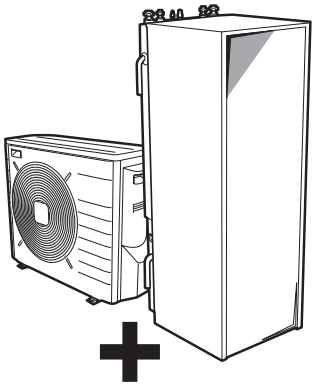
Installer reference guide

Daikin Altherma low temperature split



ERLQ004-006-008CA
EHVH04S18CA3VF
EHVH08S18CA3VF

Installer reference guide
Daikin Altherma low temperature split

English

Table of Contents

1 About the documentation

1.1 About this document

Target audience

Authorised installers

Documentation set

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

Document	Contains…	Format
General safety precautions	Safety instructions that you must read before installing	Paper (in the box of the indoor unit)
Indoor unit installation manual	Installation instructions	
Outdoor unit installation manual	Installation instructions	Paper (in the box of the outdoor unit)
Installer reference guide	Preparation of the installation, technical specifications, good practices, reference data, …	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	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.

2 General safety precautions

2.1 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.
- All activities described in the installation manual must be performed by an authorized installer.

2.1.1 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.

WARNING

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

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.

2.2 For the installer

2.2.1 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.

NOTICE

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 aluminum 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.

2.2.2 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.
- Make sure the unit is level.

Do NOT install the unit in the following places:

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

2.2.3 Refrigerant

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.

WARNING

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

2.2.4 Water

NOTICE

Make sure water quality complies with EU directive 98/83 EC.

2.2.5 Electrical

DANGER: RISK OF ELECTROCUTION

- Turn OFF all power supply before removing the switch box cover, connecting electrical wiring or touching electrical parts.
- Disconnect the power supply for more than 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.
- 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.

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

WARNING

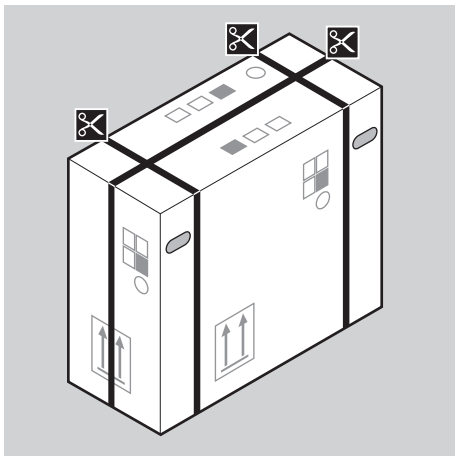
- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.

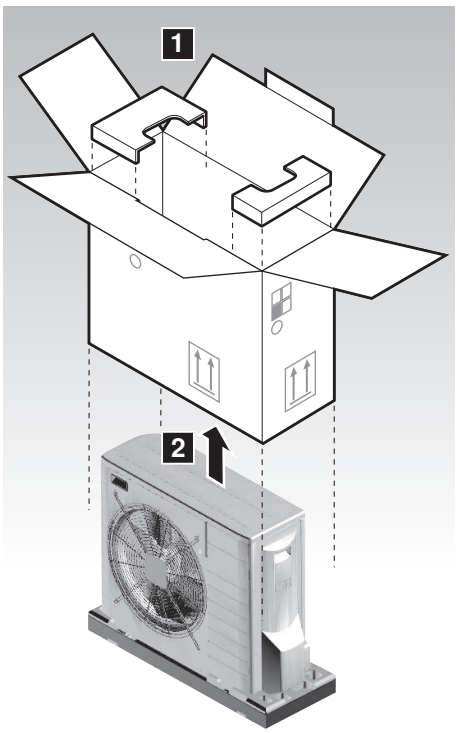
3 About the box

- 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.

3.1 Outdoor unit

3.1.1 To unpack the outdoor unit



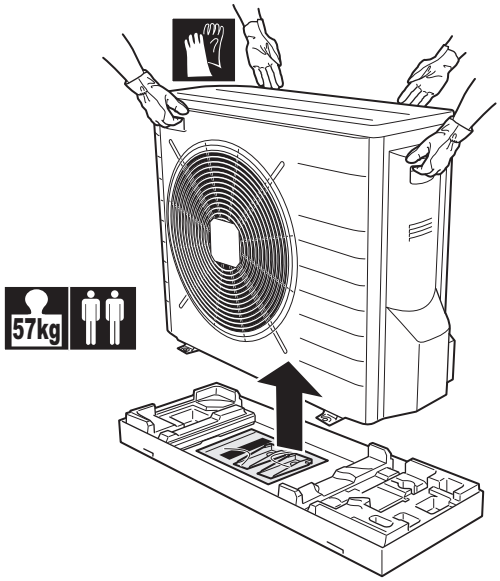


3.1.2 To remove the accessories from the outdoor unit

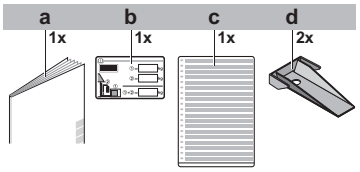
1 Lift the outdoor unit.

CAUTION

Only handle the outdoor unit as follows:



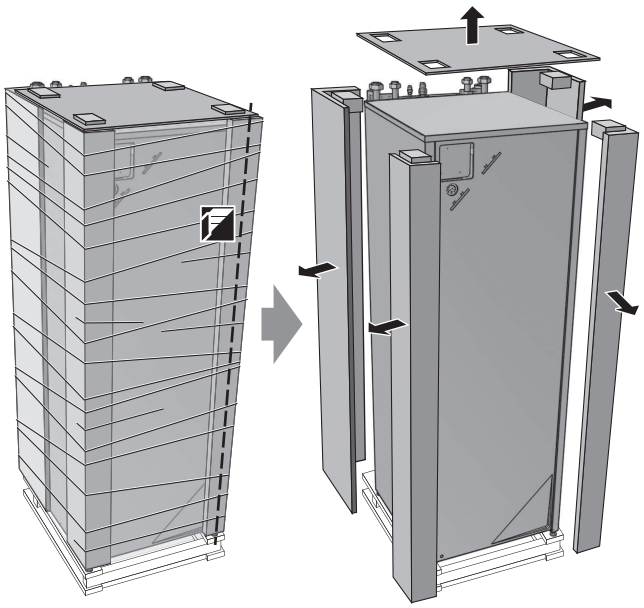
2 Remove the accessories at the bottom of the package.



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

3.2 Indoor unit

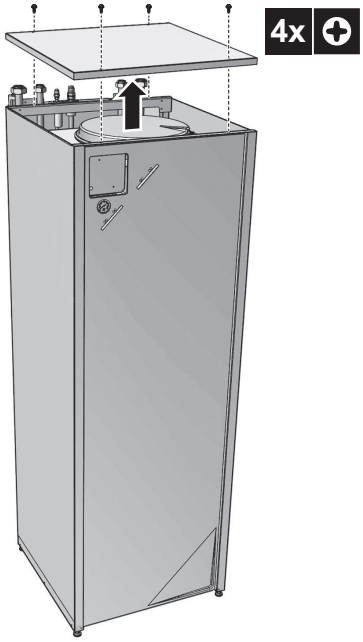
3.2.1 To unpack the indoor unit



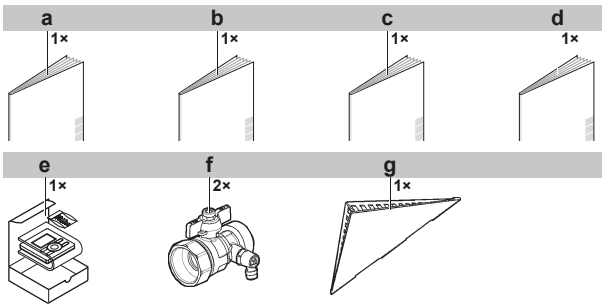
3.2.2 To remove the accessories from the indoor unit

1 Remove the screws at the top of the unit.

2 Remove the top panel.



3 Remove the accessories.



a General safety precautions
b Addendum book for optional equipment
c Indoor unit installation manual
d Operation manual
e User interface kit: user interface, 4 fixing screws, 2 plugs
f Shut-off valve
g User interface cover

4 Reinstall the top panel.

4 About the units and options

4.1 Identification

NOTICE

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

4.1.1 Identification label: Outdoor unit

Location

Model identification

Example: ER L Q 006 CA V3

Code	Explanation
ER	European split outdoor pair heat pump
L	Low water temperature – ambient zone: −10~−20°C
Q	Refrigerant R410A
006	Capacity class: ▪ 004=4.5 kW ▪ 006=6 kW ▪ 008=7.5 kW
CA	Series
V3	1~, 230 V, 50 Hz

4.1.2 Identification label: Indoor unit

Location

Model identification

Example: E HV H 04 S 18 CA 3V F

Code	Description
E	European model
HV	Floor-standing indoor unit with integrated tank
H	Heating only
04	Capacity class: ▪ 04=4.5 kW ▪ 08=7.5 kW
S	Integrated tank material: Stainless steel
18	Integrated tank volume: 180 l
CA	Series
3V	Backup heater model
F	Special unit

4.2 Possible combinations of units and options

4.2.1 List of options for 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.

4.2.2 List of options for indoor unit

User interface (EKRUCAL1, EKRUCAL2)

The user interface is delivered as an accessory with the unit. An additional user interface is optionally available.

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

The additional user interface EKRUCAL1 contains the 6 common languages: English, German, French, Dutch, Italian, Spanish.

The additional user interface EKRUCAL2 contains other languages: English, Swedish, Norwegian, Czech, Turkish, Portuguese.

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

For installation instructions, see "7.6.6 To connect the user interface" on page 38.

Room thermostat (EKRTWA, EKRTR1)

You can connect an optional room thermostat to the indoor unit. This thermostat can either be wired (EKRTWA) or wireless (EKRTR1).

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 Daikin Extranet.

For installation instructions, see the installation manual of the PC cable.

4.2.3 Possible combinations of indoor unit and outdoor unit

Indoor unit	Outdoor unit		
	ERLQ004CAV3	ERLQ006CAV3	ERLQ008CAV3
EHVH04S18CA3VF	O	—	—
EHVH08S18CA3VF	—	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 41.

This chapter contains applications 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:

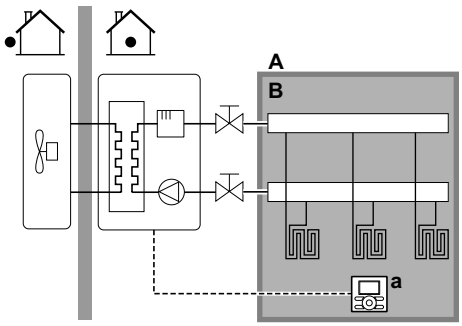
- How many rooms are heated by the Daikin heat pump system?
- Which heat emitter types are used in each room and what is their design leaving water temperature?

Once the space heating requirements are clear, Daikin recommends to follow the setup guidelines below.

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 (standard equipment) installed in the room and used as room thermostat
  - User interface (standard equipment) installed at the indoor unit and used for control close to the indoor unit + user interface (optional equipment EKRUCAL) installed in the room and used as room thermostat

Configuration

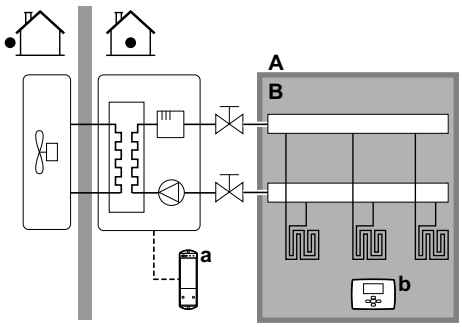
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

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

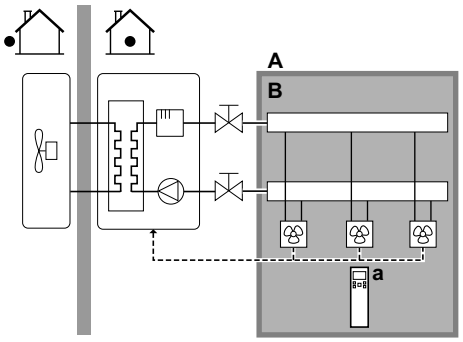
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	1 (Ext RT control): Unit operation is decided by the external thermostat.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main
External room thermostat for the **main** zone: ▪ #: [A.2.2.4] ▪ Code: [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 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 on the indoor unit (X2M/33 and X2M/34).

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.

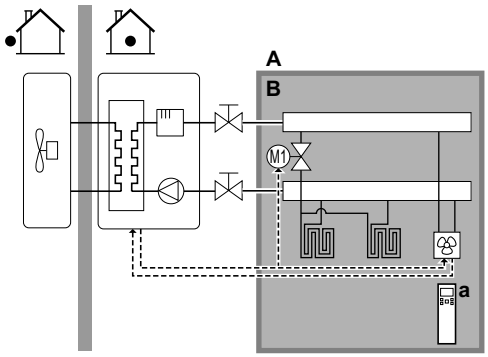
Benefits

- **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 by one digital output (X2M/33 and X2M/34) on the indoor unit to:
  - The heat pump convectors
  - The shut-off valve

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

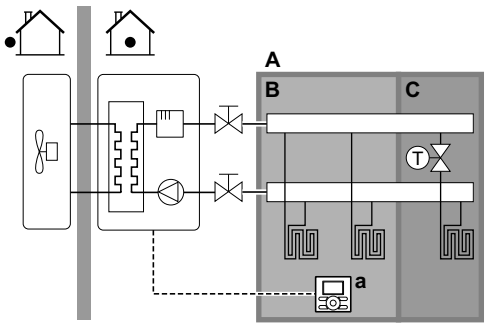
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

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

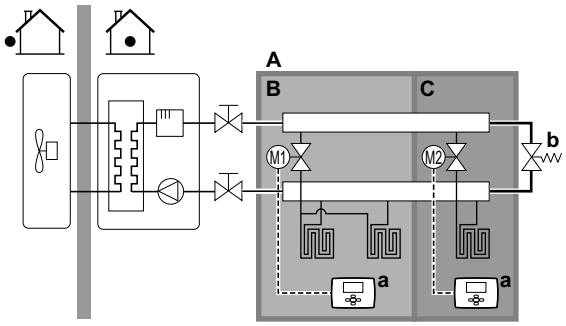
Setting	Value
Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07]	2 (RT control): Unit operation is decided based on the ambient temperature of the user interface.
Number of water temperature zones: ▪ #: [A.2.1.8] ▪ Code: [7-02]	0 (1 LWT zone): Main

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.
- 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

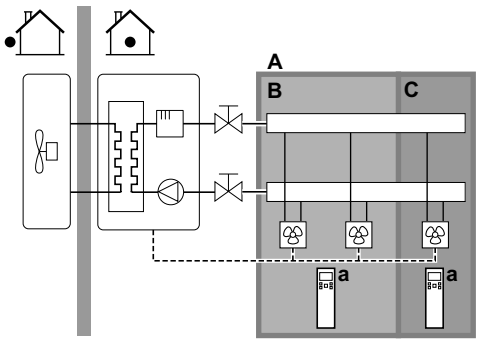
Benefits

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

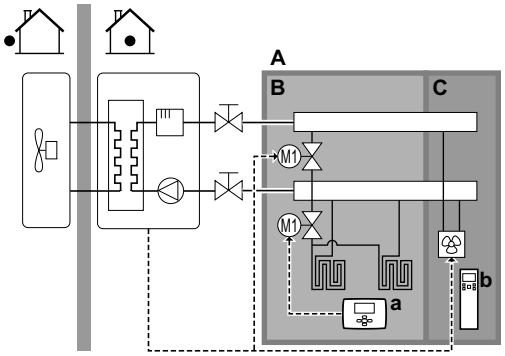
Benefits

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.
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

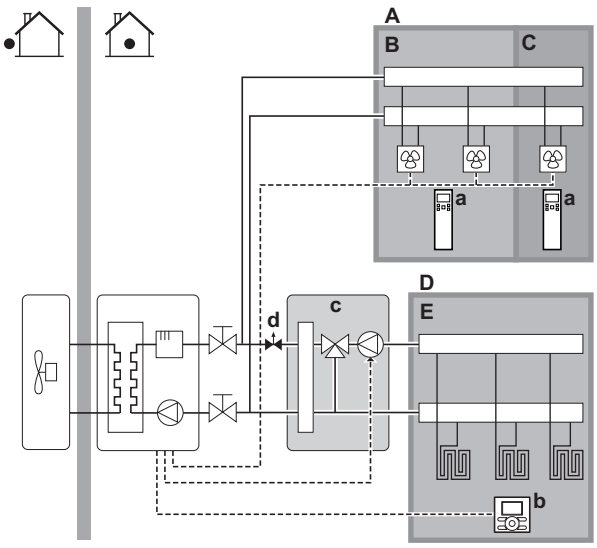
CAUTION

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

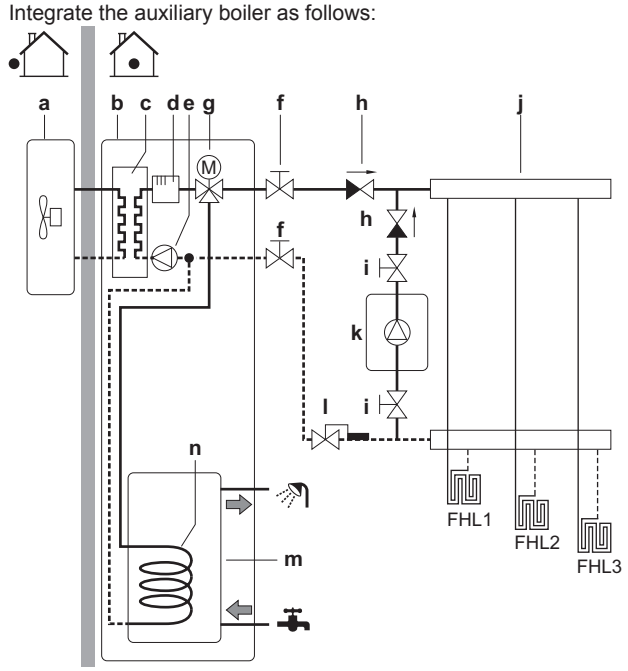
- Space heating can be done by:
  - The indoor unit
  - An auxiliary boiler (field supply) connected to the system
- When the room thermostat requests heating, the indoor unit or the auxiliary boiler starts operating depending on the outdoor temperature (status of the changeover to external heat source). 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	Backup 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
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 10.

Configuration

Via the user interface (quick wizard):

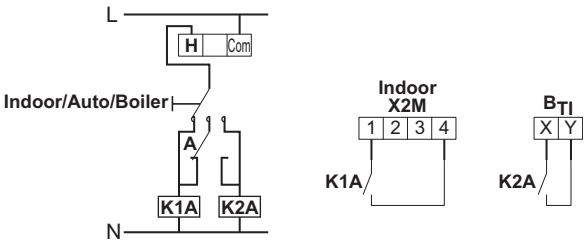
- Set the use of a bivalent system as external heat source.
- Set the bivalent temperature and hysteresis.

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 10).
- The auxiliary contact can be:
  - An outdoor temperature thermostat
  - An electricity tariff contact
  - A manually operated contact
  - …
- Setup: Connect the following field wiring:



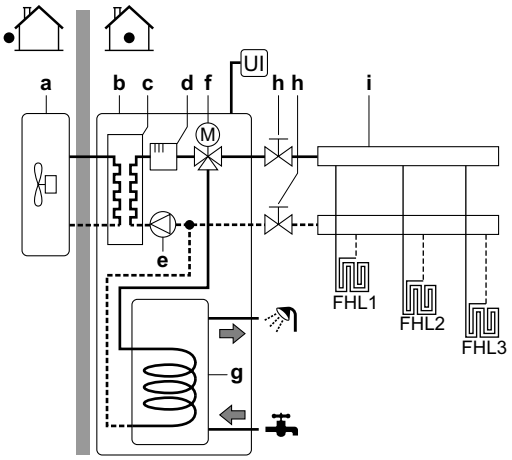
B_{TI}	Boiler thermostat input
A	Auxiliary contact (normal closed)
H	Heating demand room thermostat (optional)
K1A	Auxiliary relay for activation of indoor unit (field supply)
K2A	Auxiliary relay for activation of boiler (field supply)
Indoor	Indoor unit
Auto	Automatic
Boiler	Boiler

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

5.4.1 System layout – Integrated DHW tank



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

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
Integrated DHW tank	180 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 heat pump can higher 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 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

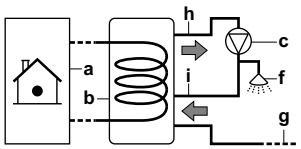
V_1	DHW consumption (equivalent hot water volume at 40°C)
V_2	Required DHW tank volume if only heated once
T_2	DHW tank temperature
T_1	Cold water temperature

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
  - Electrical backup heater
- For more information about optimizing the energy consumption for producing domestic hot water, see "8 Configuration" on page 41.

5.4.4 DHW pump for instant hot water

Setup



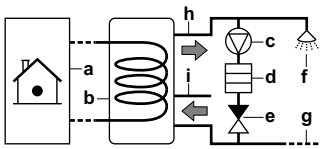
- By connecting a DHW pump, instant hot water can be available at the tap.
- The DHW pump and the installation are field supply and the responsibility of the installer.

Configuration

- For more information, see "8 Configuration" on page 41.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

5.4.5 DHW pump for disinfection

Setup



- The DHW pump and the installation are field supply and the responsibility of the installer.
- 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 41.

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

- The produced heat is calculated internally based on:
  - The leaving and entering water temperature
  - The flow rate
- Setup and configuration: No additional equipment needed.

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) and measuring the consumed energy (example: for outdoor unit). If you do so, the energy data will be invalid.

- The consumed energy is calculated internally based on:
  - The actual power input of the outdoor unit
  - The set capacity of the backup heater and booster 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)
- Preferred method because of higher accuracy.
- Requires external power meters.
- Setup and configuration:
  - For the specifications of each type of meter, see "15 Technical data" on page 72.
  - When using electrical power meters, set the number of pulses/kWh for each power meter via the user interface.

INFORMATION

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

5.5.3 Normal kWh rate power supply

General rule

One power meter that covers the entire system is sufficient.

Setup

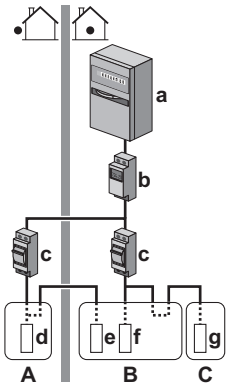
Connect the power meter to X5M/7 and X5M/8.

Power meter type

In case of…	Use a… power meter
▪ Single-phase outdoor unit ▪ Backup heater supplied from a single-phase grid (i.e. the backup heater model is *3V connected to a single-phase grid)	Single-phase

Example

Single-phase power meter



A Outdoor unit

B Indoor unit

C DHW tank

a Electrical cabinet (L_1/N)

b Power meter (L_1/N)

c Fuse (L_1/N)

d Outdoor unit (L_1/N)

e Indoor unit (L_1/N)

f Backup heater (L_1/N)

g Booster 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 18 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 and backup heater).

Setup

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

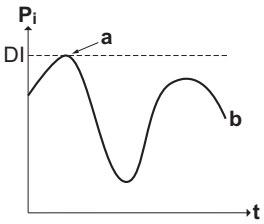
Power meter types

Single-phase power meter.

5.6 Setting up the power consumption control

- The power consumption control:
  - Allows you to limit the power consumption of the entire system (sum of outdoor unit, indoor unit and 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



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.

NOTICE

Set a minimum power consumption of ±3 kW to guarantee space heating and DHW production by allowing at least backup heater step 1.

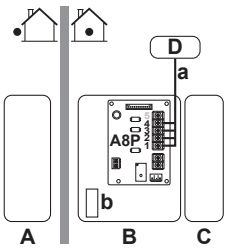
5.6.2 Power limitation activated by digital inputs

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

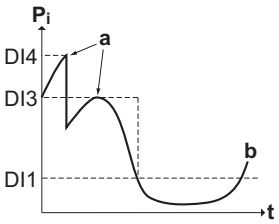
The power or current of the entire Daikin system is limited dynamically by digital inputs (maximum four steps). Each power limitation level is set via the user interface by limiting one of the following:

- 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 Backup 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 specification and the connection of the digital inputs, see "15.4 Wiring diagram – components: Indoor unit" on page 81.

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 41):

- 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 the backup heater.

If… has priority	Then set the heater priority via the user interface to…
Space heating	Backup heater.

2 Turns OFF the backup heater.
3 Limits the outdoor unit.
4 Turns OFF the outdoor unit.

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 indoor sensor.
- Configuration: Select outdoor sensor [A.2.2.B].
- During suspend (see "8 Configuration" on page 41), 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

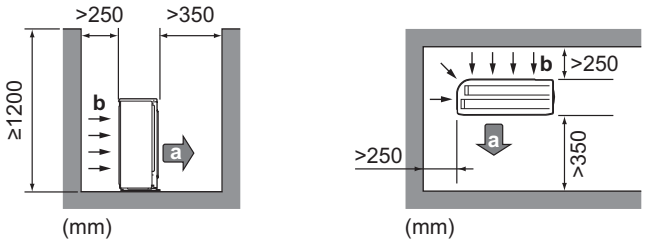
6.1 Preparing installation site

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.

6.1.1 Installation site requirements of the outdoor unit

Mind the following spacing guidelines:



a Air outlet
b Air inlet

See "15.1 Dimensions and service space" on page 72 for more detailed information about spacing guidelines.

NOTICE

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

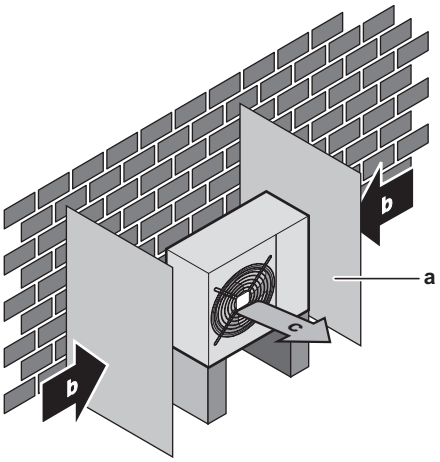
When the outdoor unit is subject to windy and/or low ambient temperatures, mind the following guidelines:

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;
- 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

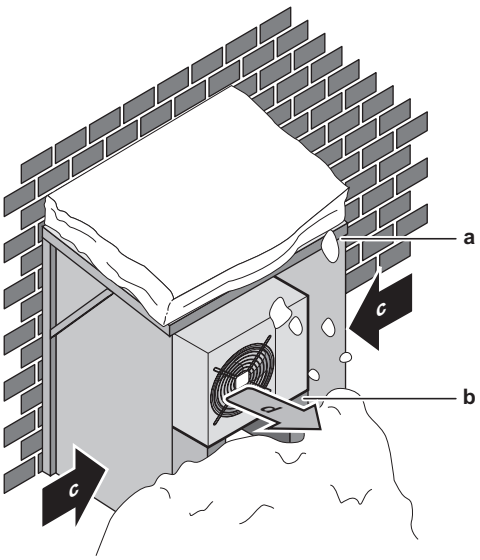
- Choose a location where the hot/cold air discharged from the unit or the operation noise, will NOT disturb anyone.
- Heat exchanger fins are sharp and injury is possible. Choose an installation location where there is no risk for injury (especially in areas where children playing).
- Sound sensitive areas (e.g. near a bedroom and the like), so that the operation noise will cause no trouble.
  Note: If the sound is measured under actual installation conditions, the measured value will be higher than the sound pressure level mentioned in Sound spectrum in the data book due to environmental noise and sound reflections.

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

- in coastal areas or other places where the air contains high levels of salt. Corrosion may occur,
- where the voltage fluctuates a lot,
- in vehicles or vessels,
- where acidic or alkaline vapour is present.

6.1.2 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

- The unit should be installed in a way that a minimum of 15 cm free space is assured below the bottom plate of the unit at all weather conditions (e.g., heavy snowfall). It is recommended to install the unit at a minimum height of 30 cm. See "7.2 Mounting the outdoor unit" on page 26 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.

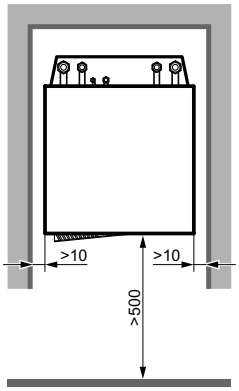
6.1.3 Installation site requirements of the indoor unit

- Mind the following measurements guidelines:

Maximum refrigerant piping length between indoor unit and outdoor unit	30 m[(a)]
Minimum refrigerant piping length between indoor unit and outdoor unit	3 m
Maximum height difference between indoor unit and outdoor unit	20 m

(a) Check the outdoor unit installation manual.

- Mind the following spacing installation guidelines:



(mm)

Do NOT install the unit in places such as:

- Where there is mist of mineral oil, oil spray or vapour.
  Plastic parts may deteriorate, and cause them to fall out or water to leak.
- Sound sensitive areas (e.g. near a bedroom and the like), 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 5~30°C in heating mode.

6.2 Preparing refrigerant piping

6.2.1 Refrigerant piping requirements

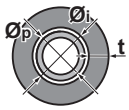
- Use piping with annealed temper grade, in function of the pipe diameter.
- The minimal pipe thickness should comply with applicable legislation. The minimal pipe thickness for R410A piping must be in accordance with the following table.

