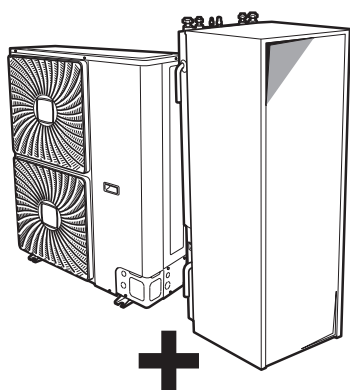




Installer reference guide

Daikin Altherma - Low Temperature Split



ERHQ011-014-016BA
ERLQ011-014-016CA
EHVH/X16S18+26CA

Installer reference guide
Daikin Altherma - Low Temperature Split

English

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1 About the documentation

1.1 About this document

Target audience

Authorized 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) |

| Document | Contains... | Format |
|--------------------------------------|------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Installer reference guide | Preparation of the installation, technical specifications, good practices, reference data, ... | CD/DVD (in the box of the indoor unit) |
| Addendum book for optional equipment | Additional info about how to install optional equipment | Paper (in the box of the indoor unit) CD/DVD (in the box of the indoor unit) |

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.

2 General safety precautions



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.

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

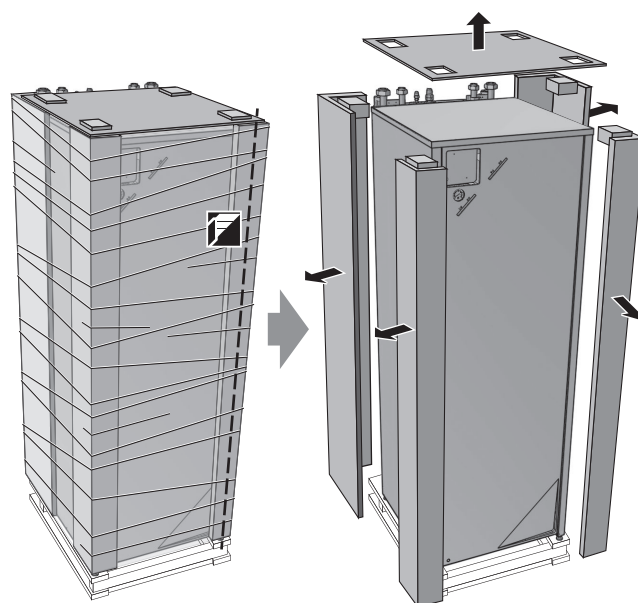
- After finishing the electrical work, confirm that each electrical component and terminal inside the electrical components box is connected securely.
- Make sure all covers are closed before starting up the unit.

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.

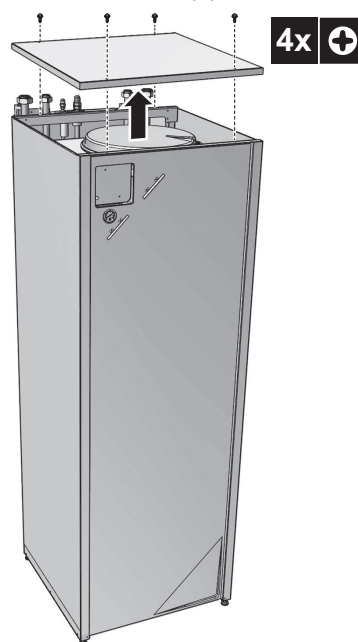
3.1 Indoor unit

3.1.1 To unpack the indoor unit

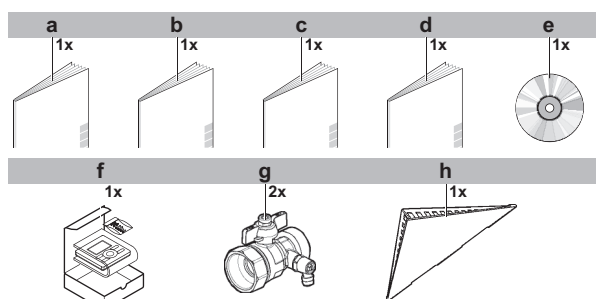


3.1.2 To remove the accessories from the indoor unit

- 1 Remove the screws at the top of the unit.
- 2 Remove the top panel.



3 Remove the accessories.



a General safety precautions

4 About the units and options

- b Addendum book for optional equipment
- c Indoor unit installation manual
- d Operation manual
- e CD/DVD
- f User interface kit: user interface, 4 fixing screws, 2 plugs
- g Shut-off valve
- h 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: Indoor unit

Location



Model identification

Example: E HV H 04 S 18 CA 3V

| Code | Description |
|------|--------------------------------------------------------------------------------------------------------------------|
| E | European model |
| HV | HV=Floor-standing indoor unit with integrated tank |
| H | <ul style="list-style-type: none">▪ H=Heating only▪ X=Heating/cooling |
| 04 | Capacity class: <ul style="list-style-type: none">▪ 04=4.5 kW▪ 08=7.5 kW▪ 16=16 kW |
| S | Integrated tank material: S=Stainless steel |
| 18 | Integrated tank volume: <ul style="list-style-type: none">▪ 18=180 l▪ 26=260 l |
| CA | Series |
| 3V | Backup heater model <ul style="list-style-type: none">▪ 3V▪ 9W |

4.2 Possible combinations of units and options

4.2.1 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 "7.4.5 To connect the user interface" on page 30.

Room thermostat (EKRTWA, EKTR1)

You can connect an optional room thermostat to the indoor unit. This thermostat can either be wired (EKRTWA) or wireless (EKTR1).

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 (EKTR1).

For installation instructions, 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/cooling On/OFF output
- Changeover to external heat source
- Only for EHVH/X16 models: Control signal for bottom plate heater kit EKBPTH16A.

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.

4.2.2 Possible combinations of indoor unit and outdoor unit

| Outdoor unit | Indoor unit | | | |
|--------------|---------------|---------------|---------------|---------------|
| | EHVH16S18CA3V | EHVX16S18CA3V | EHVH16S26CA9W | EHVX16S26CA9W |
| ERHQ011BAV3 | O | O | O | O |
| ERHQ014BAV3 | O | O | O | O |
| ERHQ016BAV3 | O | O | O | O |
| ERLQ011CAV3 | O | O | O | O |
| ERLQ014CAV3 | O | O | O | O |
| ERLQ016CAV3 | O | O | O | O |
| ERHQ011BAW1 | O | O | O | O |
| ERHQ014BAW1 | O | O | O | O |
| ERHQ016BAW1 | O | O | O | O |
| ERLQ011CAW1 | O | O | O | O |
| ERLQ014CAW1 | O | O | O | O |
| ERLQ016CAW1 | O | O | O | O |

5 Application guidelines

5.1 Overview: Application guidelines

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



NOTICE

- The illustrations in the application guidelines are meant for reference only, and are NOT to be used as detailed hydraulic diagrams. The detailed hydraulic dimensioning and balancing are NOT shown, and are the responsibility of the installer.
- For more information about the configuration settings to optimize heat pump operation, see "8 Configuration" on page 33.

This chapter contains applications guidelines for:

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

5.2 Setting up the space heating/cooling system

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



INFORMATION

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

PC configurator (EKPCAB*)

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.

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

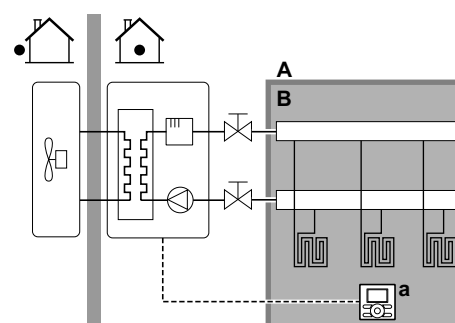
- How many rooms are heated (or cooled) by the Daikin heat pump system?
- Which heat emitter types are used in each room and what is their design leaving water temperature?

Once the space heating/cooling 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

5 Application guidelines

- 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

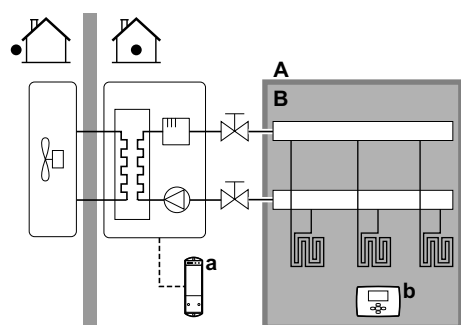
| Setting | Value |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Unit temperature control: ▪ #: [A.2.1.7] ▪ Code: [C-07] | 2 (RT control): Unit operation is decided based 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

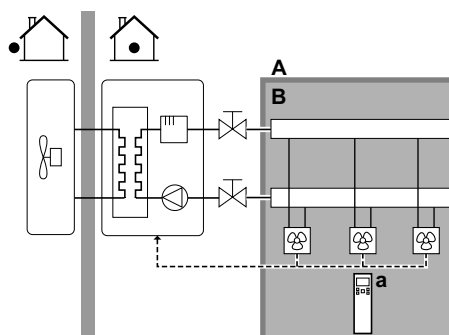
| Setting | Value |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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] | Configure according to the setup: <ul style="list-style-type: none"> 1 (Thermo ON/OFF): When the used external room thermostat or heat pump convactor can only send a thermo ON/OFF condition. No separation between heating or cooling demand. 2 (C/H request): When the used external room thermostat can send a separate heating/cooling 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.
- Comfort.** In case of under floor heating, the wireless external room thermostat prevents condensation on the floor during cooling operation by measuring the room humidity.

Heat pump convectors

Setup



- A Main leaving water temperature zone
- B One single room
- a 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/cooling 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. No separation between heating or cooling demand. |

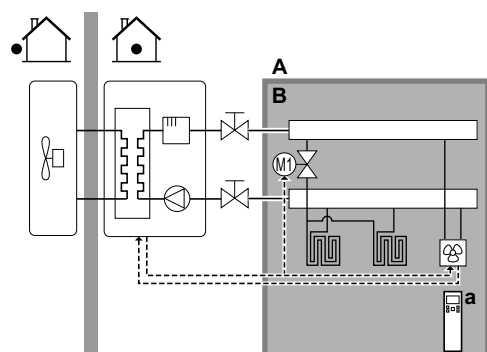
Benefits

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

Combination: Under floor heating + Heat pump convectors

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

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.
- A shut-off valve (field supply) is installed before the under floor heating to prevent condensation on the floor during cooling operation.
- The desired room temperature is set via the remote controller of the heat pump convectors.
- The space heating/cooling 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. No separation between heating or cooling demand. |

Benefits

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

5.2.2 Multiple rooms – One LWT zone

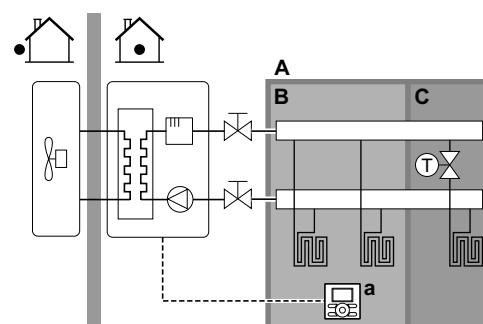
If only one leaving water temperature zone is needed because the design leaving water temperature of all heat emitters is the same, you do NOT need a mixing valve station (cost effective).

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.

5 Application guidelines



INFORMATION

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

Configuration

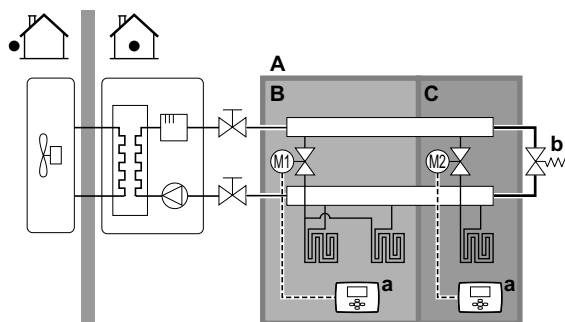
| Setting | Value |
|------------------------------------|---------------------------------------------------------------------------------------------------|
| Unit temperature control: | 2 (RT control): Unit operation is decided based on the ambient temperature of the user interface. |
| ▪ #: [A.2.1.7]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

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

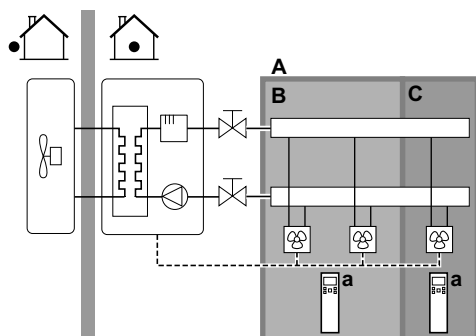
Benefits

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 or cooling 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 EKVHPC on each heat pump convector.

Configuration

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

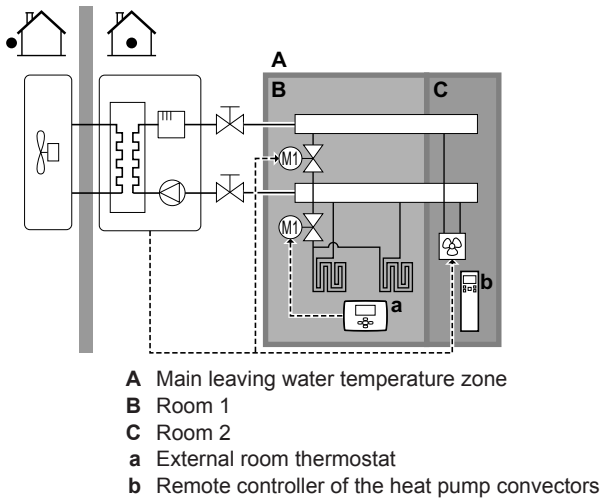
Benefits

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



- 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: Two shut-off valves (field supply) are installed before the under floor heating:
 - A shut-off valve to prevent hot water supply when the room has no heating demand
 - A shut-off valve to prevent condensation on the floor during cooling operation of the rooms with heat pump convectors
- For each room with heat pump convectors: The desired room temperature is set via the 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 EKVHPC 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 in heating, and the highest design temperature in cooling

- Additional zone = The other zone



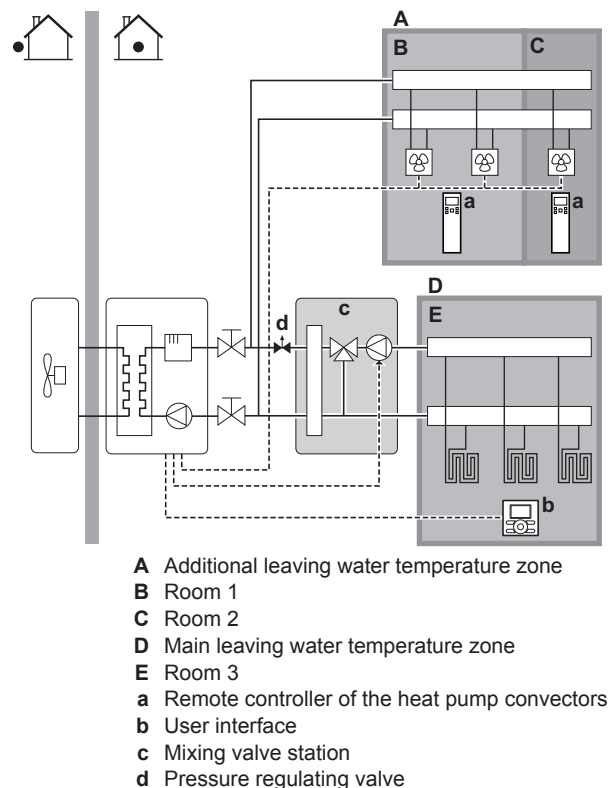
CAUTION

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)/increase (in cooling) the leaving water temperature when the additional zone has demand.

Typical example:

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

Setup



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.

5 Application guidelines

- 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 or cooling 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: <ul style="list-style-type: none">#: [A.2.1.7]Code: [C-07] | 2 (RT control): Unit operation is decided based on the ambient temperature of the user interface. Note: <ul style="list-style-type: none">Main room = user interface used as room thermostat functionalityOther rooms = external room thermostat functionality |
| Number of water temperature zones: <ul style="list-style-type: none">#: [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: <ul style="list-style-type: none">#: [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. No separation between heating or cooling demand. |
| Shut-off valve output | Set to follow the thermo demand of the main zone. |
| Shut-off valve | If the main zone must be shut off during cooling mode to prevent condensation on the floor, set it accordingly. |
| At the mixing valve station | Set the desired main leaving water temperature for heating and/or cooling. |

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 excellent cooling comfort of the heat pump convectors.
- 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.

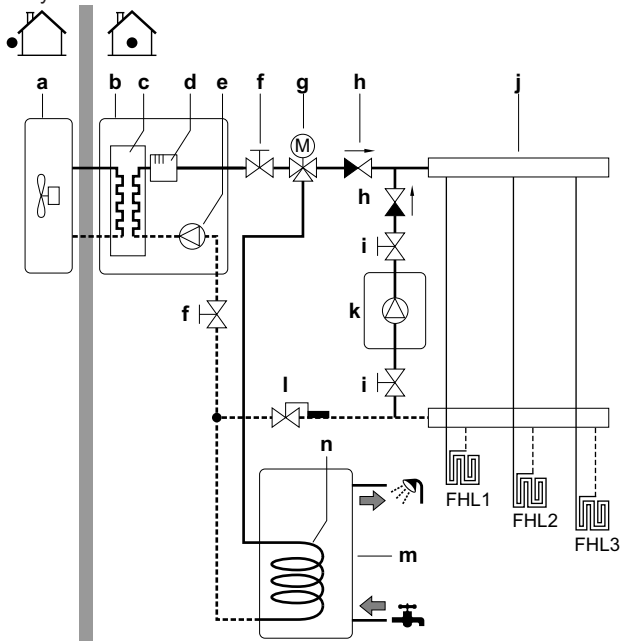


INFORMATION

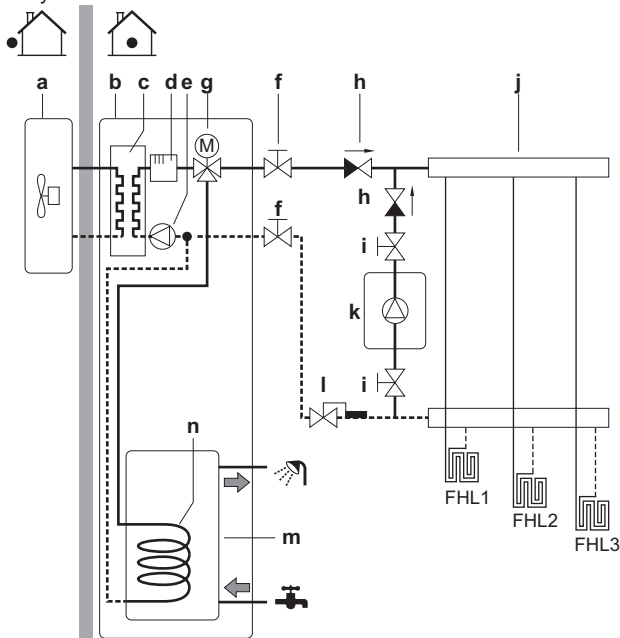
- During heating operation of the heat pump, the heat pump operates to achieve the desired temperature set via the user interface. When weather-dependent operation is active, the water temperature is determined automatically depending on the outdoor temperature.
- During heating operation of the auxiliary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

Setup

- Integrate the auxiliary boiler as follows:
Only for EHBH/X



Only for EHVH/X



- 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 (EHBH/X: option)
- n Heat exchanger coil
- FHL1...3 Under floor heating



NOTICE

- Make sure the auxiliary boiler and its integration in the system complies with applicable legislation.
- Daikin is NOT responsible for incorrect or unsafe situations in the auxiliary boiler system.
- Make sure the return water to the heat pump does NOT exceed 55°C. To do so:
 - Set the desired water temperature via the auxiliary boiler controller to maximum 55°C.
 - Install an aquastat valve in the return water flow of the heat pump.
 - Set the aquastat valve to close above 55°C and to open below 55°C.
- Install non-return valves.
- Make sure to only have one expansion vessel in the water circuit. An expansion vessel is already premounted in the indoor unit.
- Install the digital I/O PCB (option EKR1HB).
- 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/cooling system" on page 7.

Configuration

Via the user interface (quick wizard):

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

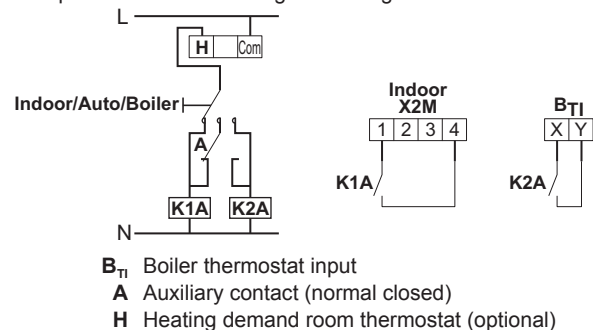


NOTICE

- 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/cooling system" on page 7).
- The auxiliary contact can be:
 - An outdoor temperature thermostat
 - An electricity tariff contact
 - A manually operated contact
 - ...
- Setup: Connect the following field wiring:



5 Application guidelines

- K1A** Auxiliary relay for activation of indoor unit (field supply)
K2A Auxiliary relay for activation of boiler (field supply)
Indoor Indoor unit
Auto Automatic
Boiler Boiler

NOTICE

- Make sure the auxiliary contact has enough differential or time delay to prevent frequent changeover between indoor unit and auxiliary boiler.
- If the auxiliary contact is an outdoor temperature thermostat, install the thermostat in the shadow so that it is NOT influenced or turned ON/OFF by direct sunlight.
- Frequent changeover may cause corrosion of the auxiliary boiler. Contact the manufacturer of the auxiliary boiler for more information.

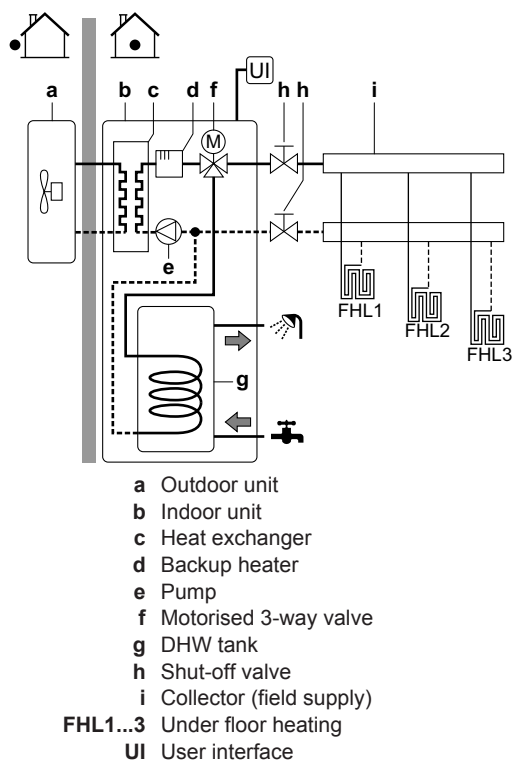
5.4 Setting up the domestic hot water tank

The DHW tank can be:

- Integrated in the indoor unit
- Installed standalone as option

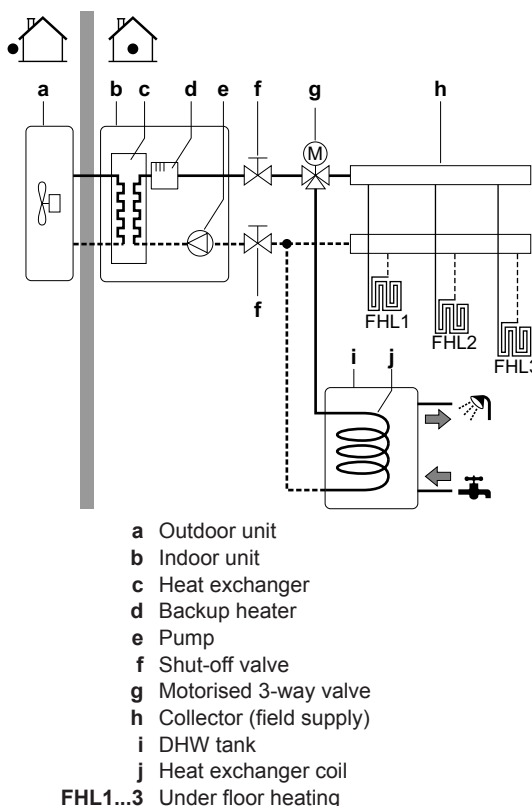
5.4.1 System layout – Integrated DHW tank

Only for EHVH/X.



