1.2		Eco (heating)		R/W	[3-07]~[3-06], step: A.3.2.4 **19°C**		
└ LWT main							
7.4.2.1	[8-09]	Comfort (heating)		R/W	[9-01]~[9-00], step: 1°C **35°C**		
7.4.2.2	[8-0A]	Eco (heating)		R/W	[9-01]~[9-00], step: 1°C **33°C**		
7.4.2.5		Comfort (heating)		R/W	-10~10°C, step: 1°C **0°C**		
7.4.2.6		Eco (heating)		R/W	-10~10°C, step: 1°C **-2°C**		
└ Tank temperature							
7.4.3.1	[6-0A]	Storage comfort		R/W	30~[6-0E]°C, step: 1°C **60°C**		
7.4.3.2	[6-0B]	Storage eco		R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
7.4.3.3	[6-0C]	Reheat		R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
└ Quiet level							
7.4.4				R/W	**0: Level 1 (*4)** **1: Level 2 (*3)** 2: Level 3		
└ Electricity price							
7.4.5.1	[C-0C] [D-0C]	High		R/W	0,00~990/kWh **0/kWh**		
7.4.5.2	[C-0D] [D-0D]	Medium		R/W	0,00~990/kWh **0/kWh**		
7.4.5.3	[C-0E] [D-0E]	Low		R/W	0,00~990/kWh **0/kWh**		
└ Fuel price							
7.4.6				R/W	0,00~990/kWh 0,00~290/MBtu **8,0/kWh**		
└ Set weather dependent							
└ Main							
7.7.1.1	[1-00]	Set weather-dependent heating	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
7.7.1.1	[1-01]	Set weather-dependent heating	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
7.7.1.1	[1-02]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00]°C, step: 1°C **35°C**		
7.7.1.1	[1-03]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C **25°C**		
└ Additional							
7.7.2.1	[0-00]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
7.7.2.1	[0-01]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	[9-05]~[9-06]°C, step: 1°C **45°C**		
7.7.2.1	[0-02]	Set weather-dependent heating	High ambient temp. for LWT add zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
7.7.2.1	[0-03]	Set weather-dependent heating	Low ambient temp. for LWT add zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
Installer settings							
└ System layout							
└ Standard							
A.2.1.1	[E-00]	Unit type		R/O	0~5 **0: LT split**		
A.2.1.2	[E-01]	Compressor type		R/O	0: 8 1: 16		
A.2.1.3	[E-02]	Indoor software type		R/O	0~1 **1: Type 2**		
A.2.1.4	[E-03]	Backup heater steps		R/W	**0: No BUH** 1: 1 step 2: 2 steps		
A.2.1.5	[5-0D]	BUH type		R/W	0~5 **1: 1P,(1/1+2)** 4: 3PN,(1/2)		
A.2.1.6	[D-01]	Forced off contact		R/W	**0: No** 1: Open tariff 2: Closed tariff 3: Thermostat		
A.2.1.7	[C-07]	Unit control method		R/W	**0: LWT control** 1: Ext RT control 2: RT control		
A.2.1.8	[7-02]	Number of LWT zones		R/W	**0: 1 LWT zone** 1: 2 LWT zones		
A.2.1.9	[F-0D]	Pump operation mode		R/W	0: Continuous **1: Sample** 2: Request		
A.2.1.A	[E-04]	Power saving possible		R/O	0: No 1: Yes		
A.2.1.B		User interface location		R/W	0: At unit **1: In room**		
└ Options							
A.2.2.1	[E-05]	DHW operation		R/W	**0: No (*1)** **1: Yes (*2)**		
A.2.2.3	[E-07]	DHW tank type		R/W (*1) R/O (*2)	0~6 **0: Type 1 (*1)** **2: Type 3 (*2)** 5: Type 6		
A.2.2.4	[C-05]	Contact type main		R/W	1: Thermo ON/OFF **2: C/H request**		
A.2.2.5	[C-06]	Contact type add.		R/W	1: Thermo ON/OFF **2: C/H request**		
A.2.2.6.1	[C-02]	Digital I/O PCB	Ext. backup heat src	R/W	**0: No** 1: Bivalent 2: - 3: -		