Pipe for…	Outer diameter (Ø)	Pipe thickness (t)	
Liquid	6.4 mm (1/4")	≥0.8 mm	
Gas	15.9 mm (5/8")	≥1.0 mm	

6.2.2 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 110°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



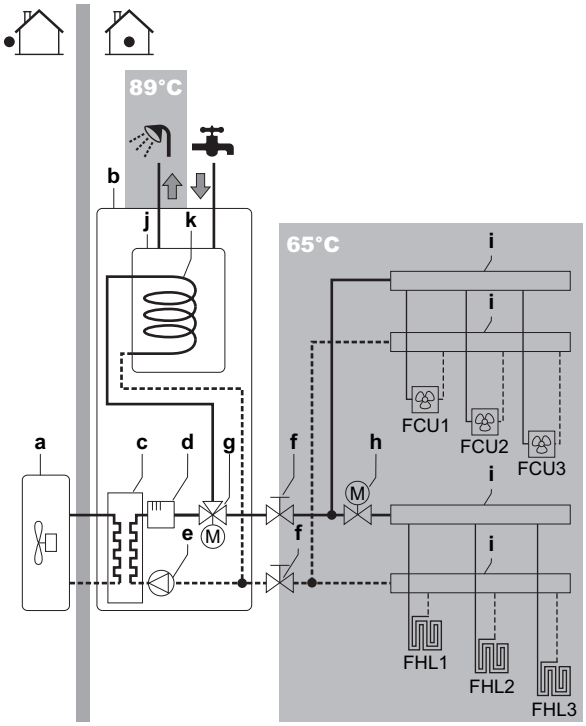
6.3 Preparing water piping

6.3.1 Water circuit requirements

- Use the indoor unit ONLY in a closed water system.
  Using the system in an open water system will lead to excessive corrosion.
- The maximum water pressure is 4 bar.
  Provide adequate safeguards in the water circuit to ensure that the maximum pressure is NOT exceeded.
- All installed piping and piping accessories (valve, connections,…) must withstand the following temperatures:

INFORMATION

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



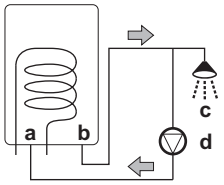
a Outdoor unit
b Indoor unit
c Heat exchanger
d Backup heater
e Pump
f Stop valve
g Motorised 3-way valve
h Motorised 2-way valve (field supply)
i Collector

j	Domestic hot water tank
k	Heat exchanger coil
FCU1...3	Fan coil unit (optional)
FHL1...3	Floor heating loop

- Make all water piping connections in accordance with the applicable legislation and the outlook diagram that is delivered with the unit, respecting the water inlet and outlet.
- Do NOT use excessive force when connecting the piping. Deformation of the piping can cause malfunctioning of the unit.
- Provide drain taps at all low points of the system in order to allow complete drainage of the water circuit.
- Provide a proper drain for the pressure relief valve to avoid water dripping out of the unit. See "7.5.2 To connect the pressure relief valve to the drain" on page 33.
- 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.
- Only use materials that are compatible with water used in the system and with the materials used in the indoor unit.
- Check that all components in the field piping can withstand the water pressure and water temperature.
- 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.
- Never use Zn-coated parts in the water circuit. Because the unit's internal water circuit uses copper piping, excessive corrosion may occur.
- Only use appropriate tooling to handle brass, which is a soft material. If NOT, pipes will get damaged.
- Select the water piping diameter in relation to the required water flow and the available external static pressure of the pump. See "15 Technical data" on page 72 for the external static pressure curves of the indoor unit.
- You can find the minimum required water flow for the indoor unit operation in the following table. When the water flow is lower, flow error 7H will be displayed and the indoor unit will be stopped.

Model	Minimum water flow (l/min)
04	5
08	11

- 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.
- 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.
- 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 advised 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.
- If air, moisture or dust gets into the water 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.
- For safety reasons, it is NOT allowed to add any kind of glycol to the water circuit.
- 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.
  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.
  The disinfection function provided on the equipment is specified in the operation manual of the indoor unit.
- 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.
- The installation must be in compliance with the applicable legislation and may require additional hygienic installation measures.
- In accordance with the applicable legislation, it may be necessary to install thermostatic mixing valves.
- 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.
- 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

6.3.2 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)

6.3.3 To check the water volume

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

ONLY applicable for EHVH04+08S18CA3VF.

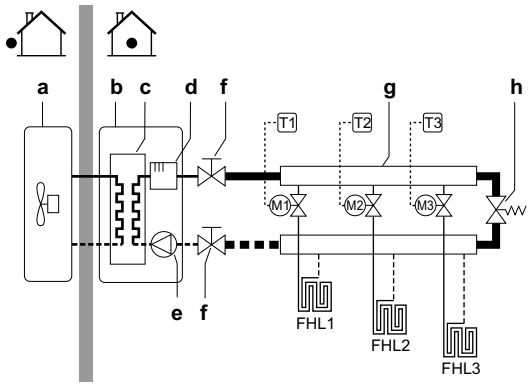
The system does not require a minimum water volume. Since an extra flow-through vessel was built into the unit, the total water volume in the installation can be **0 l**. It is however required that when all heat emitters are closed, the user interface displays a minimum water flow of 15 l/min.

INFORMATION

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

NOTICE

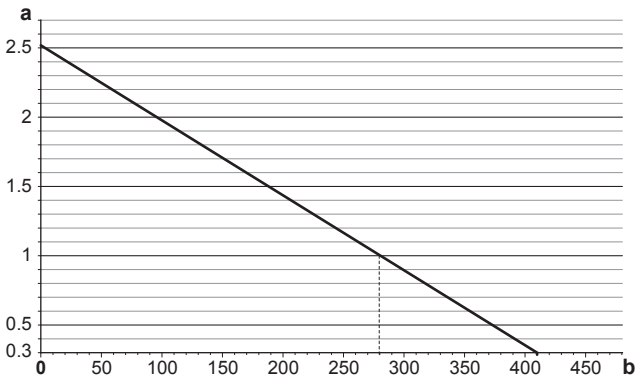
When circulation in each space heating loop is controlled by remote-controlled valves, it is important that a minimum water flow of **15 l/min** is guaranteed, even if all the valves are closed.



a Outdoor unit
b Indoor unit
c Heat exchanger
d Backup heater
e Pump
f Shut-off valve
g Collector (field supply)
h 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.

6.3.4 Changing the pre-pressure of the expansion vessel

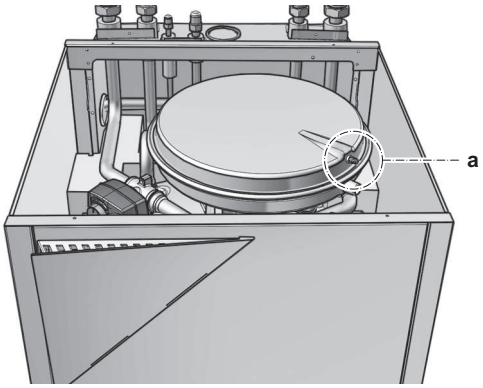
NOTICE

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 schräder valve of the expansion vessel.



a Schräder valve

6.3.5 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.

6.4 Preparing electrical wiring

6.4.1 About preparing electrical wiring

WARNING

- If the power supply has a missing or wrong N-phase, equipment will 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 the piping or sharp edges, 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 should have a dedicated power supply.

WARNING

ALWAYS use multicore cable for power supply cables.

6.4.2 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.

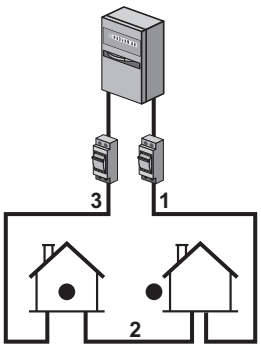
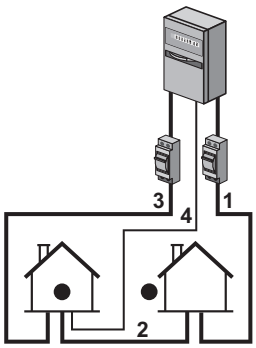
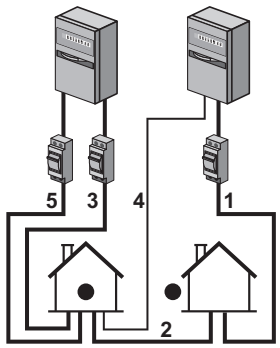
When the equipment is connected to such preferential kWh rate power supply, the electricity company is allowed to:

- 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.

6.4.3 Overview of electrical connections except external actuators

Normal power supply	Preferential kWh rate power supply	
	Power supply is NOT interrupted	Power supply is interrupted
a  	b  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.	a b  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.

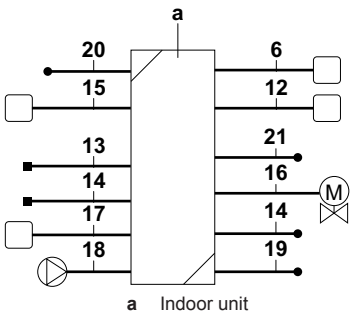
a Normal power supply
b Preferential kWh rate power supply
1 Power supply for outdoor unit
2 Power supply and interconnection cable to indoor unit
3 Power supply for backup heater
4 Preferential kWh rate power supply (voltage free contact)
5 Normal kWh rate power supply (to power the indoor unit PCB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

6.4.4 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 may NOT match your system layout.



a Indoor unit

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)
3	Power supply for backup heater	See table below.	—
4	Preferential kWh rate power supply (voltage free contact)	2	(d)
5	Normal kWh rate power supply	2	6.3 A
User interface			
6	User interface	2	(e)
Optional equipment			
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)
20	Changeover to external heat source control	2	(b)
21	Space cool/heat operation control	2	(b)
22	Power consumption digital inputs	2 (per input signal)	(b)

(a) Refer to name plate on outdoor unit.
(b) Minimum cable section 0.75 mm².
(c) Cable section 2.5 mm².
(d) 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.
(e) Cable section 0.75 mm² till 1.25 mm²; maximum length: 500 m. Applicable for both single user interface and dual use interface connection.

NOTICE

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

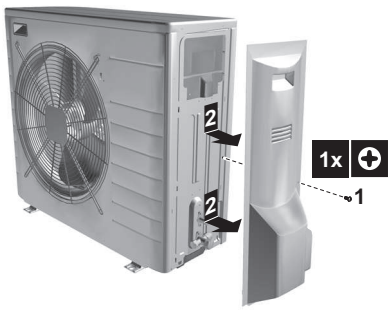
Backup heater type	Power supply	Required number of conductors
*3V	1× 230 V	2+GND

7 Installation

7.1 Opening the units

7.1.1 To open the outdoor unit

1 Remove 1 screw from the service cover.



2 Remove the service cover.

7.1.2 To open the indoor unit

1 Loosen and remove the screws at the bottom of the unit.

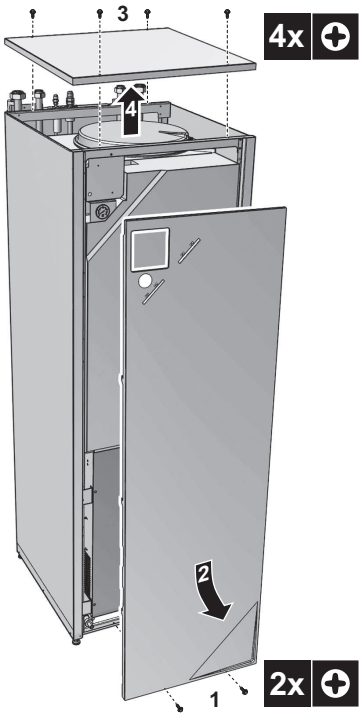
2 Slide the front panel of the unit downwards and remove it.

CAUTION

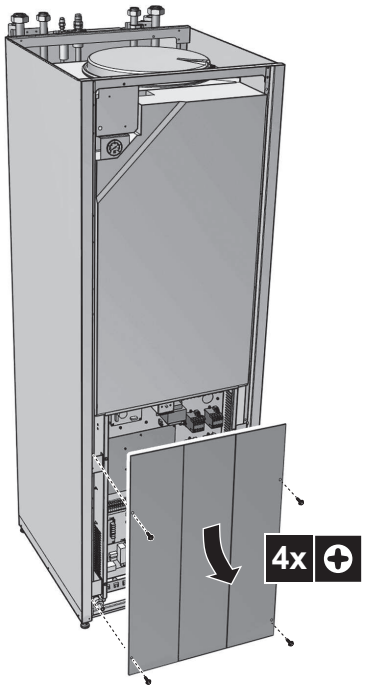
The front panel is heavy. Be careful NOT to jam your fingers when opening or closing the unit.

3 Loosen and remove the 4 screws that fix the top panel.

4 Remove the top panel from the unit.



7.1.3 To open the switch box cover of the indoor unit



7.2 Mounting the outdoor unit

7.2.1 To prepare the installation structure

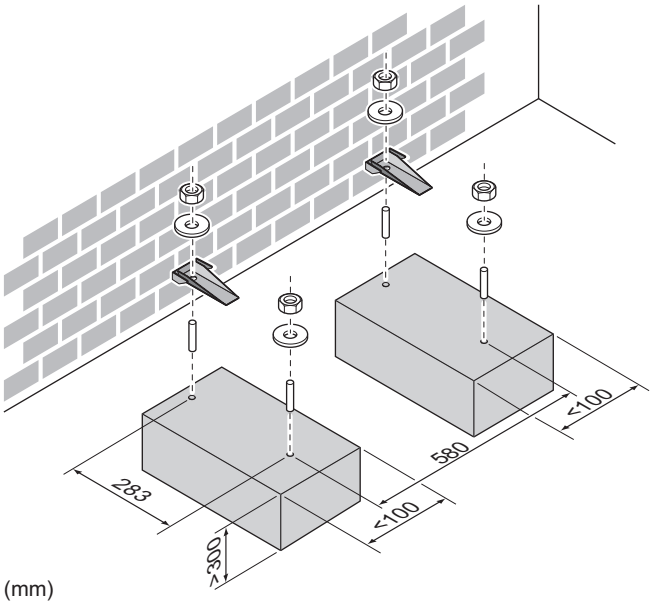
Check the strength and level of the installation ground so that the unit will not cause any operating vibration or noise.

Fix the unit securely by means of the 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:

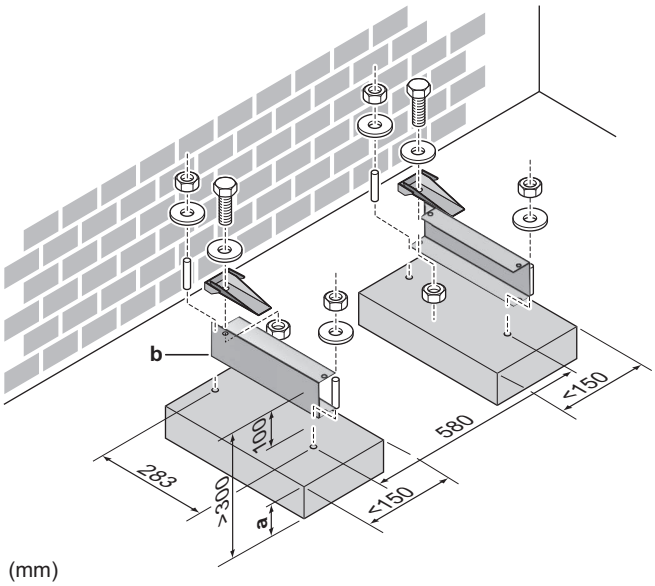
INFORMATION

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



(mm)

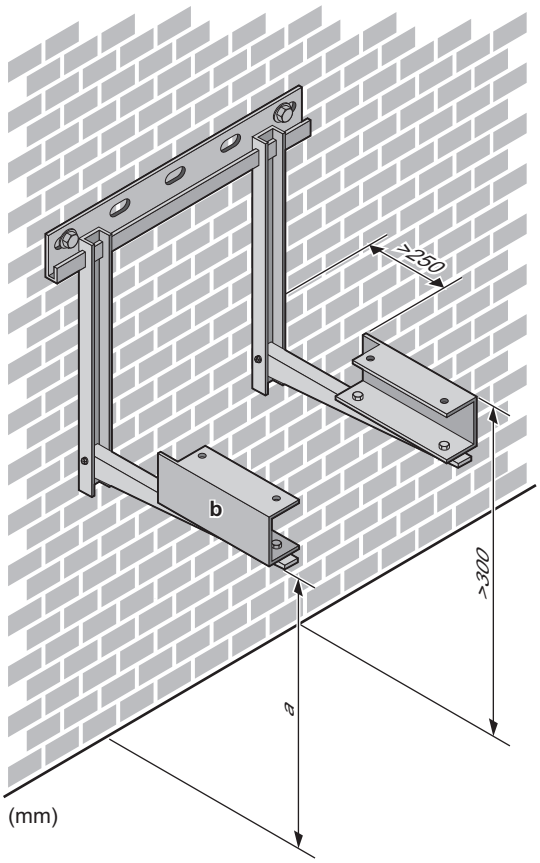
In order to guarantee good operation of the unit in areas with risk of snowfall, a minimum of 10 cm needs to be assured below the bottom plate of the unit. It is recommended to construct a pedestal with the same height as the maximum snowfall height. On this pedestal it is then recommended to install the EKFT008CA option kit to guarantee the minimum space of 10 cm below the bottom plate of the unit.



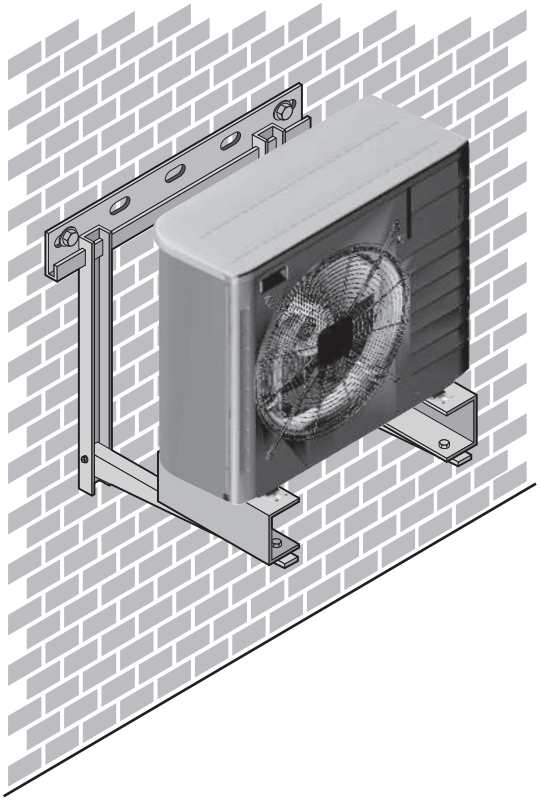
(mm)

a Maximum snowfall height
b EKFT008CA option kit

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

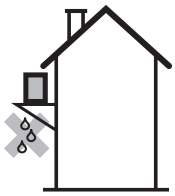


a Maximum snowfall height
b EKFT008CA option kit



7.2.2 To prepare drain work

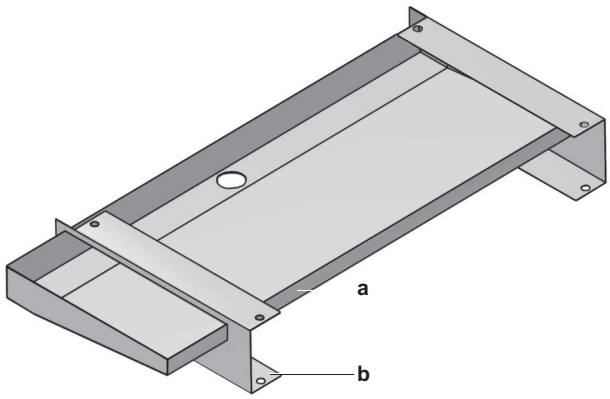
- Avoid installation places where water leaking from the unit due to a blocked drain pan, cause damage to the location.
- Make sure that condensation water can be evacuated properly.
- Install the unit on a base to make sure that there is a proper drainage in order to avoid ice accumulation.
- Prepare 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 underside 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).



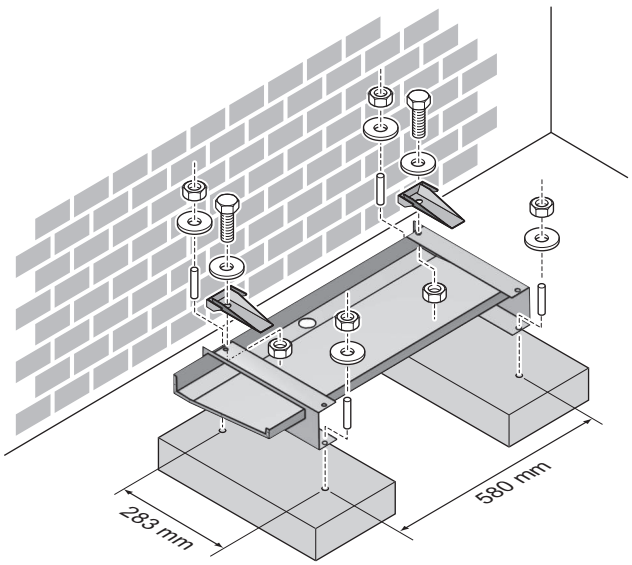
NOTICE

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



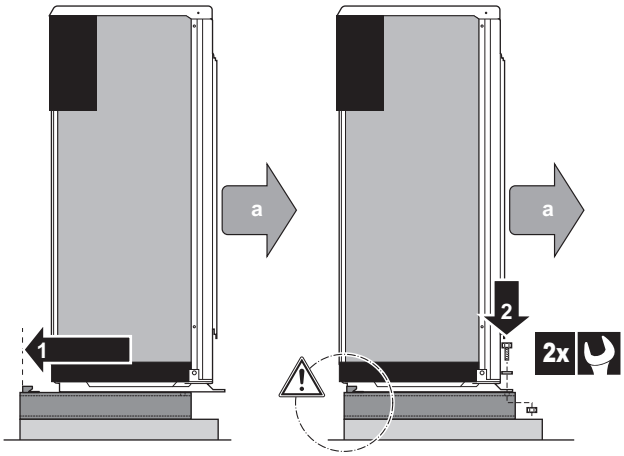
7.2.3 To install the outdoor unit

CAUTION

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

1 Lift the outdoor unit as described in "3.1.2 To remove the accessories from the outdoor unit" on page 6.

2 Install the outdoor unit as follows:

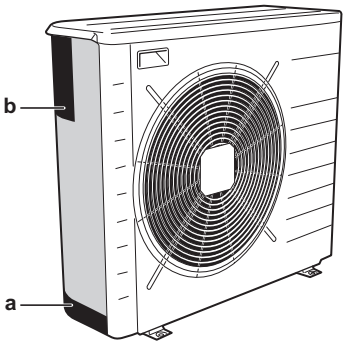


a Air outlet

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

7.2.4 To prevent the outdoor unit from falling over

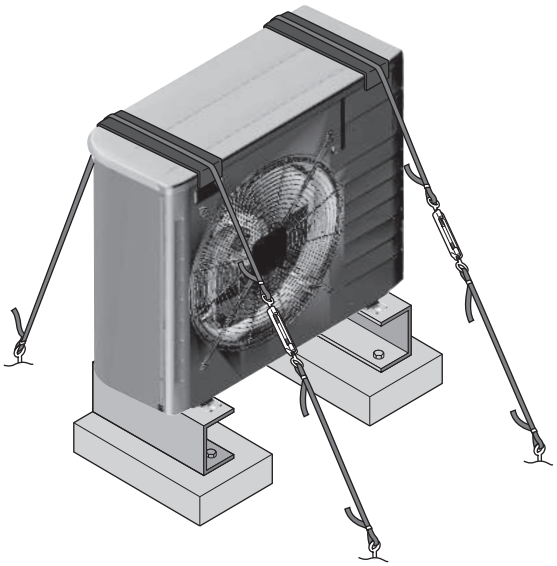
In case the unit is installed in places where strong wind can tilt the unit, take following measure:

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).

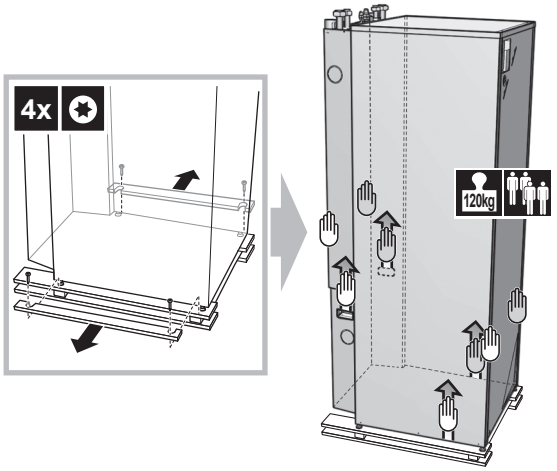
4 Attach the cable's ends. Tighten those ends.



7.3 Mounting the indoor unit

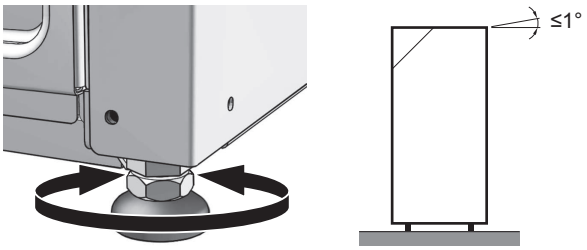
7.3.1 To install the indoor unit

1 Lift the indoor unit from the pallet and place it on the floor.



2 Slide the indoor unit into position.

3 Adjust the height of the leveling feet to compensate for floor irregularities. The maximum allowed deviation is 1°.



7.4 Connecting the refrigerant piping

DANGER: RISK OF BURNING

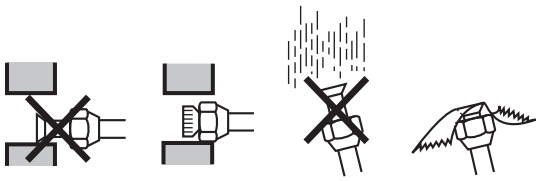
CAUTION

- 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).



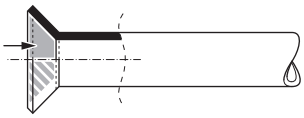
Unit	Installation period	Protection method
Outdoor unit	>1 month	Pinch the pipe
	<1 month	Pinch or tape the pipe
Indoor unit	Regardless of the period	

INFORMATION

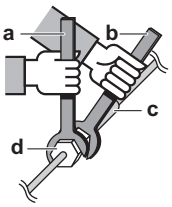
Do NOT open the refrigerant stop valve before checking the refrigerant piping. When you need to charge additional refrigerant it is recommended to open the refrigerant stop valve after charging.

Take the following guidelines into account when connecting pipes:

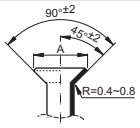
- Coat the flare inner surface with ether oil or ester oil when connecting a flare nut. Tighten 3 or 4 turns by hand, before tightening firmly.



- 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 (mm)	Flare shape (mm)
Ø6.4	15~17	8.7~9.1	
Ø15.9	63~75	19.3~19.7	

7.4.1 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).

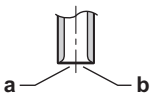
7.4.2 To flare the pipe end

CAUTION

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

1 Cut the pipe end with a pipe cutter.

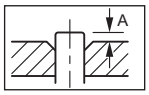
2 Remove burrs with the cut surface lacing downward so that the chips does not enter the pipe.



a Cut exactly at right angles.
b Remove burrs.

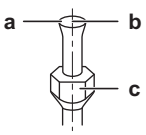
3 Remove the flare nut from the stop valve and put the flare nut on the pipe.

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



		Conventional flare tool	
	Flare tool for R410A (clutch type)	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.

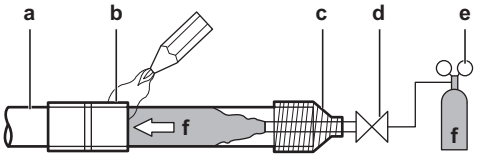


a Flare's inner surface must be flawless.
b The pipe end must be evenly flared in a perfect circle.
c Make sure the flare nut is lifted.

7.4.3 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 (just enough so it can be felt on the skin) with a pressure-reducing valve.



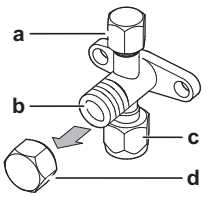
a Refrigerant piping
b Part to be brazed
c Taping
d Manual valve
e Pressure-reducing valve
f Nitrogen

- Do NOT use anti-oxidants when brazing pipe joints.
- Do NOT use flux when brazing copper-to-copper refrigerant piping. Use phosphor copper brazing filler alloy (BCuP), which does not require flux.

7.4.4 To handle the stop valve

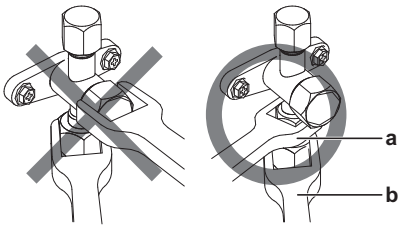
Take the following guidelines into account:

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



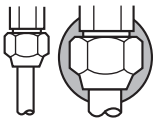
a Service port and service port cap
b Valve stem
c Field piping connection
d Stem cap

- 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.

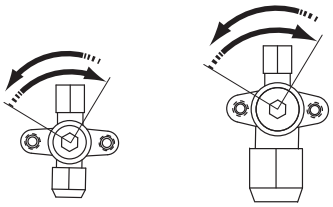


Silicon sealant, make sure there is no gap.

7.4.5 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:



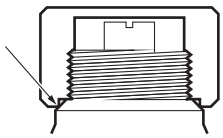
Counterclockwise to open.
Clockwise to close.

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

7.4.6 To handle the stem cap

Take the following guidelines into account:

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



- After handling the stop valve, make sure to tighten the stem cap securely.
- For the tightening torque, refer to the following table.
- Check for refrigerant leaks after tightening the stem cap.

Item	Tightening torque (N·m)
Stem cap, liquid side	13.5~16.5
Stem cap, gas side	22.5~27.5
Service port cap	11.5~13.9

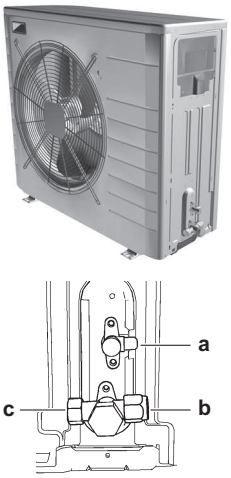
7.4.7 To handle the service cap

Take the following guidelines into account:

- 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 securely. For the tightening torque, refer to the table in chapter "7.4.6 To handle the stem cap" on page 30.
- Check for refrigerant leaks after tightening the service port cap.

7.4.8 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.

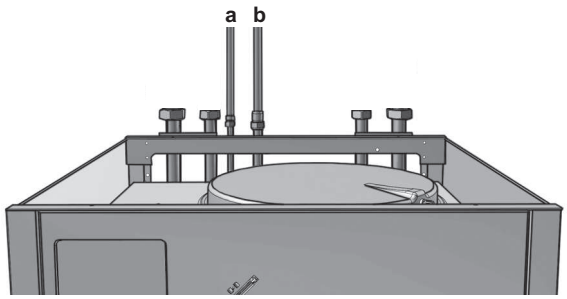


a Liquid stop valve
b Gas stop valve
c Service port

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

7.4.9 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.