5.4.2 System layout – Standalone DHW tank

Only for EHBH/X.



5.4.3 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:

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

Possible DHW tank volumes

| Type | Possible volumes |
|---------------------|---------------------------------------------------------------------------------------|
| Integrated DHW tank | <ul style="list-style-type: none"> 180 l 260 l |
| Standalone DHW tank | <ul style="list-style-type: none"> 150 l 200 l 300 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 x 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 x 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 = (3x100 l) + (1x150 l) + (3x10 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: <ul style="list-style-type: none"> • $V_2 = 180$ l • $T_2 = 54^\circ\text{C}$ • $T_1 = 15^\circ\text{C}$ Then $V_1 = 280$ l |
| $V_2 = V_1 \times (40 - T_1) / (T_2 - T_1)$ | If: <ul style="list-style-type: none"> • $V_1 = 480$ l • $T_2 = 54^\circ\text{C}$ • $T_1 = 15^\circ\text{C}$ 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

5.4.4 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 integrated DHW tank)
 - Electrical booster heater (for standalone DHW tank)
 - Solar panels

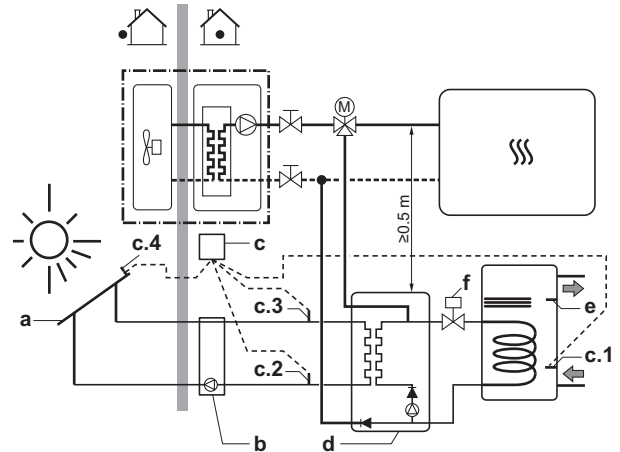
- For more information about:

- Optimizing the energy consumption for producing domestic hot water, see "8 Configuration" on page 33.
- Connecting the electrical wiring of the standalone DHW tank to the indoor unit, see the installation manual of the DHW tank.
- Connecting the water piping of the standalone DHW tank to the indoor unit, see the installation manual of the DHW tank.

5.4.5 Combination: Standalone DHW tank + Solar panels

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

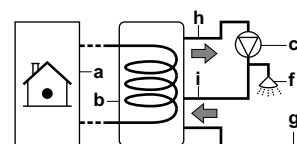
For installation instructions, see the installation manual of the solar kit and addendum book for optional equipment.



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

5.4.6 DHW pump for instant hot water

Setup



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

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

5 Application guidelines

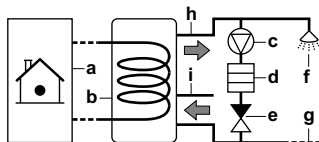
- For more information about connecting the recirculation connection:
 - for integrated DHW tank, see "7 Installation" on page 24,
 - for separate DHW tank, see installation manual of DHW tank.

Configuration

- For more information, see "8 Configuration" on page 33.
- You can program a schedule to control the DHW pump via the user interface. For more information, see the user reference guide.

5.4.7 DHW pump for disinfection

Setup



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

- The DHW pump and the installation are field supply and the responsibility of the installer.
- For the integrated DHW tank, the temperature of the DHW tank can be set to maximum 60°C. If applicable legislation requires higher temperature for disinfection, you can connect a DHW pump and heater element as shown above.
- If applicable legislation requires disinfection of the water piping until the tapping point, you can connect a DHW pump and heater element (if needed) as shown above.

Configuration

The indoor unit can control DHW pump operation. For more information, see "8 Configuration" on page 33.

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 space cooling
 - For domestic hot water production
- You can read out the energy data:
 - Per month
 - Per year



INFORMATION

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

5.5.1 Produced heat

- Applicable for all models.

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

5.5.2 Consumed energy

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

- Calculating
- Measuring



INFORMATION

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

Calculating the consumed energy

- Only applicable for EHBH/X04+08 and EHVH/X04+08.
- 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)
 - The booster heater

Measuring the consumed energy

- Applicable for all models.
- Preferred method because of higher accuracy.
- Requires external power meters.
- Setup and configuration:
 - For the specifications of each type of meter, see "14 Technical data" on page 66.
 - When using electrical power meters, set the number of pulses/kWh for each power meter via the user interface. Consumed energy data for EHVH/X16 and EHBH/X16 models will only be available if this setting is configured.



INFORMATION

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

5.5.3 Normal kWh rate power supply

General rule

One power meter that covers the entire system is sufficient.

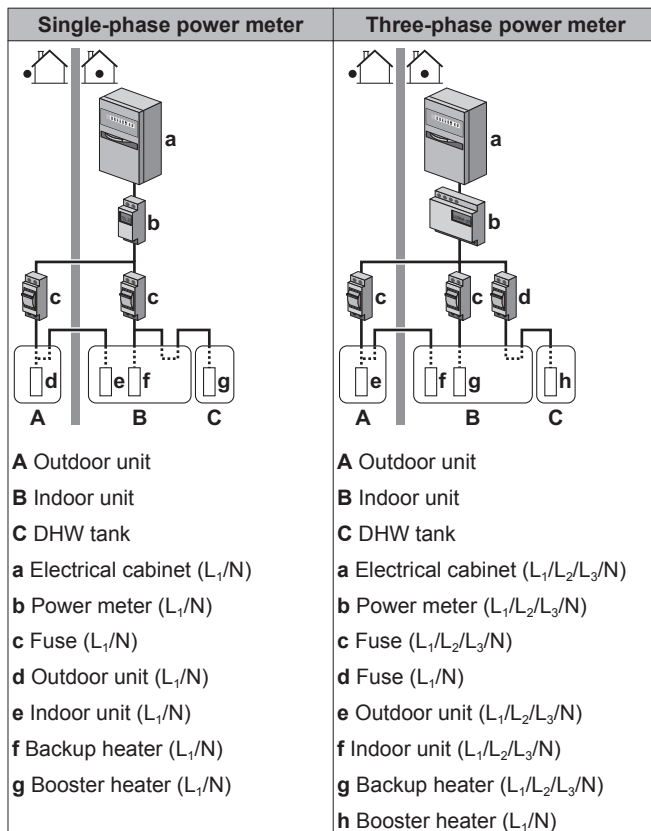
Setup

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

Power meter type

| In case of... | Use a... power meter |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <ul style="list-style-type: none"> Single-phase outdoor unit Backup heater supplied from a single-phase grid (i.e. the backup heater model is *3V or *9W connected to a single-phase grid) | Single-phase |
| In other cases (i.e. a three-phase outdoor unit and/or a *9W backup heater model connected to a three-phase grid) | Three-phase |

Example



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 17 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, backup heater and optional booster heater).

Setup

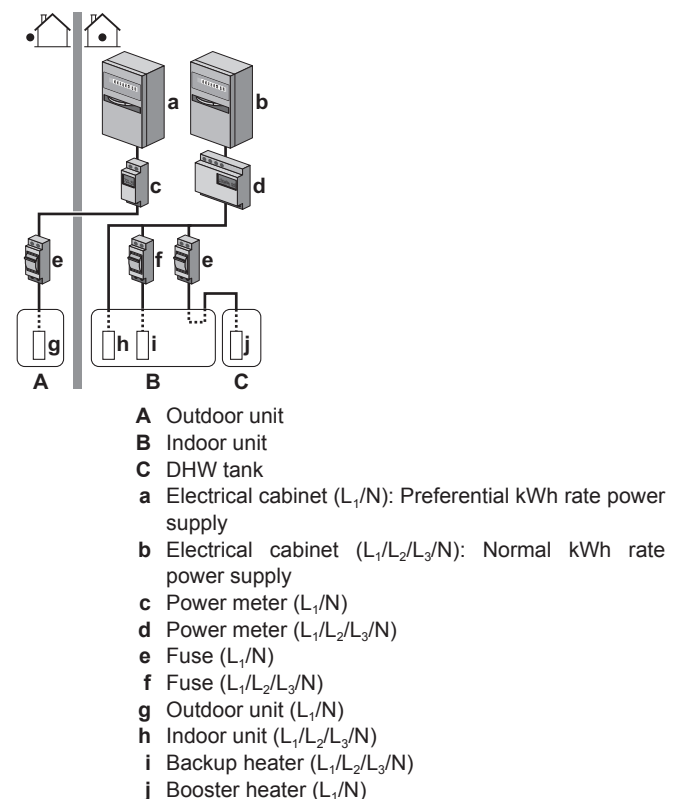
- Connect power meter 1 to X5M/7 and X5M/8.
- Connect power meter 2 to X5M/9 and X5M/10.

Power meter types

- Power meter 1: Single- or three-phase power meter according to the power supply of the outdoor unit.
- Power meter 2:
 - In case of a single-phase backup heater configuration, use a single-phase power meter.
 - In other cases, use a three-phase power meter.

Example

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



5.6 Setting up the power consumption control

- The power consumption control:
 - Is only applicable for EHBH/X04+08 and EHVH/X04+08.
 - Allows you to limit the power consumption of the entire system (sum of outdoor unit, indoor unit, backup heater and optional booster 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 Application guidelines



INFORMATION

Power consumption control CANNOT be used in applications with booster heater.

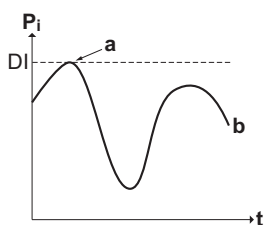
5.6.1 Permanent power limitation

Permanent power limitation is useful to assure a maximum power or current input of the system. In some countries, legislation limits the maximum power consumption for space heating and DHW production. Example: The maximum power input depends on the area of the house and an annual fee has to be paid to the electrical company according to the size of the installed field fuse. By permanently limiting the maximum power or current of the system, you can install smaller field fuses.



NOTICE

When the current control is intended to reduce the installed field fuse sizes, the field fuse will trip to protect the field wires in case of overcurrents caused by the unit. Make sure the selection of the field fuse complies with applicable legislation.



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

Setup and configuration

- No additional equipment needed.
- Set the power consumption control settings in [A.6.3.1] via the user interface (for the description of all settings, see "8 Configuration" on page 33):
 - Select full time limitation mode
 - Select the type of limitation (power in kW or current in A)
 - Set the desired power limitation level



NOTICE

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

- Set a minimum power consumption of ± 3.6 kW to guarantee defrost operation. Otherwise, if defrosting is interrupted several times, the heat exchanger will freeze up.
- Set a minimum power consumption of ± 3 kW to guarantee space heating and DHW production by allowing at least one electrical heater (backup heater step 1 or booster heater).

5.6.2 Power limitation activated by digital inputs

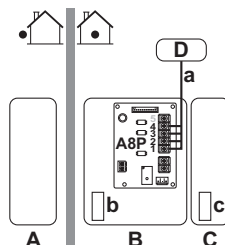
Power limitation is also useful in combination with an energy management system.

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

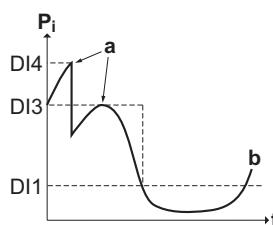
- Current (in A)

- Power input (in kW)

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



A Outdoor unit
B Indoor unit
C DHW tank
D Energy management system
a Power limitation activation (4 digital inputs)
b Backup heater
c Booster 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 EKR1AHTA) 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 "14.5 Wiring diagram – components: Indoor unit" on page 72.

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 33):

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



INFORMATION

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

5.6.3 Power limitation process

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

- 1 Limits certain electrical heaters.

| If... has priority | Then set the heater priority via the user interface to... |
|-------------------------------|------------------------------------------------------------------------|
| Domestic hot water production | Booster heater. Result: The backup heater will be turned OFF first. |
| Space heating | Backup heater. Result: The booster heater will be turned OFF first. |

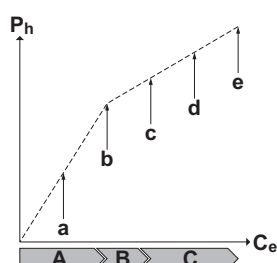
- 2 Turns OFF all electrical heaters.
- 3 Limits the outdoor unit.
- 4 Turns OFF the outdoor unit.

Example

If the configuration is as follows:

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

Then power consumption is limited as follows:



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

5.7 Setting up an external temperature sensor

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

Indoor ambient temperature

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

Outdoor ambient temperature

- In the outdoor unit, the outdoor ambient temperature is measured. Therefore, the outdoor unit must be installed on a location:
 - At the north side of the house or at the side of the house where the most heat emitters are located
 - That is NOT exposed to direct sunlight
- If this is NOT possible, Daikin recommends to connect a remote outdoor sensor (option EKRSCA1).
- Setup: For installation instructions, see the installation manual of the remote indoor sensor.
- Configuration: Select outdoor sensor [A.2.2.B].
- During suspend (see "8 Configuration" on page 33), 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 and in the automatic heating/cooling changeover logic. 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 indoor unit

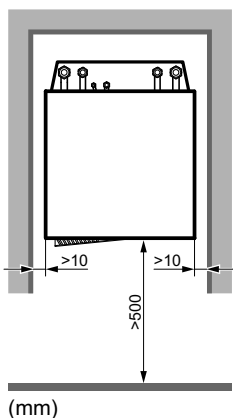
- Mind the measurement guidelines:

| | |
|------------------------------------------------------------------------|---------------------|
| Maximum refrigerant piping length between indoor unit and outdoor unit | 75 m ^(a) |
| Minimum refrigerant piping length between indoor unit and outdoor unit | 3 m ^(b) |
| Maximum height difference between indoor unit and outdoor unit | 30 m |

- (a) Check the outdoor unit installation manual.
 (b) When <5 m, you need to recharge the outdoor unit (check the outdoor unit installation manual).

- Mind the following spacing installation guidelines:

6 Preparation



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.
- Do NOT install the unit in 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 "14.8 Sound spectrum" on page 83 due to environmental noise and sound reflections.
- 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 $>5^{\circ}\text{C}$.
- The indoor unit is designed for indoor installation only and for ambient temperatures ranging $5\sim 35^{\circ}\text{C}$ in cooling mode and $5\sim 30^{\circ}\text{C}$ in heating mode.

6.2 Preparing water piping

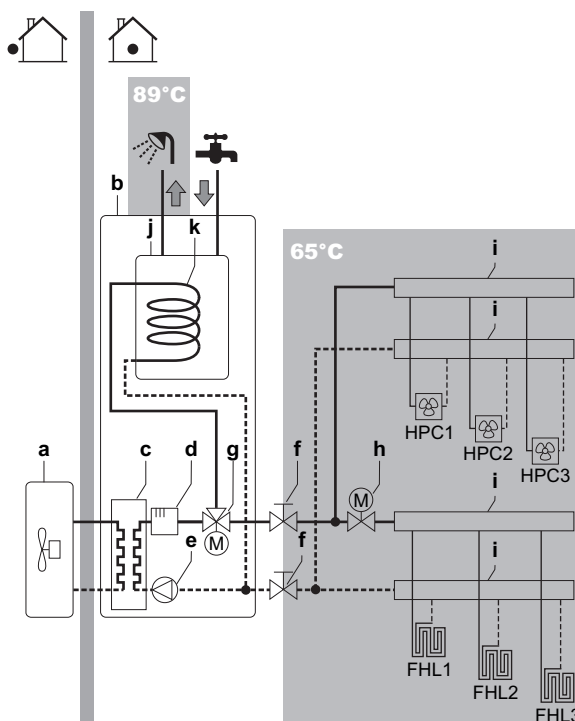
6.2.1 Water circuit requirements

- 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.



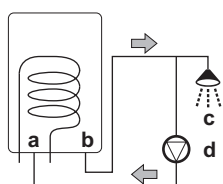
- a Outdoor unit
- b Indoor unit
- c Heat exchanger
- d Backup heater
- e Pump
- f Stop valve
- g Motorised 3-way valve
- h Motorised 2-way valve (field supply)
- i Collector
- j Domestic hot water tank
- k Heat exchanger coil
- HPC1...3 Heat pump convector (optional)
- FHL1...3 Floor heating loop

- 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 "7.3.2 To connect the pressure relief valve to the drain" on page 26.
- 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 "14 Technical data" on page 66 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+16 | 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 the filed 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

6.2.2 Formula to calculate the expansion vessel pre-pressure

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

$$P_g = 0.3 + (H/10) \text{ (bar)}$$

6.2.3 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

Check that the total water volume in the installation is minimum 20 liter, the internal water volume of the indoor unit NOT included.



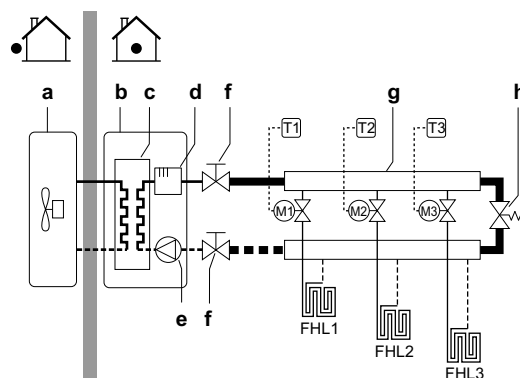
INFORMATION

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



NOTICE

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

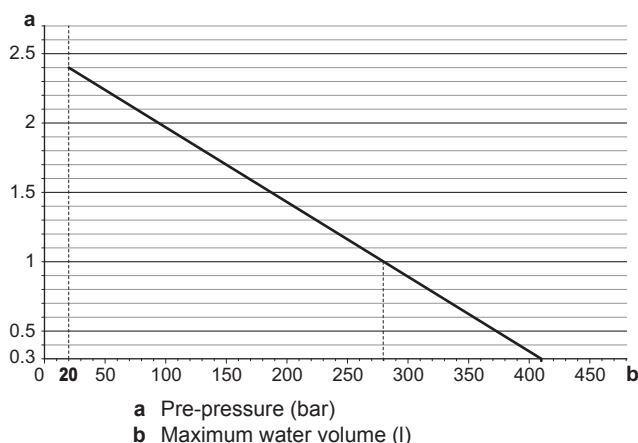


- a Outdoor unit
- b Indoor unit
- c Heat exchanger
- d Backup heater
- e Pump
- f Shut-off valve
- g Collector (field supply)
- h By-pass valve (field supply)
- FHL1...3 Floor heating loop (field supply)
- T1...3 Individual room thermostat (optional)
- M1...3 Individual motorised valve to control loop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

Maximum water volume

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

6 Preparation



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: <ul style="list-style-type: none"> Decrease the pre-pressure. Check if the water volume does NOT exceed the maximum allowed water volume. |
| >7 m | Do the following: <ul style="list-style-type: none"> 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. |

(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.

6.2.4 Changing the pre-pressure of the expansion vessel



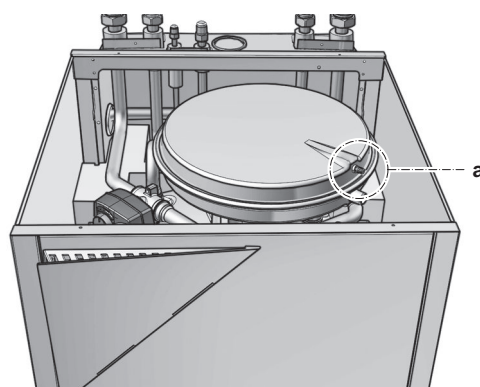
NOTICE

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 schröder valve of the expansion vessel.



a Schröder valve

6.2.5 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:
 $P_g = (0.3 + (H/10)) \text{ bar} = (0.3 + (0/10)) \text{ bar} = 0.3 \text{ bar}$
- 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.

6.3 Preparing electrical wiring

6.3.1 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.

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.

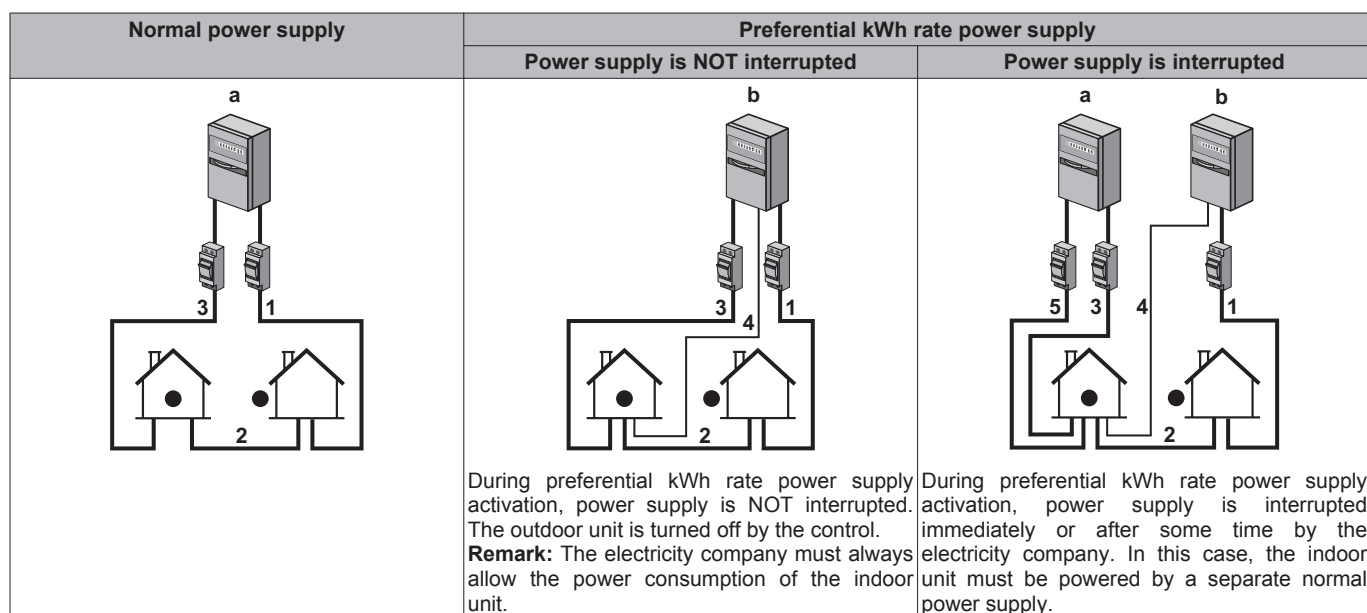
The indoor unit is designed to receive an input signal by which the unit switches into forced off mode. At that moment, the outdoor unit compressor will not operate.