(*1) EHBH*_(*2) EHVH*_
(*3) *04/08*_(*4) *11/16*

Field settings table

Breadcrumb	Field code	Setting name			Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.2.2.6.2	[D-07]	Digital I/O PCB	Solar kit	R/W	**0: No** 1: Yes		
A.2.2.6.3	[C-09]	Digital I/O PCB	Alarm output	R/W	**0: Normally open** 1: Normally closed		
A.2.2.6.4	[F-04]	Digital I/O PCB	Bottom plate heater	R/W	**0: No** 1: Yes		
A.2.2.7	[D-04]	Demand PCB		R/W	**0: No** 1: Pwr consmp ctrl		
A.2.2.8	[D-08]	External kWh meter 1		R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.2.2.9	[D-09]	External kWh meter 2		R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.2.2.A	[D-02]	DHW pump		R/W	**0: No** 1: Secondary rtrn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.2.2.B	[C-08]	External sensor		R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
		└ Capacities					
A.2.3.1	[6-02]	Booster heater		R/W	0~10 kW, step: 0,2 kW **3 kW (*1)** **2,4 kW (*2)**		
A.2.3.2	[6-03]	BUH: step 1		R/W	0~10 kW, step: 0,2 kW **3 kW**		
A.2.3.3	[6-04]	BUH: step 2		R/W	0~10 kW, step: 0,2 kW **3 kW**		
A.2.3.6	[6-07]	Bottom plate heater		R/W	0~200 W, step: 10 W **0 W**		
	Space operation						
	└ LWT settings						
		└ Main					
A.3.1.1.1		LWT setpoint mode		R/W	0: Fixed **1: Weather dep.** 2: Fixed + scheduled 3: WD + scheduled		
A.3.1.1.2.1	[9-01]	Temperature range	Minimum temp (heating)	R/W	15~37°C, step: 1°C **25°C**		
A.3.1.1.2.2	[9-00]	Temperature range	Maximum temp (heating)	R/W	37~depending on outdoor unit, step: 1°C **55°C**		
A.3.1.1.5	[8-05]	Modulated LWT		R/W	**0: No** 1: Yes		
A.3.1.1.6.1	[F-0B]	Shut-off valve	Thermo On/OFF	R/W	**0: No** 1: Yes		
A.3.1.1.7	[9-0B]	Emitter type		R/W	0: Quick **1: Slow**		
			└ Additional				
A.3.1.2.1		LWT setpoint mode		R/W	0: Fixed **1: Weather dep.** 2: Fixed + scheduled 3: WD + scheduled		
A.3.1.2.2.1	[9-05]	Temperature range	Minimum temp (heating)	R/W	15~37°C, step: 1°C **25°C**		
A.3.1.2.2.2	[9-06]	Temperature range	Maximum temp (heating)	R/W	37~depending on outdoor unit, step: 1°C **55°C**		
			└ Delta T source				
A.3.1.3.1	[9-09]	Heating		R/W	3~10°C, step: 1°C **5°C**		
		└ Room thermostat					
A.3.2.1.1	[3-07]	Room temp. range	Minimum temp (heating)	R/W	12~18°C, step: A.3.2.4 **12°C**		
A.3.2.1.2	[3-06]	Room temp. range	Maximum temp (heating)	R/W	18~30°C, step: A.3.2.4 **30°C**		
A.3.2.2	[2-0A]	Room temp. offset		R/W	-5~5°C, step: 0,5°C **0°C**		
A.3.2.3	[2-09]	Ext. room sensor offset		R/W	-5~5°C, step: 0,5°C **0°C**		
A.3.2.4		Room temp. step		R/W	0: 0,5 °C **1: 1 °C**		
		└ Operation range					
A.3.3.1	[4-02]	Space heating OFF temp		R/W	14~35°C, step: 1°C **25°C (*3)** **35°C (*4)**		
	└ Domestic hot water (DHW)						
		└ Type					
A.4.1	[6-0D]			R/W	0: Reheat only 1: Reheat + sched. **2: Scheduled only**		
		└ Disinfection					
A.4.4.1	[2-01]	Disinfection		R/W	0: No **1: Yes**		
A.4.4.2	[2-00]	Operation day		R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
A.4.4.3	[2-02]	Start time		R/W	0~23 hour, step: 1 hour **23**		