7.4.10 About checking the refrigerant piping

Checking the refrigerant piping typically consists of:

1 Checking for leaks.

2 Performing vacuum drying.

NOTICE

Use a 2-stage vacuum pump with a non-return valve that can evacuate to a gauge pressure of −100.7 kPa (5 Torr absolute).

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.

Keep in mind the following guidelines:

- The piping inside the unit has been factory tested for leaks.
- If using additional refrigerant, perform air purging from the refrigerant pipes and indoor unit using a vacuum pump. Then charge additional refrigerant.

7.4.11 To check for leaks

NOTICE

- Do NOT exceed the maximum operation pressure of 4000 kPa (40 bar).
- Only use recommended bubble test solution.

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.

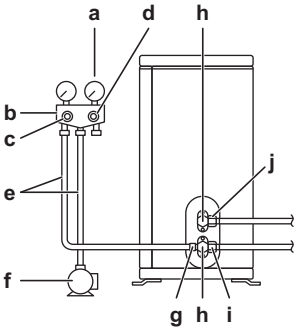
3 Discharge all nitrogen gas.

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.

7.4.12 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.

7.4.13 To determine the additional refrigerant amount

If the total liquid piping length is…	Then…
≤10 m	Do NOT add additional refrigerant.
>10 m	Add 20 g refrigerant per extra meter (above 10 m).

7.4.14 To calculate 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.

7.4.15 To charge refrigerant

WARNING

- Only use R410A as refrigerant. Other substances may cause explosions and accidents.
- R410A contains fluorinated greenhouse gases covered by the Kyoto Protocol. Its global warming potential value is 1975. Do NOT vent these gases into the atmosphere.
- When charging refrigerant, always use protective gloves and safety glasses.

CAUTION

Do NOT charge the refrigerant more than the specified amount, to avoid compressor breakdown.

Other guidelines:

- Only use tools exclusively for R410A to ensure pressure resistance and to 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.

1 Connect the refrigerant cylinder to the service port.

2 Charge the additional refrigerant amount.

3 Open the gas stop valve.

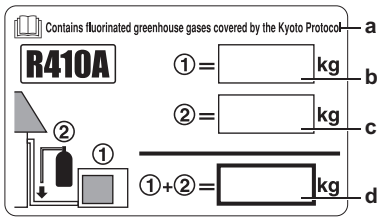
If pump down is needed in case of dismantling or relocate the system, see "13.1 To pump down" on page 70 for more details.

7.4.16 To fix the fluorinated greenhouse gases label

NOTICE

National implementation of EU regulation on certain fluorinated greenhouse gases may require to provide the appropriate official language on the unit. Therefore, an additional multilingual fluorinated greenhouse gases label is supplied with the unit.

1 Fill in the label as follows:



a From the multilingual fluorinated greenhouse gases label peal 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

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

7.5 Connecting the water piping

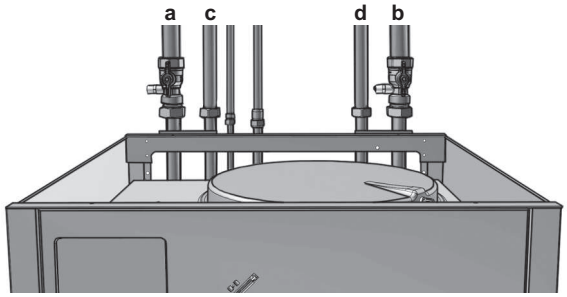
7.5.1 To connect the water piping

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 the position. Orientation of the integrated drain and fill valves is important for servicing.

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



a Space heating water out
b Space heating water in
c Domestic hot water out
d Domestic cold water in (cold water supply)

NOTICE

It is recommended to install shut-off valves to domestic cold water in and domestic hot water out connections. Shut-off valves are field supplied.

NOTICE

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

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

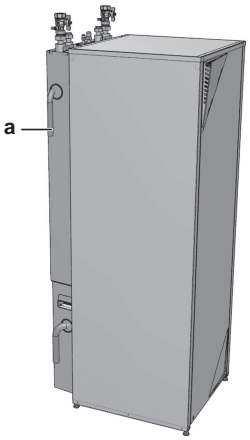
3 Connect the domestic hot water in and out pipes to the indoor unit.

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 higher position as 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.

7.5.2 To connect the pressure relief valve to the drain

The blow out of the pressure relief valve is coming out of the backside of the unit.

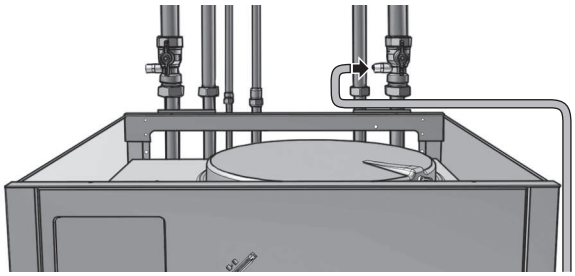


a Pressure relief blow-out

The blow out should be connected to an appropriate drain according to the applicable legislation. It is recommended to use a tundish.

7.5.3 To fill the water circuit

1 Connect the water supply hose to the fill valve.



2 Open the fill valve.

3 Make sure that the automatic air purge valve is open (at least 2 turns).

INFORMATION

For location of the air purge valve, see Components: Indoor unit in chapter "15 Technical data" on page 72.

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.

6 Close the fill valve.

7 Disconnect the water supply hose from the 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.

7.5.4 To fill the domestic hot water tank

1 Open every hot water tap in turn to purge air from the system pipe work.

2 Open the cold water supply valve.

3 Close all water taps after all air is purged.

4 Check for water leaks.

5 Manually operate the field installed pressure relief valve to ensure that free water flow through the discharge pipe.

7.5.5 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 sealing materials should be at least 20 mm to prevent condensation on the surface of the sealing.

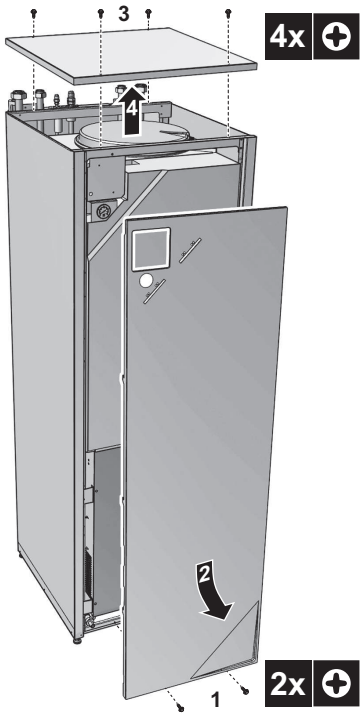
7.5.6 To connect the recirculation piping

1 Loosen and remove the screws at the bottom of the unit.

2 Slide the front panel of the unit downwards and remove it.

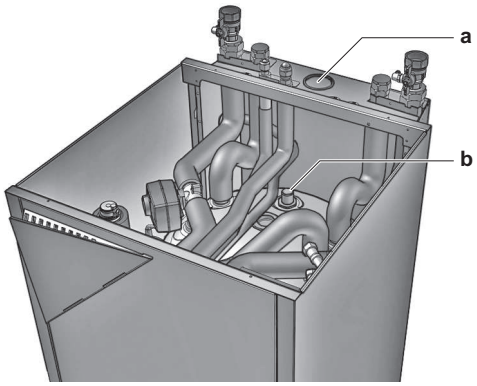
3 Loosen and remove the 4 screws that fix the top panel.

4 Remove the top panel from the unit.



5 Remove the expansion vessel.

6 Remove the upper insulation cover of the unit.

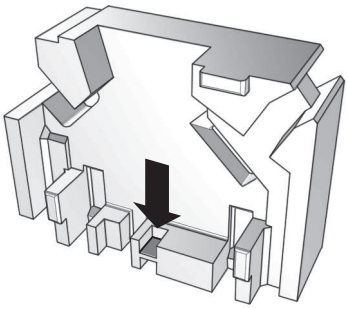


a Knock-out hole
b Connection for recirculation piping

7 Remove the knock-out hole at the backside of the unit.

8 Connect the recirculation piping to the recirculation connection and route the piping through the knock-out hole at the backside of the unit.

9 Remove the indicated part in the figure below.



10 Re-attach the insulation, expansion vessel and casing.

7.6 Connecting the electrical wiring

DANGER: RISK OF ELECTROCUTION

INFORMATION

More information about the legend and the location of the wiring diagram of the unit can be found in "15.4 Wiring diagram" on page 81.

WARNING

ALWAYS use multicore cable for power supply cables.

7.6.1 About electrical compliance

Only for ERLQ006CAV3+ERLQ008CAV3

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.).

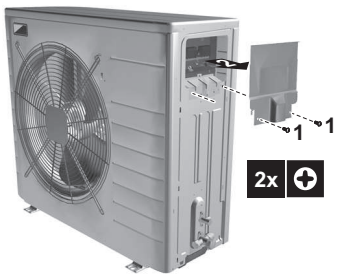
Only for indoor units

See "7.6.5 To connect the backup heater power supply" on page 37.

7.6.2 To connect the electrical wiring on the outdoor unit

1 Remove the 2 switch box cover screws.

2 Remove the switch box cover.

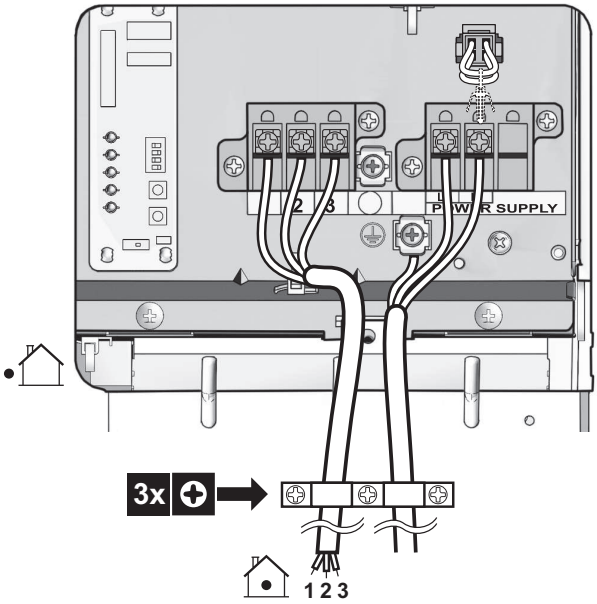


3 Strip insulation (20 mm) from the wires.

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

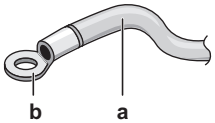
4 Open the wire clamp.

5 Connect the interconnection cable and power supply as follows:



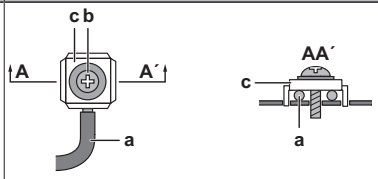
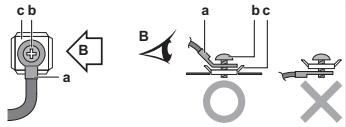
6 Install the switch box cover.

- 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

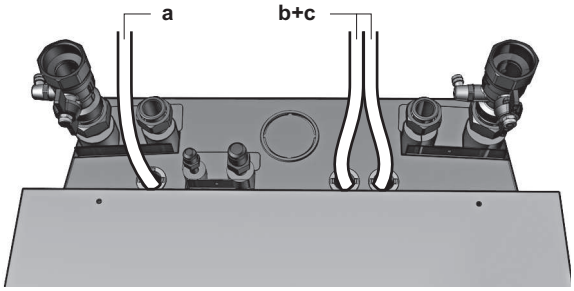
- Use the following methods for installing wires:

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

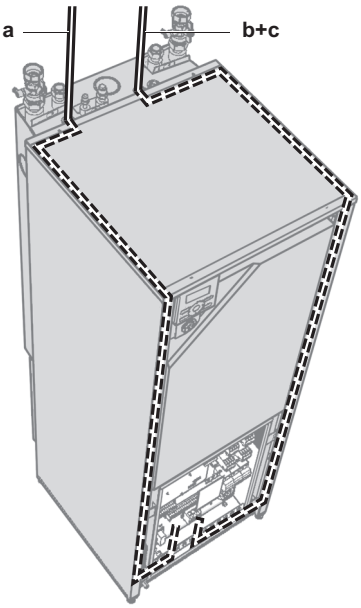
7.6.3 To connect the electrical wiring on the indoor unit

1 To open the indoor unit, see "7.1.2 To open the indoor unit" on page 26 and "7.1.3 To open the switch box cover of the indoor unit" on page 26.

2 Wiring should enter the unit from the top:



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



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.

Routing	Possible cables (depending on unit type and installed options)
a Low voltage	▪ User interface ▪ Power consumption digital inputs (field supply) ▪ Outdoor ambient temperature sensor (option) ▪ Indoor ambient temperature sensor (option) ▪ Electrical meters (field supply)
b High voltage power supply	▪ Interconnection cable ▪ Normal kWh rate power supply ▪ Preferential kWh rate power supply ▪ Power supply for backup heater

Routing	Possible cables (depending on unit type and installed options)
c High voltage control signal	▪ Preferential power supply contact ▪ Heat pump convector (option) ▪ Room thermostat (option) ▪ Shut-off valve (field supply) ▪ Domestic hot water pump (field supply) ▪ Alarm output ▪ Changeover to external heat source control ▪ Space heat operation control

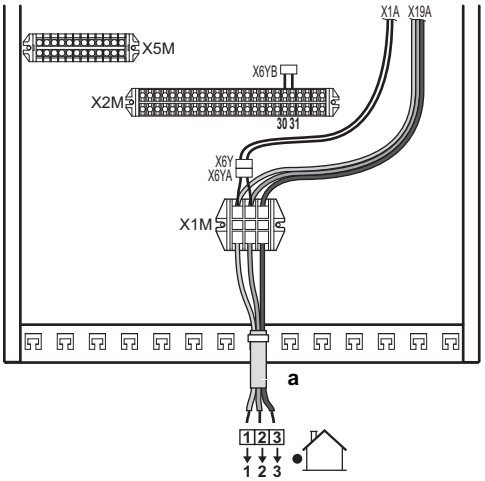
CAUTION

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

7.6.4 To connect the main power supply

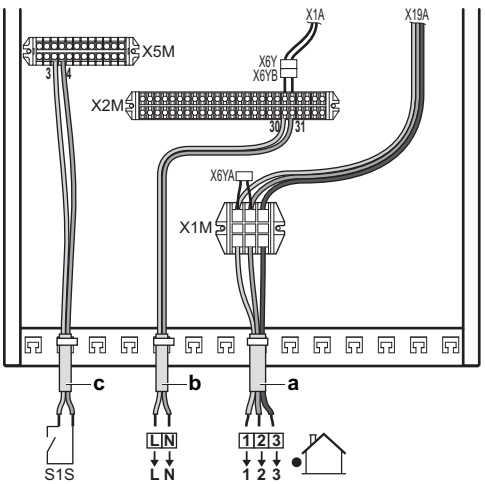
1 Connect the main power supply.

In case of normal kWh rate power supply



Legend: see illustration below.

In case of preferential kWh rate power supply



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

INFORMATION

In case of preferential kWh rate power supply, 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:

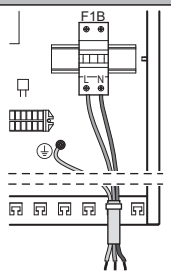
- if preferential kWh rate power supply is interrupted when active, OR
- if no power consumption of the indoor unit is allowed at the preferential kWh rate power supply when active.

7.6.5 To connect the backup heater power supply

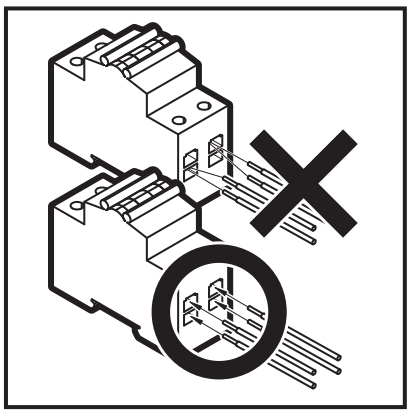
The backup heater capacity can vary, depending on the indoor unit model. Make sure that the power supply is in accordance with the backup heater capacity, as listed in the table below.

Backup heater type	Backup heater capacity	Power supply	Maximum running current
*3V	3 kW	1~ 230 V	13 A

1 Connect the backup heater power supply. Use a single pole fuse for F1B.

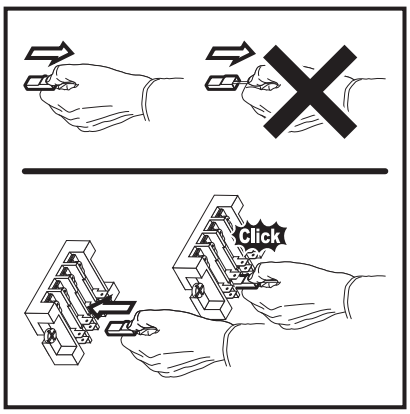
Backup heater type	Connections to backup heater power supply	Connections to terminals
3 kW 1~ 230 V (*3V)		—

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.



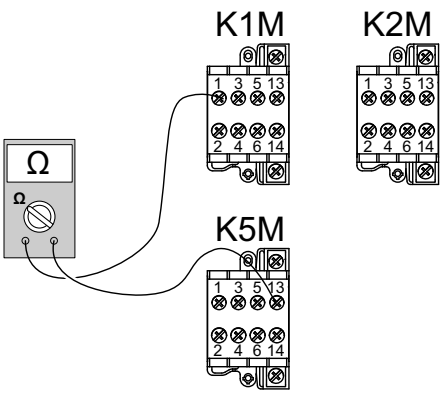
2 Fix the cable with cable ties to the cable tie mountings.

3 Configure the user interface for the respective power supply. See "8.2.2 Quick wizard: Standard" on page 43.

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.

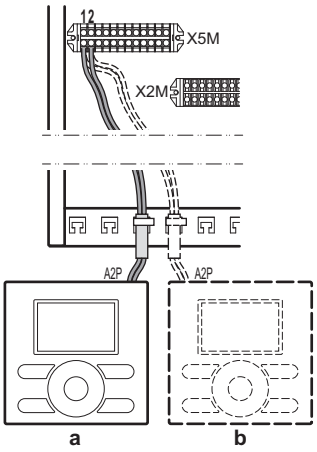
		3 kW **1~ 230 V**
K1M/1	K5M/13	52.9Ω
	K1M/3	∞
	K1M/5	∞
K1M/3	K1M/5	26.5Ω
K2M/1	K5M/13	∞
	K2M/3	∞
	K2M/5	∞
K2M/3	K2M/5	52.9Ω
K1M/5	K2M/1	∞

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



7.6.6 To connect the user interface

1 Connect the user interface cable to the indoor unit.

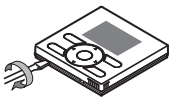


a User interface delivered with the unit
b Optional user interface

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

To fix the user interface to the unit

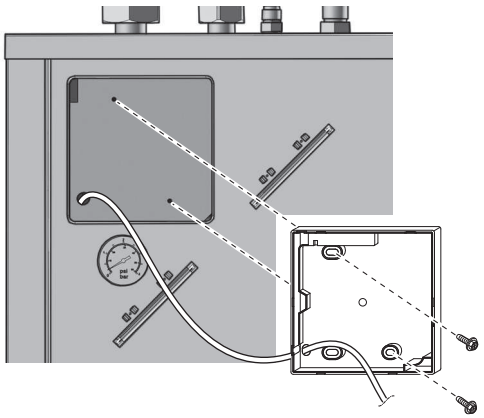
1 Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate.



NOTICE

The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.

2 Fix the wallplate of the user interface to the frontplate of the unit.



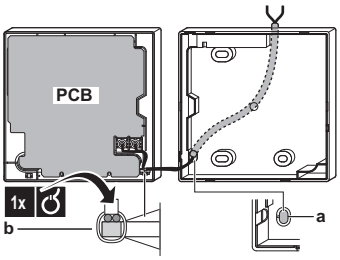
NOTICE

Be careful NOT to distort the shape of the backside of the user interface by overtightening the mounting screws.

3 Cut off a 2 wire conductor.

4 Connect the wires to the user interface as shown below.

From the rear



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.

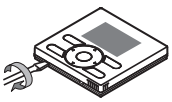
5 Reinstall the faceplate onto the wallplate.

NOTICE

Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

To fix the user interface to the wall in case of installation as room thermostat

1 Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate.



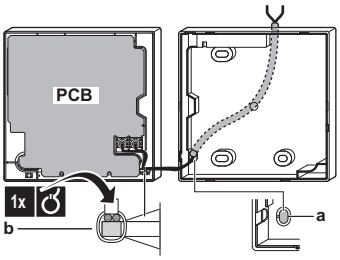
NOTICE

The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.

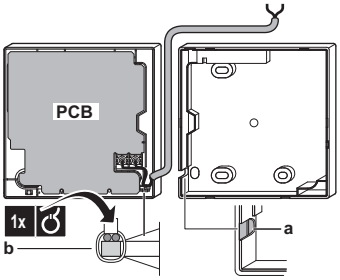
2 Fix the wallplate of the user interface to the wall.

3 Connect the wires to the user interface as shown below

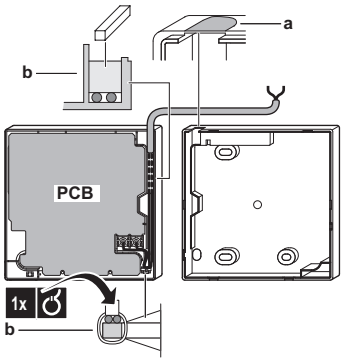
From the rear



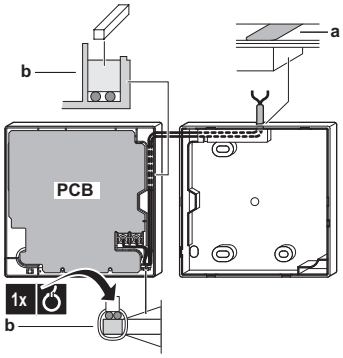
From the left



From the top



From the top center



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.

4 Reinstall the faceplate onto the wallplate.

NOTICE

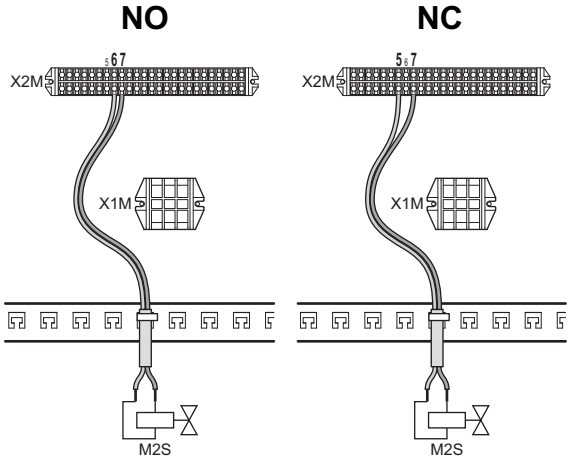
Be careful NOT to pinch the wiring when attaching the frontplate to the unit.

7.6.7 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.



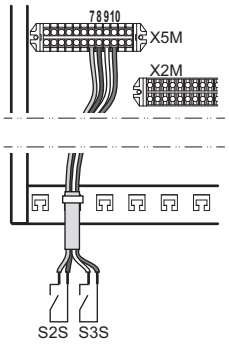
2 Fix the cable with cable ties to the cable tie mountings.

7.6.8 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.

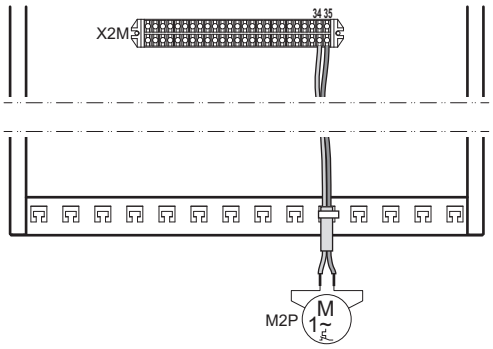
1 Connect the electrical meters cable to the appropriate terminals as shown in the illustration below.



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

7.6.9 To connect the domestic hot water pump

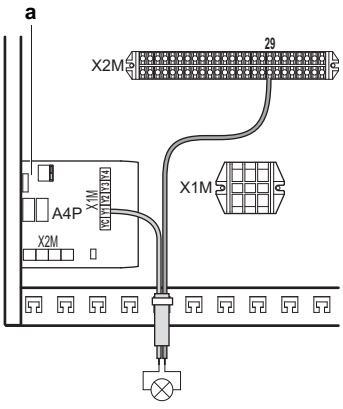
1 Connect the domestic hot water pump cable to the appropriate terminals as shown in the illustration below.



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

7.6.10 To connect the alarm output

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

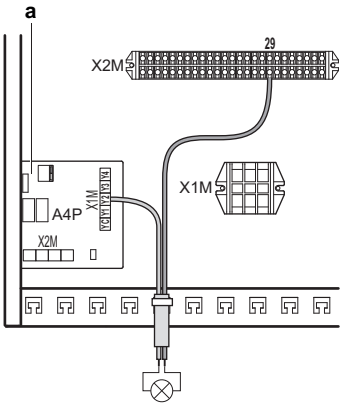


a Installation of EKRP1HB is required.

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

7.6.11 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.

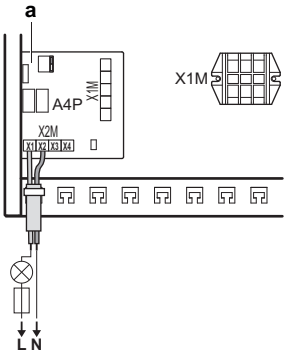


a Installation of EKRP1HB is required.

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

7.6.12 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.

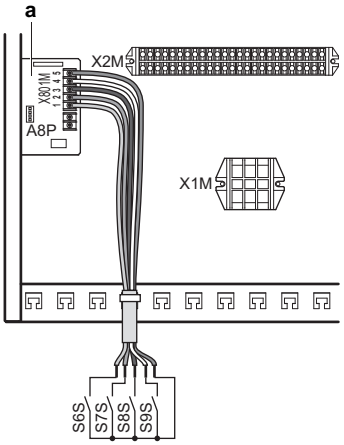


a Installation of EKRP1HB is required.

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

7.6.13 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.



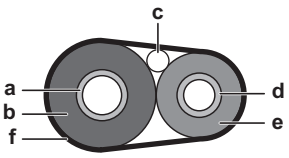
a Installation of EKRP1AHTA is required.

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

7.7 Finishing the outdoor unit installation

7.7.1 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.

7.7.2 To close the outdoor unit

1 Close the switch box cover.

2 Close the service cover.

NOTICE

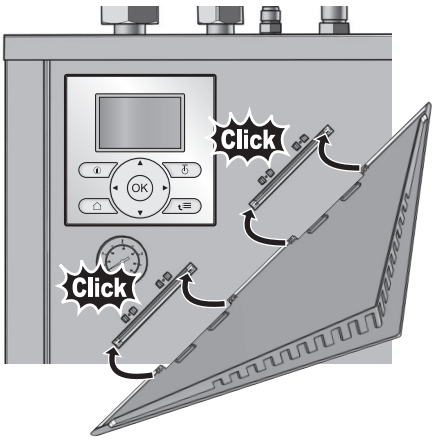
When closing the outdoor unit cover, make sure that the tightening torque does NOT exceed 4.1 N•m.

7.8 Finishing the indoor unit installation

7.8.1 To fix the user interface cover to the indoor unit

1 Make sure that the front panel is removed from the indoor unit. See "7.1.2 To open the indoor unit" on page 26.

2 Plug the user interface cover into the hinges.



3 Mount the front panel to the indoor unit.

7.8.2 To close the indoor unit

1 Close the switch box cover.

2 Reinstall the top plate.

3 Reinstall the front panel.

NOTICE

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

8 Configuration

8.1 Overview: Configuration

If you do NOT configure the system correctly, it might NOT work as expected. You can configure the system with the user interface.

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. If necessary, you can also make changes to the configuration afterwards.

The installer can prepare the configuration off-site on PC and afterwards upload the configuration to the system with the PC configurator. See "8.1.1 To connect the PC cable to the switch box" on page 41 for more information about the connection.

The configuration influences the following:

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

Legend for the settings tables:

- **#**: Breadcrumb in the menu structure
- **Code**: Code in the overview settings

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.

The most commonly used installation settings are accessible through the menu structure. Their location is mentioned by the breadcrumb indication (#). Additionally, all installer settings can also be found in "8.5 Menu structure: Overview installer settings" on page 60.

For access to the setting codes, see "To access the installer settings" on page 42.

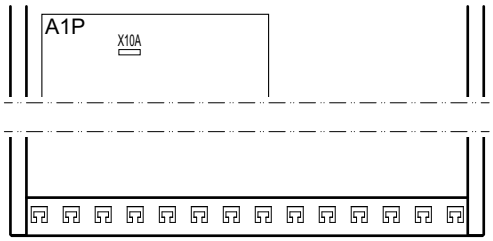
Not all settings are accessible through the menu structure. Some are only accessible through their code. Then in the table explained below, the bread crumb is set as N/A (not applicable).

8.1.1 To connect the PC cable to the switch box

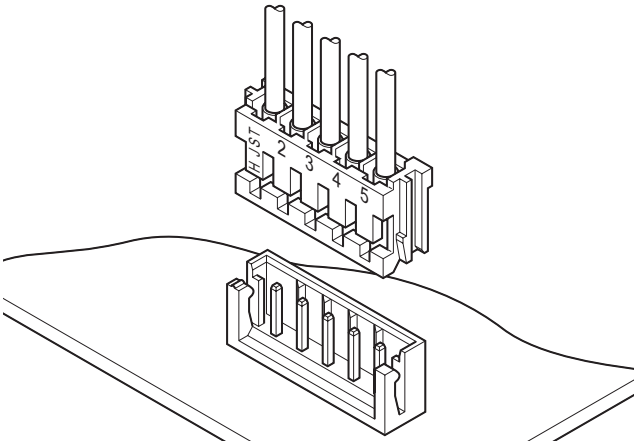
Prerequisite: The EKPCCAB kit is required.