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

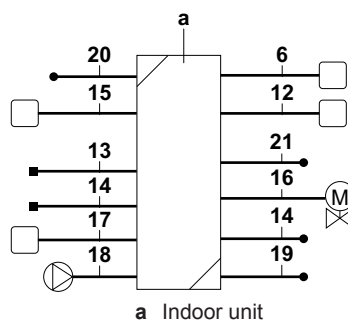
6.3.2 About preferential kWh rate power supply

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, ...

6.3.3 Overview of electrical connections except external actuators



- 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)



6.3.4 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.

| 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) |

7 Installation

| Item | Description | Wires | Maximum running current |
|----------------------------------|-----------------------------------------------------------|----------------------|-------------------------|
| 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 | | | |
| 11 | Power supply for bottom plate heater | 2 | (b) |
| 12 | Room thermostat | 3 or 4 | 100 mA ^(b) |
| 13 | Outdoor ambient temperature sensor | 2 | (b) |
| 14 | Indoor ambient temperature sensor | 2 | (b) |
| 15 | Heat pump convector | 4 | 100 mA ^(b) |
| Field supplied components | | | |
| 16 | Shut-off valve | 2 | 100 mA ^(b) |
| 17 | Electricity meter | 2 (per meter) | (b) |
| 18 | Domestic hot water pump | 2 | (b) |
| 19 | Alarm output | 2 | (b) |
| 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:

- Wiring diagram in the switch box of the unit
- "14.5 Wiring diagram" on page 72

| Backup heater type | Power supply | Required number of conductors |
|--------------------|--------------|-------------------------------|
| *3V | 1x 230 V | 2+GND |
| *9W | 1x 230 V | 2+GND + 2 bridges |
| | 3x 230 V | 3+GND + 1 bridge |
| | 3x 400 V | 4+GND |

7 Installation

7.1 Opening the units

7.1.1 To open the indoor unit

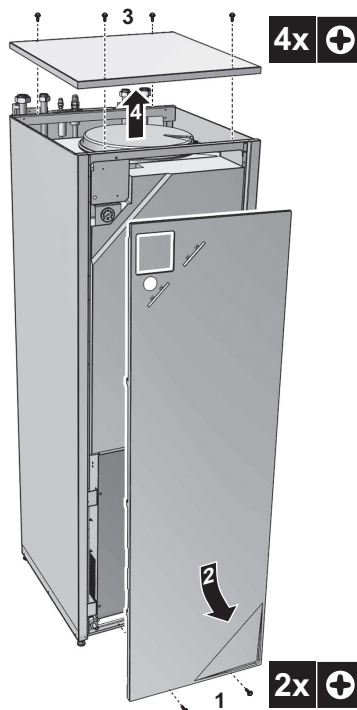
- 1 Loosen and remove the screws at the bottom of the unit.
- 2 Slide the front panel of the unit downwards and remove it.



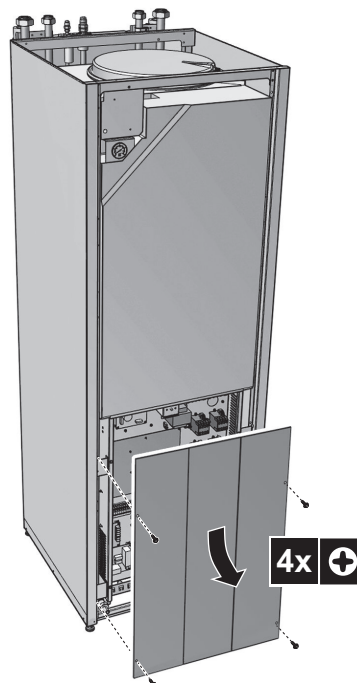
CAUTION

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.



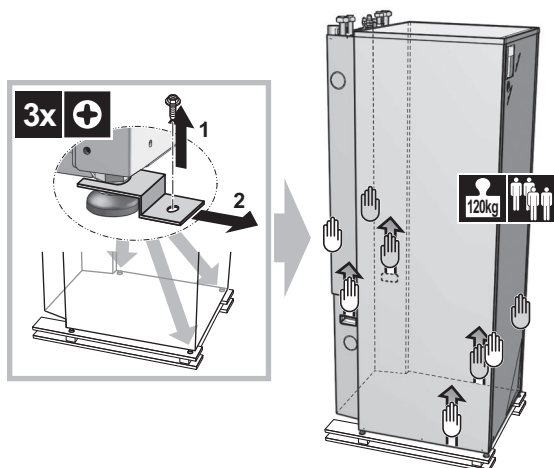
7.1.2 To open the switch box cover of the indoor unit



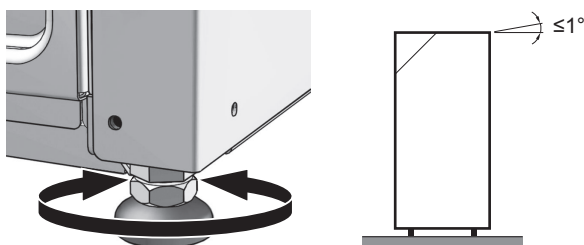
7.2 Mounting the indoor unit

7.2.1 To install the indoor unit

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



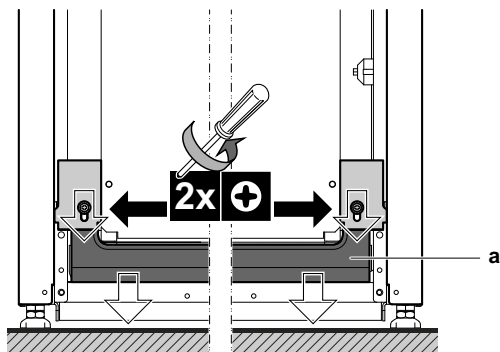
- 2 Slide the indoor unit into position.
- 3 Adjust the height of the leveling feet to compensate for floor irregularities. The maximum allowed deviation is 1°.



7.2.2 To lower the sound plate

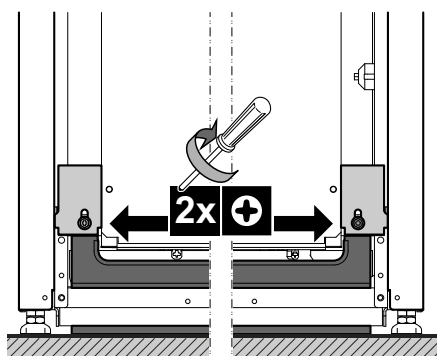
Only applicable for EHVH/X16.

- 1 Loosen the 2 screws and lower the sound plate as shown in the illustration below.



a Sound plate

- 2 Tighten the 2 screws.



7.3 Connecting the water piping

7.3.1 To connect the water piping

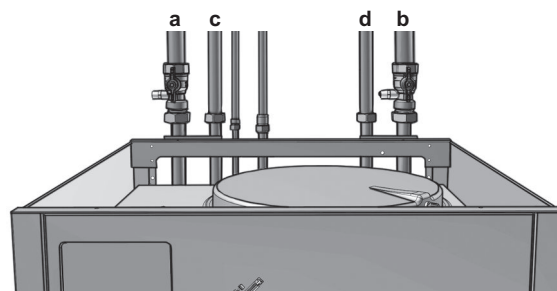


NOTICE

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/cooling water out
- b Space heating/cooling 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.

7 Installation

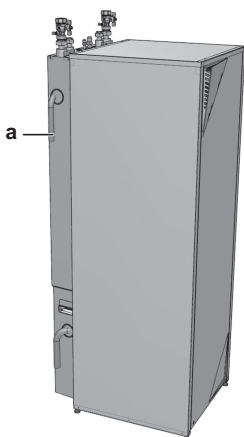


NOTICE

- 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.

7.3.2 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.

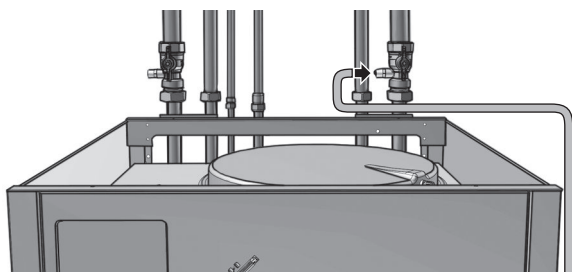


a Pressure relief blow-out

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

7.3.3 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 "14.2.1 Components: Indoor unit" on page 68.

- 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.



NOTICE

- Air in the water circuit can cause malfunctioning of the backup heater. During filling, it may not be possible to remove all the air from the circuit. Remaining air will be removed through the automatic air purge valves during the initial operating hours of the system. Additional filling with water afterwards may be required.
- To purge the system, use the special function as described in the chapter "9 Commissioning" on page 58. This function should be used to purge the heat exchanger coil of the domestic hot water tank.

- 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.

7.3.4 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.

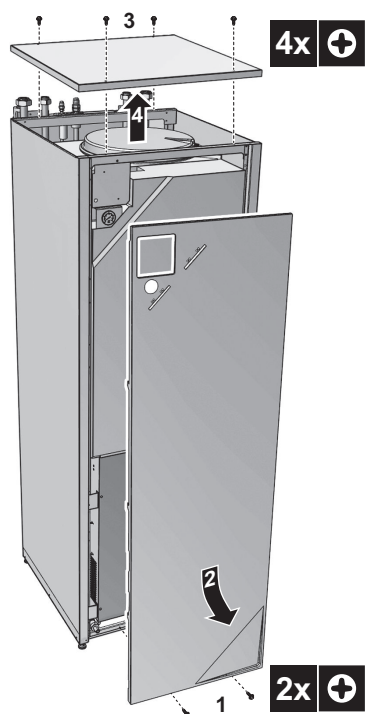
7.3.5 To insulate the water piping

The piping in the complete water circuit must be insulated to prevent condensation during cooling operation and reduction of the heating and cooling capacity.

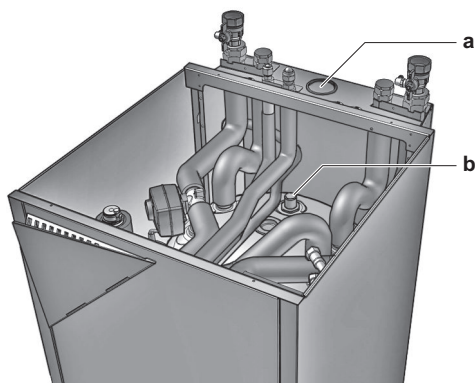
If the temperature is higher than 30°C and the humidity is higher than RH 80%, the thickness of the sealing materials should be at least 20 mm to prevent condensation on the surface of the sealing.

7.3.6 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.

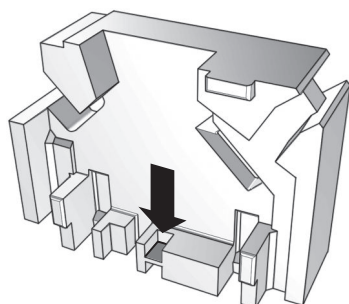


- 5 Remove the expansion vessel.
- 6 Remove the upper insulation cover of the unit.



- 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.

7.4 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 "14.5 Wiring diagram" on page 72.



WARNING

Always use multicore cable for power supply cables.

7.4.1 About electrical compliance

Only for ERLQ006CAV3+ERLQ008CAV3

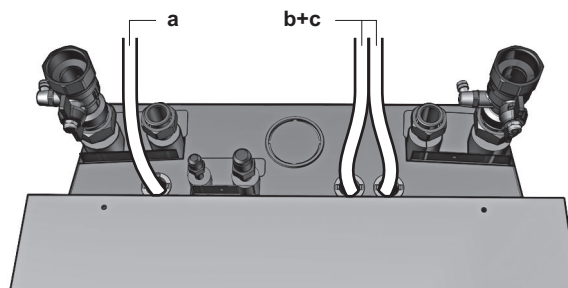
Equipment complying with EN/IEC 61000-3-12 (European/ International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤75 A per phase.).

Only for indoor units

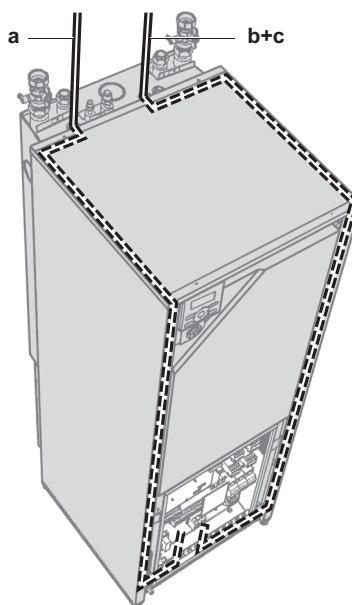
See "7.4.4 To connect the backup heater power supply" on page 29.

7.4.2 To connect the electrical wiring on the indoor unit

- 1 To open the indoor unit, see "7.1.1 To open the indoor unit" on page 24 and "7.1.2 To open the switch box cover of the indoor unit" on page 24.
- 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.

7 Installation



INFORMATION

Only applicable for indoor units with 260 liter tank. To access the domestic hot water temperature sensor, the switch box can be tilt. The switch box should NOT be removed from the unit.

| Routing | Possible cables (depending on unit type and installed options) |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a Low voltage | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Interconnection cable Normal kWh rate power supply Preferential kWh rate power supply Power supply for backup heater Power supply for bottom plate heater (option) |
| c High voltage control signal | <ul style="list-style-type: none"> 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 cool/heat operation control |



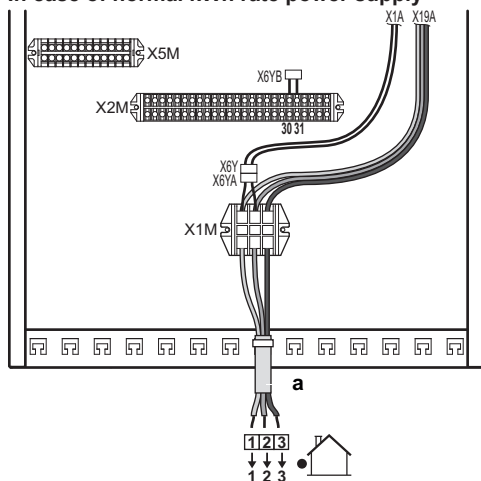
CAUTION

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

7.4.3 To connect the main power supply

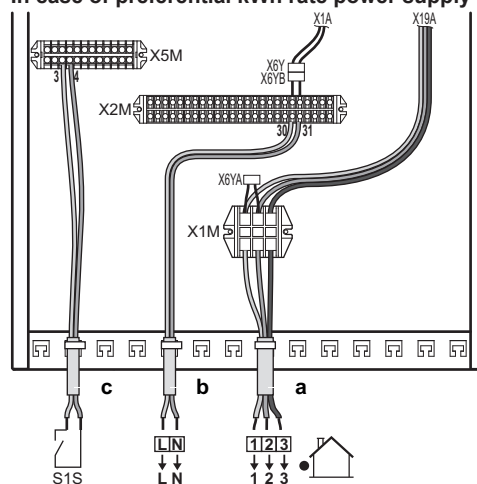
- 1 Connect the main power supply.

In case of normal kWh rate power supply



Legend: see illustration below.

In case of preferential kWh rate power supply



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

- 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.

7.4.4 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 | $Z_{\max}(\Omega)$ |
|--------------------|------------------------|--------------|-------------------------|--------------------|
| *3V | 3 kW | 1~ 230 V | 13 A | — |
| *9W | 3 kW | 1~ 230 V | 13 A | — |
| | 6 kW | 1~ 230 V | 26 A ^{(a)(b)} | 0.29 |
| | 6 kW | 3~ 230 V | 15 A ^(b) | — |
| | 6 kW | 3N~ 400 V | 8.6 A | — |
| | 9 kW | 3N~ 400 V | 13 A | — |

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

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

1 Connect the backup heater power supply.

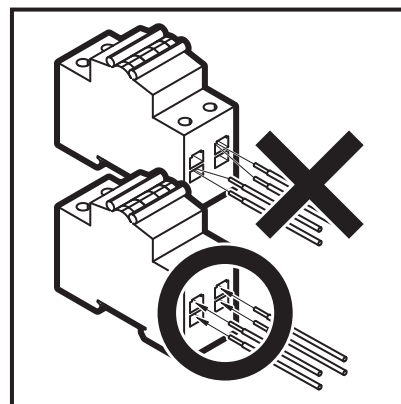
For *3V models, use a single pole fuse for F1B. For *9W models, use a double pole fuse for F1B.

| Backup heater type ^(a) | Connections to backup heater power supply | Connections to terminals |
|-----------------------------------|-------------------------------------------|--------------------------|
| 3 kW 1~ 230 V (*3V) | | — |
| 3 kW 1~ 230 V (*9W) | | |
| 6 kW 1~ 230 V (*9W) | | |
| 6 kW 3~ 230 V (*9W) | | |

| Backup heater type ^(a) | Connections to backup heater power supply | Connections to terminals |
|-----------------------------------|-------------------------------------------|--------------------------|
| 6 kW 3N~ 400 V (*9W) | | |
| 9 kW 3N~ 400 V (*9W) | | |

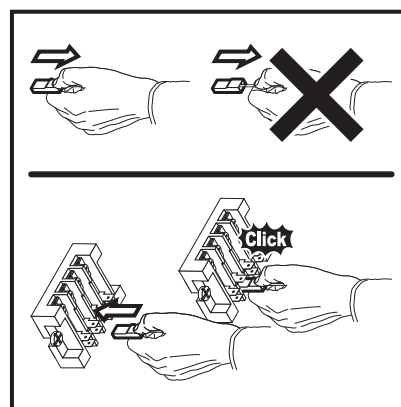
(a) For configuration of the backup heater, see "8.2.2 Quick wizard: Standard" on page 35.

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 35.

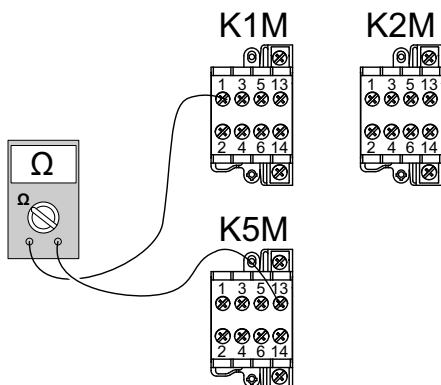
During connection of the backup heater, miswiring is possible. To detect possible miswiring, it is highly recommended to measure the resistance value of the heater elements. Depending on the different backup heater types, following resistance values (see table below) should be measured. ALWAYS measure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

| | | 3 kW 1~ 230 V | 6 kW 1~ 230 V | 6 kW 3~ 230 V | 6 kW 3N~ 400 V | 9 kW 3N~ 400 V |
|-------|--------|---------------------|---------------------|---------------------|----------------------|----------------------|
| K1M/1 | K5M/13 | 52.9Ω | 52.9Ω | 52.9Ω | ∞ | ∞ |
| | K1M/3 | ∞ | ∞ | ∞ | 105.8Ω | 105.8Ω |

7 Installation

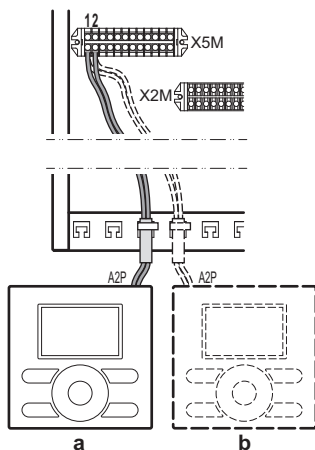
| | | 3 kW 1~ 230 V | 6 kW 1~ 230 V | 6 kW 3~ 230 V | 6 kW 3N~ 400 V | 9 kW 3N~ 400 V |
|-------|--------|---------------------|---------------------|---------------------|----------------------|----------------------|
| | K1M/5 | ∞ | ∞ | ∞ | 105.8Ω | 105.8Ω |
| K1M/3 | K1M/5 | 26.5Ω | 26.5Ω | 26.5Ω | 105.8Ω | 105.8Ω |
| K2M/1 | K5M/13 | ∞ | 26.5Ω | 26.5Ω | ∞ | ∞ |
| | K2M/3 | ∞ | ∞ | ∞ | 52.9Ω | 52.9Ω |
| | K2M/5 | ∞ | ∞ | ∞ | 52.9Ω | 52.9Ω |
| K2M/3 | K2M/5 | 52.9Ω | 52.9Ω | 52.9Ω | 52.9Ω | 52.9Ω |
| K1M/5 | K2M/1 | ∞ | ∞ | ∞ | ∞ | ∞ |

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



7.4.5 To connect the user interface

- 1 Connect the user interface cable to the indoor unit.

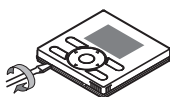


- a User interface delivered with the unit
b Optional user interface

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

To fix the user interface to the unit

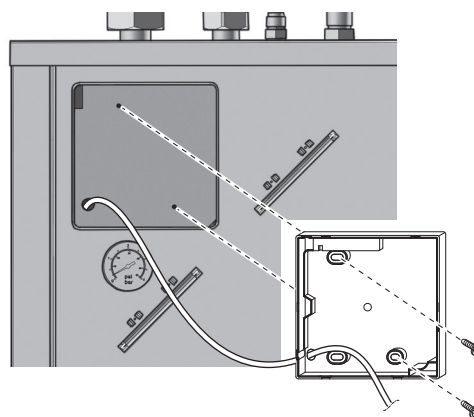
- 1 Insert a screwdriver into the slots underneath the user interface and carefully separate the faceplate from the wallplate.



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.

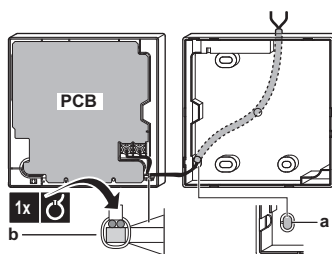


NOTICE

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.

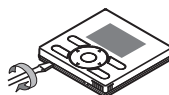
- 5 Reinstall the faceplate onto the wallplate.

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.

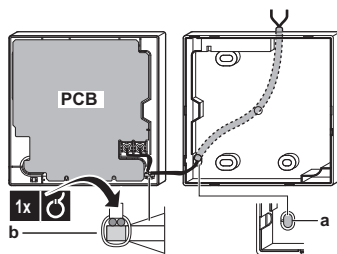


NOTICE

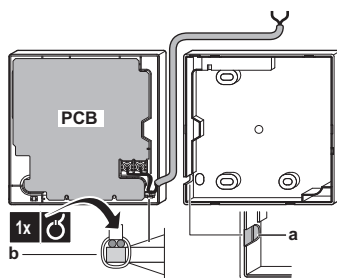
The PCB is mounted in the faceplate of the user interface. Be careful NOT to damage it.

- 2 Fix the wallplate of the user interface to the wall.
- 3 Connect the wires to the user interface as shown below

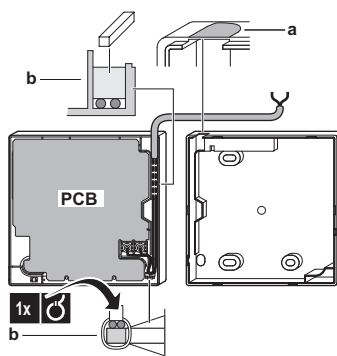
From the rear



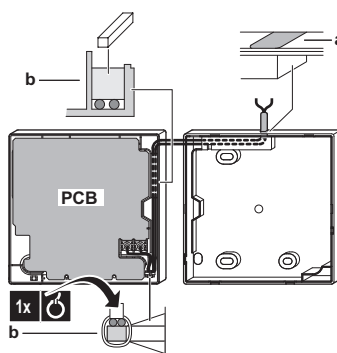
From the left



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.