(*1) EHBH*_(*2) EHVH*_
(*3) *04/08*_(*4) *11/16*

Field settings table						Installer setting at variance with default value	
Breadcrumb	Field code	Setting name			Range, step **Default value**	Date	Value
A.4.4.4	[2-03]	Temperature target		R/W (*1) R/O (*2)	55~80°C, step: 5°C **70°C**		
A.4.4.5	[2-04]	Duration		R/W	5~60 min, step: 5 min **10 min**		
		└ Maximum setpoint					
A.4.5	[6-0E]			R/W	[E-07]≠2: 40~80°C, step: 1°C **60°C** [E-07]=2: 40~65°C, step: 1°C **65°C**		
		└ SP mode					
A.4.6				R/W	**0: Fixed** 1: Weather dep.		
		└ Weather dependent curve					
A.4.7	[0-0B]	Weather-dependent curve	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
A.4.7	[0-0C]	Weather-dependent curve	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C **60°C (*1)** **65°C (*2)**		
A.4.7	[0-0D]	Weather-dependent curve	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.4.7	[0-0E]	Weather-dependent curve	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
	└ Heat sources						
		└ Backup heater					
A.5.1.1	[4-00]	Operation mode		R/W	0~2 0: Disabled **1: Enabled**		
A.5.1.3	[4-07]	Enable BUH step 2		R/W	0: No **1: Yes**		
A.5.1.4	[5-01]	Equilibrium temp.		R/W	-15~35°C, step: 1°C **0°C**		
	└ System operation						
		└ Auto restart					
A.6.1	[3-00]			R/W	0: No **1: Yes**		
		└ Preferential kWh rate					
A.6.2.1	[D-00]	Allowed heaters		R/W	**0: None** 1: BSH only 2: BUH only 3: All heaters		
A.6.2.2	[D-05]	Forced pump OFF		R/W	0: Forced off **1: As normal**		
		└ Pwr consumpt. Control					
A.6.3.1	[4-08]	Mode		R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
A.6.3.2	[4-09]	Type		R/W	0: Current **1: Power**		
A.6.3.3	[5-05]	Amp. value		R/W	0~50 A, step: 1 A **50 A**		
A.6.3.4	[5-09]	kW value		R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.6.3.5.1	[5-05]	Amp. limits for DI	Limit DI1	R/W	0~50 A, step: 1 A **50 A**		
A.6.3.5.2	[5-06]	Amp. limits for DI	Limit DI2	R/W	0~50 A, step: 1 A **50 A**		
A.6.3.5.3	[5-07]	Amp. limits for DI	Limit DI3	R/W	0~50 A, step: 1 A **50 A**		
A.6.3.5.4	[5-08]	Amp. limits for DI	Limit DI4	R/W	0~50 A, step: 1 A **50 A**		
A.6.3.6.1	[5-09]	kW limits for DI	Limit DI1	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.6.3.6.2	[5-0A]	kW limits for DI	Limit DI2	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.6.3.6.3	[5-0B]	kW limits for DI	Limit DI3	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.6.3.6.4	[5-0C]	kW limits for DI	Limit DI4	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.6.3.7	[4-01]	Priority		R/W	**0: None** 1: BSH 2: BUH		
		└ Averaging time					
A.6.4	[1-0A]			R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
		└ Ext amb. sensor offset					
A.6.5	[2-0B]			R/W	-5~5°C, step: 0,5°C **0°C**		
		└ Boiler efficiency					
A.6.A	[7-05]			R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
		└ Emergency					
A.6.C				R/W	**0: Manual** 1: Automatic		
	└ Overview settings						
A.8	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.		R/W	[9-05]~min(45,[9-06])°C, step: 1°C **35°C**		
A.8	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.		R/W	[9-05]~[9-06]°C, step: 1°C **45°C**		
A.8	[0-02]	High ambient temp. for LWT add zone heating WD curve.		R/W	10~25°C, step: 1°C **15°C**		
A.8	[0-03]	Low ambient temp. for LWT add zone heating WD curve.		R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[0-04]	--			**8**		
A.8	[0-05]	--			**12**		
A.8	[0-06]	--			**35**		
A.8	[0-07]	--			**20**		