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!



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

2 Press ☰ for more than 4 seconds.

Result: 🔧 is displayed on the home pages.

3 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 switch between user permission levels (End user and Advanced end user)

1 Go to [6] or any of its submenus: ☰ > Information.

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.

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

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".

Overview settings				
		01		
00	01	15	02	03
04	05		06	07
08	09		0a	0b
0c	0d		0e	0f
OK Confirm		◆ Adjust		◆ Scroll

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

Overview settings				
		01		
00	01	15	02	03
04	05		06	07
08	09		0a	0b
0c	0d		0e	0f
OK Confirm		◆ Adjust		◆ Scroll

Result: The value to be modified is now highlighted.

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

Overview settings				
		01		
00	01	20	02	03
04	05		06	07
08	09		0a	0b
0c	0d		0e	0f
OK Confirm		◆ Adjust		◆ Scroll

5 Push OK to confirm the modification of the parameter.

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

7 Push the ⌂ or ☰ button to leave the overview settings menu.

8 Confirm by pressing OK.

Installer settings	
The system will restart.	
OK	Cancel
OK Confirm	◆ Adjust

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 EKRUCAL2 to EKRUCAL1.

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

Tue 15:10
U5: Auto adress
⏻ Push 4 sec. to continue ☀

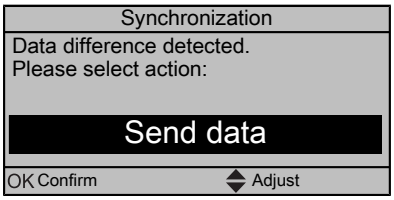
2 Push ⏻ for 4 seconds on the user interface on which you want to proceed to the quick wizard. This user interface is now the main user interface.

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.

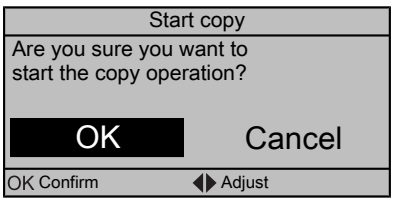
4 For proper operation of the system, the local data on the two user interfaces must be the same. If this is NOT the case, both user interfaces will display:



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 display Busy and will NOT allow operation.
- The copy operation can take up until 90 minutes.
- It is recommended to change installer settings, or the configuration itself, on the main user interface.

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 "8.1.4 To copy the system settings from the first to the second user interface" on page 43.

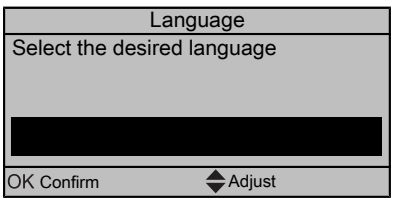
8.1.5 Quick wizard: Set the system layout after first power ON

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

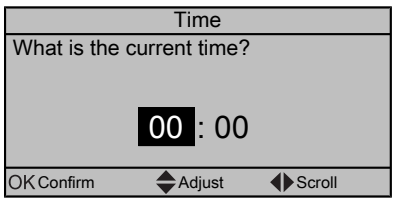
- language,
- date,
- time,
- system layout.

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

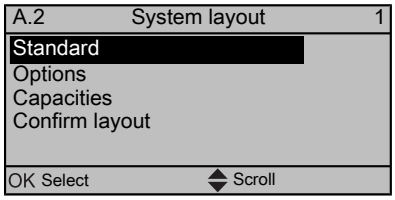
1 At power ON, the quick wizard starts as long as the system layout was NOT confirmed yet, by setting the language.



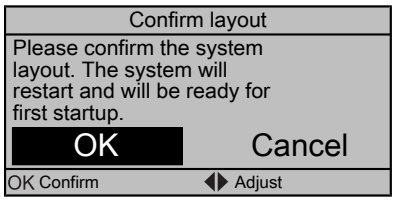
2 Set the current date and time.



3 Set the system layout settings: Standard, Options, Capacities. For more details, see "8.2 Basic configuration" on page 43.



4 Confirm by pressing 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

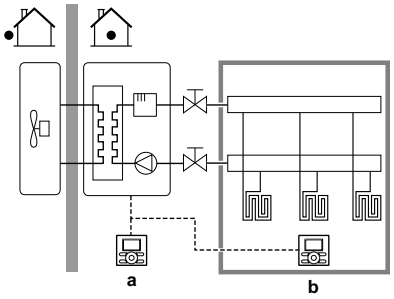
#	Code	Description
[A.1]	N/A	Language
[1]	N/A	Time and date

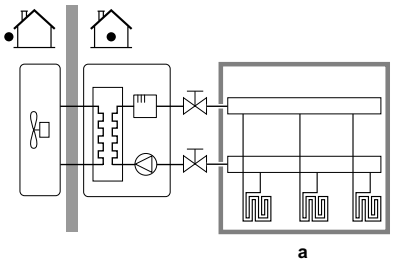
8.2.2 Quick wizard: Standard

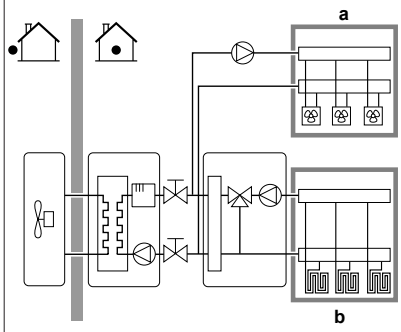
Space heating settings

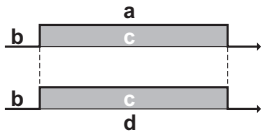
The system can heat up a space. Depending on the type of application, the space heating settings must be made accordingly.

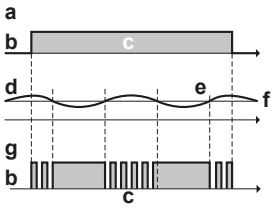
#	Code	Description
[A.2.1.7]	[C-07]	Unit control method: ▪ 0 (LWT control): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating demand of the room. ▪ 1 (Ext RT control): Unit operation is decided by the external thermostat or equivalent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

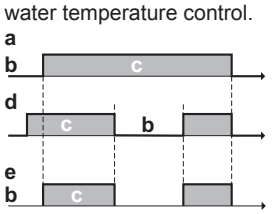
#	Code	Description
[A.2.1.B]	N/A	Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):  ▪ a: At unit ▪ b: In room as room thermostat User interface location: ▪ At unit: the other user interface is automatically set to In room and if RT control is selected act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

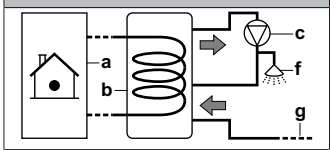
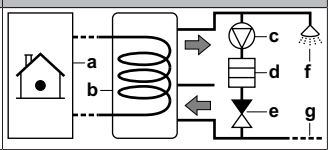
#	Code	Description
[A.2.1.9]	[F-0D]	<< continuation ▪ 2 (Request): Pump operation based on request. **Example:** Using a room thermostat creates thermo ON/OFF condition. When there is no such demand, the pump is OFF. **Remark:** Request is NOT available in leaving water temperature control.  ▪ a: Space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

Following settings must be made accordingly.

#	Code	Description
[A.2.2.1]	[E-05]	DHW operation: ▪ 0 (No): N/A ▪ 1 (Yes): Installed. **Remark:** The domestic hot water tank is by default installed. Do NOT change this setting.
[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 heater: ▪ 0 (Horizontal BSH): N/A ▪ 1 (Backup heater): The backup heater will also be used in domestic hot water heating.
[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. See also illustrations below.

Domestic hot water pump installed for…	
Instant hot water	Disinfection
 	

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

Thermostats and external sensors

See "5 Application guidelines" on page 10.

#	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 10. ▪ 1 (Thermo ON/OFF): The connected external room thermostat or heat pump convector sends the heating demand by the same signal as it is connected to only 1 digital input (preserved for the main leaving water temperature zone) on the indoor unit (X2M/1). Select this value in case of a connection to the heat pump convector (FWXV). ▪ 2 (C/H request)(default): The connected external room thermostat sends separate heating demand and is therefore connected to the 2 digital input (preserved for the main leaving water temperature zone) on the indoor unit (X2M/1 and 2). 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 10. ▪ 1 (Thermo ON/OFF): See Contact type main. Connected on the indoor unit (X2M/1a). ▪ 2 (C/H request)(default): See Contact type main. Connected on the indoor unit (X2M/1a and 2a).
[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 10. ▪ 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 10.

#	Code	Description
[A.2.2.6.1]	[C-02]	Ext. backup heat src Indicates if the space heating is also performed by means of an other 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 10.
[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.

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 10.

#	Code	Description
[A.2.2.7]	[D-04]	Demand PCB Indicates if the optional demand PCB is installed. ▪ 0 (No)(default): NOT installed. ▪ 1 (Yes): Installed. Power consumption control by digital inputs is selectable in [A.6.2.1].

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.2.3.2]	[6-03]	BUH: step 1: The capacity of the first step of the backup heater at nominal voltage. Nominal value 3 kW. Default: 3 kW. 0~10 kW (in steps of 0.2 kW)

8.2.5 Space heating control

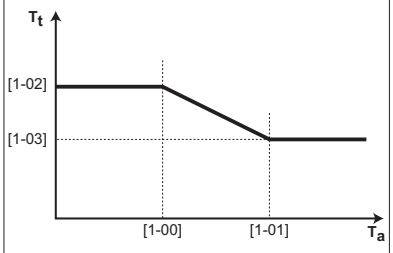
The basic required settings in order to configure the space heating of your system are described in this chapter. The weather-dependent installer settings define the parameters for the weather-dependent operation of the unit. When weather-dependent operation is active, the water temperature is determined 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 10°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: ▪ Absolute (default): 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. 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 ▪ Abs + 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
[A.3.1.1.3]	[1-00] [1-01] [1-02] [1-03]	Set weather-dependent heating:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>

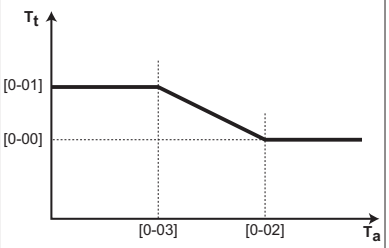
#	Code	Description
[A.3.1.1.3]	[1-00] [1-01] [1-02] [1-03]	<< continuation ▪ [1-00]: Low outdoor ambient temperature. −20°C~5°C (default: −10°C) ▪ [1-01]: High outdoor ambient temperature. 10°C~20°C (default: 15°C) ▪ [1-02]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature (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. Between minimum and maximum leaving water temperature (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: ▪ Absolute (default): 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. 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.3.1.2.1]	N/A	<< continuation ▪ Abs + 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
[A.3.1.2.3]	[0-00] [0-01] [0-02] [0-03]	Set weather-dependent heating:  ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature continued >>

#	Code	Description
[A.3.1.2.3]	[0-00] [0-01] [0-02] [0-03]	<< continuation ▪ [0-03]: Low outdoor ambient temperature. −20°C~5°C (default: −10°C) ▪ [0-02]: High outdoor ambient temperature. 10°C~20°C (default: 15°C) ▪ [0-01]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature 25°C~depending on outdoor unit (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. Between minimum and maximum leaving water temperature 25°C~depending on outdoor unit (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 emitter

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: 3~10°C (in steps of 1°C; default value: 5°C).

Specific for installations that require higher water temperatures (e.g., radiators)

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. **Note:** The desired leaving water temperature can only be read out on the user interface

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: ▪ 0 (Quick) **Example:** Small water volume and fan coils. ▪ 1 (Slow) **Example:** Large water volume, floor heating loops.

8.2.6 Domestic hot water control

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 Setpoint mode: ▪ 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 53 for more details.

INFORMATION

It is recommended NOT to use the selection of ([6-0D]=0, [A.4.1] Domestic hot water Setpoint mode=Reheat only).

The risk of space heating capacity shortage/comfort problems is significant (in case of frequent domestic hot water operation, frequent and long space heating interruption will happen).

Readout the desired tank temperature

The desired tank temperature is displayed on the user interface. By the following settings, you can configure the way the tank temperature is displayed:

- by its numerical value
- by an equivalent.

Use the numerical value in case the understanding of tank temperature is clear for the customer. On the user interface the customer can set the desired tank temperature per 1°C. For customers with less feeling about tank temperatures, choose display by equivalent number of people. They will set the desired tank temperature by indicating their domestic hot water consumption as a number of people.

As installer, you configure the conversion between the equivalent domestic hot water consumption per person at 1 heat-up cycle and the real desired tank temperature. Please take into account the installed tank size. Additionally, using the graphical display, the customer is made aware about the amount of consumed domestic hot water.

#	Code	Description
[A.4.3.1]	N/A	How is the tank temperature to be displayed on the user interface? ▪ As temperature. 60°C ▪ As graphic: The temperature has to be displayed as available hot water for x persons. If you choose this, you also have to configure which number equals which temperature under [A.4.3.2.1]~[A.4.3.2.6]: 4
[A.4.3.2.1]	N/A	1 person The absolute desired tank temperature for 1 person. 30~80°C (default: 42°C)
[A.4.3.2.2]	N/A	2 persons The increment of the desired tank temperature for 2 persons compared to 1 person. 0~20°C (default: 6°C)
[A.4.3.2.3]	N/A	3 persons The increment of the desired tank temperature for 3 persons compared to 2 persons. 0~20°C (default: 15°C)
[A.4.3.2.4]	N/A	4 persons The increment of the desired tank temperature for 4 persons compared to 3 persons. 0~20°C (default: 17°C)
[A.4.3.2.5]	N/A	5 persons The increment of the desired tank temperature for 5 persons compared to 4 persons. 0~20°C (default: 1°C)
[A.4.3.2.6]	N/A	6 persons The increment of the desired tank temperature for 6 persons compared to 5 persons. 0~20°C (default: 1°C)

INFORMATION

The real desired tank temperature is defined by the selected absolute desired tank temperature and the number of persons + selected increment value(s).

Example: 3 persons (default settings)

Real desired tank temperature=[A.4.3.2.1] + [A.4.3.2.2] + [A.4.3.2.3]

Real desired tank temperature=42+6+15=63°C.

Maximum tank temperature

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 tank 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. If ▪ [E-07]=0: N/A ▪ [E-07]=1: 40~60°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 a higher comfort but also a higher 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 absolute desired leaving water temperature should be specified or the desired shift values.

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]~[9-00] (default: 35°C)
[7.4.2.2]	[8-0A]	Eco (heating) [9-01]~[9-00] (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~+10°C (default: 0°C)
[7.4.2.6]	N/A	Eco (heating) −10~+10°C (default: −3°C)

Temperature ranges (leaving water temperatures)

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

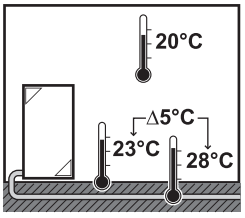
NOTICE

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~depending on outdoor unit (default: 55°C)
[A.3.1.1.2.1]	[9-01]	Minimum temp (heating) 15~37°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~depending on outdoor unit (default: 55°C)
[A.3.1.2.2.1]	[9-05]	Minimum temp (heating) 15~37°C (default: 25°C)

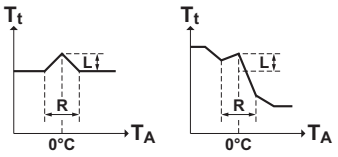
Leaving water temperature overshoot temperature

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]	1~4°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 b

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]	1~5°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) 18~30°C (default: 30°C)
[A.3.2.1.1]	[3-07]	Minimum temp (heating) 12~18°C (default: 12°C)

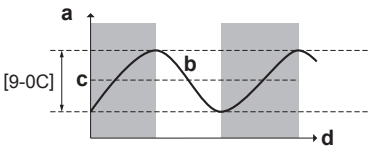
Room temperature step

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. Daikin advises 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]	1~6°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]	−5~5°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]	−5~5°C, step 0.5°C (default: 0°C)

Room frost protection

ONLY applicable in case of room thermostat control. When the actual room temperature would drop below the room frost temperature, the unit will supply leaving water (in heating operation mode) to the heat emitters to heat up the room again.

NOTICE

Even if the room thermostat control is OFF on the user interface, room frost protection remains active.

#	Code	Description
N/A	[2-06]	Room frost protection ▪ 0: disabled ▪ 1: enabled (default)
N/A	[2-05]	Room antifrost temperature 4~16°C (default: 12°C)

Shut-off valve

ONLY applicable in case of 2 leaving water temperature zones.

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 10.

#	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]	14~25°C (default: 25°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

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]	30~80°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]	30~50°C (default: 45°C)

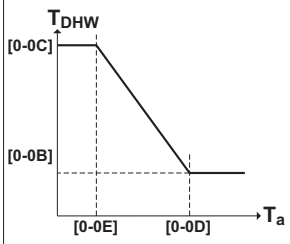
Reheat: The desired reheat tank temperature is used:

- in reheat mode or scheduled + reheat mode, as guaranteed minimum tank temperature: if the tank temperature drops below this value, the tank is heated up.
- during storage comfort, to prioritize the domestic hot water preparation. When the tank temperature raises above this value, domestic hot water preparation and space heating are executed sequentially.

#	Code	Description
[7.4.3.3]	[6-0C]	30~50°C (default: 45°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.

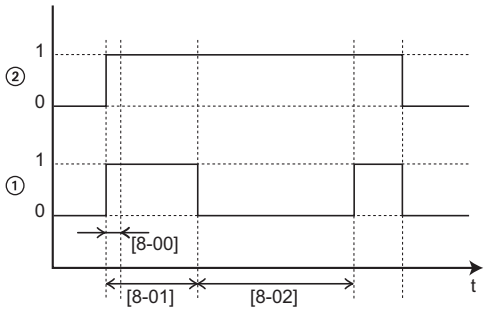
#	Code	Description
[A.4.2.2]	N/A	Weather dependent desired tank temperature is: ▪ Absolute (default): disabled. All desired tank temperature are NOT weather dependent. ▪ Weather dep.: enabled. In scheduled or scheduled+reheat mode, the storage comfort temperature is weather dependent. Storage economic 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. −20~5°C (default: −10°C) ▪ [0-0D]: high outdoor ambient temperature: 10~20°C (default: 15°C) ▪ [0-0C]: desired tank temperature when the outdoor temperature equals or drops below the low ambient temperature: 55~70°C (default: 70°C) ▪ [0-0B]: desired tank temperature when the outdoor temperature equals or rises above the high ambient temperature: 35~55°C (default: 55°C)

Timers for simultaneous request space and domestic hot water operation

#	Code	Description
N/A	[8-00]	Minimum running time for domestic hot water operation. During this time, space heating is NOT allowed, even when the target domestic hot water temperature has been reached. Range: 0~20 minutes (default: 5)

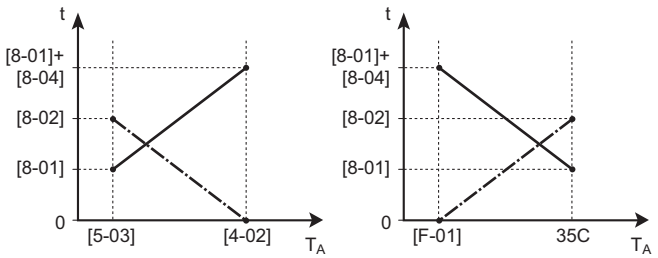
#	Code	Description
N/A	[8-01]	Maximum running time for domestic hot water operation. Domestic hot water heating stops even when the target domestic hot water temperature is NOT reached. The actual maximum running time also depends on setting [8-04]. ▪ When system layout = Room thermostat control: This 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: 0.5) (step: 1/2 hour)
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

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



T_A Ambient (outdoor) temperature
t Time
Anti-recycle time
Maximum running current

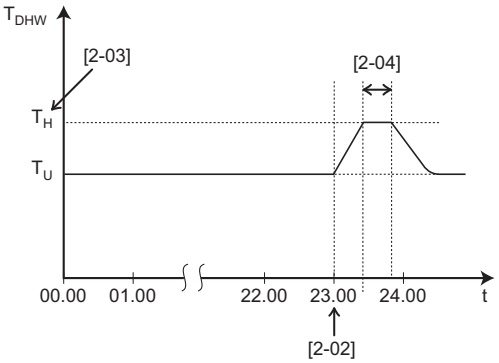
Disinfection

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.4.4.2]	[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: 60°C (fixed).
[A.4.4.5]	[2-04]	Duration: 40~60 minutes, default: 60 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.

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 > Setpoint mode > 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 > Setpoint mode > 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.

8.3.3 Heat source settings

Backup heater

Backup heater operation mode: defines when backup heater operation is disabled or only allowed during domestic hot water operation. This setting is only overruled when backup heating is required during defrost operation or malfunctioning of the outdoor unit (when [A.5.1.2] [4-06] is enabled).

#	Code	Description
[A.5.1.1]	[4-00]	Backup heater operation: ▪ 0: Disabled ▪ 1: Enabled ▪ 2: Limited, only enabled during domestic hot water operation or for system with integrated domestic hot water tank.
[A.5.1.2]	[4-06]	Defines if during emergency operation the backup heater is: ▪ 1: Allowed ▪ 0: NOT allowed Emergency operation will startup backup heater operation during certain outdoor malfunctions.
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.

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 — which heating source can/will provide the space heating, either the indoor unit or an auxiliary boiler.

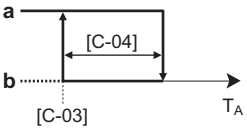
The field setting "bivalent operation" apply only the indoor unit space heating operation and the permission signal for the auxiliary boiler.

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

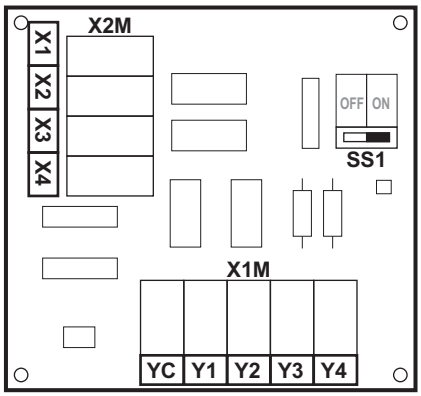
CAUTION

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 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.



#	Code	Description
N/A	[C-03]	ON temperature. If the outdoor temperature drops below this temperature, the bivalent heat source permission signal will be active.
N/A	[C-04]	Hysteresis. Temperature difference between bivalent heat source ON and OFF to prevent too much switching.

8.3.4 System settings

Priorities

#	Code	Description
N/A	[5-02]	Space heating priority. Defines whether backup heater will assist the heat pump during domestic hot water operation. Consequence: Shorter tank heating operation time and shorter interruption of the space heating cycle. This setting MUST always be 1. [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]. If the backup heater operation is limited ([4-00]=0) and the outdoor temperature is lower than setting [5-03], the domestic hot water will not be heated with the backup heater.
N/A	[5-03]	Space heating priority temperature. Defines the outdoor temperature which below the backup heater will assist during domestic hot water heating.
[A.6.1.2]	[C-00]	If a solar kit is installed, what has priority to heat up the tank? ▪ 0: Solar kit ▪ 1: Heat pump
[A.6.1.1.1]	[C-01]	If there is a simultaneous demand for space heating and domestic hot water heating (by heat pump), which operation mode has priority? ▪ 0: The operation mode with the highest request has priority. ▪ 1: Always space heating has priority.

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, Daikin recommends 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]	Auto restart function: ▪ 0: Enabled ▪ 1: Disabled

Preferential kWh rate power supply

#	Code	Description
[A.2.6.1]	[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.
[A.6.2.1]	[D-00]	Which heaters are allowed to operate during preferential kWh rate power supply? ▪ 0 (default): None ▪ 1: Booster heater only ▪ 2: Backup heater only ▪ 3: All heaters See table below. Settings 1, 2 and 3 are 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 30-31 X2M) and the backup heater is NOT connected to the preferential kWh rate power supply.

Do NOT use 1 or 3.

[d-00]	Backup heater	Compressor
0 (default)	Forced OFF	Forced OFF
2	Allowed	

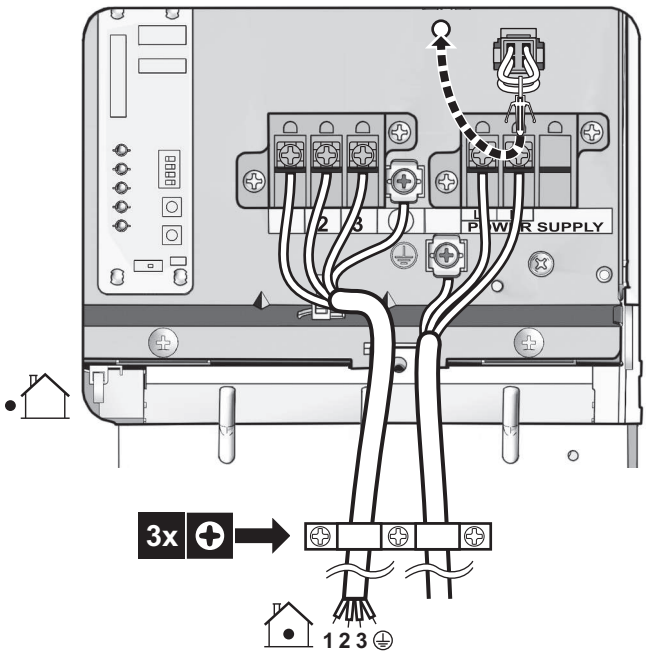
Power saving function

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.



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

Power consumption control

See "5 Application guidelines" on page 10 for detailed information about this functionality.

#	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. 0~50 A, step 1 A (default: 50 A)
[A.6.3.4]	[5-09]	Value: Only applicable in case of full time power limitation mode. 0~20 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 0~50 A, step 1 A (default: 50 A)
[A.6.3.5.2]	[5-06]	Limit DI2 0~50 A, step 1 A (default: 50 A)
[A.6.3.5.3]	[5-07]	Limit DI3 0~50 A, step 1 A (default: 50 A)
[A.6.3.5.4]	[5-08]	Limit DI4 0~50 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 0~20 kW, step 0.5 kW (default: 20 kW)
[A.6.3.6.2]	[5-0A]	Limit DI2 0~20 kW, step 0.5 kW (default: 20 kW)
[A.6.3.6.3]	[5-0B]	Limit DI3 0~20 kW, step 0.5 kW (default: 20 kW)
[A.6.3.6.4]	[5-0C]	Limit DI4 0~20 kW, step 0.5 kW (default: 20 kW)

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: ▪ No averaging (default) ▪ 12 hours ▪ 24 hours ▪ 48 hours ▪ 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]	−5~5°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? ▪ OK ▪ Cancel

Pump operation

The pump operation field setting apply to the pump operation logic only when [F-0D]=1.

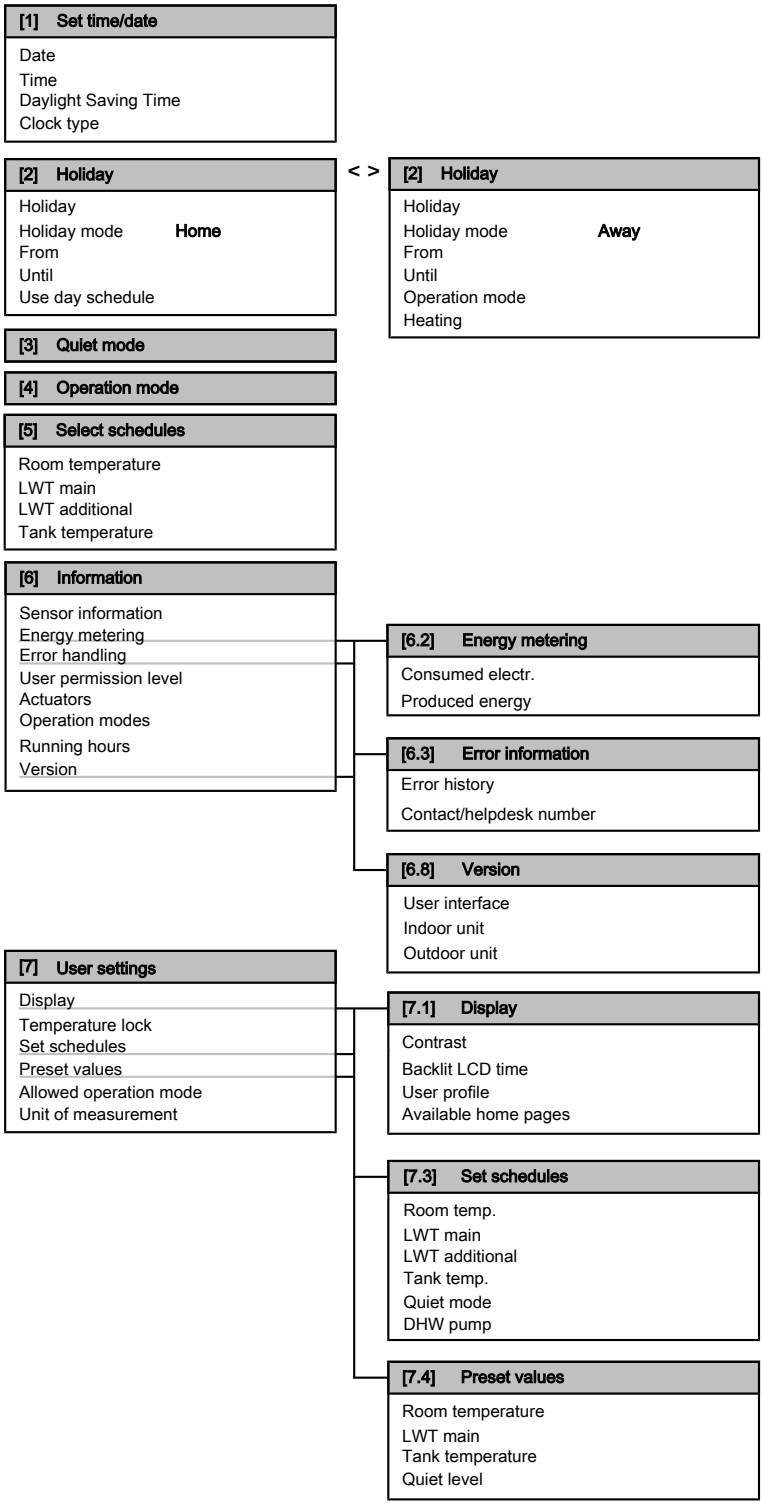
When the pump operation function is disabled the pump will stop if the outdoor temperature is higher than the value set by [4-02]. When the pump operation is enabled, the pump operation is possible at all outdoor temperatures.