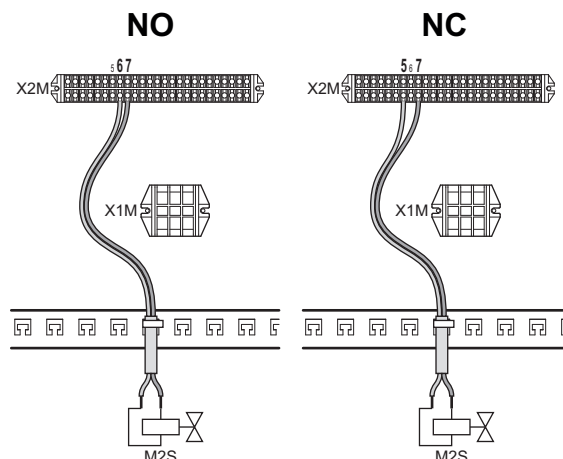
7.4.6 To connect the shut-off valve

- 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.

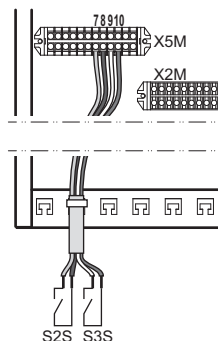
7.4.7 To connect the electrical meters



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.

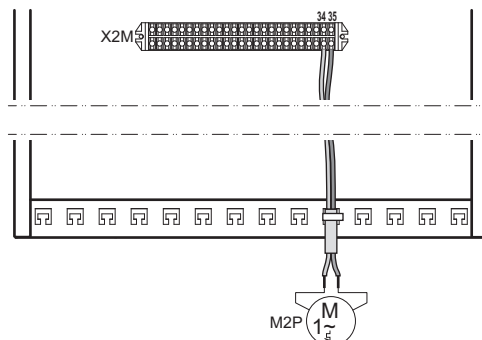
- 1 Connect the electrical meters cable to the appropriate terminals as shown in the illustration below.



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

7.4.8 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.

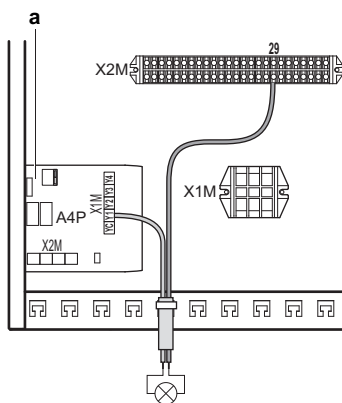


- 2 Fix the cable with cable ties to the cable tie mountings.

7 Installation

7.4.9 To connect the alarm output

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

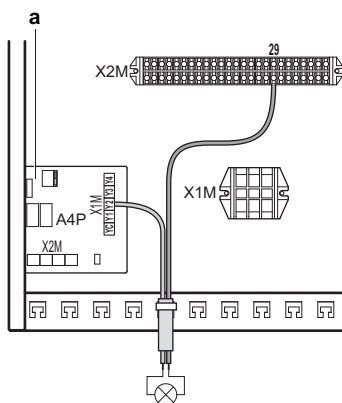


a Installation of EKR1HB is required.

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

7.4.10 To connect the space cooling/heating ON/OFF output

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

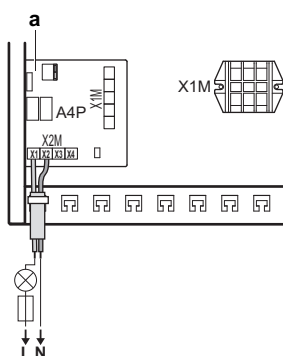


a Installation of EKR1HB is required.

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

7.4.11 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.

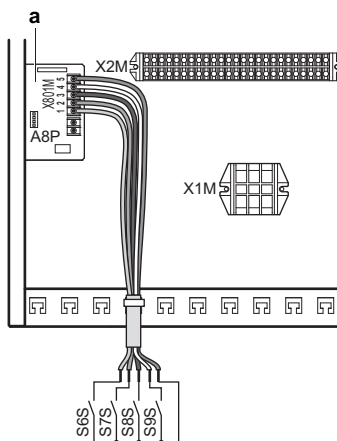


a Installation of EKR1HB is required.

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

7.4.12 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.



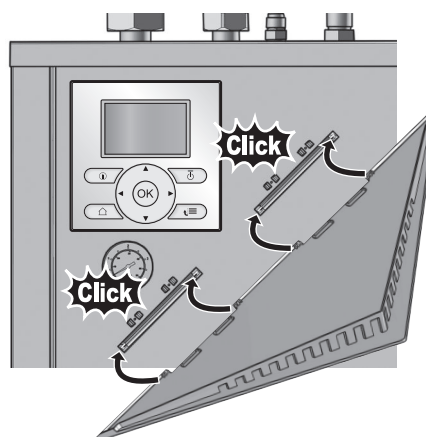
a Installation of EKR1AHTA is required.

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

7.5 Finishing the indoor unit installation

7.5.1 To fix the user interface cover to the indoor unit

- 1 Make sure that the front panel is removed from the indoor unit. See "7.1.1 To open the indoor unit" on page 24.
- 2 Plug the user interface cover into the hinges.



- 3 Mount the front panel to the indoor unit.

7.5.2 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 33 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.

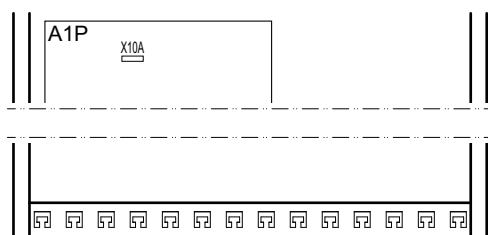
The most commonly used installation settings are accessible through the menu structure. Their location is mentioned by the breadcrumb indication (#). Additionally, all installer settings can also be found in "8.5 Menu structure: Overview installer settings" on page 57.

For access to the setting codes, see "To access the installer settings" on page 33.

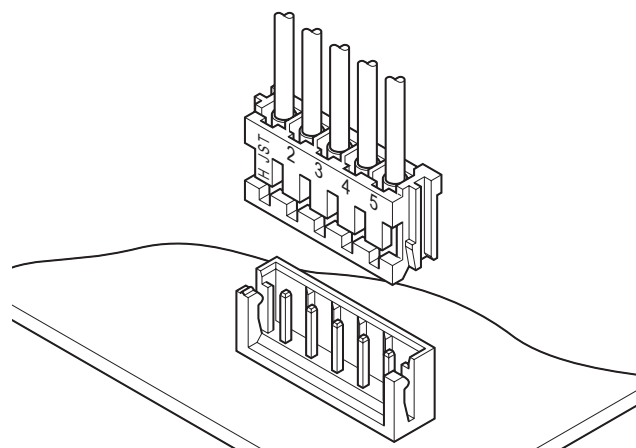
Not all settings are accessible through the menu structure. Some are only accessible through their code. Then in the table explained below, the bread crumb is set as N/A (not applicable).

8.1.1 To connect the PC cable to the switch box

- 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.

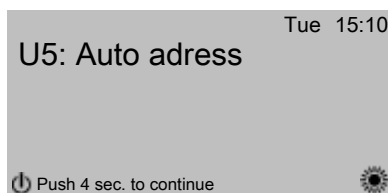
8.1.3 To copy the system settings from the first to the second user interface


If an optional user interface is connected, the installer must first proceed below instructions for the proper configuration of the two 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:

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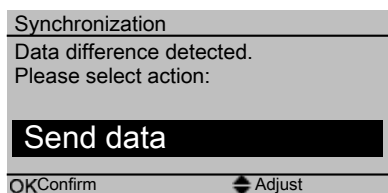
- 2 Push  for 4 sec. on the user interface on which you want to proceed to the quick wizard.



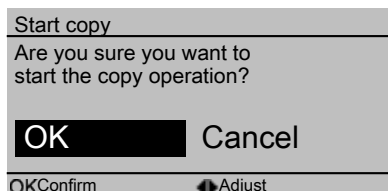
INFORMATION


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 doesn't 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  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 be possible to operate. Please do not power off or disconnect the user interface.
- The copy operation can take up to 90 minutes.

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

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

See "8.1.3 To copy the system settings from the first to the second user interface" on page 33.

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

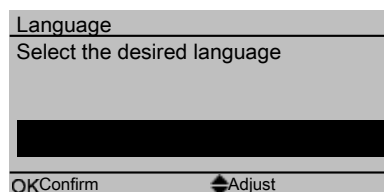
After first power ON of the system, you are guided on the user interface to do initial settings:

- language,

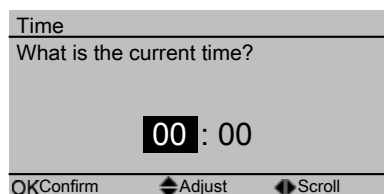
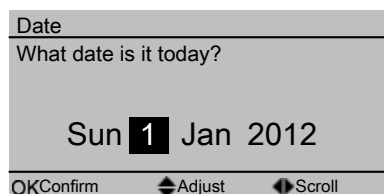
- date,
- time,
- system layout.

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

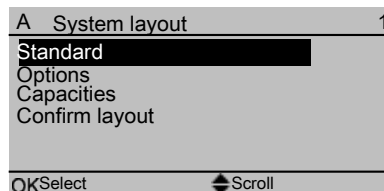
- 1 At power ON, the quick wizard starts as long as the system layout was NOT confirmed yet, by setting the language.



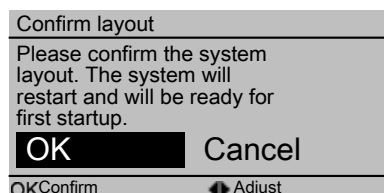
- 2 Set the current date and time.



- 3 Set the system layout settings: Standard, Options, Capacities. For more details, see "8.2 Basic configuration" on page 34.



- 4 Confirm by pressing .



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

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

8.2 Basic configuration

8.2.1 Quick wizard: Language / time and date

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

8.2.2 Quick wizard: Standard

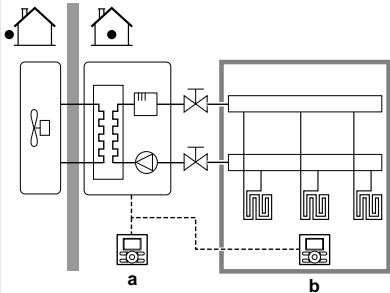
Backup heater configuration (only for *9W model)

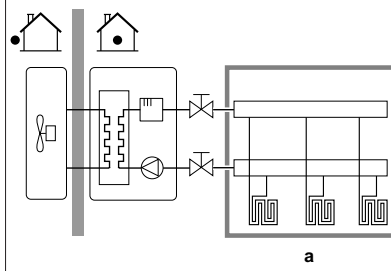
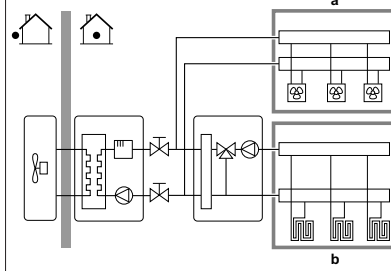
The backup heater in a *9W model is adapted to be connected to most common European electricity grids. Besides hardware configuration, the backup heater type must be set on the user interface.

| # | Code | Description |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.1.5] | [5-0D] | BUH type: <ul style="list-style-type: none"> 1 (1P,(1/1+2)): 6 kW 1~ 230 V (*9W) 3 (3P,(1/1+2)): 6 kW 3~ 230 V (*9W) 4 (3PN,(1/2)): 6 kW 3N~ 400 V (*9W) 5 (3PN,(1/1+2)): 9 kW 3N~ 400 V (*9W) |

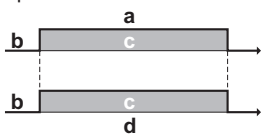
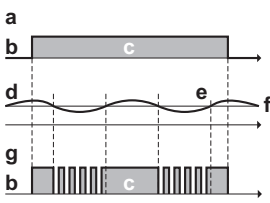
Space heating/cooling settings

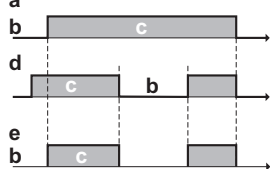
The system can heat up or cool down a space. Depending on the type of application, the space heating/cooling settings must be made accordingly.

| # | Code | Description |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.1.7] | [C-07] | Unit control method: <ul style="list-style-type: none"> 0 (LWT control): Unit operation is decided based on the leaving water temperature regardless the actual room temperature and/or heating or cooling 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. |
| [A.2.1.B] | N/A | Only if there are 2 user interfaces (1 installed in the room, 1 installed at the indoor unit):  <ul style="list-style-type: none"> a: At unit b: In room as room thermostat User interface location: <ul style="list-style-type: none"> 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. <p>Number of LWT zones:</p> <ul style="list-style-type: none"> 0 (1 LWT zone)(default): Only 1 leaving water temperature zone. This zone is called the main leaving water temperature zone.  <ul style="list-style-type: none"> a: Main LWT zone <ul style="list-style-type: none"> 1 (2 LWT zones): 2 leaving water temperature zones. The zone with the lowest leaving water temperature (in heating) is called the main leaving water temperature zone. The zone with the highest leaving water temperature (in heating) is called the additional leaving water temperature zone. In practice, the main leaving water temperature zone consists of the higher load heat emitters and a mixing station is installed to achieve the desired leaving water temperature.  <ul style="list-style-type: none"> a: Add LWT zone b: Main LWT zone |

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| # | Code | Description |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.1.9] | [F-0D] | <p>When the space heating/cooling control is OFF by the user interface, the pump is always OFF. When the space heating/cooling control is On, you can select the desired pump operation mode (only applicable during space heating/cooling)</p> <p>Pump operation mode:</p> <ul style="list-style-type: none"> 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.  <ul style="list-style-type: none"> a: Space heating/cooling control (user interface) b: OFF c: On d: Pump operation 1 (Sample)(default): The pump is ON. When there is heating or cooling demand as the 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 or cooling if necessary. Remark: Sample is NOT available in extended room thermostat control or room thermostat control.  <ul style="list-style-type: none"> a: Space heating/cooling control (user interface) b: OFF c: On d: LWT temperature e: Actual f: Desired g: Pump operation 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: |

| # | Code | Description |
|---|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <p>Request is NOT available in leaving water temperature control.</p>  <ul style="list-style-type: none"> a: Space heating/cooling control (user interface) b: OFF c: On d: Heating demand (by ext RT or RT) e: Pump operation |

8.2.3 Quick wizard: Options

Domestic hot water settings

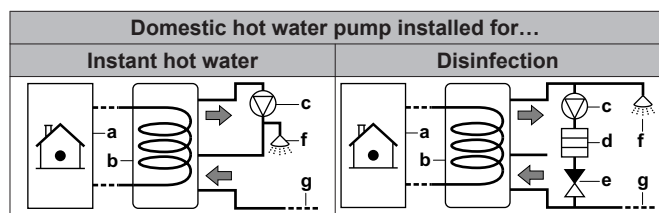
This chapter only applies to systems with a domestic hot water tank installed:

- EHBH/X: an optional domestic hot water tank is available,
- EHVH/X: a domestic hot water tank is standard incorporated into the indoor unit.

Following settings must be made accordingly.

| # | Code | Description |
|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.1] | [E-05] | <p>DHW operation:</p> <ul style="list-style-type: none"> 0 (No): NOT installed. Default for EHBH/X. 1 (Yes): Installed. Default for EHVH/X. Remark: For EHVH/X, the domestic hot water tank is by default installed. Do NOT change this setting. |
| [A.2.2.3] | [E-07] | <p>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.</p> <p>DHW tank heater:</p> <ul style="list-style-type: none"> 0 (Horizontal BSH): Installed at side of the tank. Default for EHBH/X. 1 (Backup heater): Default for EHVH/X. The backup heater will also be used in domestic hot water heating. |

| # | Code | Description |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.A] | [D-02] | <p>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.</p> <p>DHW pump:</p> <ul style="list-style-type: none"> 0 (No)(default): NOT installed. 1 (Secondary rtn): 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. <p>See also illustrations below.</p> |



- 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 7.

| # | Code | Description |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.4] | [C-05] | <p>Contact type main</p> <p>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 7.</p> <ul style="list-style-type: none"> 1 (Thermo ON/OFF): The connected external room thermostat or heat pump convector sends the heating or cooling 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 and cooling 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 (EKTR1) room thermostat. |

| # | Code | Description |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.5] | [C-06] | <p>Contact type add.</p> <p>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 7.</p> <ul style="list-style-type: none"> 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] | <p>External sensor</p> <p>When an optional external ambient sensor is connected, the type of the sensor must be set. See "5 Application guidelines" on page 7.</p> <ul style="list-style-type: none"> 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 7.

| # | Code | Description |
|-------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.6.1] | [C-02] | <p>Ext. backup heat src</p> <p>Indicates if the space heating is also performed by means of an other heat source that the system.</p> <ul style="list-style-type: none"> 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 auxiliary boiler is used. See "5 Application guidelines" on page 7. |
| [A.2.2.6.2] | [D-07] | <p>Solar kit</p> <p>Only applicable for EHBH/X. Indicates if the domestic hot water tank is also heated by thermal solar panels.</p> <ul style="list-style-type: none"> 0 (No)(default): NOT installed. 1 (Yes): Installed. The domestic hot water tank can –besides by the heat pump- also be heated by thermal solar panels. Set this value if thermal solar panels are installed. See "5 Application guidelines" on page 7. |

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| # | Code | Description |
|-------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.6.3] | [C-09] | Alarm output Indicates the logic of the alarm output on the digital I/O PCB during malfunctioning. <ul style="list-style-type: none"> 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. |
| [A.2.2.6.4] | [F-04] | Bottom plate heater Only applicable for EHBH/X16 and EHVH/X16. Indicates if an optional bottom plate heater is installed on the outdoor unit. The power of the bottom plate heater is in this case supplied by the indoor unit. <ul style="list-style-type: none"> 0 (No)(default): NOT installed. 1 (Yes): Installed. Remark: If this value is set, the output on the digital I/O PCB cannot be used for space heating/cooling output. See "5 Application guidelines" on page 7. |

Demand PCB

The demand PCB is used to enable the power consumption control by digital inputs. See "5 Application guidelines" on page 7.

| # | Code | Description |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.7] | [D-04] | Demand PCB Only applicable for EHBH/X04+08 and EHVH/X04+08. Indicates if the optional demand PCB is installed. <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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) |

| # | Code | Description |
|-----------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.2.9] | [D-09] | Optional external kWh meter 2: <ul style="list-style-type: none"> 0 (No): NOT installed 1: Installed (0.1 pulse/kWh) 2: Installed (1 pulse/kWh) 3: Installed (10 pulse/kWh) 4: Installed (100 pulse/kWh) 5: Installed (1000 pulse/kWh) |

8.2.4 Quick wizard: Capacities (energy metering)

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

| # | Code | Description |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.2.3.1] | [6-02] | Booster heater: Only applies to domestic hot water tanks with an internal booster heater (EKHW*). The capacity of the booster heater at nominal voltage. Nominal value is 3 kW. Default: 0. 0~10 kW (in steps of 0.2 kW) |
| [A.2.3.2] | [6-03] | BUH: step 1: The capacity of the first step of the backup heater at nominal voltage. Nominal value 3 kW. Default: 3 kW. 0~10 kW (in steps of 0.2 kW) |
| [A.2.3.3] | [6-04] | BUH: step 2: Only applies to a two-step backup heater (*9W). The capacity difference between the second and first step of the backup heater at nominal voltage. Nominal value depends on the backup heater configuration: <ul style="list-style-type: none"> 3 kW, 1N~ 230 V: 0 kW 6 kW, 1N~ 230 V: 3 kW (6 kW-3 kW) 6 kW, 3~ 230 V: 3 kW (6 kW-3 kW) 6 kW, 3N~ 400 V: 3 kW (6 kW-3 kW) 9 kW, 3N~ 400 V: 6 kW (9 kW-3 kW) 0~10 kW (in steps of 0.2 kW): <ul style="list-style-type: none"> *3V: default 0 kW *9W: default 6 kW |
| [A.2.3.6] | [6-07] | Bottom plate heater: Only applies to an optional bottom plate heater (EKBPHTH16A). The capacity of the optional bottom plate heater at nominal voltage. Default: 0 W. 0~200 W (in steps of 10 W) |

8.2.5 Space heating/cooling control

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

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

Leaving water temperature: Main zone

| # | Code | Description |
|-------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.3.1.1.1] | N/A | <p>LWT setpoint mode:</p> <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> weather-dependent (i.e. depends on the outdoor ambient temperature) fixed in time (i.e., not scheduled) Abs + scheduled: The desired leaving water temperature is: <ul style="list-style-type: none"> NOT weather-dependent (i.e., does NOT 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. WD + scheduled: The desired leaving water temperature is: <ul style="list-style-type: none"> 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] | <p>Set weather-dependent heating:</p> <p> <ul style="list-style-type: none"> T_t: Target leaving water temperature (main) T_a: Outdoor temperature [1-00]: Low outdoor ambient temperature. $-20^{\circ}\text{C} \sim 5^{\circ}\text{C}$ (default: -10°C) [1-01]: High outdoor ambient temperature. $10^{\circ}\text{C} \sim 20^{\circ}\text{C}$ (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. </p> |

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| # | Code | Description |
|-------------|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.3.1.1.4] | [1-06] [1-07] [1-08] [1-09] | <p>Set weather-dependent cooling:</p> <ul style="list-style-type: none"> ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature ▪ [1-06]: Low outdoor ambient temperature. 10°C~25°C (default: 20°C) ▪ [1-07]: High outdoor ambient temperature. 25°C~43°C (default: 35°C) ▪ [1-08]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature 5°C~22°C (default: 22°C). Note: This value should be higher than [1-09] as for low outdoor temperatures less cold water suffices. ▪ [1-09]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. Between minimum and maximum leaving water temperature 5°C~22°C (default: 18°C). Note: This value should be lower than [1-08] as for high outdoor temperatures colder 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 | <p>LWT setpoint mode:</p> <ul style="list-style-type: none"> ▪ Absolute (default) The desired leaving water temperature is: <ul style="list-style-type: none"> ▪ 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: <ul style="list-style-type: none"> ▪ weather-dependent (i.e. depends on the outdoor ambient temperature) ▪ fixed in time (i.e., not scheduled) ▪ Abs + scheduled: The desired leaving water temperature is: <ul style="list-style-type: none"> ▪ 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: <ul style="list-style-type: none"> ▪ 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] | <p>Set weather-dependent heating:</p> <ul style="list-style-type: none"> ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature ▪ [0-03]: Low outdoor ambient temperature. $-20^{\circ}\text{C}\sim 5^{\circ}\text{C}$ (default: -10°C) ▪ [0-02]: High outdoor ambient temperature. $10^{\circ}\text{C}\sim 20^{\circ}\text{C}$ (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 $25^{\circ}\text{C}\sim$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 $25^{\circ}\text{C}\sim$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. |

| # | Code | Description |
|-------------|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.3.1.2.4] | [0-04] [0-05] [0-06] [0-07] | <p>Set weather-dependent cooling:</p> <ul style="list-style-type: none"> ▪ T_t: Target leaving water temperature (main) ▪ T_a: Outdoor temperature ▪ [0-07]: Low outdoor ambient temperature. $10^{\circ}\text{C}\sim 25^{\circ}\text{C}$ (default: 20°C) ▪ [0-06]: High outdoor ambient temperature. $25^{\circ}\text{C}\sim 43^{\circ}\text{C}$ (default: 35°C) ▪ [0-05]: Desired leaving water temperature when the outdoor temperature equals or drops below the low ambient temperature. Between minimum and maximum leaving water temperature $5^{\circ}\text{C}\sim 22^{\circ}\text{C}$ (default: 12°C). Note: This value should be higher than [1-09] as for low outdoor temperatures less cold water suffices. ▪ [0-04]: Desired leaving water temperature when the outdoor temperature equals or rises above the high ambient temperature. Between minimum and maximum leaving water temperature $5^{\circ}\text{C}\sim 22^{\circ}\text{C}$ (default: 8°C). Note: This value should be lower than [1-08] as for high outdoor temperatures colder 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: $3\sim 10^{\circ}\text{C}$ (in steps of 1°C ; default value: 5°C). |
| [A.3.1.3.2] | [9-0A] | Cooling: required temperature difference between entering and leaving water. Range: $3\sim 10^{\circ}\text{C}$ (in steps of 1°C ; default value: 5°C). |

8 Configuration

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: <ul style="list-style-type: none"> 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 or cool down of a space can take longer. This setting can compensate for a slow or a quick heating/cooling system during the heat up/cool down cycle.