(*1) EHBH*_(*2) EHVH*_
(*3) *04/08*_(*4) *11/16*

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.8	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~[6-0E]°C, step: 1°C **55°C**		
A.8	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.	R/W	45~[6-0E]°C, step: 1°C 60**°C (*1)** **65°C (*2)**		
A.8	[0-0D]	High ambient temp. for DHW WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[0-0E]	Low ambient temp. for DHW WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[1-00]	Low ambient temp. for LWT main zone heating WD curve.	R/W	-40~5°C, step: 1°C **-10°C**		
A.8	[1-01]	High ambient temp. for LWT main zone heating WD curve.	R/W	10~25°C, step: 1°C **15°C**		
A.8	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~[9-00], step: 1°C **35°C**		
A.8	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	[9-01]~min(45, [9-00])°C , step: 1°C **25°C**		
A.8	[1-04]	--		**1**		
A.8	[1-05]	--		**1**		
A.8	[1-06]	--		**20**		
A.8	[1-07]	--		**35**		
A.8	[1-08]	--		**22**		
A.8	[1-09]	--		**18**		
A.8	[1-0A]	What is the averaging time for the outdoor temp?	R/W	**0: No averaging** 1: 12 hours 2: 24 hours 3: 48 hours 4: 72 hours		
A.8	[2-00]	When should the disinfection function be executed?	R/W	0: Each day 1: Monday 2: Tuesday 3: Wednesday 4: Thursday **5: Friday** 6: Saturday 7: Sunday		
A.8	[2-01]	Should the disinfection function be executed?	R/W	0: No **1: Yes**		
A.8	[2-02]	When should the disinfection function start?	R/W	0~23 hour, step: 1 hour **23**		
A.8	[2-03]	What is the disinfection target temperature?	R/W	55~80°C, step: 5°C **70°C**		
A.8	[2-04]	How long must the tank temperature be maintained?	R/W	5~60 min, step: 5 min **10 min**		
A.8	[2-05]	Room antifrost temperature	R/W	4~16°C, step: 1°C **16°C**		
A.8	[2-06]	Room frost protection	R/W	0: Disabled **1: Enabled**		
A.8	[2-09]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
A.8	[3-01]	--		**0**		
A.8	[3-02]	--		**1**		
A.8	[3-03]	--		**4**		
A.8	[3-04]	--		**2**		
A.8	[3-05]	--		**1**		
A.8	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: A.3.2.4 **30°C**		
A.8	[3-07]	What is the mimimum desired room temperature in heating?	R/W	12~18°C, step: A.3.2.4 **12°C**		
A.8	[3-08]	--		**35**		
A.8	[3-09]	--		**15**		
A.8	[4-00]	What is the BUH operation mode?	R/W	0~2 0: Disabled **1: Enabled**		
A.8	[4-01]	Which electric heater has priority?	R/W	**0: None** 1: BSH 2: BUH		
A.8	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~35°C, step: 1°C **25°C (*3)** **35°C (*4)**		
A.8	[4-03]	Operation permission of the booster heater.	R/W	0: Limited 1: No limit 2: Most optimum **3: Optimum** 4: Only legionella		
A.8	[4-04]	--		**2**		
A.8	[4-05]	--		**0**		
A.8	[4-06]	-- (Do not change this value)		**0/1**		
A.8	[4-07]	Enable the second step of the backup heater?	R/W	0: No **1: Yes**		
A.8	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
A.8	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
A.8	[4-0A]	--		**0**		
A.8	[4-0B]	Automatic cooling/heating changeover hysteresis.	R/W	1~10°C, step: 0,5°C **1°C**		
A.8	[4-0D]	Automatic cooling/heating changeover offset.	R/W	1~10°C, step: 0,5°C **3°C**		
A.8	[4-0E]	Is the installer on site?	R/W	0: No **1: Yes**		
A.8	[5-00]	Is backup heater operation allowed above equilibrium temperature during space heating operation?	R/W	0: Allowed **1: Not allowed**		
A.8	[5-01]	What is the equilibrium temperature for the building?	R/W	-15~35°C, step: 1°C **0°C**		