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

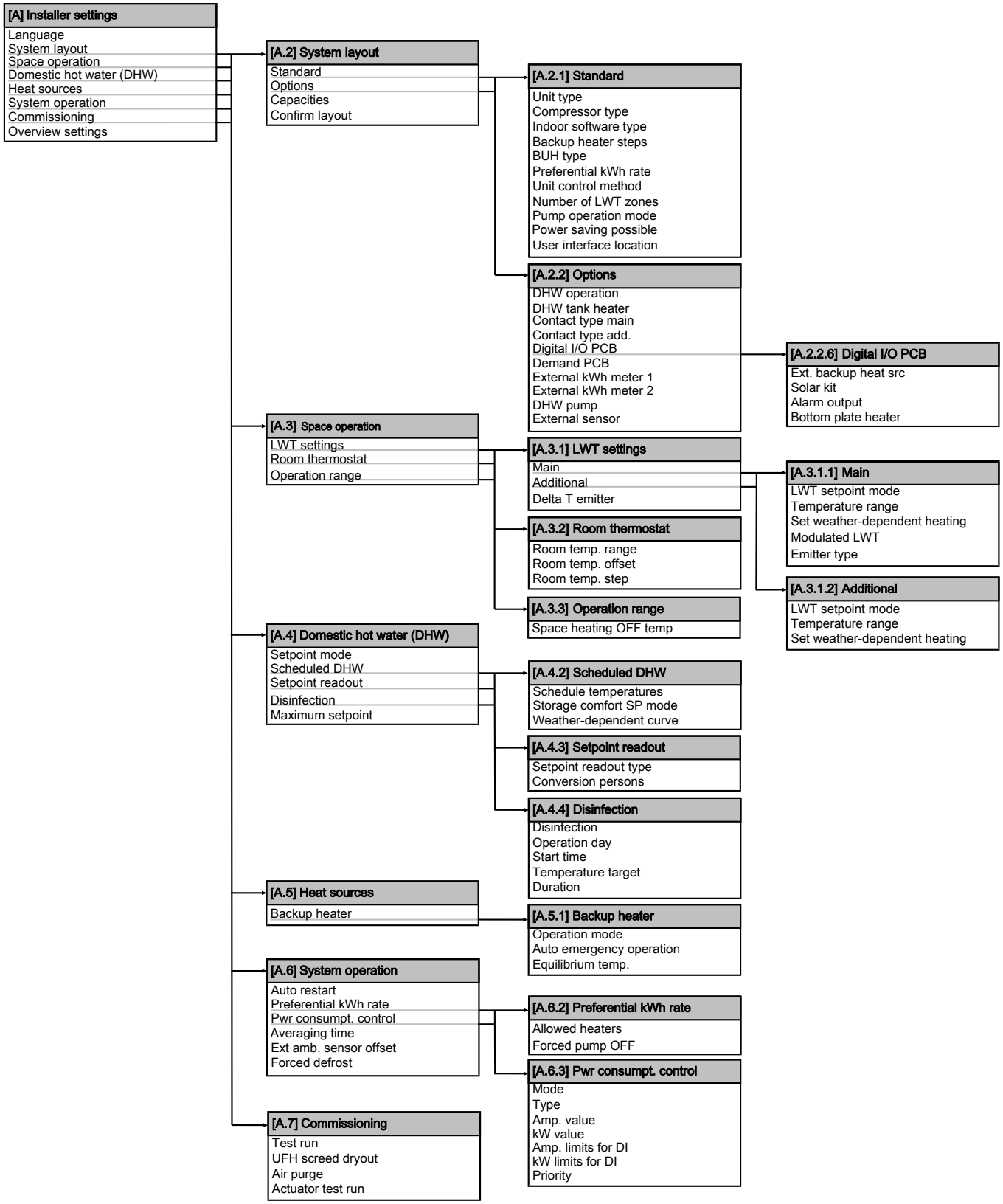
Pump operation during flow abnormality [F-09] defines whether the pump stops at flow abnormality or allow to continue operation when flow abnormality occurs. This functionality is only valid in specific conditions where it is preferable to keep the pump active when T_a <4°C (pump will be activated for 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)

8.4 Menu structure: Overview



8.5 Menu structure: Overview installer settings



INFORMATION

Solar kit and bottom plate heater settings are shown but NOT applicable for this unit. Settings shall NOT be used or changed.

9 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.
- Before startup, the installation must be powered for at least 2 hours to allow the crankcase heater to operate.

9.1 Overview: Commissioning

Commissioning typically consists of the following stages:

1 Checking the "Checklist before test run".
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 Checklist before test run

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

☐	The **indoor unit** 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 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.
☐	Depending on the backup heater type, the **backup heater circuit breaker** F1B or F3B 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.

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, burning of the compressor may result.

NOTICE

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

9.3 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.

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.

Make sure the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

The air purge function automatically stops after 30 minutes.

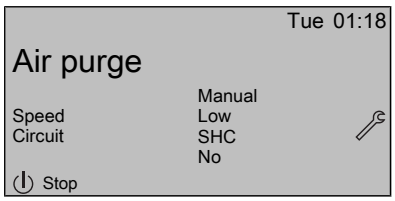
INFORMATION

It is recommended to start the air purge function in manual mode. When almost all of the air is removed, it is recommended to start the automatic mode. If necessary, repeat the automatic mode until you are sure that all air is removed from the system.

9.3.1 To perform a manual air purge

1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 42.
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. Use the ◀ and ▶ buttons to scroll to Circuit.

8 Use the ▲ and ▼ buttons to set the desired position of the 3-way valve.

Result: SHC

Result: Tank

9 Set the desired position of the bypass valve. Use the ◀ and ▶ buttons to scroll to .

10 Use the ▲ and ▼ buttons to set the desired position of the bypass valve.

Result: No (boiler not bypassed)

Result: Yes (boiler bypassed)

Result: The air purge function automatically stops after 42 minutes.

9.3.2 To perform an automatic air purge

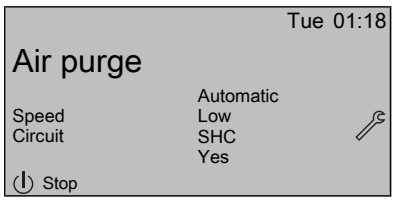
1 Set the user permission level to Installer. See "To set the user permission level to Installer" on page 42.

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.



Result: The air purge function automatically stops after 42 minutes.

9.3.3 To interrupt air purge

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

9.4 To perform a test run

Prerequisite: Make sure the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

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

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

3 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

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 stop the test run 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.

9.5 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 the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

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

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

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

4 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.

9.5.1 Possible actuator test runs

- Backup heater test
- Pump test

INFORMATION

Calibration of the produced heat calculation is included in this test.

Make sure that air is purged before executing the test run. Also avoid causing disturbances in the water circuit during the test run.

- 2-way valve test
- 3-way valve test
- Bivalent signal test
- Alarm output test
- Heating signal test
- Quick heat-up test
- Circulation pump test

9.6 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 the user interface shows the home screens and that the space heating and domestic hot water demands are turned off.

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.

NOTICE

The installer is responsible for:

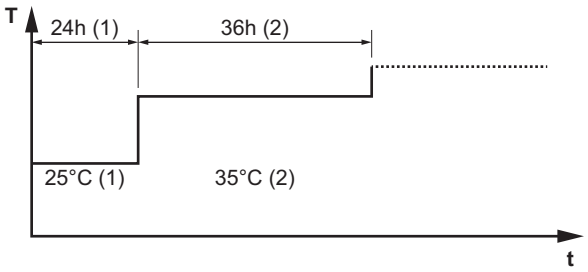
- contacting the screed manufacturer for the initial heating instructions to avoid cracking the screed,
- programming the underfloor heating screed dryout schedule according to the above instruction of the screed manufacturer,
- checking the proper functioning of the setup on a regular basis,
- selecting the correct program complying with the type of the used screed of the floor.

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

9.6.1 To program an underfloor heating screed dryout schedule

1 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout > Set dryout schedule.

2 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.

3 To add a new step, select "–h" or "–" on an empty line and press .

4 To delete a step, set the duration to "–" by pressing .

5 Press OK to save the schedule.

INFORMATION

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.

9.6.2 To perform an underfloor heating screed dryout

INFORMATION

Preferential kWh rate power supply cannot be used in combination with underfloor heating screed dryout.

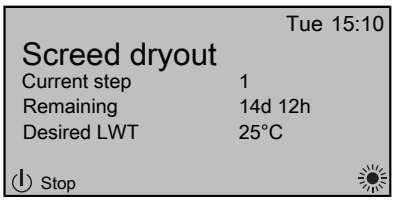
1 Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout.

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.



9.6.3 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

9.6.4 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 "12.3 Solving problems based on error codes" on page 68. 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 CD/DVD and the printed documentation and ask him/her to keep it for future reference.
- Explain the user how to properly operate the system and what he/she has to do in case of problems.
- Show the user what jobs he/she has to do in relation to maintenance of the unit.
- Explain the user about energy saving tips as described in the operation manual.

11 Maintenance and service

NOTICE

Maintenance should preferably be carried out yearly by an installer or service agent.

11.1 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.

11.1.1 Opening the indoor unit

CAUTION

The front panel is heavy. Be careful NOT to jam your fingers when opening or closing the unit.

You just need to remove the front panel and remove the expanded polystyrene front cover of the unit to gain access to most parts which need maintenance. In rare cases, you may also need to remove the switch box.

11.2 Checklist for yearly maintenance of the indoor unit

Check the following at least once a year:

- Water pressure
- Water filter
- Water pressure relief valve
- Relief valve hose
- Pressure relief valve of the domestic hot water tank
- Switch box
- Descaling
- Chemical disinfection
- Anode

Water pressure

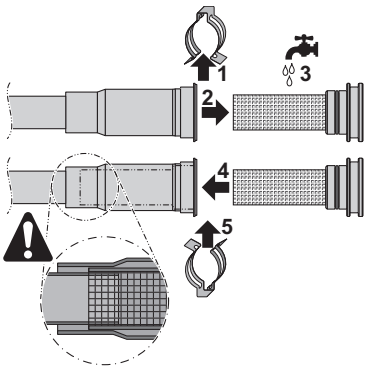
Check whether the water pressure is above 1 bar. If it is lower, add water.

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.

Pressure relief valve hose

Check whether the pressure relief valve hose is positioned appropriately to drain the water. See "7.5.2 To connect the pressure relief valve to the drain" on page 33.

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.

Descaling

Depending on water quality and set temperature, scale can deposit on the heat exchanger inside the domestic hot water tank and can restrict heat transfer. For this reason, descaling of the heat exchanger may be required at certain intervals.

Chemical disinfection

If the applicable legislation requires a chemical disinfection in specific situations, involving the domestic hot water tank, please be aware that the domestic hot water tank is a stainless steel cylinder containing an aluminium anode. We recommend to use a non-chloride based disinfectant approved for use with water intended for human consumption.

NOTICE

When using means for descaling or chemical disinfection, it must be ensured that the water quality remains compliant with EU directive 98/83 EC.

Anode

No maintenance or replacement required.

11.2.1 To drain the domestic hot water tank

1 Switch OFF the power supply.
2 Turn OFF the cold water supply.
3 Open the hot water taps.
4 Open the drain valve.

11.3 Checklist for yearly maintenance of the outdoor unit

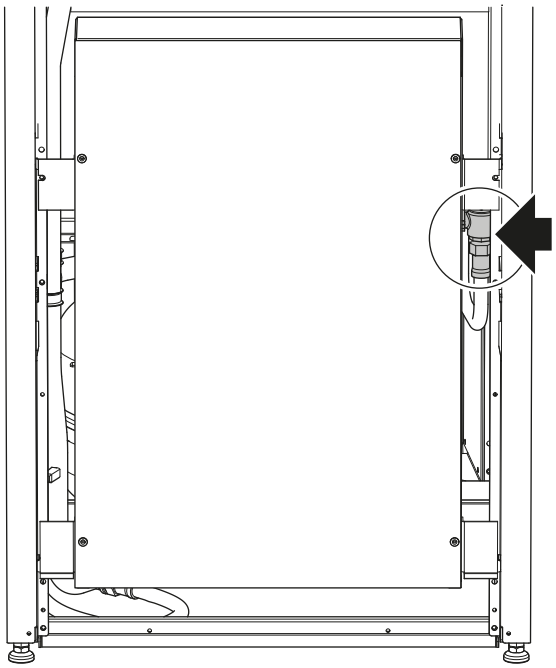
Check the following at least once a year:

- 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 To drain the domestic hot water tank

1 Open the front panel.
2 The drain hose is located at the right side of the unit. Cut the tie wraps or tape and bring the flexible drain hose forward.

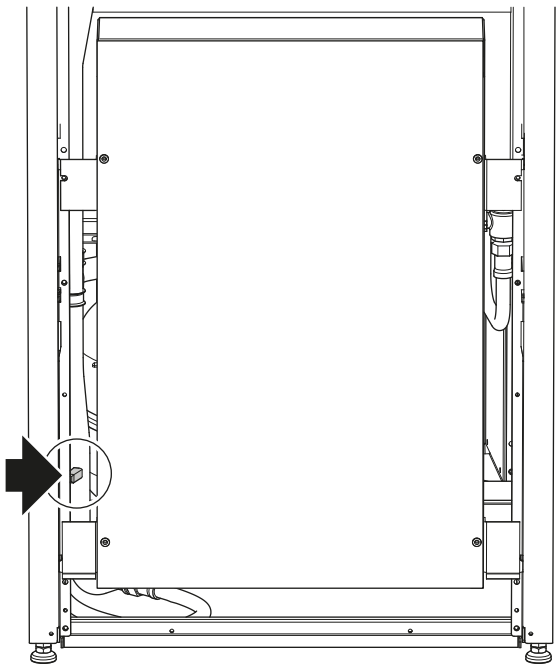


INFORMATION

To drain the tank, all the hot water tapping points need to be opened to allow air to enter the system.

11.5 To drain the flow-through vessel and backup heater

1 Open the front panel.
2 The drain hose is located at the left side of the unit. Cut the tie wraps or tape and bring the flexible drain hose forward.



12 Troubleshooting

12.1 General guidelines

Before starting the troubleshooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

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

12.2 Solving problems based on symptoms

12.2.1 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 "9.3.1 To perform a manual air purge" on page 61) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 62). ▪ 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 "15.7 ESP curve" on page 98). 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 "6.3.3 To check the water volume" on page 22).

12.2.2 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 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.

Possible causes	Corrective action
The preferential kWh rate power supply settings and electrical connections do NOT match	This should match with the connections as explained in "6.4.1 About preparing electrical wiring" on page 24 and "7.6.4 To connect the main power supply" on page 37.
The preferential kWh rate signal was sent by the electricity company	Wait for the power to return (2 hours max.).

12.2.3 Symptom: The pump is making noise (cavitation)

Possible causes	Corrective action
There is air in the system	Purge air manually (see "9.3.1 To perform a manual air purge" on page 61) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 62).
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 "6.3.4 Changing the pre-pressure of the expansion vessel" on page 23).

12.2.4 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 "6.3.3 To check the water volume" on page 22 and "6.3.4 Changing the pre-pressure of the expansion vessel" on page 23).
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.

12.2.5 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.

12.2.6 Symptom: The space is NOT sufficiently heated at low outdoor temperatures

Possible causes	Corrective action
The 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 OR ▪ [A.8] > Installer settings > Overview settings [5-01] ▪ The thermal protector of the backup heater has not been activated. If it has, check: ▪ The water pressure ▪ Whether there is air in the system ▪ The air purge operation Press the reset button in the switch box. See "15.2 Components" on page 76 for the location of the reset button.
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 [5-00]

Possible causes	Corrective action
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]

12.2.7 Symptom: The pressure at the tapping point is temporarily unusual 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.

12.2.8 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.

12.2.9 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 > Setpoint mode > 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 > Setpoint mode > 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.

12.2.10 Symptom: The energy metering (produced heat) is NOT working correctly

Possible causes	Corrective action
The measured temperatures for produced heat calculation are NOT accurate.	Execute a calibration of the system by performing an actuator test run of the pump (see "9.5 To perform an actuator test run" on page 62).

12.3 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.

12.3.1 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.
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.

Error code	Detailed error code	Description
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
A1	00	Zero cross detection problem. Power reset required. Please contact your dealer.
AA	01	Backup heater overheated. Power reset required. Please contact your dealer.
UA	00	Indoor unit, outdoor unit matching problem. Power reset required.
7H	01	Water flow problem.
89	01	Heat exchanger frozen.
8H	00	Abnormal increase BUH outlet water temperature.
8F	00	Abnormal increase BUH outlet water temperature (DHW).
C0	00	Flow sensor/switch malfunction. Please contact your dealer.
U3	00	Under floor heating screed dryout function not completed correctly.
81	00	Leaving water temperature sensor problem. Please contact your dealer.
C4	00	Heat exchanger temperature sensor problem. Please contact your dealer.
80	00	Returning water temperature sensor problem. Please contact your dealer.
U5	00	User interface communication problem.
U4	00	Indoor/outdoor unit communication problem.
EC	00	Abnormal increase tank temperature.
HC	00	Tank temperature sensor problem. Please contact your dealer.

Error code	Detailed error code	Description
CJ	02	Room temperature sensor problem. Please contact your dealer.
H1	00	External temperature sensor problem. Please contact your dealer.
HJ	08	Water circuit pressure is too high.
HJ	09	Water circuit pressure is too low.
HJ	10	Water pressure sensor problem. Please contact your dealer.
HJ	11	
HJ	12	
89	02	Heat exchanger frozen.
A1	00	EEPROM reading error.
AH	00	Tank disinfection function not completed correctly.
89	03	Heat exchanger frozen.
UA	52	Boiler/hydrobox combination abnormality
U6	36	Boiler standby abnormality

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 > Setpoint mode > 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 > Setpoint mode > 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.

13 Disposal

13.1 To pump down

In order to protect the environment, be sure to pump down in following cases:

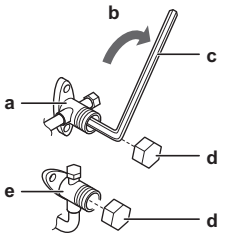
- when relocating or disposing of the unit,
- after maintenance or service to the refrigerant side of the system.

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.

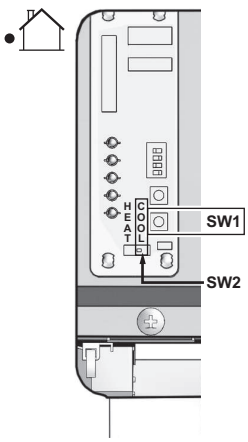


a Gas stop valve
b Closing direction
c Hexagonal wrench
d Valve lid
e Liquid stop valve

13.2 To start and stop forced cooling

Confirm that dipswitch 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 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.

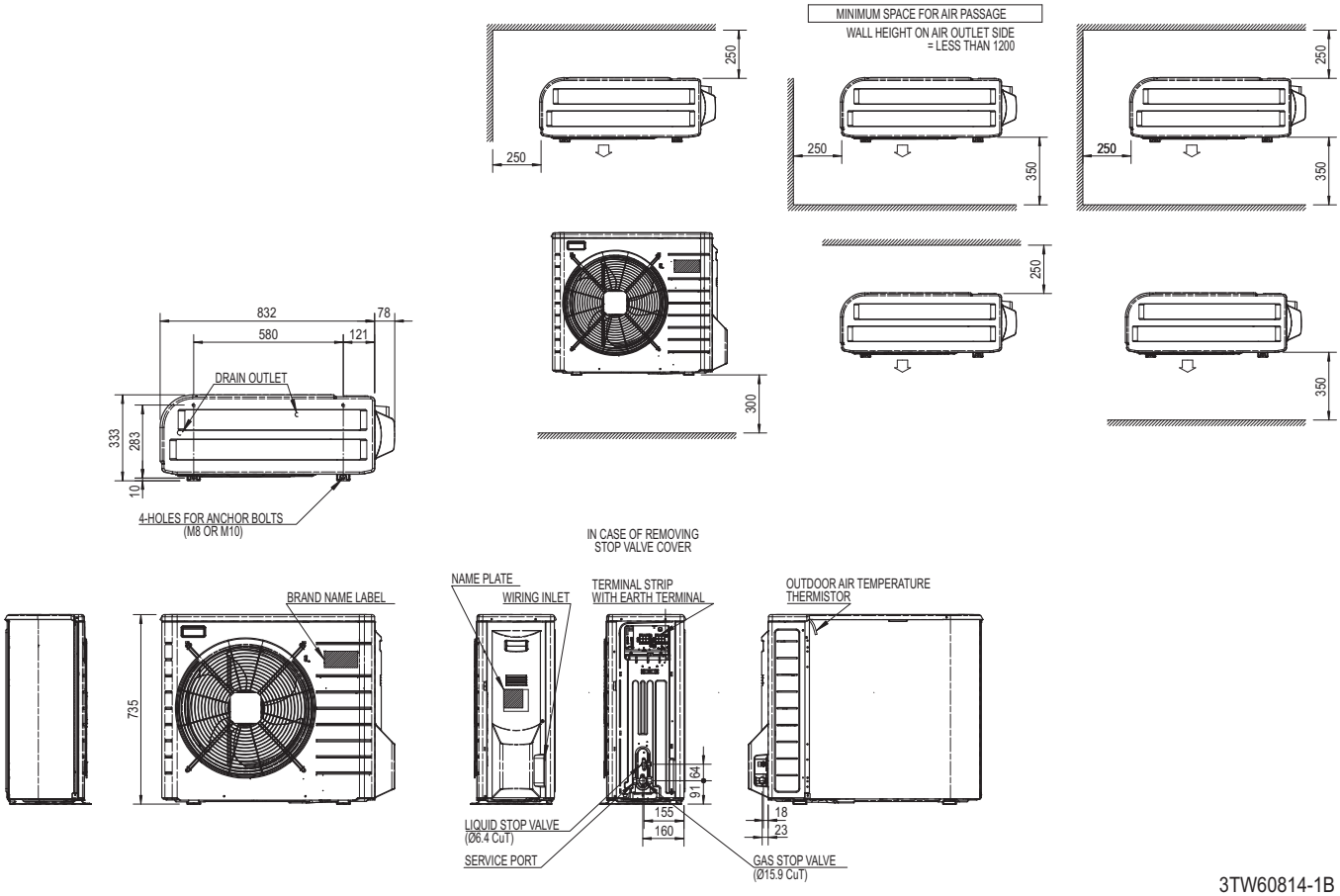
Field supply

Equipment not made by Daikin that can be combined with the product according to the instructions in the accompanying documentation.

15 Technical data

15.1 Dimensions and service space

15.1.1 Dimensions and service space: Outdoor unit



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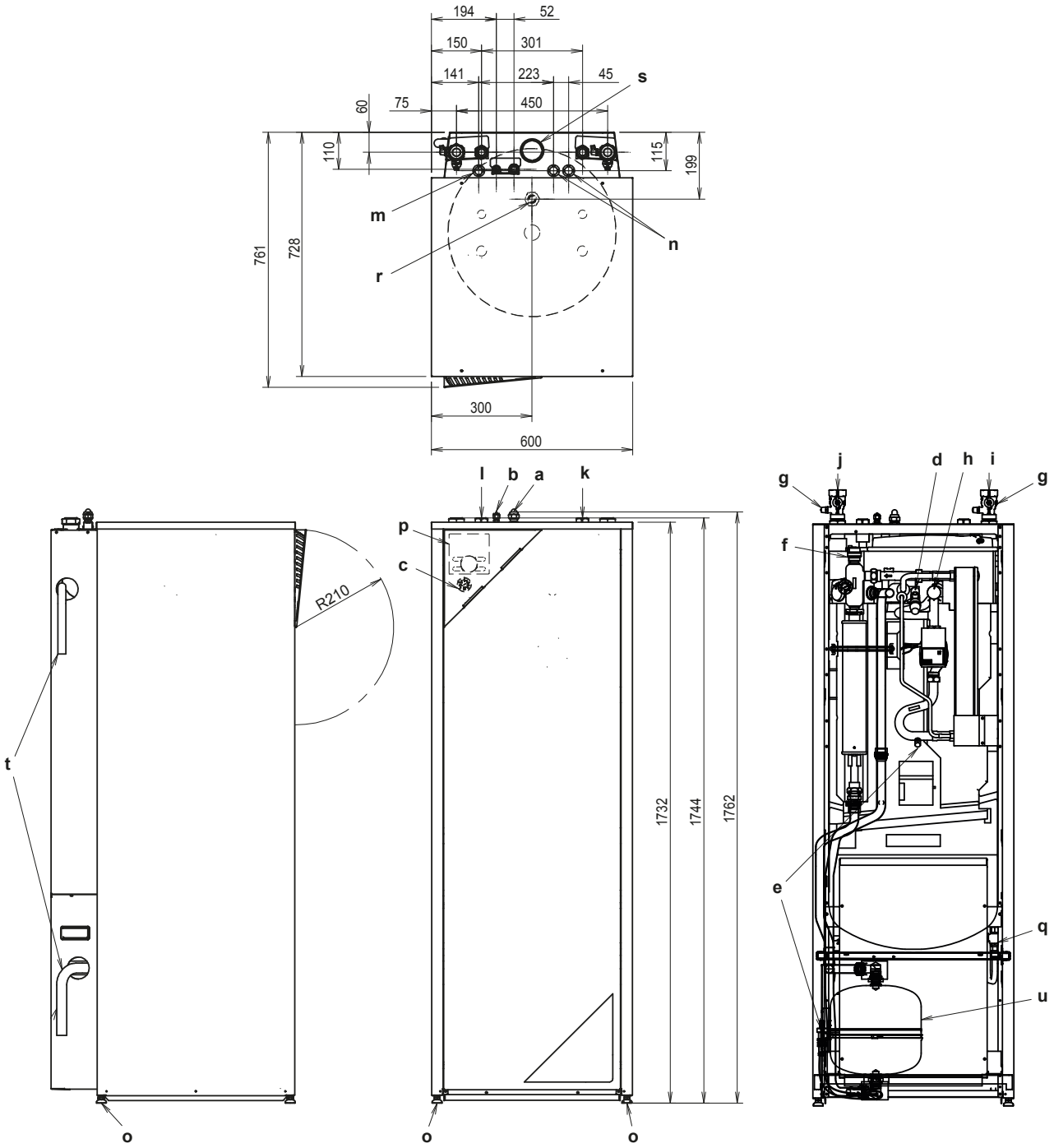
15.1.2 Dimensions and service space: Indoor unit



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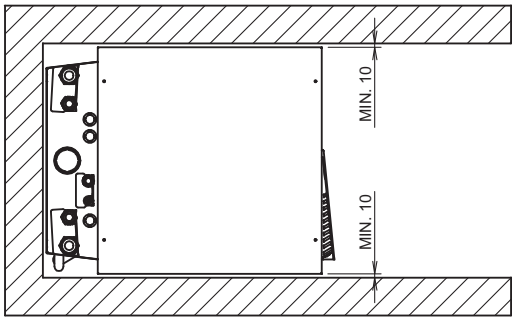
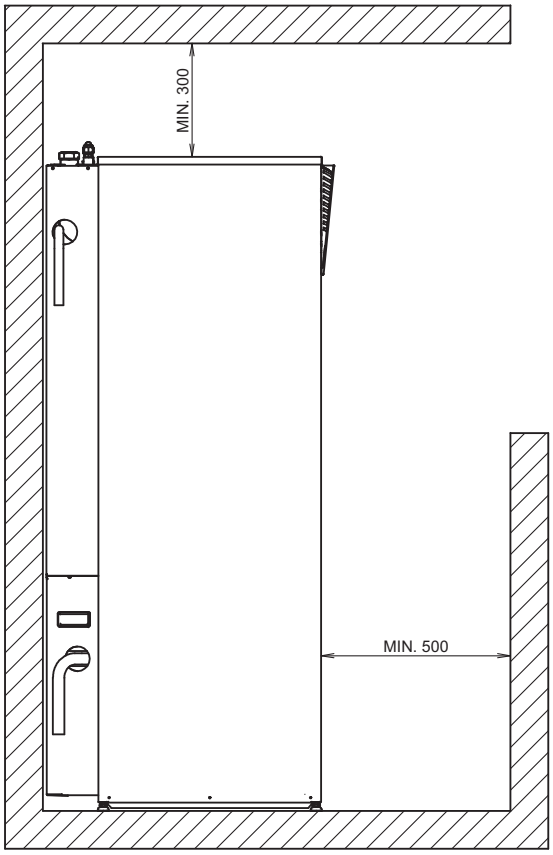
a Gas pipe connection Ø15.9 mm
b Liquid pipe connection Ø6.35 mm
c Pressure gauge
d Safety valve
e Drain valve water circuit
f Air purge
g Stop valve with fill valve (included accessory)
h Water filter
i Water IN connection 1-1/4" female British standard pipe thread
j Water OUT connection 1-1/4" female British standard pipe thread
k Tank IN connection 1" female British standard pipe thread
l Tank OUT connection 1" female British standard pipe thread
m Control wiring intake (Ø24 mm)
n Power supply wiring intake (Ø24 mm)
o Levelling feet
p User interface (included accessory)
q Drain valve tank circuit
r Recirculation connection G 1/2" female

s Hole for recirculation piping or option wiring (Ø62 mm)
t Drain outlet (unit+safety valve)
u Flow-through vessel (12 l)

Note 1: Typical field installation is according to local and national regulations.