Note: The setting of the emitter type will influence the maximum modulation of the desired leaving water temperature and the possibility for usage of the automatic cooling/heating changeover based on the indoor ambient 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: <ul style="list-style-type: none"> Quick Example: Small water volume and fan coils. Slow Example: Large water volume, floor heating loops. |

8.2.6 Domestic hot water control

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

Configuring the desired tank temperature

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

| # | Code | Description |
|---------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.4.1] | [6-0D] | Domestic hot water Setpoint mode: <ul style="list-style-type: none"> 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 for more details" on page 46.



INFORMATION

It is recommended NOT to use the selection of ([6-0D]=0, [A.4.1] Domestic hot water Setpoint mode=Reheat only) in case of a domestic hot water tank without internal booster heater.

The risk of space heating (cooling) capacity shortage/comfort problems is significant (in case of frequent domestic hot water operation, frequent and long space heating/cooling 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 by 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 has the tank temperature to be displayed on the user interface? <ul style="list-style-type: none"> As temperature.  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]:  |
| [A.4.3.2.1] | N/A | 1 person The absolute desired tank temperature for 1 person. 30~80°C (default: 42°C) |

| # | Code | Description |
|-------------|------|------------------------------------------------------------------------------------------------------------------------|
| [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 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 <ul style="list-style-type: none"> [E-07]=0: 40~80°C (default: 60°C) (for EHBH/X in combination with EKH*) [E-07]=1: 40~60°C (default: 60°C) (only for EHVH/X) 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/cooling operation: advanced****Preset leaving water temperature**

You can define preset leaving water temperature temperatures:

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

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

**NOTICE**

The preset leaving water temperature 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) |
| [7.4.2.3] | [8-07] | Comfort (cooling) [9-03]~[9-02] (default: 18°C) |
| [7.4.2.4] | [8-08] | Eco (cooling) [9-03]~[9-02] (default: 20°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) |
| [7.4.2.7] | N/A | Comfort (cooling) -10~+10°C (default: 0°C) |
| [7.4.2.8] | N/A | Eco (cooling) -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 or too cold) leaving water temperature. Thereto the available desired heating temperature range and desired cooling temperature range can be configured.

8 Configuration



NOTICE

In case of a floor heating application it is important to limit the:

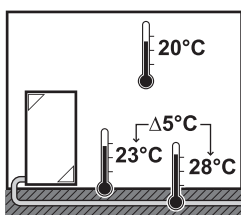
- maximum leaving water temperature at heating operation according to the specifications of the floor heating installation.
- the minimum leaving water temperature at cooling operation to 18~20°C to prevent condensation on the floor.



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 sufficient 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 and the highest leaving water temperature in cooling 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) |
| [A.3.1.1.2.4] | [9-02] | Maximum temp (cooling) 18~22°C (default: 22°C) |
| [A.3.1.1.2.3] | [9-03] | Minimum temp (cooling) 5~18°C (default: 5°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 and the lowest leaving water temperature in cooling 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) |
| [A.3.1.2.2.4] | [9-08] | Maximum temp (cooling) 18~22°C (default: 22°C) |

| # | Code | Description |
|---------------|--------|-------------------------------------------------|
| [A.3.1.2.2.3] | [9-07] | Minimum temp (cooling) 5~18°C (default: 5°C) |

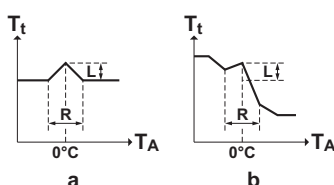
Leaving water temperature overshoot temperature

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, this compensation can be selected (see illustration below). Use this setting to compensate for possible heat losses of the building when the outdoor temperature is around 0°C (e.g. in cold region countries).



a Absolute desired LWT

b Weather dependent desired LWT

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

Weather dependent cooling allowance

Only applicable for EHBX and EHVX. It is possible to disable weather dependent cooling, meaning the desired leaving water temperature in cooling operation doesn't depend on the outdoor ambient temperature and this regardless whether weather dependent is selected or NOT. Both for the main leaving water temperature zone as for the additional leaving water temperature zone, this can be set separately.

| # | Code | Description |
|-----|--------|---------------------------------------------------------------------------------------------------------------------------|
| N/A | [1-04] | Weather dependent cooling of the main leaving water temperature zone is... 0 (disabled) (default) 1 (enabled) |
| N/A | [1-05] | Weather dependent cooling of the additional leaving water temperature zone is... 0 (disabled) (default) 1 (enabled) |

Temperature ranges (room temperature)

Only applicable in room thermostat control. In order to save energy by preventing overheating or undercooling the room, you can limit the range of the room temperature, both for heating and/or cooling.



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) |
| [A.3.2.1.4] | [3-08] | Maximum temp (cooling) 25~35°C (default: 35°C) |
| [A.3.2.1.3] | [3-09] | Minimum temp (cooling) 15~25°C (default: 15°C) |

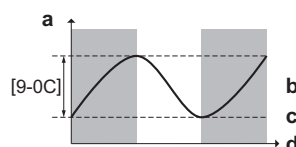
Room temperature step

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 <ul style="list-style-type: none"> 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 and/or demand of the room in 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 7.

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

Cooling: Only applicable for EHBX and EHVX. The shut-off valve closes, depending on [F-0C] when the unit is running in cooling operation mode. Enable this setting to avoid cold leaving water through the heat emitter and the forming of condensation (e.g. under floor heating loops or radiators).

| # | Code | Description |
|---------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.3.1.1.6.2] | [F-0C] | The shut-off valve: 0 (No): is NOT influenced by changing the space operation mode to cooling. 1 (Yes)(default): closes when the space operation mode is cooling. |

Operation range

Depending on the average outdoor temperature, the operation of the unit in space heating or space cooling 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] | <ul style="list-style-type: none"> EHBH/X04+08 and EHVH/X04+08: 14~25°C (default: 25°C) EHBH/X16 and EHVH/X16: 14~35°C (default: 35°C) <p>The same setting is also used in automatic heating/cooling changeover.</p> |

Space cooling On temp: Only applicable for EHBX and EHVX. When the averaged outdoor temperature drops below this value, space cooling is turned OFF.

| # | Code | Description |
|-----------|--------|---------------------------------------------------------------------------------------------------|
| [A.3.3.2] | [F-01] | 10~35°C (default: 20°C) The same setting is also used in automatic heating/cooling changeover. |

Automatic heating/cooling changeover

Only applicable for EHBX and EHVX. The end-user sets the

desired operation mode on the user interface: Heating, Cooling or Automatic (see also operation manual/user reference guide). When Automatic is selected, the changing of the operation mode is based on:

- Monthly allowance for heating and/or cooling: the end-user indicates on a monthly base which operation is allowed (# [7:5]): both heating/cooling or heating only or cooling only. If the allowed operation mode changes to cooling only, the operation mode changes to cooling. If the allowed operation mode changes to heating only, the operation mode changes to heating.
- Averaged outdoor temperature: the operation mode will be changed in order to always be within range determined by the space heating OFF temperature for heating and the space cooling On temperature for cooling. If the outdoor temperature drops, the operation mode switches to heating and vice versa. Note that the outdoor temperature will be time-averaged (see "8 Configuration" on page 33).

When the outdoor temperature is between the space cooling On and the space heating OFF temperature, the operation mode remains unchanged unless the system is configured in room thermostat control with one leaving water temperature zone and quick heat emitters. In that case, the operation mode will change based on:

- Measured indoor temperature: besides the heating and the cooling desired room temperature, the installer sets a hysteresis value (e.g. when in heating, this value is related to the desired cooling temperature) and an offset value (e.g. when in heating, this value is related to the desired heating temperature). Example: the desired room temperature in heating is 22°C and in cooling 24°C, with a hysteresis value of 1°C and an offset of 4°C. Changeover from heating to cooling will occur when the room temperature raises above the maximum of the desired cooling temperature added by the hysteresis value (thus 25°C) and the desired heating temperature added by the offset value (thus 26°C). Oppositely, changeover from cooling to heating will occur when the room temperature drops below the minimum of the desired heating temperature subtracted by the hysteresis value (thus 21°C) and the desired cooling temperature subtracted by the offset value (thus 20°C).
- Guard timer to prevent too frequent changing from heating to cooling and vice versa.

Changeover settings related to the outdoor temperature (only when automatic is selected):

| # | Code | Description |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.3.3.1] | [4-02] | Space heating OFF temp. If the outdoor temperature raises above this value, the operation mode will change to cooling: <ul style="list-style-type: none"> EHBH/X04+08 and EHVH/X04+08: 14~25°C (default: 25°C) EHBH/X16 and EHVH/X16: 14~35°C (default: 35°C) |
| [A.3.3.2] | [F-01] | Space cooling On temp. If the outdoor temperature drops below this value, the operation mode will change to heating: 10~35°C (default: 20°C) |

Changeover settings related to the indoor temperature. Only applicable when Automatic is selected and the system is configured in room thermostat control with 1 leaving water temperature zone and quick heat emitters.

| | | |
|-----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [4-0B] | Hysteresis: Ensures that changeover is only done when necessary. Example: the space operation mode only changes from cooling to heating when the room temperature drops below the desired heating temperature subtracted by the hysteresis. 1~10°C, step 0.5°C (default: 1°C) |
| N/A | [4-0D] | Offset: Ensures that the active desired room temperature can be reached. Example: if heating to cooling changeover would occur below the desired room temperature in heating, this desired room temperature could never be reached. 1~10°C, step 0.5°C (default: 1°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: Only applicable if the desired tank temperature is NOT weather dependent. The storage comfort temperature denotes the higher desired tank temperature, where the tank heat up cycle is prioritized till the reheat set point. It is the desired temperature when a storage comfort action is scheduled (preferably during night).

| # | 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 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/cooling 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: <ul style="list-style-type: none"> 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. |

| # | Code | Description |
|-----------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.4.2.3] | [0-0E] [0-0D] [0-0C] [0-0B] | <p>Weather-dependent curve</p> <ul style="list-style-type: none"> 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) |
| [A.4.2.1] | N/A | <p>Schedule temperatures</p> <p>The possible actions of the tank temperature are:</p> <ul style="list-style-type: none"> Presets (default): the predefined temperatures storage comfort, storage economic, and storage stop. The predefined temperature are set in the menu structure. Custom: custom temperatures within the allowable range and storage stop. <p>Note: When selecting this value, it is NOT possible to select weather dependent tank temperatures.</p> |

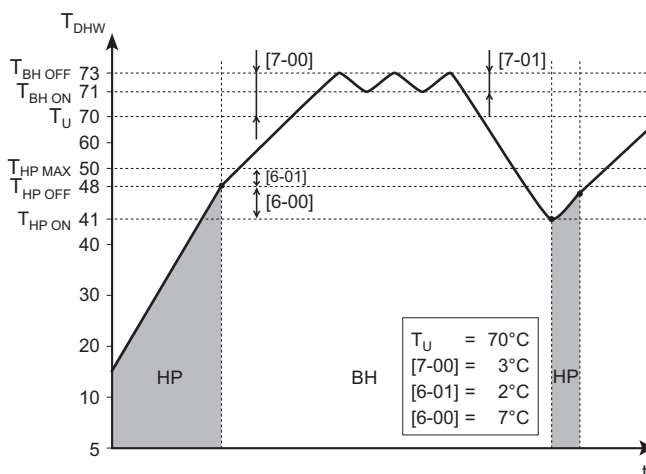
8 Configuration

Booster heater and heat pump operation

For systems with separate domestic hot water tank (only for EHBH/X)

| # | Code | Description |
|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [4-03] | <p>Defines the operation permission of the booster heater depending on ambient, domestic hot water temperature or operation mode of heat pump. This setting is only applicable in reheat mode for applications with separate domestic hot water tank.</p> <ul style="list-style-type: none"> 0: Booster heater operation is NOT allowed except for "Disinfection function" and "Powerful domestic water heating". Only use this in case the capacity of the heat pump can cover the heating requirements of the house and domestic hot water over the complete heating season. If the outdoor temperature is below setting [5-03] and [5-02]=1, the domestic hot water will not be heated. The domestic hot water temperature can be maximum the heat pump OFF temperature. 1: Booster heater operation is allowed when required. 2: The booster heater is allowed outside the operation range of the heat pump for domestic hot water operation. Booster heater operation is only allowed if: <ul style="list-style-type: none"> Ambient temperature is out of the operating range: $T_a < [5-03]$ or $T_a > 35^\circ\text{C}$ Domestic hot water temperature is 2°C lower than the heat pump OFF temperature. <p>The booster heater will be allowed to operate when $T_a < [5-03]$ depends of the status of [5-02].</p> <p>If bivalent operation is enabled and permission signal for auxiliary boiler is ON, the booster heater will be restricted even when $T_a < [5-03]$. See [C-02].</p> <ul style="list-style-type: none"> 3 (default): The booster heater is allowed when the heat pump is NOT active in domestic hot water operation. Same as setting 1, but simultaneous heat pump domestic hot water operation and booster heater operation is not allowed. <p>When setting [4-03]=1/2/3, the booster heater operation can still be restricted by the booster heater allowance schedule.</p> |
| N/A | [7-00] | <p>Overshoot temperature. Temperature difference above the domestic hot water set point temperature before the booster heater is turned OFF. The domestic hot water tank temperature will increase with [7-00] above selected temperature set point.</p> <p>Range: $0 \sim 4^\circ\text{C}$ (default: 0)</p> |
| N/A | [7-01] | <p>Hysteresis. Temperature difference between booster heater ON and booster heater OFF temperature. The minimum hysteresis temperature is 2°C.</p> <p>Range: $2 \sim 40^\circ\text{C}$ (default: 2)</p> |

| # | Code | Description |
|-----|--------|----------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [6-00] | <p>The temperature difference determining the heat pump ON temperature.</p> <p>Range: $2 \sim 20^\circ\text{C}$ (default: 2)</p> |
| N/A | [6-01] | <p>The temperature difference determining the heat pump OFF temperature.</p> <p>Range: $0 \sim 10^\circ\text{C}$ (default: 2)</p> |



BH Booster heater

HP Heat pump. If heating up time by the heat pump takes too long, auxiliary heating by the booster heater can take place

$T_{BH\ OFF}$ Booster heater OFF temperature ($T_U + [7-00]$)

$T_{BH\ ON}$ Booster heater ON temperature ($T_{BH\ OFF} - [7-01]$)

$T_{HP\ MAX}$ Maximum heat pump temperature at sensor in domestic hot water tank

$T_{HP\ OFF}$ Heat pump OFF temperature ($T_{HP\ MAX} - [6-01]$)

$T_{HP\ ON}$ Heat pump ON temperature ($T_{HP\ OFF} - [6-00]$)

T_{DHW} Domestic hot water temperature

T_U User set point temperature (as set on the user interface)

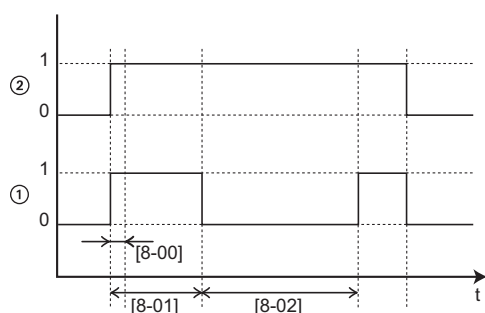
t Time

Timers

| # | Code | Description |
|-----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [8-00] | <p>Minimum running time for domestic hot water operation. During this time, space heating/cooling is NOT allowed, even when the target domestic hot water temperature has been reached.</p> <p>Range: $0 \sim 20$ minutes (default: 5)</p> |
| N/A | [8-01] | <p>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].</p> <ul style="list-style-type: none"> When system layout = Room thermostat control: This preset value is only taken into account if there is a request for space heating or cooling. If there is NO request for space heating/cooling, the tank is heated until heat pump OFF temperature. When system layout \neq Room thermostat control: This preset value is always taken into account. <p>Range: $5 \sim 95$ minutes (default: 30)</p> |

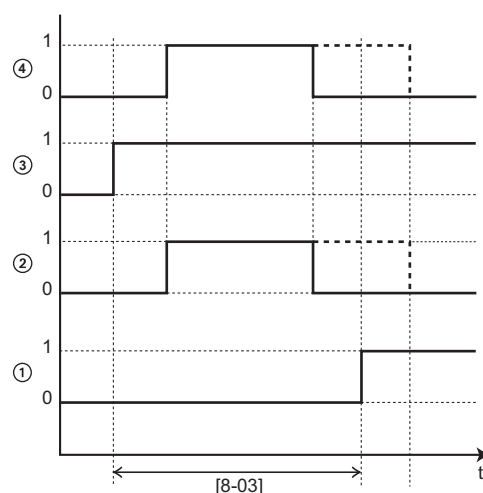
| # | Code | Description |
|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [8-02] | <p>Anti-recycling time.</p> <p>Minimum time between two cycles for domestic hot water. The actual anti-recycling time also depends on setting [8-04].</p> <p>Range: 0~10 hours (default: 3) (step: 1/2 hour) (only for EHBH/X).</p> <p>Range: 0~10 hours (default: 0.5) (step: 1/2 hour) (only for EHVH/X).</p> |
| N/A | [8-03] | <p>Booster heater delay timer.</p> <p>Only for EKH*W</p> <p>Start-up delay time for the booster heater when domestic hot water mode is active.</p> <ul style="list-style-type: none"> When domestic hot water mode is NOT active, the delay time is 20 minutes. The delay time starts from booster heater ON temperature. By adapting the booster heater delay time versus the maximum running time, you can find an optimal balance between the energy efficiency and the heat up time. If the booster heater delay time is set too high, it might take a long time before the domestic hot water reaches its set temperature. The setting [8-03] is only meaningful if setting [4-03]=1. Setting [4-03]=0/2/3 limits the booster heater automatically in relation to heat pump operation time in domestic water heating mode. Make sure that [8-03] is always in relation with the maximum running time [8-01]. <p>Range: 20~95 minutes (default: 50).</p> |
| N/A | [8-04] | <p>Additional running time for the maximum running time depending on the outdoor temperature [4-02] or [F-01].</p> <p>Range: 0~95 minutes (default: 95).</p> |

[8-02]: Anti-recycling time



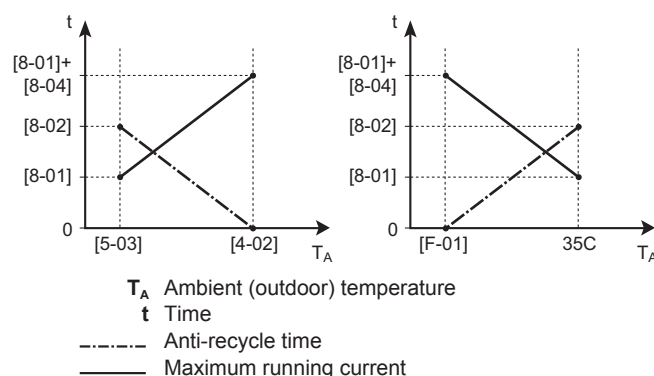
- Heat pump domestic water heating mode (1=active, 0=not active)
 - Hot water request for heat pump (1=request, 0=no request)
- t Time

[8-03]: Booster heater delay timer



- Booster heater operation (1=active, 0=not active)
 - Heat pump domestic water heating mode (1=active, 0=not active)
 - Hot water request for booster heater (1=request, 0=no request)
 - Hot water request for heat pump (1=request, 0=no request)
- t Time

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



Disinfection

Applies only to installations with a domestic hot water tank.

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



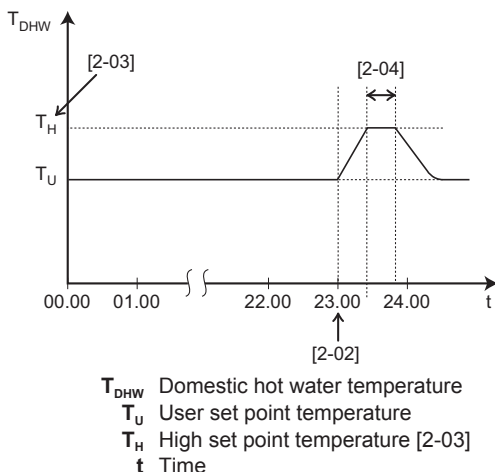
CAUTION

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

| # | Code | Description |
|-----------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.4.4.2] | [2-00] | <p>Operation day:</p> <ul style="list-style-type: none"> Each day Monday Tuesday Wednesday Thursday Friday Saturday Sunday |
| [A.4.4.2] | [2-01] | <p>Disinfection</p> <ul style="list-style-type: none"> No Yes |

8 Configuration

| # | Code | Description |
|-----------|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.4.4.3] | [2-02] | Start time: 00~23:00, step: 1:00. |
| [A.4.4.4] | [2-03] | Temperature target: <ul style="list-style-type: none"> With booster heater: 55~80°C, default: 70°C. Without booster heater: 60°C (fixed). |
| [A.4.4.5] | [2-04] | Duration: <ul style="list-style-type: none"> With booster heater: 5~60 minutes, default: 10 minutes. Without booster heater: 40~60 minutes, default: 60 minutes. |



WARNING

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

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



CAUTION

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



CAUTION

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



INFORMATION

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

- When the Domestic hot water > 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.