(*1) EHBH*_(*2) EHVH*_
(*3) *04/08*_(*4) *11/16*

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.8	[5-02]	Space heating priority.	R/W	**0: Disabled** 1: Enabled		
A.8	[5-03]	Space heating priority temperature.	R/W	-15~35°C, step: 1°C **0°C**		
A.8	[5-04]	Set point correction for domestic hot water temperature.	R/W	0~20°C, step: 1°C **10°C**		
A.8	[5-05]	What is the requested limit for DI1?	R/W	0~50 A, step: 1 A **50 A**		
A.8	[5-06]	What is the requested limit for DI2?	R/W	0~50 A, step: 1 A **50 A**		
A.8	[5-07]	What is the requested limit for DI3?	R/W	0~50 A, step: 1 A **50 A**		
A.8	[5-08]	What is the requested limit for DI4?	R/W	0~50 A, step: 1 A **50 A**		
A.8	[5-09]	What is the requested limit for DI1?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8	[5-0A]	What is the requested limit for DI2?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8	[5-0B]	What is the requested limit for DI3?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8	[5-0C]	What is the requested limit for DI4?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8	[5-0D]	What type of backup heater installation is used?	R/W	0~5 **1: 1P,(1/1+2)** 4: 3PN,(1/2)		
A.8	[5-0E]	--		**1**		
A.8	[6-00]	The temperature difference determining the heat pump ON temperature.	R/W	2~20°C, step: 1°C **2°C**		
A.8	[6-01]	The temperature difference determining the heat pump OFF temperature.	R/W	0~10°C, step: 1°C **2°C**		
A.8	[6-02]	What is the capacity of the booster heater?	R/W	0~10 kW, step: 0,2 kW **3 kW (*1)** **2,4 kW (*2)**		
A.8	[6-03]	What is the capacity of the backup heater step 1?	R/W	0~10 kW, step: 0,2 kW **3 kW**		
A.8	[6-04]	What is the capacity of the backup heater step 2?	R/W	0~10 kW, step: 0,2 kW **3 kW**		
A.8	[6-05]	--		**0**		
A.8	[6-06]	--		**0**		
A.8	[6-07]	What is the capacity of the bottom plate heater?	R/W	0~200 W, step: 10 W **0 W**		
A.8	[6-08]	What is the hysteresis to be used in reheat mode?	R/W	**2~20°C, step: 1°C** **10°C**		
A.8	[6-09]	--		**0**		
A.8	[6-0A]	What is the desired comfort storage temperature?	R/W	30~[6-0E]°C, step: 1°C **60°C**		
A.8	[6-0B]	What is the desired eco storage temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
A.8	[6-0C]	What is the desired reheat temperature?	R/W	30~min(50, [6-0E])°C, step: 1°C **45°C**		
A.8	[6-0D]	What is the desired DHW production type?	R/W	0: Reheat only 1: Reheat + sched. **2: Scheduled only**		
A.8	[6-0E]	What is the maximum temperature setpoint?	R/W	[E-07]≠2: 40~80°C, step: 1°C **60°C** [E-07]=2: 40~65°C, step: 1°C **65°C**		
A.8	[7-00]	Domestic hot water booster heater overshoot temperature.	R/W	0~4°C, step: 1°C **0°C**		
A.8	[7-01]	Domestic hot water booster heater hysteresis.	R/W	2~40°C, step: 1°C **2°C**		
A.8	[7-02]	How many leaving water temperature zones are there?	R/W	**0: 1 LWT zone** 1: 2 LWT zones		
A.8	[7-03]	--		**2,5**		
A.8	[7-04]	--		**0**		
A.8	[7-05]	Boiler efficiency	R/W	**0: Very high** 1: High 2: Medium 3: Low 4: Very low		
A.8	[8-00]	--		**1 min**		
A.8	[8-01]	Maximum running time for domestic hot water operation.	R/W	5~95 min, step: 5 min **30 min**		
A.8	[8-02]	Anti-recycling time.	R/W	0~10 hour, step: 0,5 hour **3 hours**		
A.8	[8-03]	Booster heater delay timer.	R/W	20~95 min, step: 5 min **50 min**		
A.8	[8-04]	Additional running time for the maximum running time.	R/W	0~95 min, step: 5 min **95 min**		
A.8	[8-05]	Allow modulation of the LWT to control the room temp?	R/W	**0: No** 1: Yes		
A.8	[8-06]	Leaving water temperature maximum modulation.	R/W	0~10°C, step: 1°C **3°C**		
A.8	[8-07]	--		**18**		
A.8	[8-08]	--		**20**		
A.8	[8-09]	What is the desired comfort main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **35°C**		
A.8	[8-0A]	What is the desired eco main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **33°C**		
A.8	[8-0B]	--		**13**		
A.8	[8-0C]	--		**10**		
A.8	[8-0D]	--		**16**		
A.8	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	37~depending on outdoor unit, step: 1°C **55°C**		
A.8	[9-01]	What is the mimimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
A.8	[9-02]	--		**22**		
A.8	[9-03]	--		**5**		
A.8	[9-04]	Leaving water temperature overshoot temperature.	R/W	1~4°C, step: 1°C **1°C**		
A.8	[9-05]	What is the mimimum desired LWT for add. zone in heating?	R/W	15~37°C, step: 1°C **25°C**		