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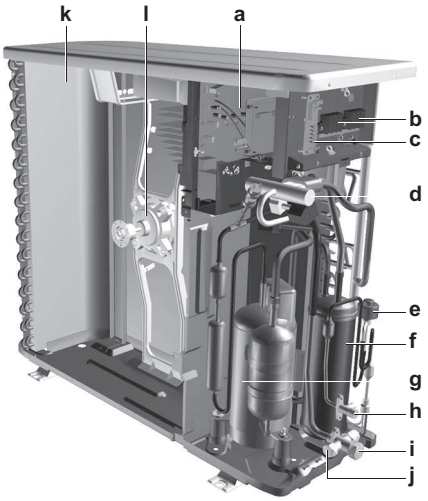
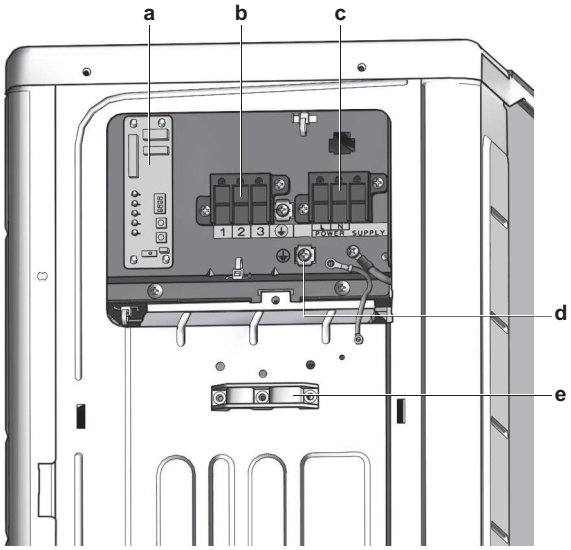
15.2 Components

15.2.1 Components: Outdoor unit



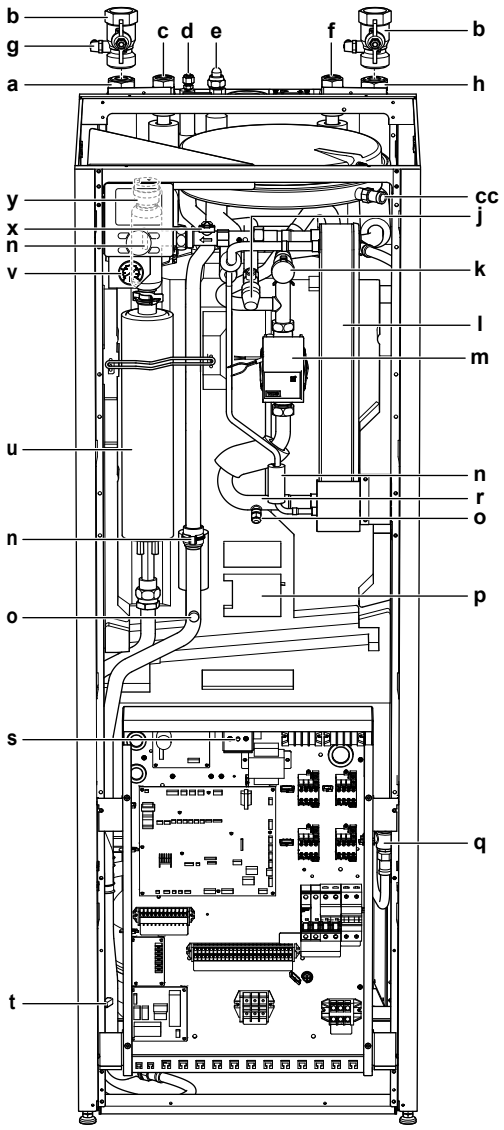
a Switch box main PCB (inverter and control PCB)
b Terminal communication and power supply
c Service PCB
d 4-way valve
e Electronic expansion valve (main)
f Accumulator
g Compressor
h Liquid stop valve
i Gas stop valve
j Service port
k Fan motor
l Heat exchanger

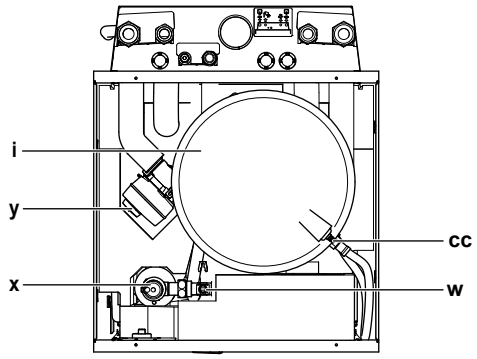
15.2.2 Components: Switch box (outdoor unit)

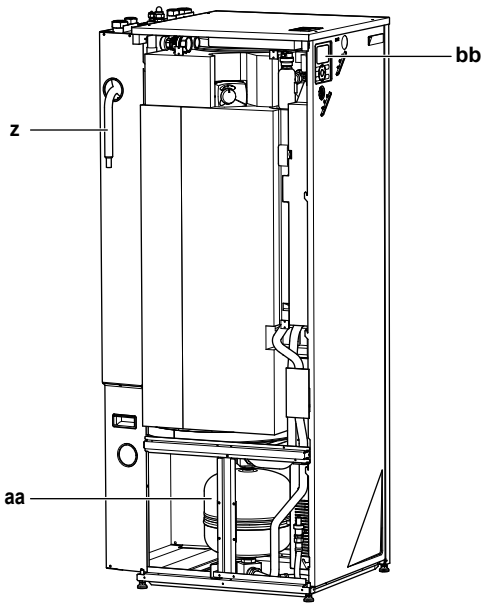


a Service PCB
b Terminal communication cable
c Terminal power supply cable
d Earth connection
e Wire clamp

15.2.3 Components: Indoor unit





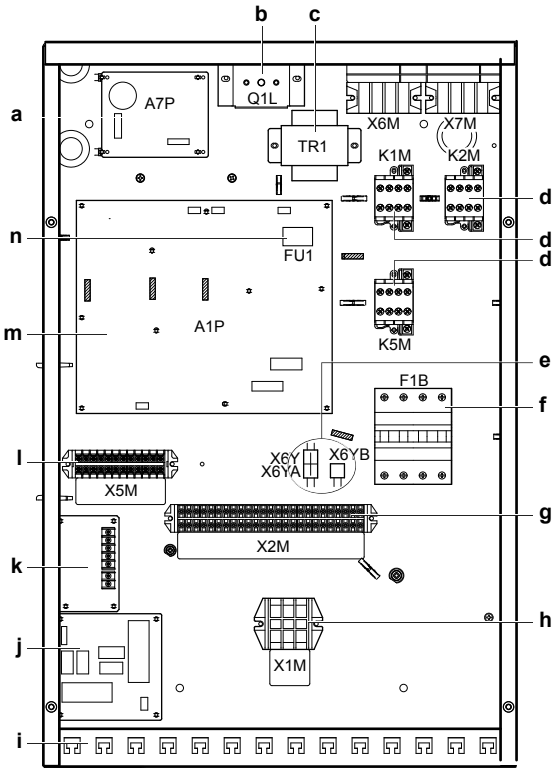


a Space heating cooling out
b Shut-off valves (accessory)
Allows isolation of the indoor unit water circuit side from the residential water circuit side.
c Domestic hot water out
d Refrigerant liquid connection R410A
e Refrigerant gas connection R410A
f Domestic hot water in
g Fill valve (accessory)
h Space heating cooling in
i Expansion vessel (10 l)
j Pressure relief valve
Prevents excessive water pressure in the water circuit by opening at 3 bar.
k Water filter
Removes dirt from the water to prevent damage to the pump or blockage of the heat exchanger.
l Heat exchanger
m Water pump
Circulates the water in the water circuit.
n Thermistors
Determines the water and refrigerant temperature at various points in the circuit.
o Drain caps
p Tank thermistors
q Domestic hot water tank drain valve
Empties the full tank.
r Switch box
Contains the main electronic and electrical parts of the indoor unit.
s Backup heater thermal protector
The protector activates when the temperature of the backup heater becomes too high.
u Backup heater
Provides additional heating in case of cold outdoor temperatures. Also serves as backup in case of malfunctioning of the outdoor unit.
v Manometer
Allows readout of the water pressure in the water circuit.
w Flow sensor
Gives feedback to the interface about the actual flow. Based on this information (and other), the interface adjusts the pump speed.
x Air purge valve
Remaining air in the water circuit will be automatically removed via the air purge valve.
y 3-way valve
Controls whether the water is used for space heating, or the domestic hot water tank.
z User interface (accessory)
aa Flow-through vessel
bb Drain flexible pressure relief valve
cc Air valve

INFORMATION

Some components are NOT directly accessible when removing the top plate and/or the front plates. It could be necessary to remove the isolation of the tank by sliding it backward of the tank. The components in the switch box are accessible by removing the switch box cover.

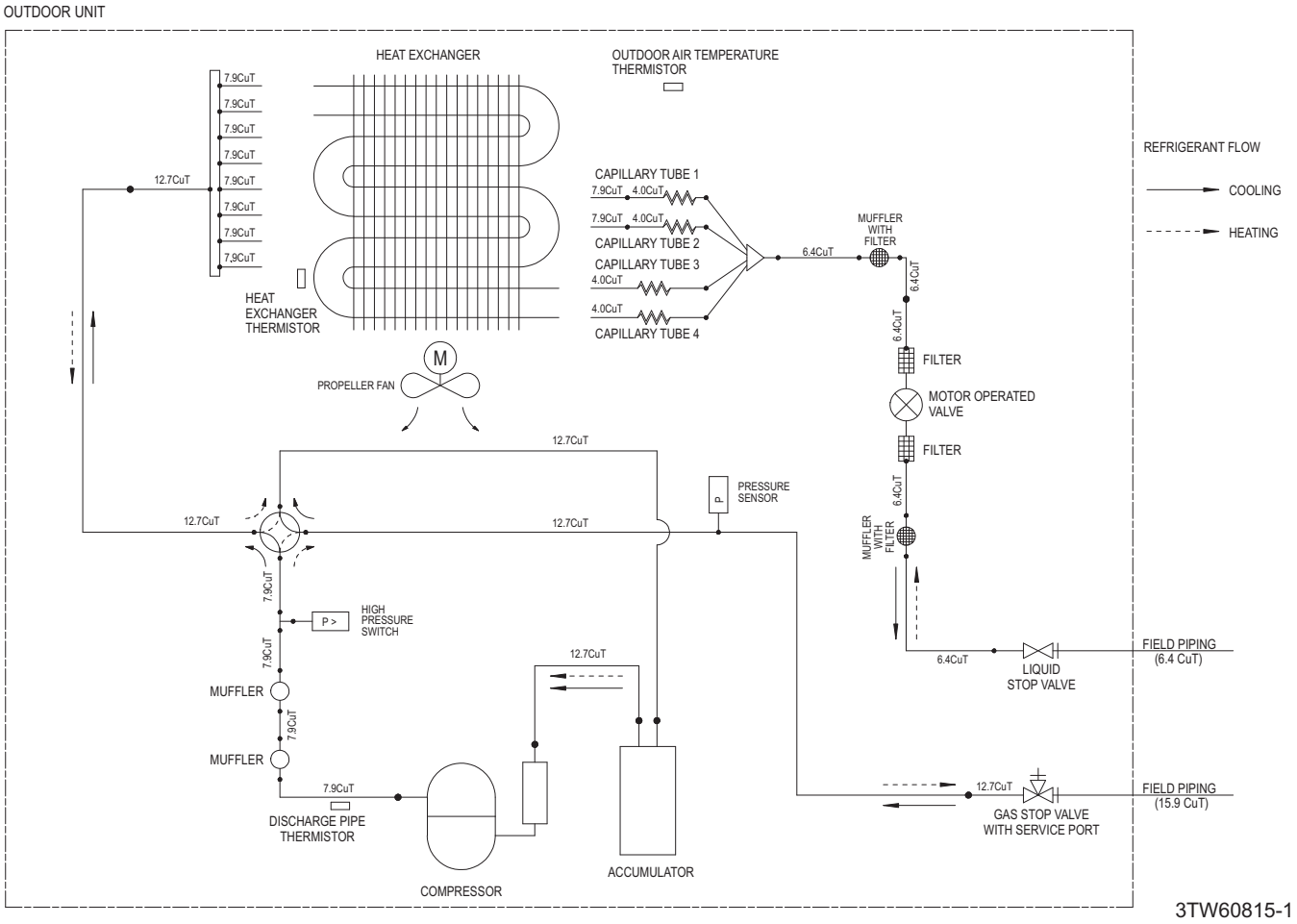
15.2.4 Components: Switch box (indoor unit)



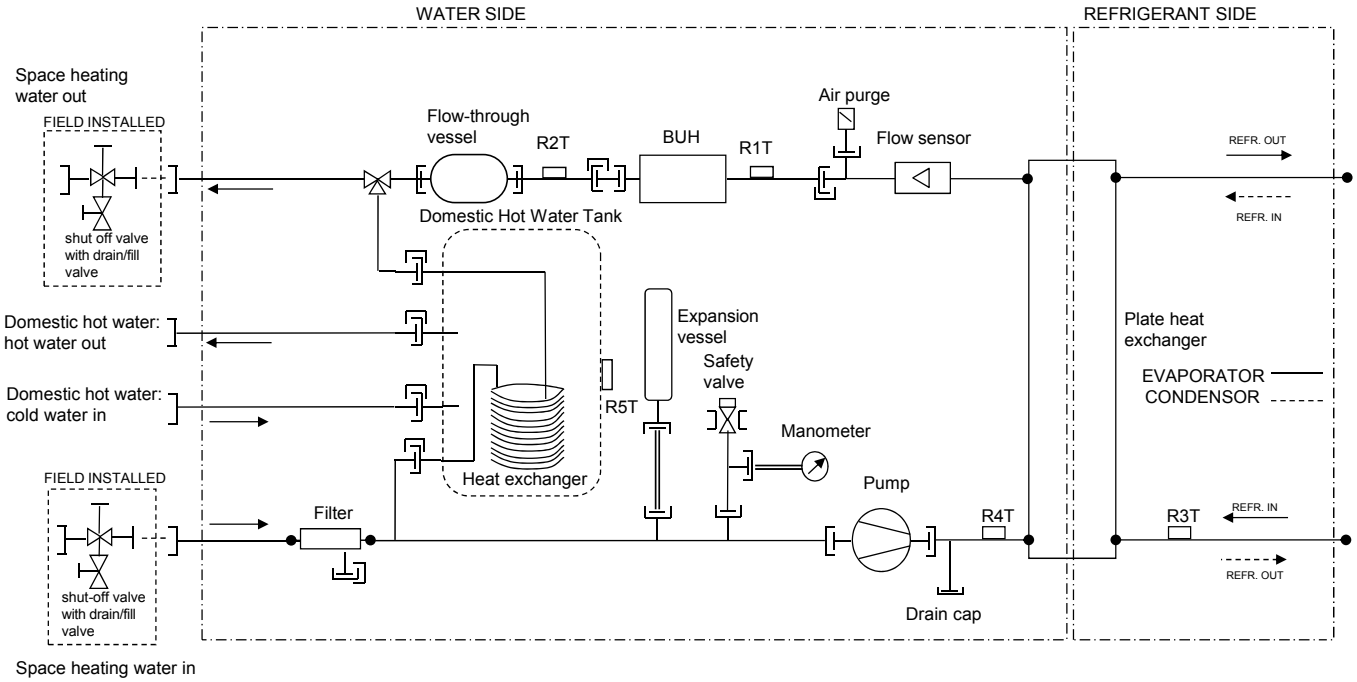
a Pump PCB A7P (Inverter PCB)
b Backup heater thermal protector Q1L
c Transformer TR1
d Backup heater contactors K1M, K2M and K5M
e Connectors X6YA/X6YB/X6Y
f Backup heater circuit breaker F1B
g Terminal block X2M (high voltage)
h Terminal block X1M (to outdoor unit)
i Cable tie mountings
j Digital I/O PCB A4P (only for installations with solar kit or digital I/O PCB kit)
k Demand PCB for power limitation
l Terminal block X5M (low voltage)
m Main PCB A1P
n PCB fuse FU1

15.3 Piping diagram

15.3.1 Piping diagram: Outdoor unit



15.3.2 Piping diagram: Indoor unit



LEGEND:

	CHECK VALVE		SCREW CONNECTION
	FLARE CONNECTION		QUICK COUPLING
	SPINNED PIPE		FLANGE CONNECTION
	PINCHED PIPE		BRAZED CONNECTION

THERMISTOR	DESCRIPTION
R5T	Tank thermistor
R4T	Inlet water thermistor
R3T	Refrigerant liquid side thermistor
R2T	Outlet water backup heater thermistor
R1T	Outlet water heat exchanger thermistor

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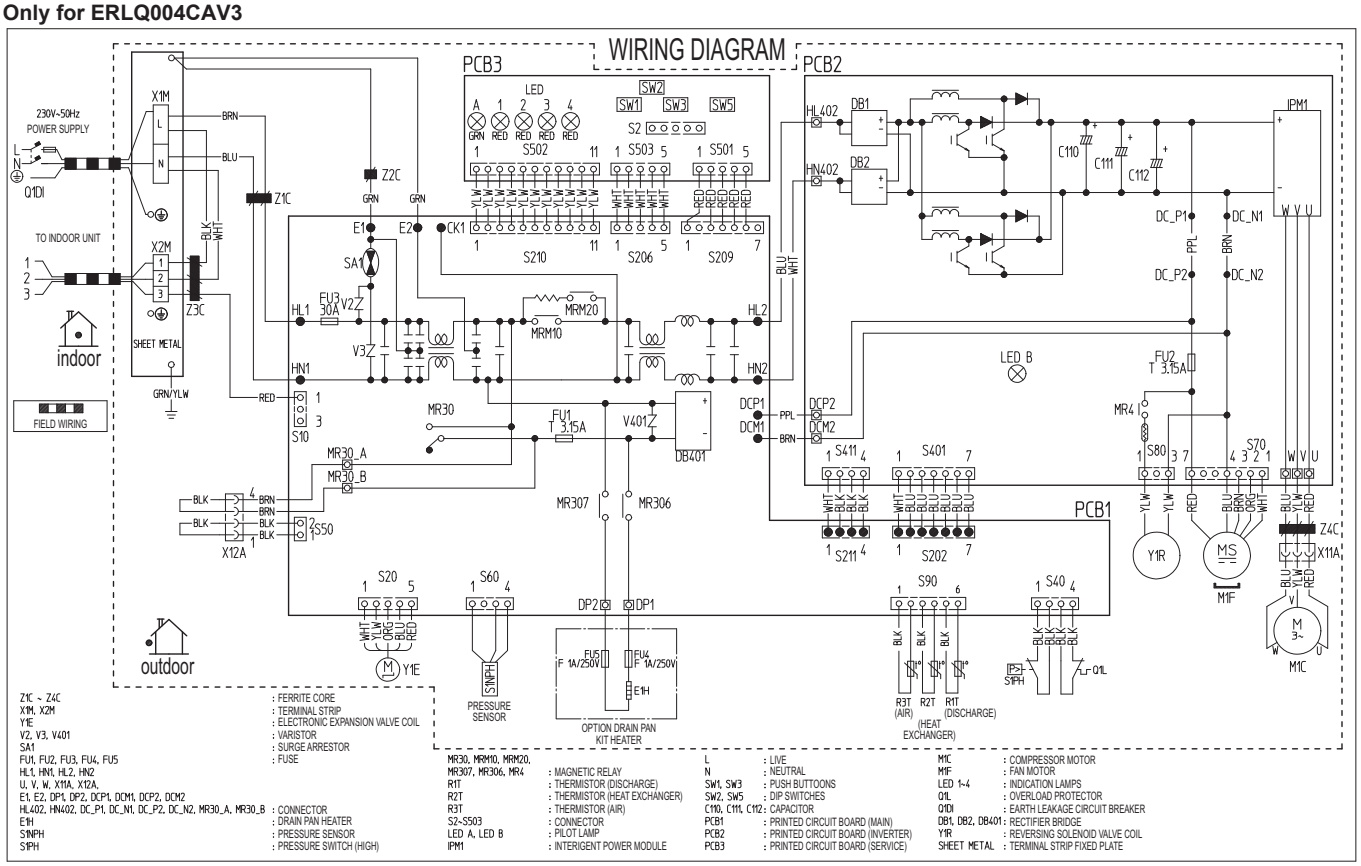
15.4 Wiring diagram

15.4.1 Wiring diagram: Outdoor 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.

Only for ERLQ004CAV3



NOTES: REFER TO PURCHASING SPECIFICATION AS303002, UNLESS OTHERWISE SPECIFIED
THIS DRAWING WAS DRAWN ON CAD SYSTEM
SIZE: LENGTH 140 x WIDTH 230.

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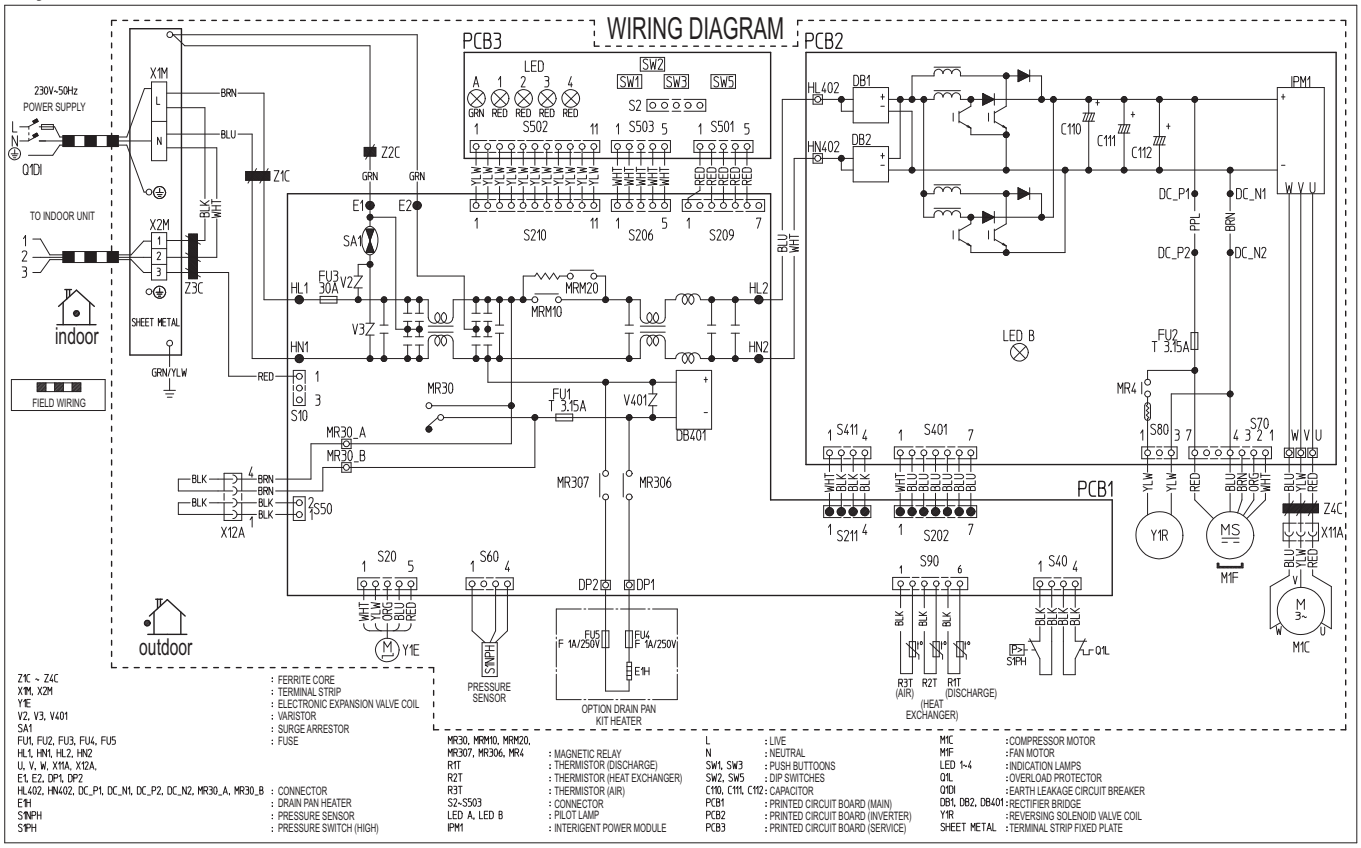
Only for ERLQ006CAV3+ERLQ008CAV3



NOTES: REFER TO PURCHASING SPECIFICATION AS303002, UNLESS OTHERWISE SPECIFIED
THIS DRAWING WAS DRAWN ON CAD SYSTEM
SIZE: LENGTH 140 x WIDTH 230.

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C110~C112	Capacitor	R1T	Thermistor (discharge)
DB1, DB2, DB401	Rectifier bridge	R2T	Thermistor (heat exchanger)
DC_N1, DC_N2	Connector	R3T	Thermistor (air)
DC_P1, DC_P2	Connector	S1NPH	Pressure sensor
DC_P1, DC_P2	Connector	S1PH	Pressure switch (high)
DP1, DP2	Connector	S2~S503	Connector
E1, E2	Connector	SA1	Surge arrestor
E1H	Drain pan heater	SHEET METAL	Sheet metal
FU1~FU5	Fuse	SW1, SW3	Push buttons
HL1, HL2, HL402	Connector	SW2, SW5	DIP switch
HN1, HN2, HN402	Connector	U	Connector
IPM1	Interigent power module	V	Connector
L	Live	V2, V3, V401	Varistor
LED 1~LED 4	Indication lamps	W	Connector
LED A, LED B	Pilot lamp	X11A, X12A	Connector
M1C	Compressor motor	X1M, X2M	Terminal strip
M1F	Compressor fan	Y1E	Electronic expansion valve
MR30, MRM306, MRM307, MR4	Magnetic relay	Y1R	Reversing solenoid valve coil
		Z1C~Z4C	Ferrite core
MRM10, MRM20	Magnetic relay		Field wiring
MR30_A~MR30_B	Connector		Terminal strip
N	Neutral		Connector
PCB1	Printed circuit board (main)		Terminal
PCB2	Printed circuit board (inverter)		Protective earth
PCB3	Printed circuit board (service)		
Q1DI	Earth leakage circuit breaker	BLK	Black
Q1L	Overload protector	BLU	Blue

BRN	Brown
GRN	Green
ORG	Orange
PPL	Purple
RED	Red
WHT	White
YLW	Yellow

15.4.2 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.

INFORMATION

Please note that the following features are NOT applicable for EHVH04+08S18CA3VF and any reference to them in the wiring diagram can be ignored:

- space cooling (units are heating only models),
- bottom plate heater (not present in outdoor unit),
- BUH step 2 (backup heater model is 3V),
- solar kit (not compatible with integrated domestic hot water tank).

NOTES to go through before starting the unit

X1M	: Main terminal	X6M, X7M	: Backup heater terminal
X2M	: Field wiring terminal for AC	X4M	: Booster 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

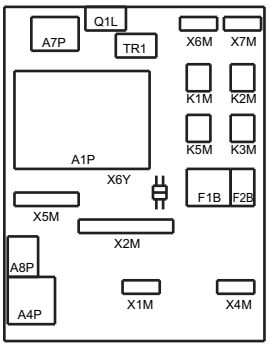
Backup heater configuration (only for *9W)
- ☐ 3V3 (1N~, 230 V, 3 kW)
- ☐ 6V3 (1N~, 230 V, 6 kW)
- ☐ 6WN (3N~, 400 V, 6 kW)
- ☐ 9WN (3N~, 400 V, 9 kW)
- ☐ 6T1 (3~, 230 V, 6 kW)

User installed options:
- ☐ Bottom plate heater
- ☐ Domestic hot water tank
- ☐ Domestic hot water tank with solar connection
- ☐ Remote user interface
- ☐ Ext. indoor thermistor
- ☐ Ext. outdoor thermistor
- ☐ Digital I/O PCB
- ☐ Demand PCB
- ☐ Solar pump and control station

Main LWT:
- ☐ On/OFF thermostat (wired)
- ☐ On/OFF thermostat (wireless)
  - ☐ Ext. thermistor
- ☐ Heat pump convector

Add LWT:
- ☐ On/OFF thermostat (wired)
- ☐ On/OFF thermostat (wireless)
  - ☐ Ext. thermistor
- ☐ Heat pump convector

POSITION IN SWITCH BOX



LEGEND

Translation can be found in the installation manual.