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

For systems without domestic hot water tank or with separate domestic hot water tank (only for EHBH/X)

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

For systems with an integrated domestic hot water tank (only for EHVH/X)

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: <ul style="list-style-type: none"> 0: Disabled 1: Enabled 2: Limited, only enabled during domestic hot water operation of for system with integrated domestic hot water tank. |
| [A.5.1.2] | [4-06] | Defines if during emergency operation the backup heater is: <ul style="list-style-type: none"> 1: Allowed 0: NOT allowed Emergency operation will startup backup heater operation during certain outdoor malfunctions. |
| [A.5.1.3] | [4-07] | Defines whether backup heater second step is: <ul style="list-style-type: none"> 1: Allowed 0: NOT allowed In this way it is possible to limit the backup heater capacity. |
| N/A | [5-00] | Is backup heater operation allowed above equilibrium temperature during space heating operation? <ul style="list-style-type: none"> 1: NOT allowed 0: Allowed |

| # | Code | Description |
|-----------|--------|--------------------------------------------------------------------------------------------------------|
| [A.5.1.4] | [5-01] | Equilibrium temperature. Outdoor temperature below which operation of the backup heater is allowed. |

**INFORMATION**

Only for systems with integrated domestic hot water tank: If the storage temperature set point is higher than 50°C, Daikin recommends NOT to disable the backup heater second step because it will have a big impact on the required time for the unit to heat up the domestic hot water tank.

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 Daikin indoor unit or an auxiliary boiler.

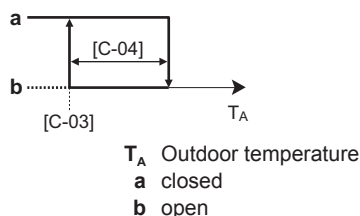
The field setting "bivalent operation" apply only the indoor unit space heating operation and the permission signal for the auxiliary boiler.

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 EKR1HB) 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 (EKR1HB)

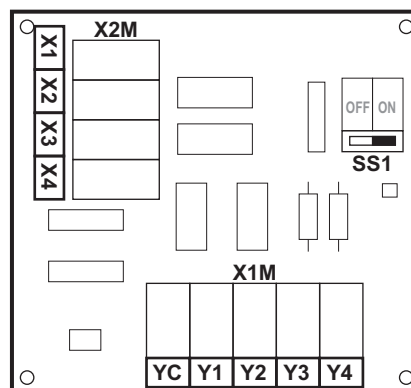
**CAUTION**

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

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

**INFORMATION**

- The combination of setting [4-03]=0/2 with bivalent operation at low outdoor temperature can result in domestic hot water shortage.
- The bivalent operation function has no impact on the domestic water heating mode. The domestic hot water is still and only heated by the indoor unit.
- The permission signal for the auxiliary boiler is located on the EKR1HB (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.

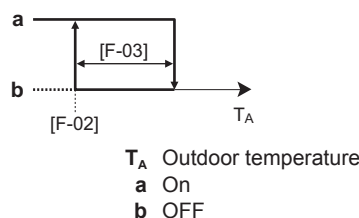


| # | Code | Description |
|-----|--------|----------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [C-03] | ON temperature. If the outdoor temperature drops below this temperature, the bivalent heat source permission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

Bottom plate heater

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

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

Bottom plate heater**CAUTION**

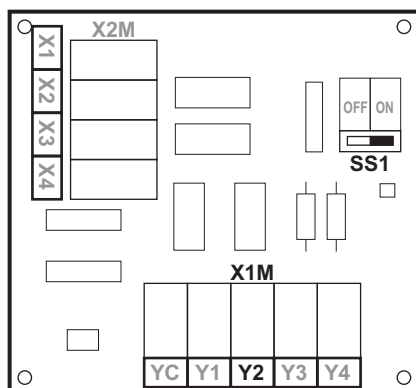
The bottom plate heater is controlled via EKR1HB.

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

**INFORMATION**

Dependent from setting [F-04] contact Y2 located on digital I/O PCB (EKR1HB) controls the option bottom plate heater. See illustration below for the schematic location of this contact. For complete upwiring, see "14.5 Wiring diagram" on page 72.

8 Configuration



8.3.4 System settings

Priorities

For systems with separate domestic hot water tank (only for EHBH/X)

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

| # | Code | Description |
|-----------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.6.1.1] | [C-01] | If there is a simultaneous demand for space heating/cooling 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/cooling has priority. |

For systems with an integrated domestic hot water tank (only for EHVH/X)

| # | 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/cooling 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/cooling 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] | <p>Connection to a preferential kWh rate power supply:</p> <ul style="list-style-type: none"> 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 close and the unit will restart operation. Therefore, always enable the auto restart function. |
| [A.6.2.1] | [d-00] | <p>Which heaters are allowed to operate during preferential kWh rate power supply?</p> <ul style="list-style-type: none"> 0 (default): None 1: Booster heater only 2: Backup heater only 3: All heaters <p>Only for EHBH/X + EKHV*: See table below.</p> <p>Only for EHVH/X: See table below.</p> <p>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 and booster heater are NOT connected to the preferential kWh rate power supply.</p> |

Only for EHBH/X + EKHV*:

| [d-00] | Booster heater | Backup heater | Compressor |
|-------------|----------------|---------------|------------|
| 0 (default) | Forced OFF | Forced OFF | Forced OFF |
| 1 | Permitted | | |
| 2 | Forced OFF | Permitted | |
| 3 | Permitted | | |

Only for EHVH/X: Do NOT use 1 or 3.

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

Power saving function



INFORMATION

Only applicable for ERLQ004~008CAV3.

Defines whether the outdoor unit power supply can be interrupted (internally by indoor unit control) during stand-still conditions (no space heating/cooling 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.

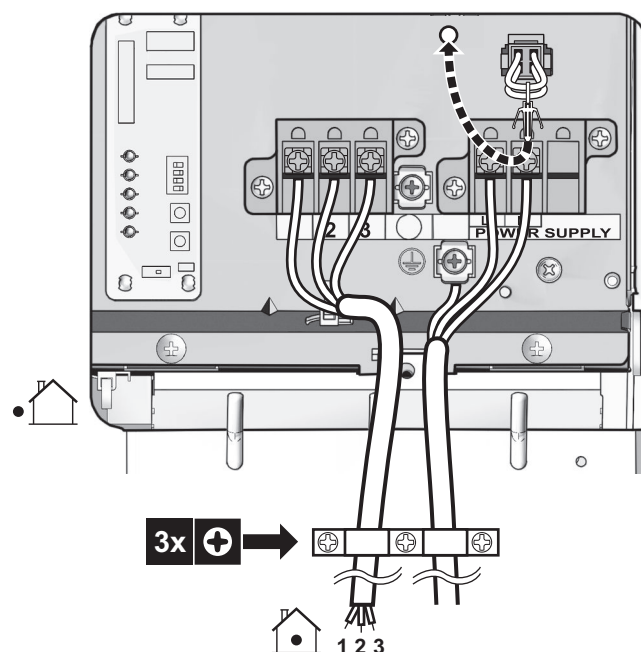
To enable the power saving function setting, [E-08] needs to be enable at the user interface in combination with the removal of the power saving connector at the outdoor unit.



NOTICE

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

In case of ERLQ004~008CAV3



| # | Code | Description |
|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [E-08] | <p>Power saving function for outdoor unit:</p> <ul style="list-style-type: none"> 0: Disabled 1 (default): Enabled |

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

Do NOT change the default setting.

| # | Code | Description |
|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [E-08] | <p>Power saving function for outdoor unit:</p> <ul style="list-style-type: none"> 0 (default): Disabled 1: Enabled |

Power consumption control

Only applicable for EHBH/X04+08 + EHVH/X04+08. See "5 Application guidelines" on page 7 for detailed information about this functionality.

Pwr consumpt. control

8 Configuration

| # | Code | Description |
|---------------------------------------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.6.3.1] | [4-08] | Mode: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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) |
| Priority: Only applicable in case of an optional EKHV*. | | |

| # | Code | Description |
|-----------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.6.3.7] | [4-01] | Power consumption control DISABLED [4-08]=0 <ul style="list-style-type: none"> 0 (None)(default): Backup heater and booster heater can operate simultaneously. 1 (BSH): The booster heater is prioritized. 2 (BUH): The backup heater is prioritized. Power consumption control ENABLED [4-08]=1 or 2 <ul style="list-style-type: none"> 0 (None)(default): Depending on the power limitation level, the booster heater will be limited first, before the backup heater is limited. 1 (BSH): Depending on the power limitation level, the backup heater will be limited first, before the booster heater is limited. 2 (BUH): Depending on the power limitation level, the booster heater will be limited first, before the backup heater is limited. |

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

In case of power consumption control is ENABLED (only for EHBH/X04+08 and EHVH/X04+08), the setting [4-01] defines the priority of the electrical heaters depending on applicable limitation.

| # | Code | Description |
|-----------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [A.6.3.7] | [4-01] | <ul style="list-style-type: none"> 0 (None)(default): No heater is prioritized. If the power consumption control is enabled, the booster heater will be limited first. 1 (BSH): The booster heater is prioritized. If the power consumption control is enabled, the backup heater (step 1 and/or step 2) will be limited first, before the booster heater is limited. 2 (BUH): The backup heater is prioritized. If the power consumption control is enabled, the booster heater will be limited first, before the backup heater is limited. |

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: <ul style="list-style-type: none"> No averaging (default) 12 hours 24 hours 48 hours 72 hours |

**INFORMATION**

If the power saving function is activated (see [E-08]), the average outdoor temperature calculation is only possible in case the external outdoor temperature sensor is used. See "5.7 Setting up an external temperature sensor" on page 19.

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] or if the outdoor temperature drops below the value set by [F-01]. When the pump operation is enabled, the pump operation is possible at all outdoor temperatures.

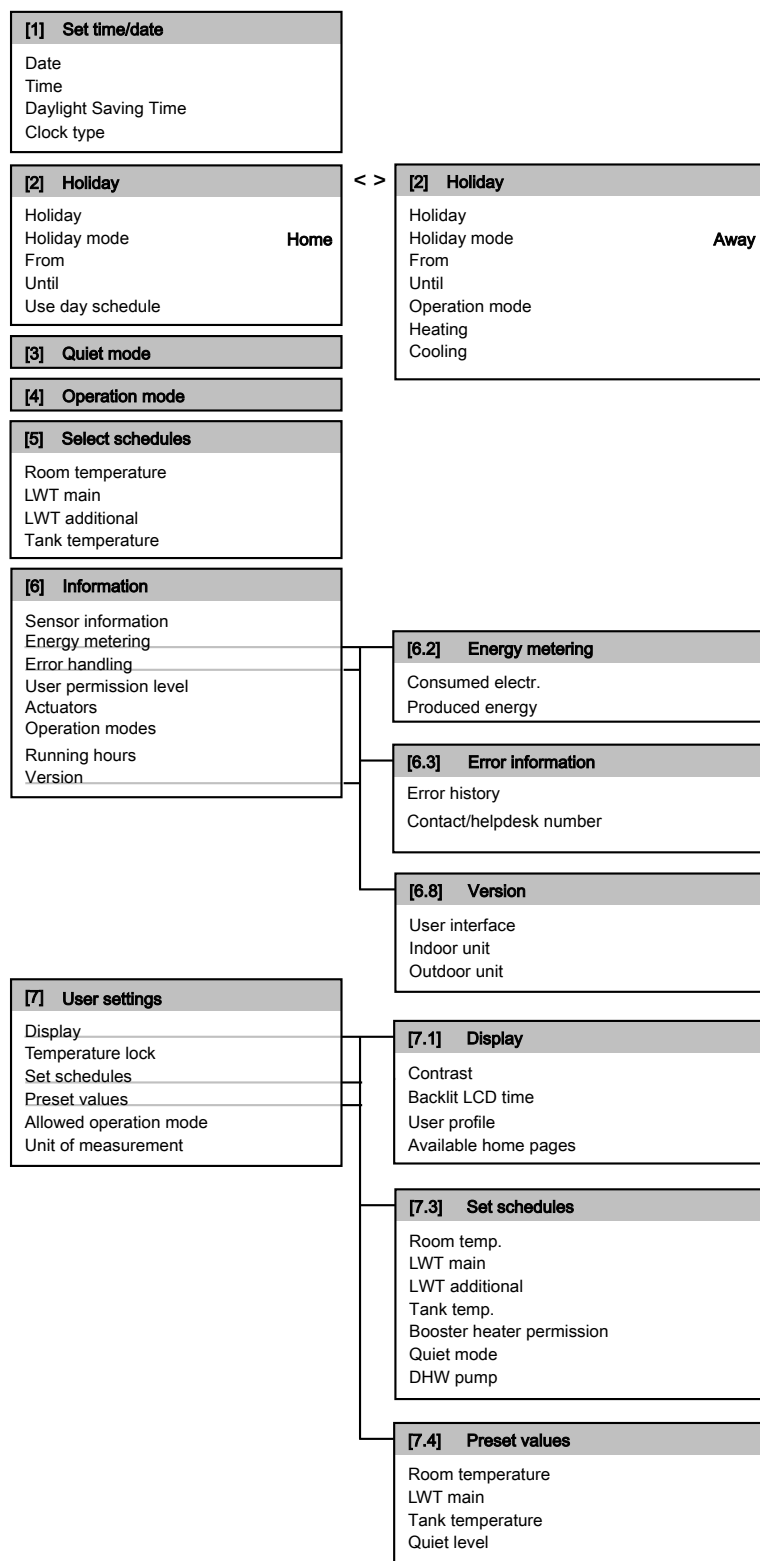
| # | Code | Description |
|-----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [F-00] | Pump operation: ▪ 0: Disabled if outdoor temperature is higher than [4-02] or lower than [F-01] depending on heating/cooling operation mode. ▪ 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 $T_a < 4^\circ\text{C}$ (pump will be activated for 10 minutes and disactivated after 10 minutes). Daikin shall NOT be held liable for any damage resulting this functionality.

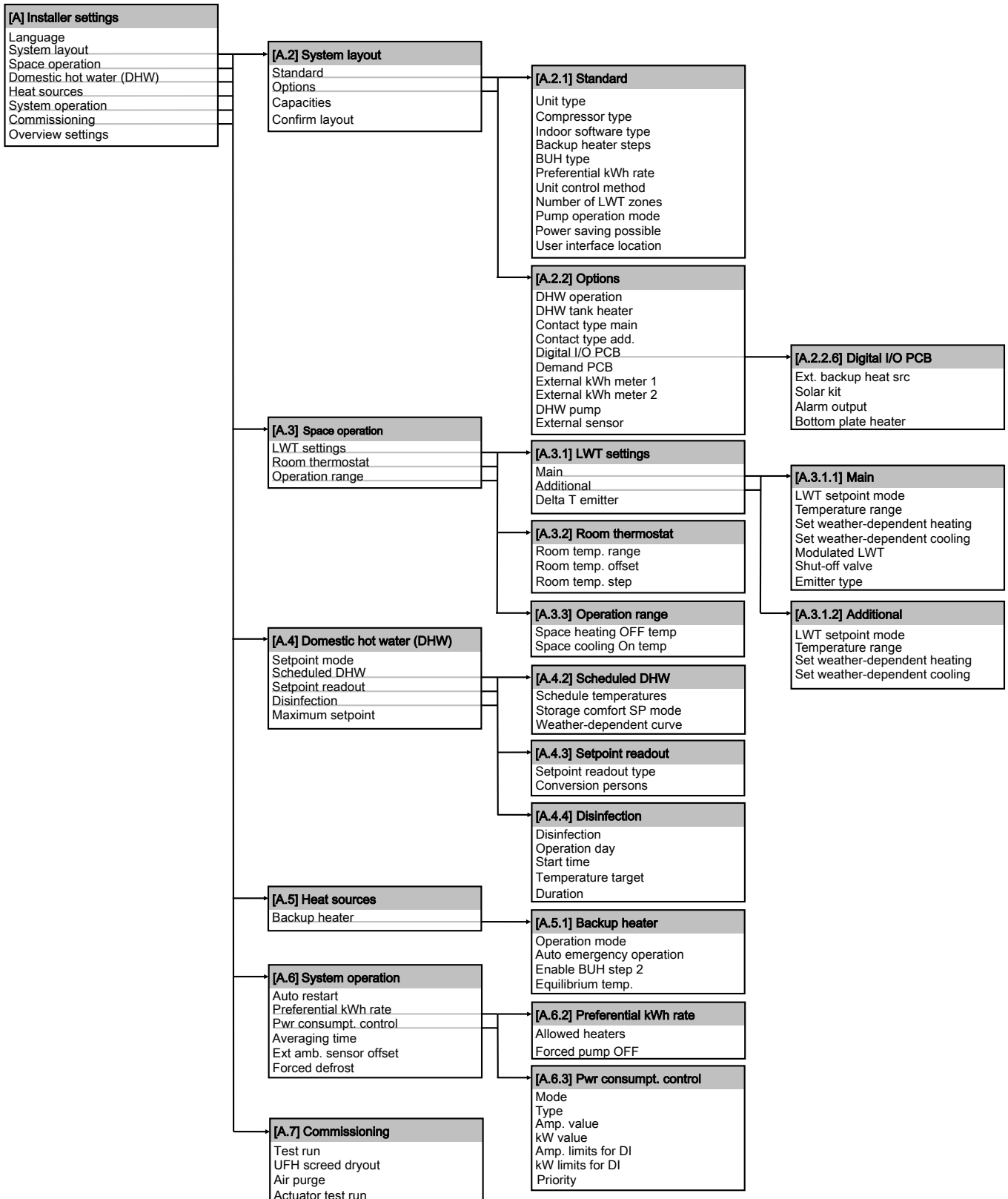
| # | Code | Description |
|-----|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A | [F-09] | Pump continue operation when flow abnormality: ▪ 0: Pump will be desactivated. ▪ 1: Pump will be activated when $T_a < 4^\circ\text{C}$ (10 minutes ON – 10 minutes OFF) |

8 Configuration

8.4 Menu structure: Overview



8.5 Menu structure: Overview installer settings



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 originates from the compressor that needs elapse of a 50 hours run in period before reaching smooth operation and stable power consumption.
- Before startup, the installation must be powered for at least 2 hours to allow crankcase heater to operate.

9.1 Overview: Commissioning

Commissioning typically consists of the following stages:

- Checking the "Checklist before test run".
- Performing an air purge.
- Performing a test run for the system.
- If necessary, performing a test run for one or more actuators.
- 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:

| | |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | The indoor unit is properly mounted. |
| <input type="checkbox"/> | The outdoor unit is properly mounted. |
| <input type="checkbox"/> | The following field wiring has been carried out according to this document and the applicable legislation: <ul style="list-style-type: none"> 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) |
| <input type="checkbox"/> | The system is properly earthed and the earth terminals are tightened. |
| <input type="checkbox"/> | The fuses or locally installed protection devices are according to this document, and have not been bypassed. |
| <input type="checkbox"/> | The power supply voltage on the local supply panel is according to the voltage on the identification label of the unit. |
| <input type="checkbox"/> | There are NO loose connections or damaged electrical components in the switch box. |
| <input type="checkbox"/> | There are NO damaged components or squeezed pipes on the inside of the indoor and outdoor units. |
| <input type="checkbox"/> | Depending on the backup heater type, the backup heater circuit breaker F1B or F3B on the switch box is turned ON. |
| <input type="checkbox"/> | Only for tanks with built-in booster heater: The booster heater circuit breaker F2B on the switch box is turned ON. |
| <input type="checkbox"/> | There are NO refrigerant leaks . |
| <input type="checkbox"/> | The refrigerant pipes (gas and liquid) are thermally insulated. |
| <input type="checkbox"/> | The correct pipe size is installed and the pipes are properly insulated. |
| <input type="checkbox"/> | There is NO water leak inside the indoor unit. |

| | |
|--------------------------|-----------------------------------------------------------------------------|
| <input type="checkbox"/> | The shut-off valves are properly installed and fully open. |
| <input type="checkbox"/> | The stop valves (gas and liquid) on the outdoor unit are fully open. |
| <input type="checkbox"/> | The air purge valve is open (at least 2 turns). |
| <input type="checkbox"/> | The pressure relief valve purges water when opened. |



NOTICE

Before starting up the system, the unit must be energized 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 remove of air in the water circuit will start.

There are 2 modes to purge 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 space heating or domestic hot water heating mode. The operation speed of the pump (slow or quick) can also be set.
- Automatic: the unit change automatically the pump speed and the position of the 3-way valve between space heating or domestic hot water heating mode.

The air purge function stops automatically after 30 minutes.



INFORMATION


It is recommended to start the air purge function in manually mode. When almost all 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

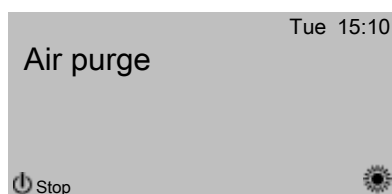
- Set the user permission level to Installer. See "To set the user permission level to Installer" on page 33.
- Set the air purge mode: go to [A.7.3.1] > Installer settings > Commissioning > Air purge > Type.
- Select Manual and press **OK**.
- Set the desired pump speed: go to [A.7.3.2] > Installer settings > Commissioning > Speed.
- Select the desired pump speed and press **OK**.
Result: Low
Result: High
- If applicable, select the desired position of the 3-way valve. If not applicable, go to [A.7.3.4].
- Set the desired position of the 3-way valve: go to [A.7.3.3] > Installer settings > Commissioning > Air purge > Circuit.
- Select the desired circuit and press **OK**.

Result: SHC



Result: Tank

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

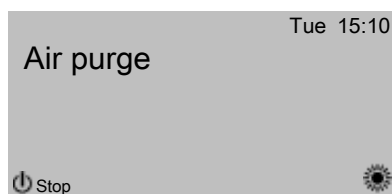
Result: Air purging is started and following screen will be shown.



9.3.2 To perform an automatic air purge

- Set the user permission level to Installer. See "To set the user permission level to Installer" on page 33.
- Set the air purge mode: go to [A.7.3.1]  > Installer settings > Commissioning > Air purge > Type.
- Select Automatic and press **OK**.
- 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 started and following screen will be shown.




9.3.3 To interrupt air purge

- Go to [A.7.3].
- Press  and press **OK** to confirm the air purge function.

9.4 To perform a test run

- Go to [A.7.1]:  > Installer settings > Commissioning > Test run.
- Select a test and press **OK**.
Example: Heating.
- 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 two user interfaces are present, you can start a test run from both user interfaces.


- The user interface that you used to start the test run displays a status screen.
- The other user interface displays a busy screen. During busy screen, you cannot stop the test run.


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 (heating/cooling mode) and tank temperature (domestic hot water mode).

For monitoring 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).

- Make sure the room temperature control, the leaving water temperature control and the domestic hot water control are turned OFF via the user interface.
- Go to [A.7.4]:  > Installer settings > Commissioning > Actuator test run.
- Select an actuator and press **OK**.
Example: Pump.
- Select OK and press **OK**.

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

9.5.1 Possible actuator test runs

- Booster heater test
- Backup heater (step 1) test
- Backup heater (step 2) test
- Pump test
- Solar pump test
- 2-way valve test
- 3-way valve test
- Bottom plate heater test
- Bivalent signal test
- Alarm output test
- Cooling/heating signal test
- Quick heatup test
- Circulation pump test

9.6 Underfloor heating screed dryout

This function will be used to dry-out the screed of an underfloor heating very slowly during the construction of a house. It allows the installer to program and execute this program.

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 to:

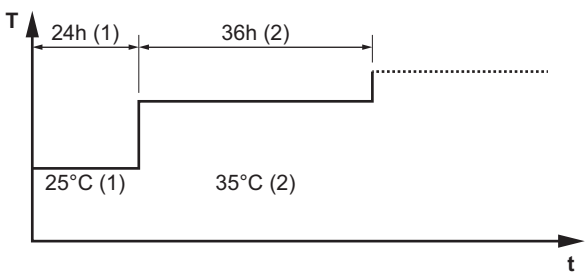
- contact the screed manufacturer for the initial heating instructions to avoid cracking the screed,
- program the underfloor heating screed dryout schedule according to the above instruction of the screed manufacturer,
- check on regular base the good working of the setup,
- select the correct program that complies the type of used screed for the floor.