(*1) EHBH*_(*2) EHVH*_
(*3) *04/08*_(*4) *11/16*

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.8	[9-06]	What is the maximum desired LWT for add. zone in heating?	R/W	37~depending on outdoor unit, step: 1°C **55°C**		
A.8	[9-07]	--		**5**		
A.8	[9-08]	--		**22**		
A.8	[9-09]	What is the desired delta T in heating?	R/W	3~10°C, step: 1°C **5°C**		
A.8	[9-0A]	--		**5**		
A.8	[9-0B]	What emitter type is connected to the main LWT zone?	R/W	0: Quick **1: Slow**		
A.8	[9-0C]	Room temperature hysteresis.	R/W	1~6°C, step: 0,5°C **1 °C**		
A.8	[9-0D]	Pump speed limitation	R/W	0~8, step:1 0 : 100% 1~4 : 80~50% 5~8 : 80~50% **6**		
A.8	[9-0E]	--		**6**		
A.8	[A-00]	--		**0**		
A.8	[A-01]	--		**0 (*3)** **3 (*4)**		
A.8	[A-02]	--		**0 (*3)** **1 (*4)**		
A.8	[A-03]	--		**0**		
A.8	[A-04]	--		**0**		
A.8	[B-00]	--		**0**		
A.8	[B-01]	--		**0**		
A.8	[B-02]	--		**0**		
A.8	[B-03]	--		**0**		
A.8	[B-04]	--		**0**		
A.8	[C-00]	Domestic heating water priority.	R/W	**0: Solar priority** 1: Heat pump priority		
A.8	[C-01]	--		**0**		
A.8	[C-02]	Is an external backup heat source connected?	R/W	**0: No** 1: Bivalent 2: - 3: -		
A.8	[C-03]	Bivalent activation temperature.	R/W	-25~25°C, step: 1°C **0°C**		
A.8	[C-04]	Bivalent hysteresis temperature.	R/W	2~10°C, step: 1°C **3°C**		
A.8	[C-05]	What is the thermo request contact type for the main zone?	R/W	1: Thermo ON/OFF **2: C/H request**		
A.8	[C-06]	What is the thermo request contact type for the add. zone?	R/W	0: - 1: Thermo ON/OFF **2: C/H request**		
A.8	[C-07]	What is the unit control method in space operation?	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
A.8	[C-08]	Which type of external sensor is installed?	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
A.8	[C-09]	What is the required alarm output contact type?	R/W	**0: Normally open** 1: Normally closed		
A.8	[C-0A]	--		**0**		
A.8	[C-0C]	High electricity price decimal (Do not use)	R/W	0~7 **0**		
A.8	[C-0D]	Medium electricity price decimal (Do not use)	R/W	0~7 **0**		
A.8	[C-0E]	Low electricity price decimal (Do not use)	R/W	0~7 **0**		
A.8	[D-00]	Which heaters are permitted if prefer. kWh rate PS is cut?	R/W	**0: None** 1: BSH only 2: BUH only 3: All heaters		
A.8	[D-01]	Forced off contact type	R/W	**0: No** 1: Open tariff 2: Closed tariff 3: Thermostat		
A.8	[D-02]	Which type of DHW pump is installed?	R/W	**0: No** 1: Secondary rtrn 2: Disinf. Shunt 3: Circul. Pump 4: CP & disinf. Sh		
A.8	[D-03]	Leaving water temperature compensation around 0°C.	R/W	**0: Disabled** 1: Enabled, shift 2°C (from -2 to 2°C) 2: Enabled, shift 4°C (from -2 to 2°C) 3: Enabled, shift 2°C (from -4 to 4°C) 4: Enabled, shift 4°C (from -4 to 4°C)		
A.8	[D-04]	Is a demand PCB connected?	R/W	**0: No** 1: Pwr consmp ctrl		
A.8	[D-05]	Is the pump allowed to run if prefer. kWh rate PS is cut?	R/W	0: Forced off **1: As normal**		
A.8	[D-07]	Is a solar kit connected?	R/W	**0: No** 1: Yes		
A.8	[D-08]	Is an external kWh meter used for power measurement?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.8	[D-09]	Is an external kWh meter used for power measurement?	R/W	**0: No** 1: 0,1 pulse/kWh 2: 1 pulse/kWh 3: 10 pulse/kWh 4: 100 pulse/kWh 5: 1000 pulse/kWh		
A.8	[D-0A]	--		**0**		
A.8	[D-0B]	--		**2**		
A.8	[D-0C]	What is the high electricity price (Do not use)	R/W	0~49 **0**		
A.8	[D-0D]	What is the medium electricity price (Do not use)	R/W	0~49 **0**		