Part n°		Description
A1P		main PCB
A2P		user interface PCB
A3P	*	solar pumpstation PCB
A3P	*	On/OFF thermostat (PC=power circuit)
A3P	*	heat pump convector
A4P	*	digital I/O PCB
A4P	*	receiver PCB (wireless On/OFF thermostat)
A7P		pump driver PCB (only for *16*)
A8P	*	demand PCB
B1L		flow sensor
BSK	*	solar pump station relay
DS1 (A8P)	*	dipswitch
E1H		backup heater element (1 kW)
E2H		backup heater element (2 kW)
E3H		backup heater element (3 kW)
E4H	*	booster heater (3 kW)
F1B		overcurrent fuse backup heater
F2B	*	overcurrent fuse booster heater
F1T		thermal fuse backup heater
F1U, F2U	*	fuse 5 A 250 V for digital I/O PCB
FU1		fuse T 6.3 A 250 V for PCB
PHC1	*	optocoupler input circuit
K1M, K2M		contactor backup heater
K3M	*	contactor booster heater
K5M		safety contactor BUH (only *9W)
K*R		relay on PCB
M1P		main supply pump
M2P	#	domestic hot water pump
M2S	#	2 way valve for cooling mode
M3S	(*)	3 way valve for floorheating/ domestic hot water
Q1DI, Q2DI	#	earth leakage circuit breaker
Q1L		thermal protector backup heater
Q2L	*	thermal protector booster heater
R1T		outlet water heat exchanger thermistor
R1T (A2P)		ambient sensor user interface
R1T (A3P)	*	ambient sensor On/OFF thermostat
R2T		outlet backup heater thermistor
R2T	*	external sensor (floor or ambient)
R3T		refrigerant liquid side thermistor
R4T		inlet water thermistor
R5T	(*)	domestic hot water thermistor
R6T	*	external indoor or outdoor ambient thermistor
R1H (A3P)	*	humidity sensor
S1S	#	preferential kWh rate PS contact
S2S	#	electrical meter pulse input 1
S3S	#	electrical meter pulse input 2
S6S-S9S	#	digital power limitation inputs
SS1 (A4P)	*	selector switch
T1R (A7P)		rectifier bridge (only for *16*)
TR1		power supply transformer
X*M		terminal strip
X*Y		connector

* : optional
(*) : standard for *HV*, optional for *HB*
\# : field supply

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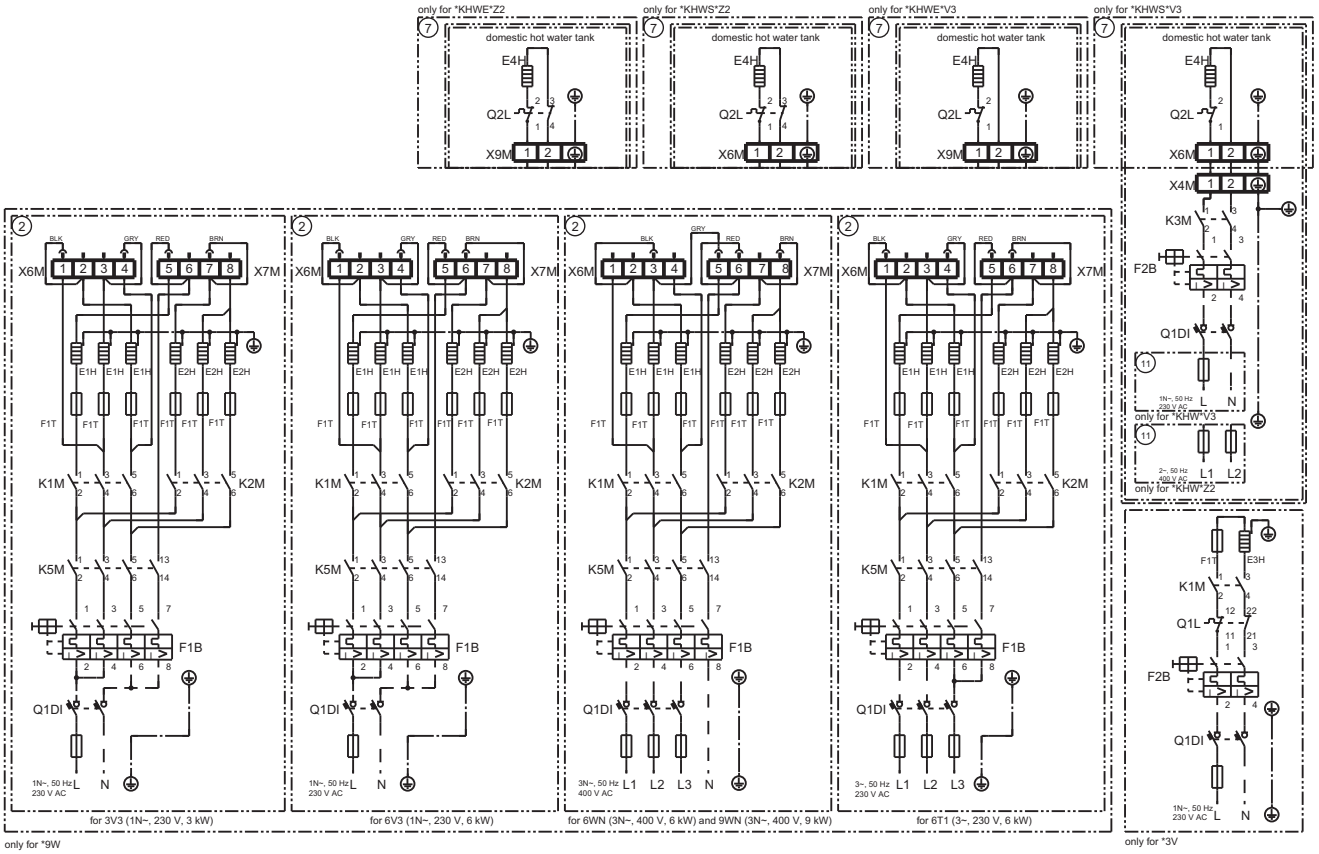

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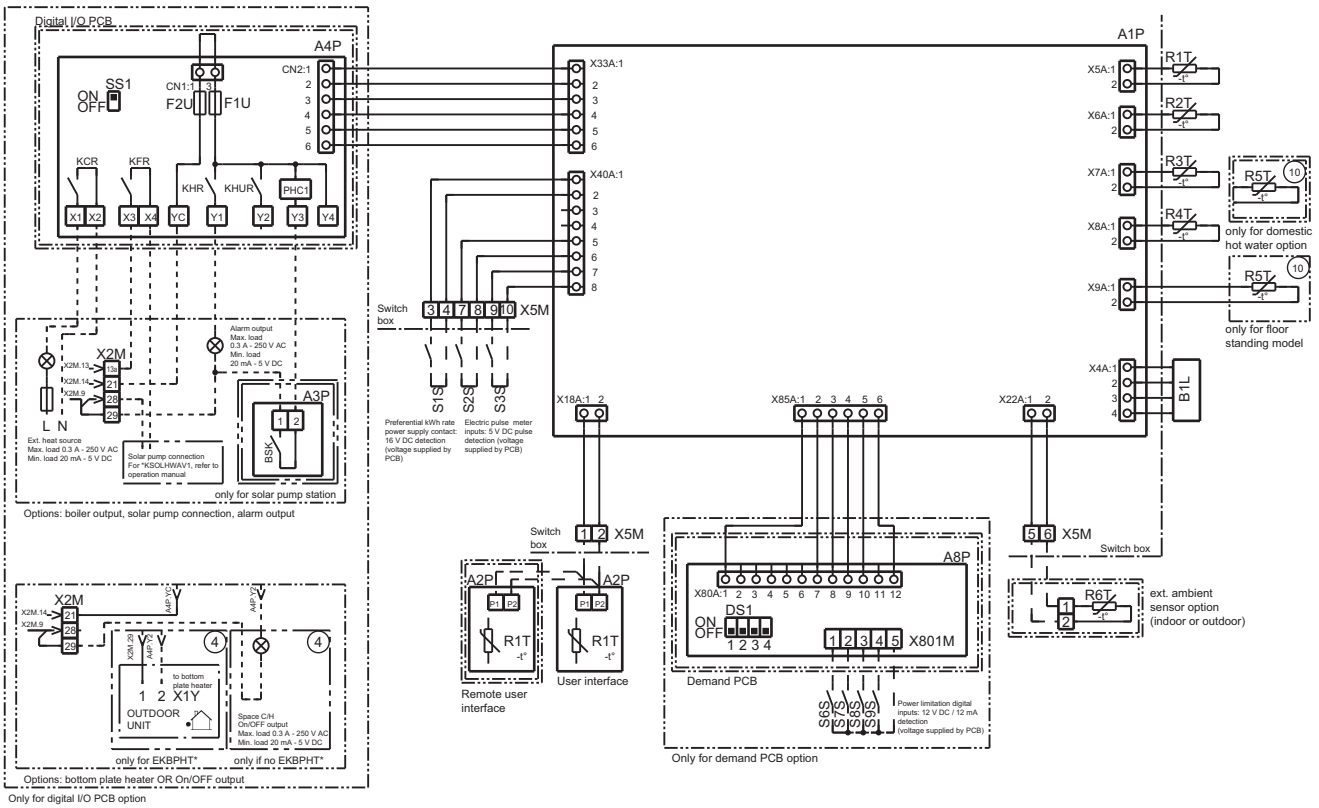

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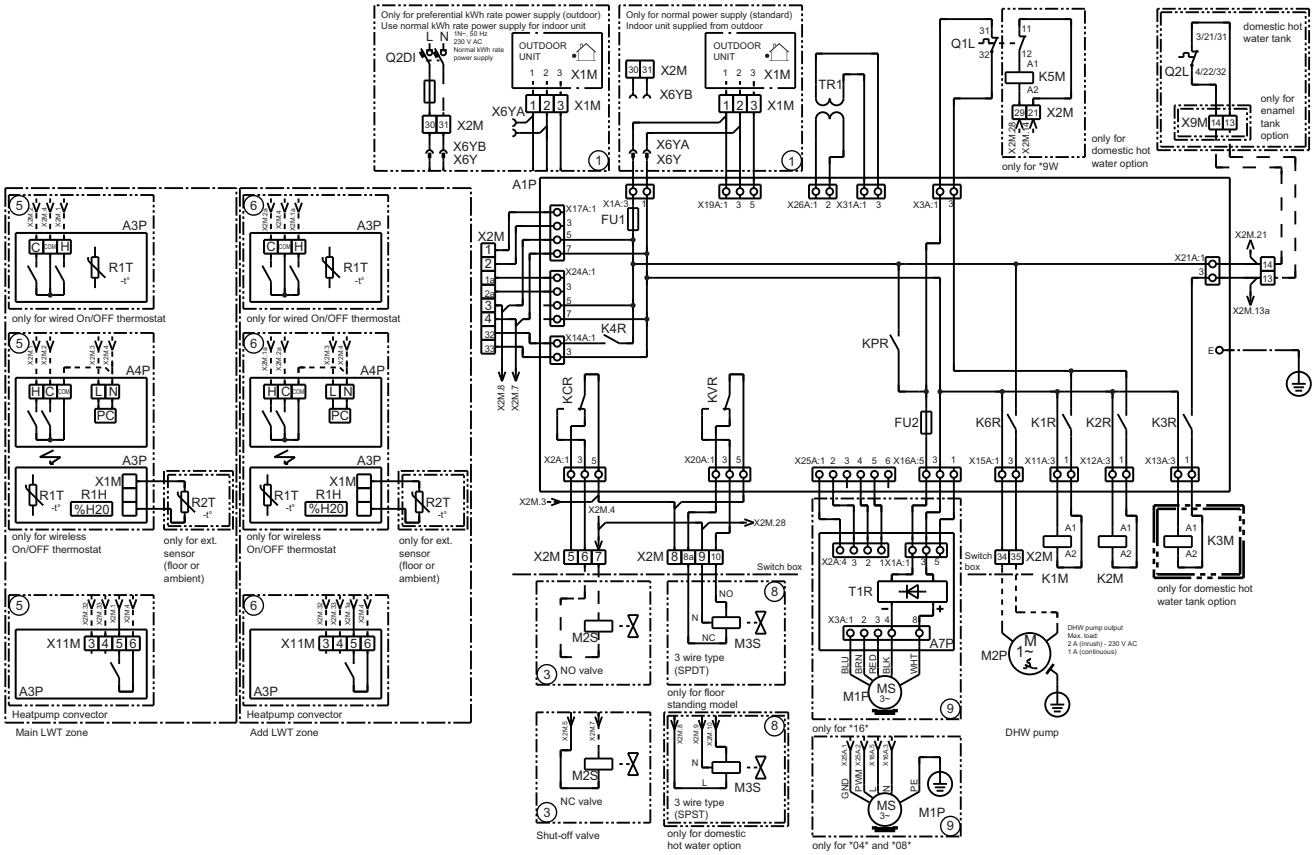

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A1P		Main PCB
A2P		User interface PCB
A3P	*	Solar pump station PCB
A3P	*	On/OFF thermostat (PC=power circuit)
A3P	*	Heat pump convector
A4P	*	Digital I/O PCB
A4P	*	Receiver PCB (Wireless On/OFF thermostat)
A7P		Pump driver PCB (not applicable)
A8P	*	Demand PCB
B1L		Flow sensor
BSK	*	Solar pump station relay
DS1(A8P)	*	DIP switch
E1H		Backup heater element (1 kW)
E2H		Backup heater element (2 kW)
E3H		Backup heater element (3 kW)
E4H	*	Booster heater (3 kW)
F1B		Overcurrent fuse backup heater
F2B	*	Overcurrent fuse booster heater
F1T		Thermal fuse backup heater
F1U, F2U	*	Fuse 5 A 250 V for digital I/O PCB
FU1		Fuse T 6.3 A 250 V for PCB
PHC1	*	Optocoupler input circuit
K1M, K2M		Contactor backup heater
K3M	*	Contactor booster heater
K5M		Safety contactor backup heater (only for *9W)
K*R		Relay on PCB

M1P		Main supply pump
M2P	#	Domestic hot water pump
M2S	#	2-way valve for cooling mode
M3S	(*)	3-way valve for floor heating/domestic hot water
Q1DI, Q2DI	#	Earth leakage circuit breaker
Q1L		Thermal protector backup heater
Q2L	*	Thermal protector booster heater
R1T		Outlet water heat exchanger thermistor
R1T (A2P)		Ambient sensor user interface
R1T (A3P)	*	Ambient sensor On/OFF thermostat
R2T		Outlet backup heater thermistor
R2T	*	External sensor (floor or ambient)
R3T		Refrigerant liquid side thermistor
R4T		Inlet water thermistor
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
S6S~S9S	#	Digital power limitation inputs
SS1 (A4P)	*	Selector switch
T1R (A7P)		Rectifier bridge (not applicable)
TR1		Power supply transformer
X*M		Terminal strip
X*Y		Connector

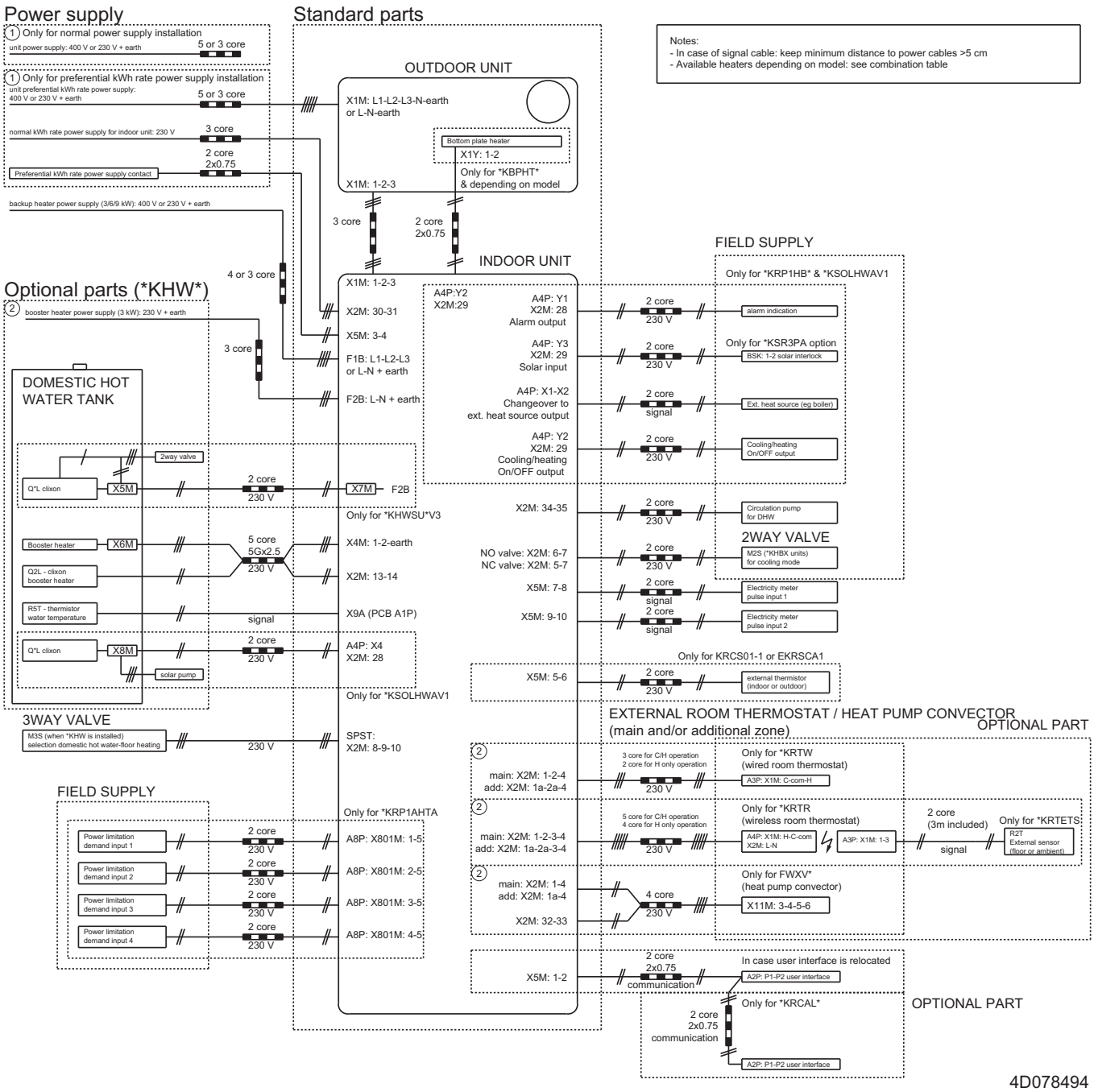
* =	Optional
(*) =	Not applicable
# =	Field supply
BLK	Black
BRN	Brown
GRY	Grey
RED	Red

Notes to go through before starting the unit

English	Translation
X1M	Main terminal
X2M	Field wiring terminal for AC
X5M	Field wiring terminal for DC
X6M, X7M	Backup heater terminal
X4M	Booster heater terminal
⏚	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
Backup heater configuration (only for *9W)	Backup heater configuration (only for *9W)
User installed options	User installed options
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	Extended indoor thermistor
Ext outdoor thermistor	Extended 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	Extended thermistor
Heat pump convector	Heat pump convector
Add LWT	Additional leaving water temperature

Electrical connection diagram Daikin Altherma

For more details please check unit wiring



* electrical meter specification

- pulse meter type/voltage free contact for 5 VDC detection by PCB
- possible number of pulse:
  - 0.1 pulse/kWh
  - 1pulse/kWh
  - 10pulse/kWh
  - 100 pulse/kWh
  - 1000 pulse/kWh
- pulse duration:
  - minimum On time 40ms
  - minimum OFF time 100ms
- measurement type (depending on installation):
  - single phase AC meter
  - three phase AC meter (balanced loads)
  - three phase AC meter (unbalanced loads)

* electrical meter installation guideline

- General: it is the reponsability of the installer to cover the complete power consumption with electrical meters (combination of estimation and metering is not allowed)
- Required number of electrical meters:

Outdoor unit type		*RLQ(04/06/08)*				*R*Q(011/014/016)*V3				*R*Q(011/014/016)*W1				
Indoor unit type		*HB(H/X)(04/08)CA#				*HB(H/X)16CA#				*HB(H/X)16CA#				
	Backup heater type (#)	3V / 9W	9W		9W	3V / 9W	9W		9W	3V / 9W		9W		9W
	Backup heater power supply	1~ 230V	3~ 400V		3~ 230V	1~ 230V	3~ 400V		3~ 230V	1~ 230V		3~ 400V		3~ 230V
	Backup heater configuration	3 / 6 kW	6 / 9 kW		6 kW	3 / 6 kW	6 / 9 kW		6 kW	3 / 6 kW		6 / 9 kW		6 kW
		Regular kWh rate power supply												
Electrical meter type	1~	1	1	-	-	1	1	-	-	1	-	1	-	-
	3~ balanced	-	1	-	-	-	1	-	-	1	-	1	-	-
	3~ unbalanced	-	-	1	1	-	-	1	1	-	1	-	1	1
		Benefit kWh rate power supply												
Electrical meter type	1~	2	1		1	2	1		1	1		-		-
	3~ balanced	-	-		-	-	-		-	1		1		1
	3~ unbalanced	-	1		1	-	1		1	-		1		1

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15.5 Technical specifications

15.5.1 Technical specifications: Outdoor unit

Nominal capacity and nominal input

Outdoor units		ERLQ004CAV3	ERLQ006CAV3	ERLQ008CAV3
Indoor units		**EHVH04S18CA3VF**	**EHVH08S18CA3VF**	
Condition 1[(a)]				
Heating capacity	Minimum	1.80 kW		
	Nominal	4.40 kW	6.00 kW	7.40 kW
	Maximum	5.12 kW	8.35 kW	10.02 kW
Heating PI	Nominal	0.87 kW	1.27 kW	1.66 kW
COP	Nominal	5.04	4.74	4.45
EER	Nominal	—		
Condition 2[(a)]				
Heating capacity	Minimum	1.80 kW		
	Nominal	4.03 kW	5.67 kW	6.89 kW
	Maximum	4.90 kW	7.95 kW	9.53 kW
Heating PI	Nominal	1.13 kW	1.59 kW	2.01 kW
COP	Nominal	3.58	3.56	3.42
EER	Nominal	—		

(a) Ambient temperature DB/WB 7°C/6°C – leaving water condenser 35°C (DT=5°C).
(b) Ambient temperature DB/WB 7°C/6°C – leaving water condenser 45°C (DT=5°C).

Technical specifications

Outdoor units		ERLQ004CAV3	ERLQ006CAV3	ERLQ008CAV3
Indoor units		**EHVH04S18CA3VF**	**EHVH08S18CA3VF**	
Casing				
Colour		Ivory white		
Material		Polyester painted galvanised steel		
Dimensions				
Packing (H×W×D)		797×990×390 mm		
Unit (H×W×D)		735×832×307 mm		
Weight				
Machine weight		54 kg	56 kg	
Gross weight		57 kg	59 kg	
Packing				
Material		EPS, carton		
Weight		3 kg		
Heat exchanger				
Specifications	Length	845 mm		
	Nr. of rows	2		
	Fin pitch	1.8 mm		
	Nr. of passes	—		
	Face area	—		
	Nr. of stages	32		
Tube type		Hi-Xa(8)		
Fin	Type	WF fin		
	Treatment	Anti-corrosion treatment (PE)		
Fan				
Type		Propeller		
Quantity		1		
Air flow rate (nominal at 230 V)	Heating	—		
Discharge direction		Horizontal		
Motor	Quantity	1		
	Output	53		

Outdoor units		ERLQ004CAV3	ERLQ006CAV3	ERLQ008CAV3
Indoor units		**EHVH04S18CA3VF**	**EHVH08S18CA3VF**	
Compressor				
Quantity		1		
Motor	Model	2YC36BXD#C	2YC45NXD#C	
	Type	Hermetically sealed swing compressor		
	Output	—		
PED				
Category of unit		I (excluded from scope of **PED** due to article 1, item 3.6 of 97/23/EC)		
Most critical part		—		
PS×V		—		
PS×DN		—		
Operation range(1)				
Heating (outdoor unit)*	Minimum	–25°C DB		
	Maximum	25°C DB		
Domestic hot water (outdoor unit)*	Minimum	–25°C DB		
	Maximum	35°C DB		
Sound level				
Nominal - Heating	Sound power	61 dBa		62 dBa
	Sound pressure(2)	48 dBa		49 dBa
Night quiet	Sound pressure	—		
Refrigerant				
Type		R410A		
Charge		1.45 kg	1.60 kg	
Control		Expansion valve (electronic type)		
Nr. of circuits		1		
Refrigerant oil				
Type		FVC50K		
Charged volume		0.75 l		
Piping connections				
Liquid	Type	Flare connection		
	Diameter (OD)	Ø6.35 mm		
Gas	Type	Flare connection		
	Diameter (OD)	Ø15.9 mm		
Drain	Quantity	2		
	Type	hole		
	Diameter (OD)	1× Ø15 mm + 1× Ø20 mm		
Piping length	Minimum	3 m		
	Maximum	30 m		
	Equivalent	—		
	Chargeless	—		
Additional refrigerant charge		0.02 kg/m IF >10 m		
Maximum height difference between outdoor unit and indoor unit		20 m		
Defrost method		Reverse cycle		
Defrost control		Sensor for outdoor heat exchanger temperature		
Capacity control method		Inverter controlled		
Standard accessories				
Item		Installation manual		
Quality		1		

(1) See operation range drawing. (*) Range increase by support backup heater.
(2) The sound pressure level is measured via a microphone at a certain distance from the unit. It is a relative value depending on the distance and acoustic environment. Refer to the sound spectrum drawing for more information.

15 Technical data

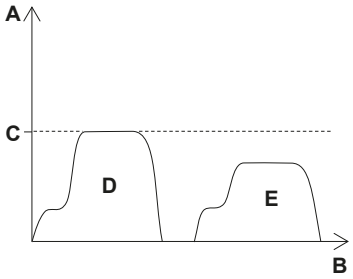
Electrical specifications

		ERLQ004CAV3 + ERLQ006CAV3 + ERLQ008CAV3
Power supply		
Name		V3
Phase		1
Frequency		50 Hz
Voltage		230 V
Voltage range	Minimum	–10%
	Maximum	+10%
Current		
Nominal running current		—
Starting current		18 A(2)
Maximum running current		18 A
Z_{max}		—
Minimum S_{sc} value		Equipment complying with EN/IEC 61000-3-12(1)
Recommended fuses		20 A
Wiring connections		
For power supply	Quantity	3
	Remark	—
For connection with indoor	Quantity	4
	Remark	Earth wire

(1) 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.
(2) See figure A.

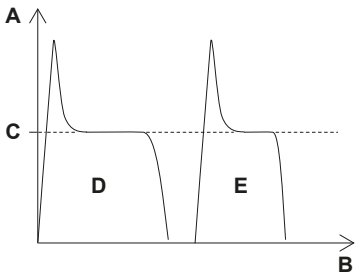
Figure A: Starting current

Daikin inverter controlled compressor starting current always less then or equal to maximal running current.



A Running current
B Time
C Maximum
D Example 1
E Example 2

Standard on/off compressor starting current to maximum running current



A Running current
B Time
C Maximum
D Example 1
E Example 2

15.5.2 Technical specifications: Indoor unit

Technical specifications

			Heating only type		
Indoor units			**EHVH04S18CA3VF**	**EHVH08S18CA3VF**	
Connected to outdoor unit			**ERLQ004CAV3**	**ERLQ006CAV3**	**ERLQ008CAV3**
Nominal input (indoor unit only)			75 W		
Casing					
Colour			White		
Material			Pre-coated sheetmetal		
Dimensions					
Packing (H×W×D)			922×690×818 mm		
Unit (H(1)×W×D)			1732×600×728 mm		
Weight of machine (net)			120 kg	121 kg	
Weight of machine (packed)			133 kg	134 kg	
Packing materials					
Material			Wood – carton – PE wrapping foil		
Weight			12 kg		
PED					
Category of unit			Art. 3.3(*)	Category I	
Most critical part			—	Plate heat exchanger	
	Ps*V		—	51 bar	
	Ps*DN		—		
Main components hydrobox					
Pump	Type		DC motor		
	Nr. of speed		Inverter controlled		
	Nominal ESP unit	Heating(3)	52 kPa	49 kPa	37 kPa
		Heating(13)	55 kPa	51 kPa	41 kPa
	Power input		46 W		
Water side heat exchanger	Type		Brazed plated		
	Quantity		1		
	Water volume		0.9 l	1.3 l	
	Minimum water flow rate		5 l/min	11 l/min	
	Nominal water flow rate	Heating(3)	12.6 l/min	17.2 l/min	21.2 l/min
		Heating(13)	11.6 l/min	16.3 l/min	19.8 l/min
	Maximum water flow rate	Heating	25 l/min	34 l/min	
	Insulation material		EPS		
Expansion vessel	Volume		10 l		
	Maximum water pressure		3 bar		
	Pre-pressure		1 bar		
Water filter	Diameter perforations		1		
	Material		Copper + brass + stainless steel		
Main components tank					
Tank	Water volume		180 l		
	Material		Stainless steel (EN1.4521)		
	Maximum temperature		65°C		
	Maximum pressure		10 bar		
	Insulation material		EPS		
	Corrosion protection		Anode		
	Heatloss(1)		1.4 kWh/24 h		
Heat exchanger	Quantity		1		
	Material		Stainless steel (EN1.4521)		
	Surface		1.9 m^2		
	Internal coil volume		8.9 l		
3-way valve	Flow factor space heating/tank heating		13/8 m^3/h		

15 Technical data

		Heating only type		
Indoor units		**EHVH04S18CA3VF**	**EHVH08S18CA3VF**	
Connected to outdoor unit		**ERLQ004CAV3**	**ERLQ006CAV3**	**ERLQ008CAV3**
Safety devices				
Thermal cut out		1		
Water circuit space heating side				
Piping connections Ø[7]		G 1-1/4 female		
Safety valve		3 bar		
Manometer		Yes		
Drain valve/fill valve		Yes		
Shut-off valves		Yes		
Air purge valve		Yes		
Total water volume[6]		4.4 l	4.8 l	
Water circuit domestic hot water side				
Pipe connections	Cold water in/hot water out Ø	G 1" female		
	Recirculation connection	G 1/2" female		
Refrigerant circuit				
Gas side		Ø15.9 mm		
Liquid side		Ø6.35 mm		
Sound level				
Sound power[3]	Nominal flow (heating)	42 dBa		
Sound pressure[4]	Nominal flow (heating)	28 dBa		
Operation range[9]				
Ambient	Space heating	–25~25°C		
	Domestic hot water	–25~35°C		
Water side	Space heating[5]	15~55°C		
	Domestic hot water[10]	25~60°C		

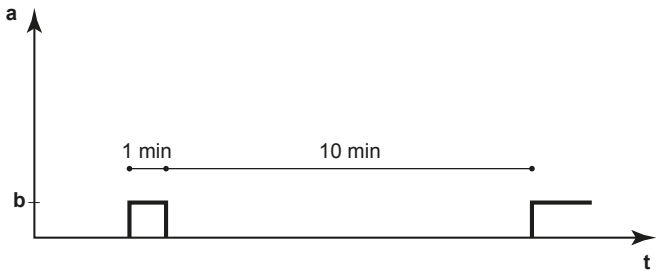
(1) Heatloss according to EN12897.
(2) Ambient temperature 35°C – leaving water evaporator 7°C (DT=5°C).
(3) DB/WB 7°C/6°C – leaving water condenser 35°C (DT=5°C).
(4) The sound pressure level is measured via a microphone at 1 m from the unit. It is a relative value, depending on the distance and acoustic environment. The sound pressure level mentioned is valid for pump medium speed – 0 external static pressure/medium speed – nominal flow/ high speed – nominal flow.
(5) 15°C~25°C: backup heater only, no heat pump operation during commissioning..
(6) Including piping, plate heat exchanger, and backup heater/excluding expansion vessel.
(7) Value mentioned is connection after ball valves. It is the same as the connection at the unit (G 1-1/4" female).
(8) Ambient temperature 35°C – leaving water evaporator 18°C (DT=5°C).
(9) For details, see operation range drawing.
(10) For outdoor units: >55°C backup heater only, no heat pump operation.
(11) Minimum flow is mentioned for heat pump operation. To allow backup heater to operate safely, a higher minimum flow is required: 12 l/min.
(12) Refer to operation range for details.
(13) DB/WB 7°C/6°C – leaving water condenser 45°C (DT=5°C).