The installer can program up to 20 steps where for each step he needs to enter:

- the duration by a number of hours up to 72 hours,
- the desired leaving water temperature.

Example:

10 Hand-over to the user



T Desired leaving water temperature (15~55°C)
t Duration (1~72h)
(1) Action step 1
(2) Action step 2

9.6.1 To program an underfloor heating screed dryout schedule

- Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout > Set dryout schedule.
- Use the , , , and to program the schedule.
 - Use and to scroll through the schedule.
 - Use and to adjust the selection.
- Result:** If a time is selected, you can set the duration between 1 and 72 hours.
- Result:** If a temperature is selected, you can set the desired leaving water temperature between 15°C and 55°C.
- To add a new step, select "–h" or "–" on an empty line and press .
- To delete a step, set the duration to "–" by pressing .
- Press to save the schedule.



INFORMATION

It is important that there is no empty step in the program. The schedule will be executed until a blank step is programmed OR after 20 consecutive steps.

9.6.2 To start an underfloor heating screed dryout

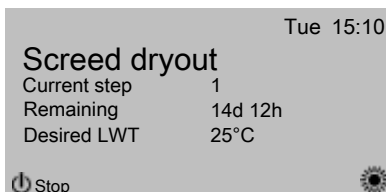


INFORMATION

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

- Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout.
- Set a dryout program.
- Select Start dryout and press .
- Select OK and press .

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 .



9.6.3 To readout the status of an underfloor heating screed dryout

- Press .

- 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 menu's 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, then 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 64. To reset the U3 error, your User permission level needs to be Installer.

- Go to the underfloor heating screed dryout screen.
- Press .
- Press to interrupt the program.
- Select OK and press .

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.

- Go to [A.7.2]: > Installer settings > Commissioning > UFH screed dryout > Dryout status > Stopped at and followed by the last executed step.
- 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 for 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.

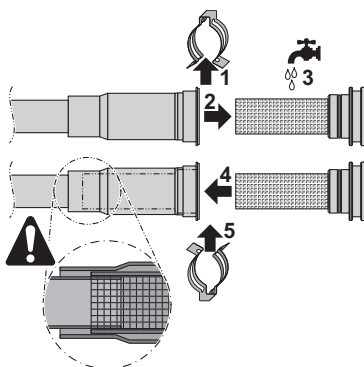
Water filter

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 the correct operation. **Water may be very hot!**

Checkpoints are:

- Water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Water coming out from the relief valve and contains debris or dirt:
 - 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 preferably).

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 "7.3.2 To connect the pressure relief valve to the drain" on page 26.

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:

- Water flow coming from the relief valve is high enough, no blockage of the valve or in between piping is suspected.
- Water coming out from the relief valve and contains debris or dirt:
 - 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 for correct operation of contactors K1M, K2M, K3M and K5M (depending on your installation). 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.

12 Troubleshooting

Anode

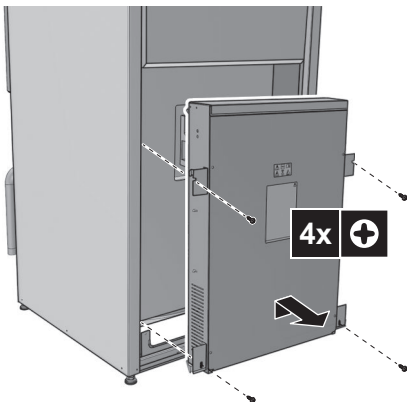
No maintenance or replacement required.

11.2.1 To drain the domestic hot water tank

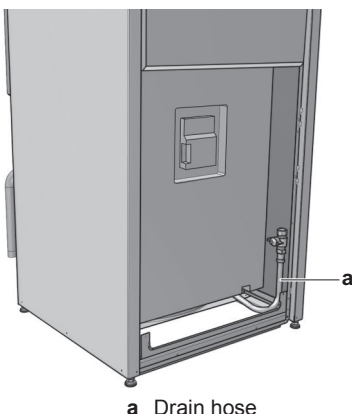
- 1 Switch OFF the power supply.
- 2 Turn OFF the cold water supply.
- 3 Open the hot water taps.
- 4 Open the drain valve.

11.3 To drain the domestic hot water tank

- 1 Open the front panel.
- 2 Remove the 4 screws, unhook and put the switch box aside.



- 3 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.



a Drain hose



INFORMATION

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



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 or cooling 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 | <p>Check and make sure that:</p> <ul style="list-style-type: none"> ▪ 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 58) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 59). ▪ 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 "14.9 ESP curve" on page 84). <p>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.</p> |
| 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 "6.2.3 To check the water volume" on page 21). |

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.

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) | <p>If the water temperature is too low, the unit uses the backup heater to reach the minimum water temperature first (15°C).</p> <p>Check and make sure that:</p> <ul style="list-style-type: none"> 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. <p>If the problem persists after you have conducted all of the above checks, contact your dealer.</p> |
| The preferential kWh rate power supply settings and electrical connections do NOT match | This should match with the connections as explained in "6.3.1 About preparing electrical wiring" on page 22 and "7.4.3 To connect the main power supply" on page 28. |
| 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 58) or use the automatic air purge function (see "9.3.2 To perform an automatic air purge" on page 59). |
| The water pressure at the pump inlet is too low | <p>Check and make sure that:</p> <ul style="list-style-type: none"> 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 "6.2.4 Changing the pre-pressure of the expansion vessel" on page 22). |

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 "6.2.3 To check the water volume" on page 21 and "6.2.4 Changing the pre-pressure of the expansion vessel" on page 22). |

| Possible causes | Corrective action |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The water circuit head is too high | <p>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.</p> <p>Check the installation requirements.</p> |

12.2.5 Symptom: The water pressure relief valve leaks

| Possible causes | Corrective action |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dirt is blocking the water pressure relief valve outlet | <p>Check whether the pressure relief valve works correctly by turning the red knob on the valve counterclockwise:</p> <ul style="list-style-type: none"> 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 | <p>Check and make sure that:</p> <ul style="list-style-type: none"> The backup heater operation mode is enabled. Go to: <ul style="list-style-type: none"> [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: <ul style="list-style-type: none"> The water pressure Whether there is air in the system The air purge operation <p>Press the reset button in the switch box. See "14.2 Components" on page 68 for the location of the reset button.</p> |
| The backup heater equilibrium temperature has not been configured correctly | <p>Increase the "equilibrium temperature" to activate the backup heater operation at a higher outdoor temperature. Go to:</p> <ul style="list-style-type: none"> [A.5.1.4] > Installer settings > Heat sources > Backup heater > Equilibrium temp. OR [A.8] > Installer settings > Overview settings [4-00] |

12 Troubleshooting

| 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) | <p>Check and make sure that the "space heating priority" settings have been configured appropriately:</p> <ul style="list-style-type: none"> 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. | <ul style="list-style-type: none"> 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 | <p>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).</p> <p>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.</p> |

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 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. |
| AC | 00 | Booster heater overheated. Please contact your dealer. |
| EC | 00 | Abnormal increase tank temperature. |

| Error code | Detailed error code | Description |
|------------|---------------------|---------------------------------------------------------------------|
| HC | 00 | Tank temperature sensor problem. Please contact your dealer. |
| CJ | 02 | Room temperature sensor problem. Please contact your dealer. |
| H1 | 00 | External temperature sensor problem. Please contact your dealer. |
| AA | 02 | External backup heater overheated. 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. |
| 89 | 02 | Heat exchanger frozen. |
| A1 | 00 | EEPROM reading error. |
| AH | 00 | Tank disinfection function not completed correctly. |
| 89 | 03 | Heat exchanger frozen. |

**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 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.

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.

13 Glossary

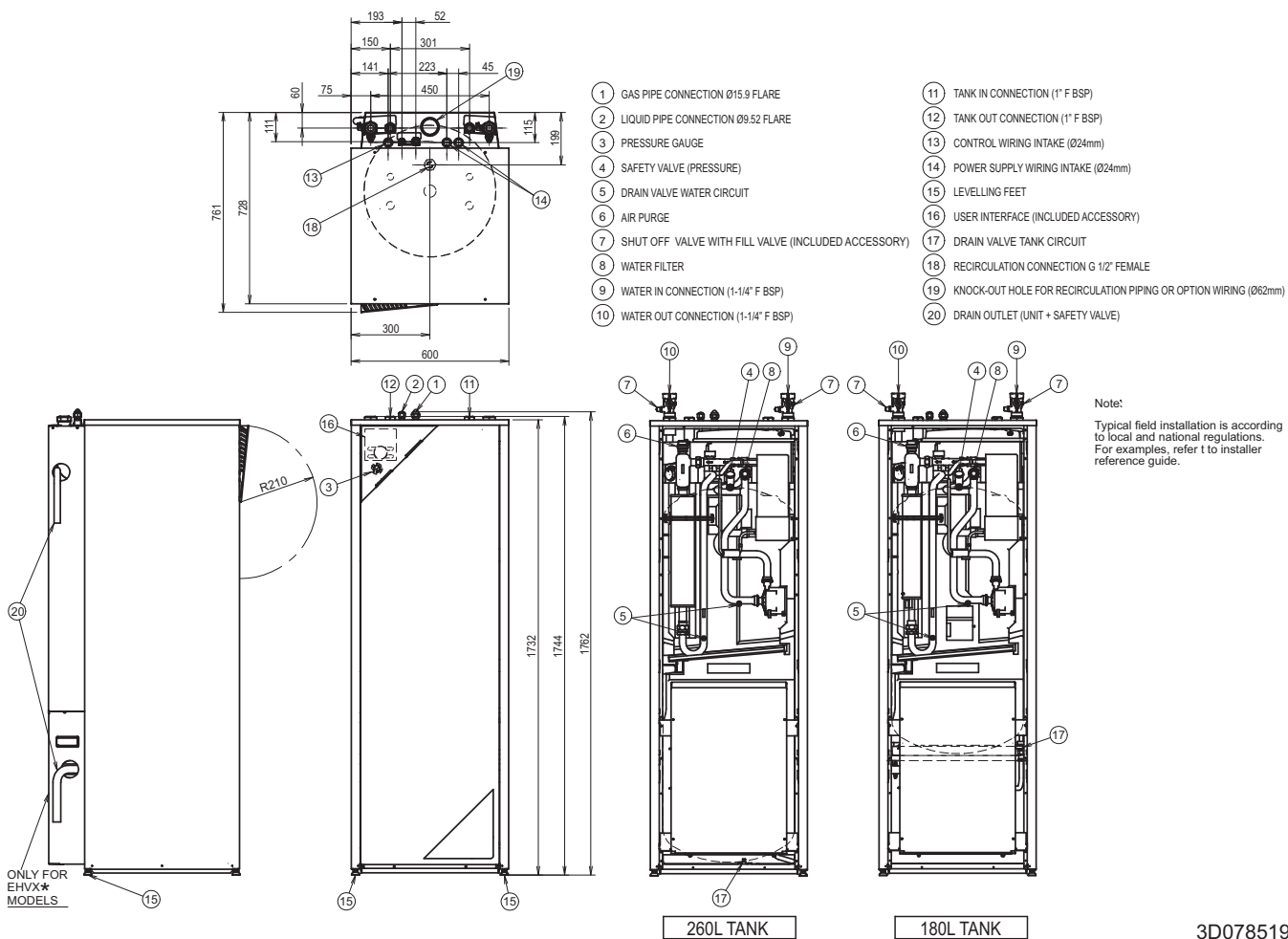
Dealer

Sales distributor for the product.

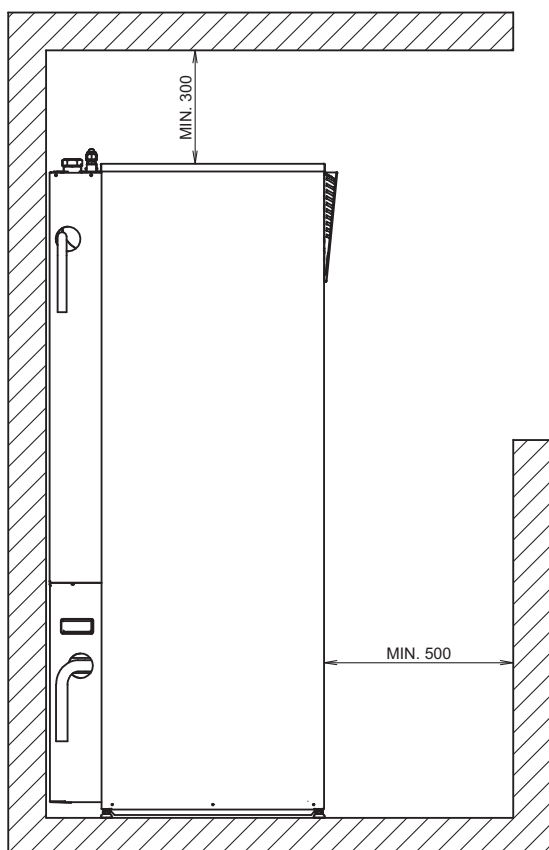
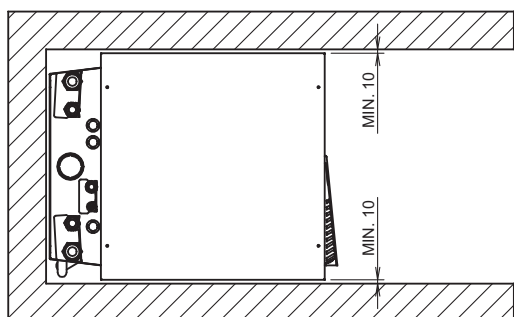
14 Technical data

14.1 Dimensions and service space

14.1.1 Dimensions and service space: Indoor unit



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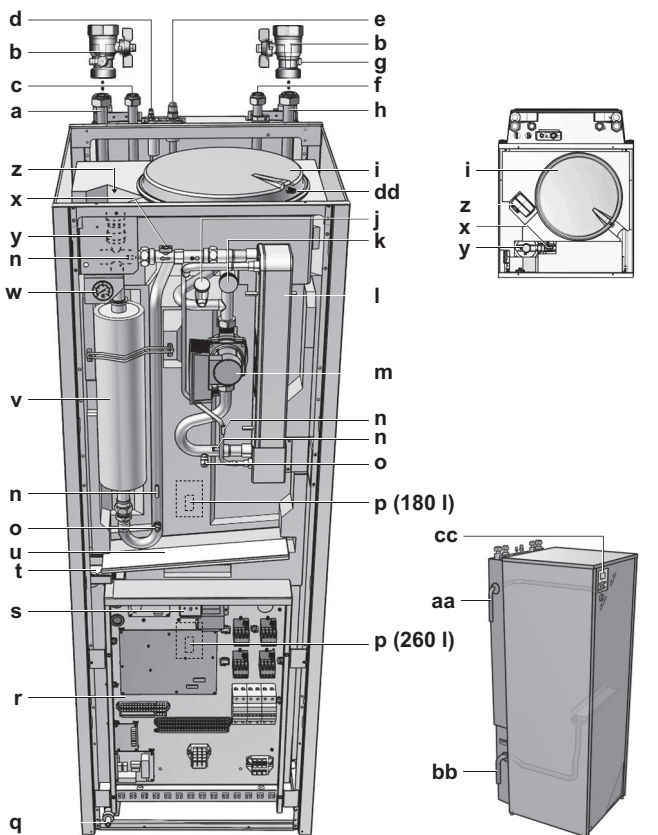


3D078541

14 Technical data

14.2 Components

14.2.1 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 (180 l/260 l)
- 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.
- t Drain collector (EHVX models only)
- u Drain gutter (EHVX models only)

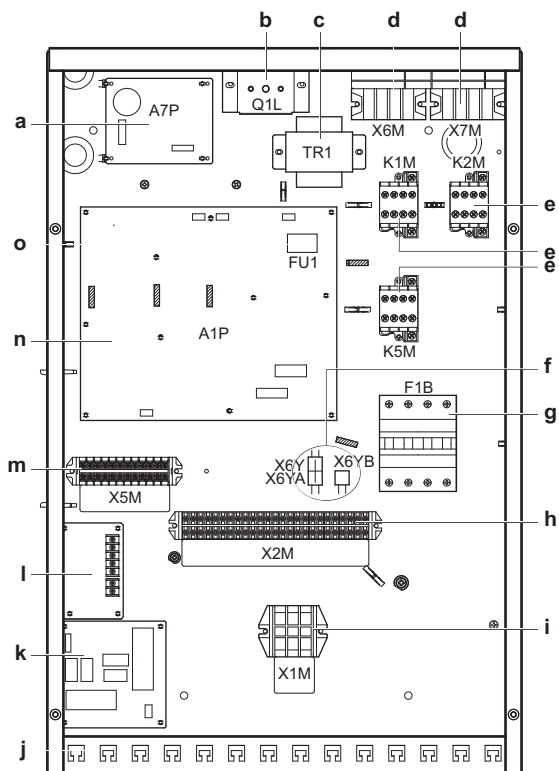
- v Backup heater
Provides additional heating in case of cold outdoor temperatures. Also serves as backup in case of malfunctioning of the outdoor unit.
- w Manometer
Allows readout of the water pressure in the water circuit.
- x Flow sensor
Gives feedback to the interface about the actual flow. Based on this information (and other), the interface adjusts the pump speed.
- y Air purge valve
Remaining air in the water circuit will be automatically removed via the air purge valve.
- z 3-way valve
Controls whether the water is used for space heating, or the domestic hot water tank.
- aa User interface (accessory)
- bb Drain flexible (EHVX models only)
- cc Drain flexible pressure relief valve
- dd 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.

14.2.2 Components: Switch box (indoor unit)



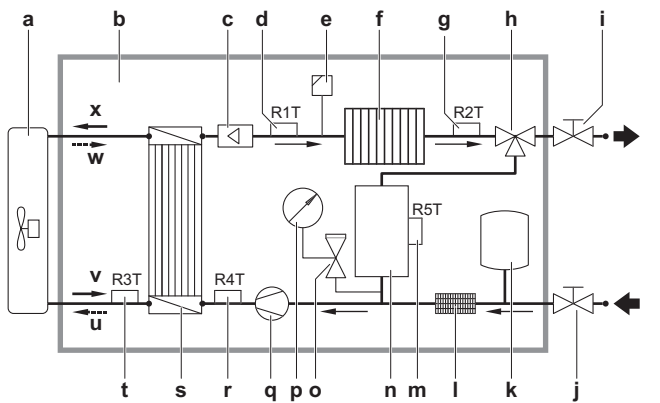
- a Pump PCB A7P (Inverter PCB)
- b Backup heater thermal protector Q1L
- c Transformer TR1
- d Terminals for backup heater X6M/X7M (*9W models only)
- e Backup heater contactors K1M, K2M and K5M
- f Connectors X6YA/X6YB/X6Y
- g Backup heater circuit breaker F1B
- h Terminal block X2M (high voltage)
- i Terminal block X1M (to outdoor unit)
- j Cable tie mountings

- k** Digital I/O PCB A4P (only for installations with solar kit or digital I/O PCB kit)
- l** Demand PCB for power limitation
- m** Terminal block X5M (low voltage)
- n** Main PCB A1P
- o** PCB fuse FU1

14 Technical data

14.3 Functional diagrams

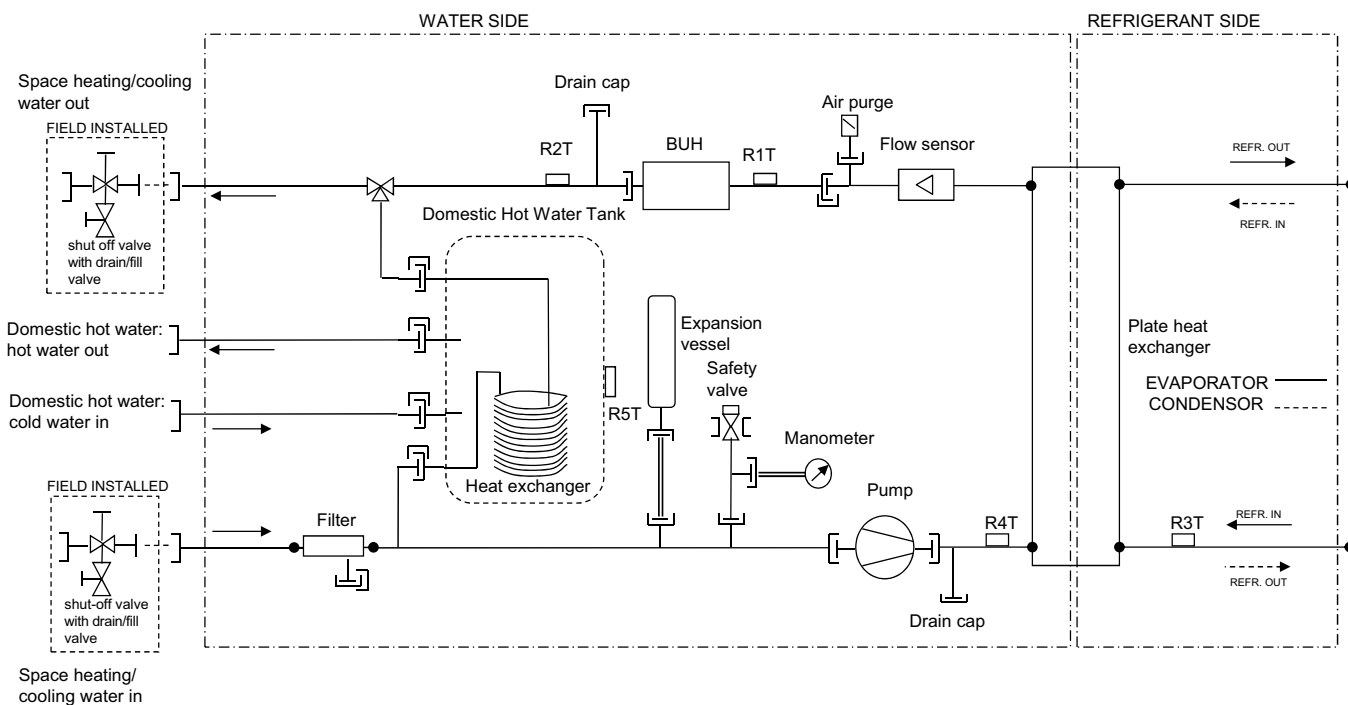
14.3.1 Functional diagram: Indoor unit



- a Outdoor unit
- b Indoor unit
- c Expansion vessel
- d Manometer
- e Air purge valve
- f Pressure relief valve
- g Backup heater
- h Pump
- i Flow sensor
- j Shut-off valve water outlet (field installation)
- k Shut-off valve water inlet with fill valve (field installation)
- l Filter
- m Heat exchanger (indoor unit)
- n Heat exchanger (domestic hot water tank)
- o Domestic hot water tank
- p Domestic hot water in
- q Domestic hot water out
- R1T Outlet water heat exchanger thermistor
- R2T Outlet water backup heater thermistor
- R3T Refrigerant liquid side thermistor
- R4T Inlet water thermistor
- R5T Tank temperature thermistor
- Heating
- Cooling

14.4 Piping diagram

14.4.1 Piping diagram: Indoor unit



LEGEND:

| | | | |
|--|--------------|--|----------------|
| | CHECK VALVE | | SCREW CONN. |
| | FLARE CONN. | | QUICK COUPLING |
| | SPINNED PIPE | | FLANGE CONN. |
| | PINCHED PIPE | | BRAZED CONN. |

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

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14 Technical data

14.5 Wiring diagram

14.5.1 Wiring diagram – components: Indoor unit

See the internal wiring diagram supplied with the unit (on the inside of the indoor unit switch box cover). The abbreviations used are listed below.