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Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.8	[D-0E]	What is the low electricity price (Do not use)	R/W	0~49 **0**		
A.8	[E-00]	Which type of unit is installed?	R/O	0~5 **0: LT split**		
A.8	[E-01]	Which type of compressor is installed?	R/O	0: 8 1: 16		
A.8	[E-02]	What is the indoor unit software type?	R/O	0~1 **1: Type 2**		
A.8	[E-03]	What is the number of backup heater steps?	R/W	**0: No BUH** 1: 1 step 2: 2 steps		
A.8	[E-04]	Is the power saving function available on the outdoor unit?	R/O	0: No 1: Yes		
A.8	[E-05]	Can the system prepare domestic hot water?	R/W	**0: No (*1)** **1: Yes (*2)**		
A.8	[E-06]	Is a DHW tank installed in the system?	R/O	0: No 1: Yes		
A.8	[E-07]	What kind of DHW tank is installed?	R/W (*1) R/O (*2)	0~6 **0: Type 1 (*1)** **2: Type 3 (*2)** 5: Type 6		
A.8	[E-08]	Power saving function for outdoor unit.	R/W	**0: Disabled (*4)** **1: Enabled (*3)**		
A.8	[E-09]	--		**0**		
A.8	[E-0A]	--		**0**		
A.8	[E-0B]	--		**0**		
A.8	[E-0C]	--		**0**		
A.8	[E-0D]	--		**0**		
A.8	[F-00]	Pump operation allowed outside range.	R/W	**0: Disabled** 1: Enabled		
A.8	[F-01]	--		**20°C**		
A.8	[F-02]	Bottom plate heater ON temperature.	R/W	3~10°C, step: 1°C **3°C**		
A.8	[F-03]	Bottom plate heater hysteresis.	R/W	2~5°C, step: 1°C **5°C**		
A.8	[F-04]	Is a bottom plate heater connected?	R/W	**0: No** 1: Yes		
A.8	[F-05]	--		**0**		
A.8	[F-06]	--		**0**		
A.8	[F-09]	Pump operation during flow abnormality.	R/W	**0: Disabled** 1: Enabled		
A.8	[F-0A]	--		**0**		
A.8	[F-0B]	Close shut-off valve during thermo OFF?	R/W	**0: No** 1: Yes		
A.8	[F-0C]	--		**1**		
A.8	[F-0D]	What is the pump operation mode?	R/W	0: Continuous **1: Sample** 2: Request		

(*1) EHBH*_(*2) EHVH*_
(*3) *04/08*_(*4) *11/16*

EAC

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