Electrical specifications

		EHVH04S18CA3VF + EHVH08S18CA3VF
Backup heater (optional)		
Type		3V
Capacity setting		3 kW
Capacity stages		1
Capacity stage 1		3 kW
Capacity stage 2		—
Minimum time delay between stages		See note 10.
Power supply	Phase	1~
	Frequency	50 Hz
	Voltage	230 V
Current	Running current backup heater	13 A
Voltage range(4)		
Minimum		207 V
Maximum		253 V
Wiring connections		
For power supply backup heater	Quantity of wires	3G
	Type of wires	(3)
Communication cable to outdoor unit	Quantity of wires	3
	Type of wires	2.5 mm^2
User interface	Quantity of wires	2
	Type of wires	0.75 mm^2~1.25 mm^2 (maximum length 500 m)
Preferential kWh rate power supply	Quantity of wires	Power: 2 Signal: 2
	Type of wires	Power: 6.3 A(3) Signal: 0.75 mm^2~1.25 mm^2 (maximum length 50 m)
Electricity meter	Quantity of wires	2
	Type of wires	Minimum 0.75 mm^2 (5 V DC pulse detection)
Domestic hot water pump	Quantity of wires	2
	Type of wires	Minimum 0.75 mm^2 (2 A in rush, 1 A continuous)
For connection with R6T	Quantity of wires	2
	Type of wires	Minimum 0.75 mm^2
For connection with A3P	Quantity of wires	Note(6)
	Type of wires	Note(3) and Note(5)
For connection with M2S	Quantity of wires	2
	Type of wires	Note(3) and Note(5)
For connection with optional FWXV (demand input and output)	Quantity of wires	4
	Type of wires	100 mA, minimum 0.75 mm^2

(1) Above mentioned power supply of the hydrobox is for the backup heater only. The switch box and pump of the hydrobox are supplied via the outdoor unit.
(3) Select diameter and type according to national and local regulations.
(4) For more details of the voltage range and current refer to the installation manual.
(5) Voltage: 230 V / maximum current: 100 mA / minimum 0.75 mm^2
(6) Depends on thermostat type, refer to the installation manual.

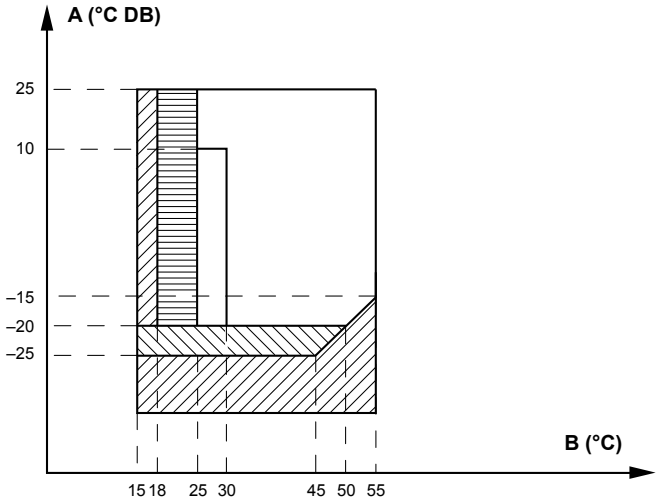
Note 10: Backup heater (*3V), minimum time delay between stages.



a Capacity
b Stage 1
t Time

15.6 Operation range

15.6.1 Operation range: Heating

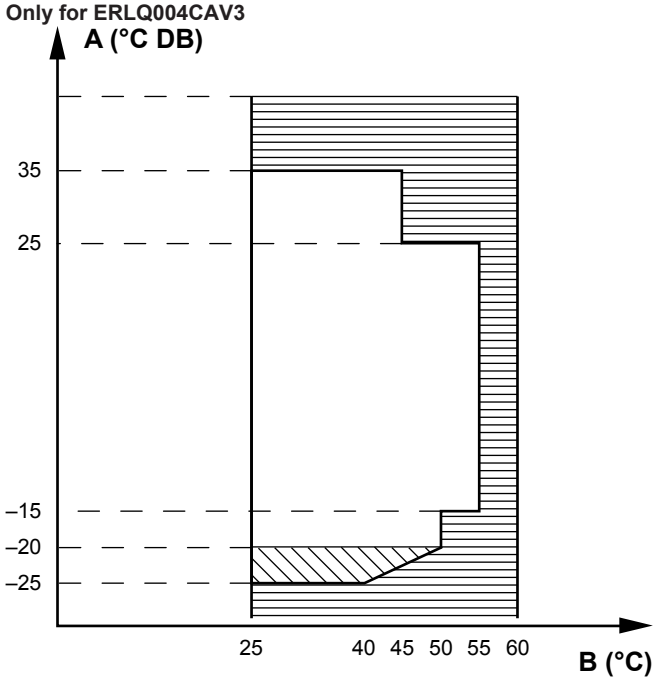


3TW60813-1B_page 2

A Outdoor temperature
B Leaving condenser water temperature
▤ Outdoor unit operation is possible if setpoint ≥25°C.
▨ Only backup heater operation (no outdoor unit operation)
▧ Operation of outdoor unit, but no guarantee of capacity. (If outdoor temperature <–20°C or <–25°C outdoor unit will stop)(Indoor unit and backup heater operation will continue)

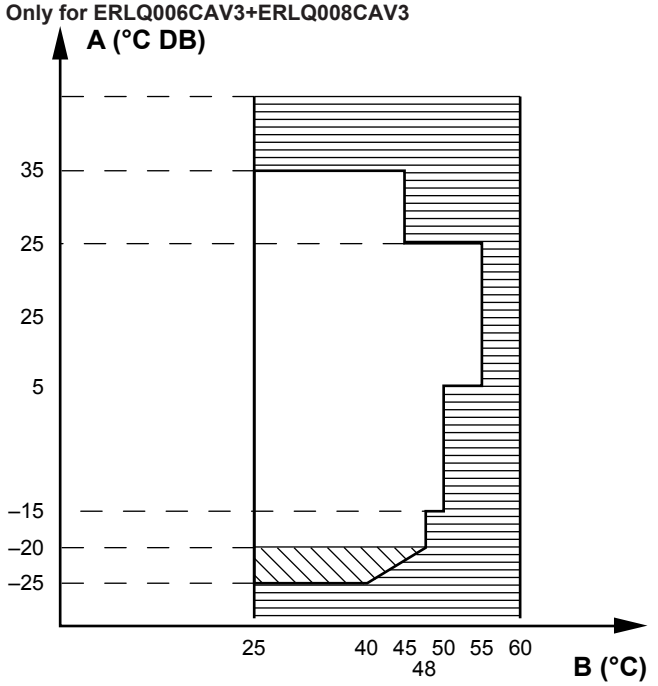
15.6.2 Operation range: Domestic hot water

Only for ERLQ004CAV3



3TW60813-2C_page 2

Only for ERLQ006CAV3+ERLQ008CAV3



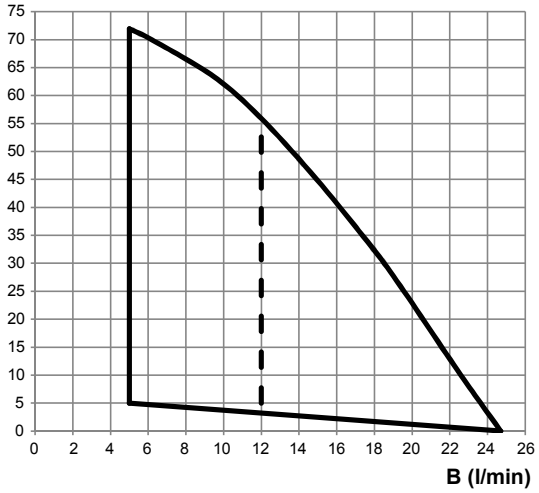
3TW60813-2C_page 2

A Outdoor temperature
B Domestic hot water temperature
▤ Only backup heater operation.
▧ Operation of outdoor unit, but no guarantee of capacity. (If outdoor temperature <–20°C or <–25°C outdoor unit will stop)(Indoor unit and backup heater operation will continue)

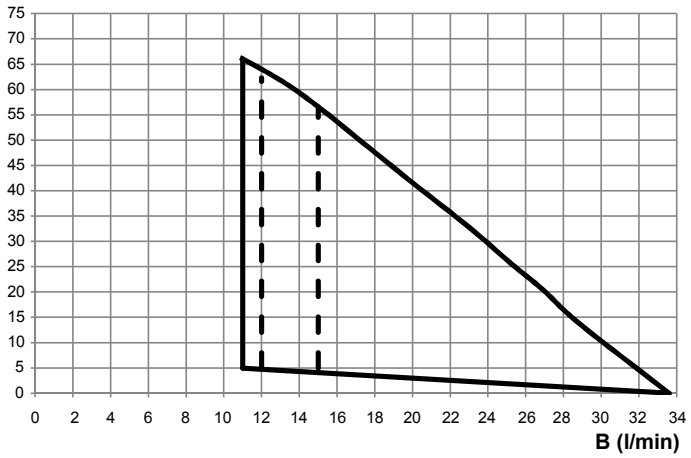
15.7 ESP curve

15.7.1 ESP curve: indoor unit

Only for EHVH04S18CA3VF
A (kPa)



Only for EHVH08S18CA3VF
A (kPa)



A External static pressure available at space heating/cooling circuit
B Water flow rate: water flow through space heating/cooling circuit

Note 1: Selecting a flow outside the area of operation can cause damage or malfunction of the unit. See also minimum and maximum allow water flow range in the technical specifications.

Note 2: Water quality MUST be according to EN directive EC98/83EC.

Field settings table

Applicable indoor units

EHVH04S18CA3VF
EHVH08S18CA3VF

Notes

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	30~80°C, step: 1°C **60°C**		
7.4.3.2	[6-0B]	Storage eco		R/W	30~50°C, step: 1°C **45°C**		
7.4.3.3	[6-0C]	Reheat		R/W	30~50°C, step: 1°C **45°C**		
└ Quiet level							
7.4.4				R/W	**0: Level 1** 1: Level 2 2: Level 3		
Installer settings							
└ System layout							
└ Standard							
A.2.1.1	[E-00]	Unit type		R/O	**0: LT split**		
A.2.1.2	[E-01]	Compressor type		R/O	**0:08**		
A.2.1.3	[E-02]	Indoor software type		R/O	**1: Type 2**		
A.2.1.4	[E-03]	Backup heater steps		R/O	**1: 1 step**		
A.2.1.5	[5-0D]	BUH type		R/W	**1: 1P,(1/1+2)**		
A.2.1.6	[D-01]	Preferential kWh rate		R/W	**0: No** 1: Active open 2: Active closed		
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	**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	**1: Yes**		
A.2.2.3	[E-07]	DHW tank heater		R/W	**1: Backup heater**		
A.2.2.4	[C-05]	Contact type main		R/W	0: - 1: Thermo ON/OFF **2: C/H request**		
A.2.2.5	[C-06]	Contact type add.		R/W	0: - 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: -		
A.2.2.6.2	[D-07]	Digital I/O PCB	Solar kit	R/W	**0: No**		
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: Yes		
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		
A.2.2.B	[C-08]	External sensor		R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
└ Capacities							
A.2.3.2	[6-03]	BUH: step 1		R/W	0~10kW, step: 0,2kW **3kW**		
Space operation							
└ LWT settings							
└ Main							
A.3.1.1.1		LWT setpoint mode		R/W	**0: Absolute** 1: Weather dep. 2: Abs + 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	37~55°C, step: 1°C **55°C**		
A.3.1.1.3	[1-00]	Set weather-dependent heating	Low ambient temp. for LWT main zone heating WD curve.	R/W	-20~5°C, step: 1°C **-10°C**		
A.3.1.1.3	[1-01]	Set weather-dependent heating	High ambient temp. for LWT main zone heating WD curve.	R/W	10~20°C, step: 1°C **15°C**		

Field settings table						Installer setting at variance with default value	
Breadcrumb	Field code	Setting name			Range, step **Default value**	Date	Value
A.3.1.1.3	[1-02]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT main zone heating WD curve.	R/W	25~55°C, step: 1°C **35°C**		
A.3.1.1.3	[1-03]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT main zone heating WD curve.	R/W	25~55°C, step: 1°C **25°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: Absolute** 1: Weather dep. 2: Abs + 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	37~55°C, step: 1°C **55°C**		
A.3.1.2.3	[0-00]	Set weather-dependent heating	Leaving water value for high ambient temp. for LWT add zone heating WD curve.	R/W	25~55°C, step: 1°C **35°C**		
A.3.1.2.3	[0-01]	Set weather-dependent heating	Leaving water value for low ambient temp. for LWT add zone heating WD curve.	R/W	25~55°C, step: 1°C **45°C**		
A.3.1.2.3	[0-02]	Set weather-dependent heating	High ambient temp. for LWT add zone heating WD curve.	R/W	10~20°C, step: 1°C **15°C**		
A.3.1.2.3	[0-03]	Set weather-dependent heating	Low ambient temp. for LWT add zone heating WD curve.	R/W	-20~5°C, step: 1°C **-10°C**		
		└ Delta T emitter					
A.3.1.3.1	[9-09]	Delta T emitter	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	14~25°C, step: 1°C **25°C**		
	└ Domestic hot water (DHW)						
		└ Setpoint mode					
A.4.1	[6-0D]			R/W	0: Reheat only 1: Reheat + sched. **2: Scheduled only**		
		└ Scheduled DHW					
A.4.2.1		Schedule temperatures		R/W	**0: Presets** 1: Custom		
A.4.2.2		Storage comfort SP mode		R/W	**0: Absolute** 1: Weather dep.		
A.4.2.3	[0-0B]	Weather-dependent curve	Leaving water value for high ambient temp. for DHW WD curve.	R/W	35~55°C, step: 1°C **55°C**		
A.4.2.3	[0-0C]	Weather-dependent curve	Leaving water value for low ambient temp. for DHW WD curve.	R/W	55~70°C, step: 1°C **70°C**		
A.4.2.3	[0-0D]	Weather-dependent curve	High ambient temp. for DHW WD curve.	R/W	10~20°C, step: 1°C **15°C**		
A.4.2.3	[0-0E]	Weather-dependent curve	Low ambient temp. for DHW WD curve.	R/W	-20~5°C, step: 1°C **-10°C**		
		└ Setpoint readout					
A.4.3.1		Setpoint readout type		R/W	**0: Temperature** 1: Graphical		
A.4.3.2.1		Conversion persons	1 person	R/W	30~80°C, step: 1°C **42°C**		
A.4.3.2.2		Conversion persons	2 persons	R/W	0~20°C, step: 1°C **6°C**		
A.4.3.2.3		Conversion persons	3 persons	R/W	0~20°C, step: 1°C **15°C**		
A.4.3.2.4		Conversion persons	4 persons	R/W	0~20°C, step: 1°C **17°C**		
A.4.3.2.5		Conversion persons	5 persons	R/W	0~20°C, step: 1°C **1°C**		
A.4.3.2.6		Conversion persons	6 persons	R/W	0~20°C, step: 1°C **1°C**		
		└ 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**		
A.4.4.4	[2-03]	Temperature target		R/W	**60°C**		
A.4.4.5	[2-04]	Duration		R/W	40~60 min, step: 5 min **60 min**		
		└ Maximum setpoint					
A.4.5	[6-0E]				**60°C**		
	└ Heat sources						
		└ Backup heater					
A.5.1.1	[4-00]	Operation mode		R/W	0: Limit **1: Enable** 2: Only DHW		
A.5.1.2	[4-06]	Auto emergency operation		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						

Field settings table						Installer setting at variance with default value	
Breadcrumb	Field code	Setting name			Range, step **Default value**	Date	Value
		└ 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** 2: BUH only		
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**		
		└ Overview settings					
A.8.1	[0-00]	Leaving water value for high ambient temp. for LWT add zone heating WD curve.		R/W	25~55°C, step: 1°C **35°C**		
A.8.2	[0-01]	Leaving water value for low ambient temp. for LWT add zone heating WD curve.		R/W	25~55°C, step: 1°C **45°C**		
A.8.3	[0-02]	High ambient temp. for LWT add zone heating WD curve.		R/W	10~20°C, step: 1°C **15°C**		
A.8.4	[0-03]	Low ambient temp. for LWT add zone heating WD curve.		R/W	-20~5°C, step: 1°C **-10°C**		
A.8.5	[0-04]	--		R/W	**8**		
A.8.6	[0-05]	--		R/W	**12**		
A.8.7	[0-06]	--		R/W	**35**		
A.8.8	[0-07]	--		R/W	**20**		
A.8.9	[0-0B]	Leaving water value for high ambient temp. for DHW WD curve.		R/W	35~55°C, step: 1°C **55°C**		
A.8.10	[0-0C]	Leaving water value for low ambient temp. for DHW WD curve.		R/W	55~70°C, step: 1°C **70°C**		
A.8.11	[0-0D]	High ambient temp. for DHW WD curve.		R/W	10~20°C, step: 1°C **15°C**		
A.8.12	[0-0E]	Low ambient temp. for DHW WD curve.		R/W	-20~5°C, step: 1°C **-10°C**		
A.8.13	[1-00]	Low ambient temp. for LWT main zone heating WD curve.		R/W	-20~5°C, step: 1°C **-10°C**		
A.8.14	[1-01]	High ambient temp. for LWT main zone heating WD curve.		R/W	10~20°C, step: 1°C **15°C**		
A.8.15	[1-02]	Leaving water value for low ambient temp. for LWT main zone heating WD curve.		R/W	25~55°C, step: 1°C **35°C**		
A.8.16	[1-03]	Leaving water value for high ambient temp. for LWT main zone heating WD curve.		R/W	25~55°C, step: 1°C **25°C**		
A.8.17	[1-04]	--		R/W	**0: Disabled**		
A.8.18	[1-05]	--		R/W	**0: Disabled**		
A.8.19	[1-06]	--		R/W	**20**		
A.8.20	[1-07]	--		R/W	**35**		
A.8.21	[1-08]	--		R/W	**22**		
A.8.22	[1-09]	--		R/W	**18**		
A.8.23	[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.8.24	[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.8.25	[2-01]	Should the disinfection function be executed?		R/W	0: No **1: Yes**		
A.8.26	[2-02]	When should the disinfection function start?		R/W	0~23 hour, step: 1 hour **23**		
A.8.27	[2-03]	What is the disinfection target temperature?		R/W	**60°C**		
A.8.28	[2-04]	How long must the tank temperature be maintained?		R/W	40~60 min, step: 5 min **60 min**		
A.8.29	[2-05]	Room antifrost temperature		R/W	4~16°C, step: 1°C **12°C**		
A.8.30	[2-06]	Room frost protection		R/W	0: Disabled **1: Enabled**		

Field settings table					Installer setting at variance with default value	
Breadcrumb	Field code	Setting name		Range, step **Default value**	Date	Value
A.8.31	[2-09]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8.32	[2-0A]	Adjust the offset on the measured room temperature	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8.33	[2-0B]	What is the required offset on the measured outdoor temp.?	R/W	-5~5°C, step: 0,5°C **0°C**		
A.8.34	[3-00]	Is auto restart of the unit allowed?	R/W	0: No **1: Yes**		
A.8.35	[3-01]	--		**0**		
A.8.36	[3-02]	--		**1**		
A.8.37	[3-03]	--		**4**		
A.8.38	[3-04]	--		**2**		
A.8.39	[3-05]	--		**1**		
A.8.40	[3-06]	What is the maximum desired room temperature in heating?	R/W	18~30°C, step: A.3.2.4 **30°C**		
A.8.41	[3-07]	What is the mimimum desired room temperature in heating?	R/W	12~18°C, step: A.3.2.4 **12°C**		
A.8.42	[3-08]	--	R/W	**35**		
A.8.43	[3-09]	--	R/W	**15**		
A.8.44	[4-00]	What is the BUH operation mode?	R/W	0: Limit **1: Enable** 2: Only DHW		
A.8.45	[4-01]	Which electric heater has priority?	R/W	**0: None** 1: BSH 2: BUH		
A.8.46	[4-02]	Below which outdoor temperature is heating allowed?	R/W	14~25°C, step: 1°C **25°C**		
A.8.47	[4-03]	--	R/W	**3**		
A.8.48	[4-04]	--		**2**		
A.8.49	[4-05]	--		**0**		
A.8.50	[4-06]	Is the backup heater allowed during emergency operation?	R/W	0: No **1: Yes**		
A.8.51	[4-07]	--	R/W	**1**		
A.8.52	[4-08]	Which power limitation mode is required on the system?	R/W	**0: No limitation** 1: Continuous 2: Digital inputs		
A.8.53	[4-09]	Which power limitation type is required?	R/W	0: Current **1: Power**		
A.8.54	[4-0B]	--	R/W	**1**		
A.8.55	[4-0D]	--	R/W	**3**		
A.8.56	[5-00]	Is backup heater operation allowed above equilibrium temperature during space heating operation?	R/W	0: Allowed **1: Not allowed**		
A.8.57	[5-01]	What is the equilibrium temperature for the building?	R/W	-15~35°C, step: 1°C **0°C**		
A.8.58	[5-02]	Space heating priority.	R/W	**1: Enabled**		
A.8.59	[5-03]	Space heating priority temperature.	R/W	-15~35°C, step: 1°C **0°C**		
A.8.60	[5-04]	Set point correction for domestic hot water temperature.	R/W	0~20°C, step: 1°C **10°C**		
A.8.61	[5-05]	What is the requested limit for DI1?	R/W	0~50 A, step: 1 A **50 A**		
A.8.62	[5-06]	What is the requested limit for DI2?	R/W	0~50 A, step: 1 A **50 A**		
A.8.63	[5-07]	What is the requested limit for DI3?	R/W	0~50 A, step: 1 A **50 A**		
A.8.64	[5-08]	What is the requested limit for DI4?	R/W	0~50 A, step: 1 A **50 A**		
A.8.65	[5-09]	What is the requested limit for DI1?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8.66	[5-0A]	What is the requested limit for DI2?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8.67	[5-0B]	What is the requested limit for DI3?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8.68	[5-0C]	What is the requested limit for DI4?	R/W	0~20 kW, step: 0,5 kW **20 kW**		
A.8.69	[5-0D]	What type of backup heater installation is used?	R/W	**1: 1P,(1/1+2)**		
A.8.70	[6-00]	The temperature difference determining the heat pump ON temperature.	R/O	**10°C**		
A.8.71	[6-01]	The temperature difference determining the heat pump OFF temperature.	R/W	0~10°C, step: 1°C **2°C**		
A.8.72	[6-02]	--	R/W	**0**		
A.8.73	[6-03]	What is the capacity of the backup heater step 1?	R/W	0~10kW, step: 0,2kW **3kW**		
A.8.74	[6-04]	--	R/W	**0**		
A.8.75	[6-05]	--		**0**		
A.8.76	[6-06]	--		**0**		
A.8.78	[6-08]	What is the reheat hysteresis? [6-0C]		**10**		
A.8.79	[6-09]	--		**0**		
A.8.80	[6-0A]	What is the desired comfort storage temperature?	R/W	30~80°C, step: 1°C **60°C**		
A.8.81	[6-0B]	What is the desired eco storage temperature?	R/W	30~50°C, step: 1°C **45°C**		
A.8.82	[6-0C]	What is the desired reheat temperature?	R/W	30~50°C, step: 1°C **45°C**		
A.8.83	[6-0D]	What is the desired setpoint mode in DHW?	R/W	0: Reheat only 1: Reheat + sched. **2: Scheduled only**		
A.8.84	[6-0E]	What is the maximum tank temperature setpoint?	R/W	40~60°C, step: 1°C **60°C**		
A.8.85	[7-00]	--	R/W	**0**		
A.8.86	[7-01]	--	R/W	**2**		
A.8.87	[7-02]	How many leaving water temperature zones are there?	R/W	**0: 1 LWT zone** 1: 2 LWT zones		
A.8.88	[8-00]	Minimum running time for domestic hot water operation.	R/W	0~20 min, step: 1 min **5 min**		
A.8.89	[8-01]	Maximum running time for domestic hot water operation.	R/W	5~95 min, step: 5 min **30 min**		
A.8.90	[8-02]	Anti-recycling time.	R/W	0~10 hour, step: 0,5 hour **0,5 hour**		
A.8.91	[8-03]	--	R/W	**50**		
A.8.92	[8-04]	Additional running time for the maximum running time.	R/W	0~95 min, step: 5 min **95 min**		
A.8.93	[8-05]	Allow modulation of the LWT to control the room?	R/W	**0: No** 1: Yes		
A.8.94	[8-06]	Leaving water temperature maximum modulation.	R/W	1~5°C, step: 1°C **3°C**		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.8.95	[8-07]	--	R/W	**18**		
A.8.96	[8-08]	--	R/W	**20**		
A.8.97	[8-09]	What is the desired comfort main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **35°C**		
A.8.98	[8-0A]	What is the desired eco main LWT in heating?	R/W	[9-01]~[9-00], step: 1°C **33°C**		
A.8.99	[9-00]	What is the maximum desired LWT for main zone in heating?	R/W	37~55°C, step: 1°C **55°C**		
A.8.100	[9-01]	What is the mimimum desired LWT for main zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
A.8.101	[9-02]	--	R/W	**22**		
A.8.102	[9-03]	--	R/W	**5**		
A.8.103	[9-04]	Leaving water temperature overshoot temperature.	R/W	1~4°C, step: 1°C **1°C**		
A.8.104	[9-05]	What is the mimimum desired LWT for add. zone in heating?	R/W	15~37°C, step: 1°C **25°C**		
A.8.105	[9-06]	What is the maximum desired LWT for add. zone in heating?	R/W	37~55°C, step: 1°C **55°C**		
A.8.106	[9-07]	--	R/W	**5**		
A.8.107	[9-08]	--	R/W	**22**		
A.8.108	[9-09]	What is the desired delta T in heating?	R/W	3~10°C, step: 1°C **5°C**		
A.8.109	[9-0A]	--	R/W	**5**		
A.8.110	[9-0B]	What emitter type is connected to the main LWT zone?	R/W	0: Quick **1: Slow**		
A.8.111	[9-0C]	Room temperature hysteresis.	R/W	1~6°C, step: 0,5°C **1 °C**		
A.8.112	[A-00]	--		**0**		
A.8.113	[A-01]	--		**0**		
A.8.114	[A-02]	--		**1**		
A.8.115	[A-03]	--		**0**		
A.8.116	[A-04]	--		**0**		
A.8.117	[B-00]	--		**0**		
A.8.118	[B-01]	--		**0**		
A.8.119	[B-02]	--		**0**		
A.8.120	[B-03]	--		**0**		
A.8.121	[B-04]	--		**0**		
A.8.122	[C-00]	Domestic heating water priority.	R/W	**0**		
A.8.123	[C-01]	--		**1**		
A.8.124	[C-02]	Is an external backup heat source connected?	R/W	**0: No** 1: Bivalent 2: - 3: -		
A.8.125	[C-03]	Bivalent activation temperature.	R/W	-25~25°C, step: 1°C **0°C**		
A.8.126	[C-04]	Bivalent hysteresis temperature.	R/W	2~10°C, step: 1°C **3°C**		
A.8.127	[C-05]	What is the thermo request contact type for the main zone?	R/W	0: - 1: Thermo ON/OFF **2: C/H request**		
A.8.128	[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.8.129	[C-07]	What is the unit control method in space operation?	R/W	**0: LWT control** 1: Ext RT control 2: RT control		
A.8.130	[C-08]	Which type of external sensor is installed?	R/W	**0: No** 1: Outdoor sensor 2: Room sensor		
A.8.131	[C-09]	What is the required alarm output contact type?	R/W	**0: Normally open** 1: Normally closed		
A.8.132	[D-00]	Which heaters are permitted if prefer. kWh rate PS is cut?	R/W	**0: None** 1: -- 2: BUH only 3: --		
A.8.133	[D-01]	Contact type of preferential kWh rate PS installation?	R/W	**0: No** 1: Active open 2: Active closed		
A.8.134	[D-02]	Which type of DHW pump is installed?	R/W	**0: No** 1: Secondary rtrn 2: Disinf. shunt		
A.8.135	[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.8.136	[D-04]	Is a demand PCB connected?	R/W	**0: No** 1: Yes		
A.8.137	[D-05]	--	R/W	**1**		
A.8.138	[D-07]	Is a solar kit connected?	R/W	**0: No**		
A.8.139	[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.8.140	[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.8.141	[E-00]	Which type of unit is installed?	R/O	**0: LT split**		
A.8.142	[E-01]	Which type of compressor is installed?	R/O	**0:08**		
A.8.143	[E-02]	What is the indoor unit software type?	R/O	**1: Type 2**		
A.8.144	[E-03]	What is the number of backup heater steps?	R/O	**1: 1 step**		
A.8.145	[E-04]	Is the power saving function available on the outdoor unit?	R/O	**1: Yes**		
A.8.146	[E-05]	Is a DHW tank installed in the system?	R/W	**1: Yes**		
A.8.147	[E-06]	Is the domestic hot water tank installed?	R/O	**1: Yes**		
A.8.148	[E-07]	Which type of electrical heater for DHW is installed?	R/W	**1: Backup heater**		
A.8.149	[E-08]	Power saving function for outdoor unit.	R/W	0: Disabled **1: Enabled**		
A.8.150	[E-09]	--		0		
A.8.151	[F-00]	Pump operation allowed outside range.	R/W	**0: Disabled** 1: Enabled		

Field settings table

Breadcrumb	Field code	Setting name		Range, step **Default value**	Installer setting at variance with default value Date	 Value
A.8.152	[F-01]	--	R/W	**20**		
A.8.153	[F-02]	--		**3**		
A.8.154	[F-03]	--		**5**		
A.8.155	[F-04]	--		**0**		
A.8.156	[F-05]	--		**0**		
A.8.157	[F-06]	--		**0**		
A.8.158	[F-09]	Pump operation during flow abnormality.	R/W	**0: Disabled** 1: Enabled		
A.8.159	[F-0A]	--		**0**		
A.8.160	[F-0B]	Close shut-off valve during thermo OFF?	R/W	**0: No** 1: Yes		
A.8.161	[F-0C]	--		**1**		
A.8.162	[F-0D]	What is the pump operation mode?	R/W	0: Continuous **1: Sample** 2: Request		

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4P366226-1 2014.01