NOTES to go through before starting the unit

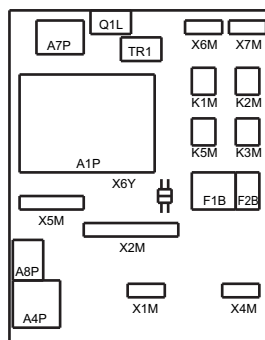
X1M : Main terminal
X2M : Field wiring terminal for AC
X5M : Field wiring terminal for DC
X6M, X7M : Backup heater terminal
X4M : Booster heater terminal

— : Earth wiring
15 : Wire number 15
— : Field supply
→ **/12.2 : Connection ** continues on page 12 column 2
① : Several wiring possibilities
Option : Option
Not mounted in switch box : Not mounted in switch box
PCB : 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 convactor
Add LWT:
☐ On/OFF thermostat (wired)
☐ On/OFF thermostat (wireless)
☐ Ext. thermistor
Heat pump convactor

POSITION IN SWITCH BOX



LEGEND

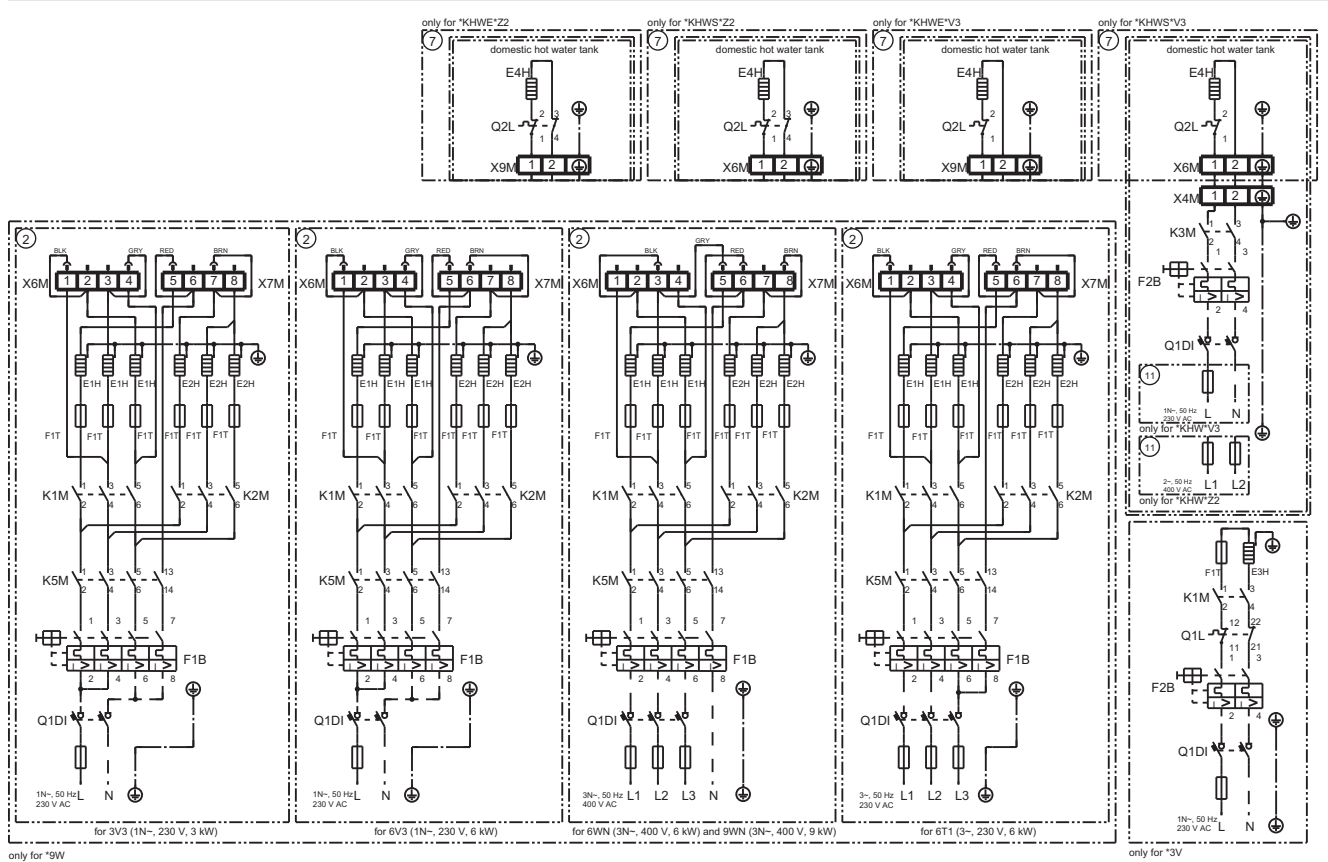


Translation can be found in the installation manual.

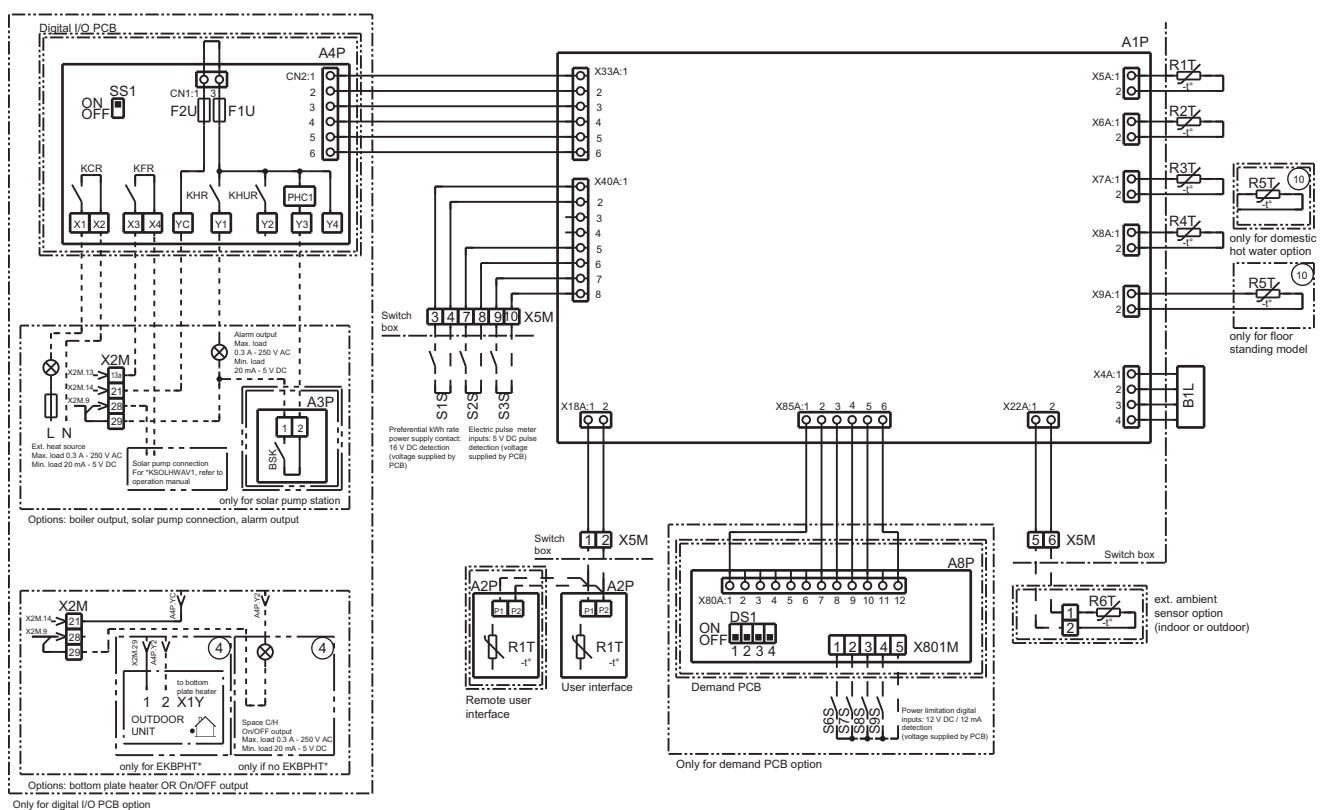
| Part n° | Description | Part n° | Description |
|-------------|-------------------------------------------|-------------|------------------------------------------------------|
| A1P | main PCB | M2P | # domestic hot water pump |
| A2P | user interface PCB | M2S | # 2 way valve for cooling mode |
|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

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

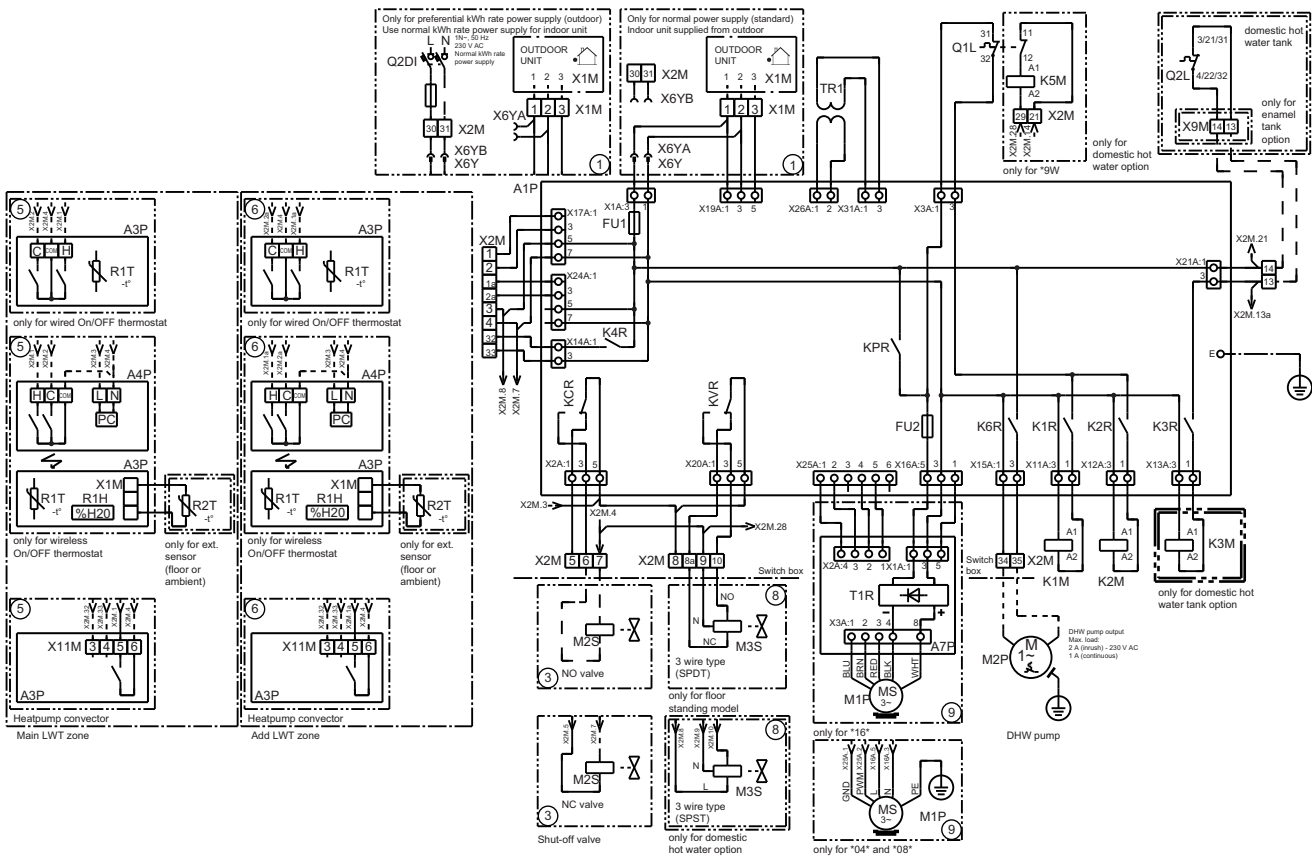
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| | | | |
|----------|--------------------------------------------------------|------------|---------------------------------------------------------|
| A1P | Main PCB | M2S | # 2-way valve for cooling mode |
| A2P | User interface PCB | M3S | (*) 3-way valve for floor heating/domestic hot water |
| A3P | * Solar pump station PCB | Q1DI, Q2DI | # Earth leakage circuit breaker |
| A3P | * On/OFF thermostat (PC=power circuit) | Q1L | Thermal protector backup heater |
| A3P | * Heat pump convactor | Q2L | * Thermal protector booster heater |
| A4P | * Digital I/O PCB | R1T | Outlet water heat exchanger thermistor |
| A4P | * Receiver PCB (Wireless On/OFF thermostat) | R1T (A2P) | Ambient sensor user interface |
| A7P | Pump driver PCB (only for EHBH/X04+08 and EHVH/X04+08) | R1T (A3P) | * Ambient sensor On/OFF thermostat |
| A8P | * Demand PCB | R2T | Outlet backup heater thermistor |
| B1L | Flow sensor | R2T | * External sensor (floor or ambient) |
| BSK | * Solar pump station relay | R3T | Refrigerant liquid side thermistor |
| DS1(A8P) | * DIP switch | R4T | Inlet water thermistor |
| E1H | Backup heater element (1 kW) | R5T | (*) Domestic hot water thermistor |
| E2H | Backup heater element (2 kW) | R6T | * External indoor or outdoor ambient thermistor |
| E3H | Backup heater element (3 kW) | R1H (A3P) | * Humidity sensor |
| E4H | * Booster heater (3 kW) | S1S | # Preferential kWh rate power supply contact |
| F1B | Overcurrent fuse backup heater | S2S | # Electrical meter pulse input 1 |
| F2B | * Overcurrent fuse booster heater | S3S | # Electrical meter pulse input 2 |
| F1T | Thermal fuse backup heater | S6S~S9S | # Digital power limitation inputs |
| F1U, F2U | * Fuse 5 A 250 V for digital I/O PCB | SS1 (A4P) | * Selector switch |
| FU1 | Fuse T 6.3 A 250 V for PCB | T1R (A7P) | Rectifier bridge (only for EHBH/X04+08 and EHVH/X04+08) |
| PHC1 | * Optocoupler input circuit | TR1 | Power supply transformer |
| K1M, K2M | Contact backup heater | X*M | Terminal strip |
| K3M | * Contact booster heater | X*Y | Connector |
| K5M | Safety contactor backup heater (only for *9W) | | * = Optional |
| K*R | Relay on PCB | | (*) = Standard for EHVH/X, optional for EHBH/X |
| M1P | Main supply pump | | # = Field supply |
| M2P | # Domestic hot water pump | BLK | Black |

| | |
|-----|-------|
| BRN | Brown |
| GRY | Grey |
| RED | Red |

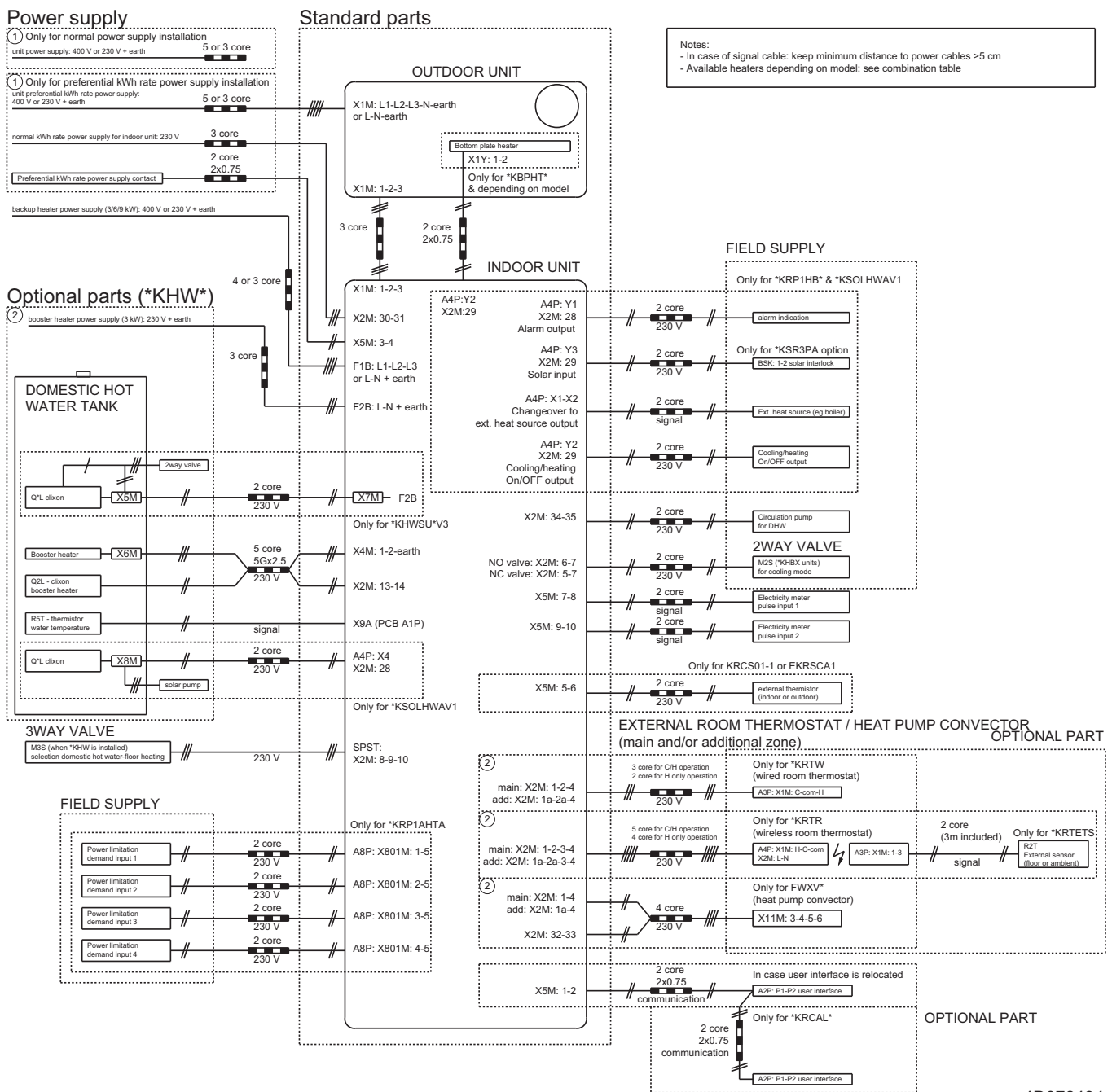
Notes to go through before starting the unit

| 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 |

14 Technical data

Electrical connection diagram Daikin Altherma

For more details please check unit wiring



4D078494

* electrical meter specification

- pulse meter type/voltage free contact for 5 VDC detection by PCB
- possible number of pulse:
 - 0.1 pulse/kWh
 - 1 pulse/kWh
 - 10 pulse/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 responsibility 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 | 1 | - | - | | | | |
| | 3~ balanced | - | - | - | - | - | - | - | 1 | 1 | 1 | | | | |
| | 3~ unbalanced | - | 1 | 1 | - | 1 | 1 | - | - | 1 | 1 | | | | |

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14.6.1 Technical specifications: Indoor unit

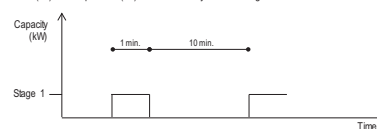
3D077571 B page 1

ELECTRICAL SPECIFICATIONS

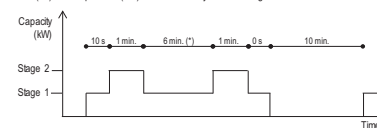
| Electric heater (optional) | Type | 3V | | | 9W | | |
|----------------------------------|------------------------------------------------------------------------|-------------------|-----------|-------------------------------------------------------------------|-----------|--------------|-----------|
| | Capacity setting | kW | 3 | 6 | 3 | 6 | 9 |
| Capacity stages | 1 | | 1 | 2 | 1 | 2 | 2 |
| | Capacity stage 1 | kW | 3 | 3 | 3 | 3 | 3 |
| Capacity stage 2 | Capacity stage 2 | kW | 6 | - | 6 | 6 | 6 |
| | Minimum time delay between stages | | Note (11) | Note (10) | Note (11) | Note (11) | Note (11) |
| Power supply (1) | Phase | | 1~ | 3~ | 1~ | 1~ | 3~ |
| | Frequency | Hz | 50 | | 50 | | |
| Current | Voltage | V | 230 | 230 | 230 | 26 | 400 |
| | Running Current (back-up heater) | A | 13 | 15,1 | 13 | 26 | 8,7 |
| | Zmax (back-up heater) | Ω | - | - | - | 0,29 | - |
| | Complex | - | - | - | - | 0,25 - j0,15 | - |
| Minimum S _c value (8) | kVA | - | - | - | - | (9) | - |
| | Running Current | A | 13 | 15,1 | 13 | 26 | 8,7 |
| Voltage range (4) | Minimum | V | 207 | 207 | 207 | 207 | 360 |
| | Maximum | V | 253 | 253 | 253 | 253 | 440 |
| Wiring connections | power supply for back up heater | quantity of wires | 3G | 4G | 3G | 4G/5G | 4G/5G |
| | type of wires | Note (3) | Note (3) | Note (3) | Note (3) | Note (3) | Note (3) |
| | Communication cable | quantity of wires | | 3 | | | |
| | type of wires | | | 2,5 mm ² | | | |
| | User interface | quantity of wires | | 2 | | | |
| | type of wires | | | 0,75 mm ² till 1,25 mm ² (max length 500 m) | | | |
| | Preferential kWh rate power supply | quantity of wires | | power : 2 | | | |
| | type of wires | | | power : 8,3 A note (3) | | | |
| | Electricity meter | quantity of wires | | 2 | | | |
| | type of wires | | | Minimum 0,75 mm ² (SVDC pulse detection) | | | |
| | domestic hot water pump | quantity of wires | | 2 | | | |
| | type of wires | | | Minimum 0,75 mm ² (2A inrush, 1A continuous) | | | |
| | for connection with R&T | 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 (5) | | | |
| | for connection with MZS | quantity of wires | | 3G | | | |
| | type of wires | | | Note (3) and (5) | | | |
| | for connection with optional FWXV* (demand input and output signal) | quantity of wires | | 4 | | | |
| | type of wires | | | 100 mA, minimum 0,75 mm ² | | | |
| | for connection with bottom plate heater | quantity of wires | | 2 | | | |
| | type of wires | | | Note (3) | | | |

| | |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Notes | (1) Above mentioned power supply of the hydro box is for the backup heater only. The Switch box & 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 installation manual |
| | (5) Voltage: 230V / Maximum current: 100mA / Minimum 0,75mm ² |
| | (6) Depends on thermostat type, refer to installation manual |
| | (8) In accordance with EN/IEC 61000-3-11(*), it may be necessary to consult the distribution network operator to ensure that the equipment is connected only to a supply with Zsys(**) ≤ Zmax |
| | (9) Equipment complying with EN/IEC 61000-3-12 (***) |
| | (*) : European/International Technical Standard setting the limits for voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 75A. |
| | (**) : European/International Technical Standard setting the limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16A and ≤ 75A per phase. |
| | (***) : System impedance |
| | |

Note (10) - Backup heater (3V) - min. time delay between stages



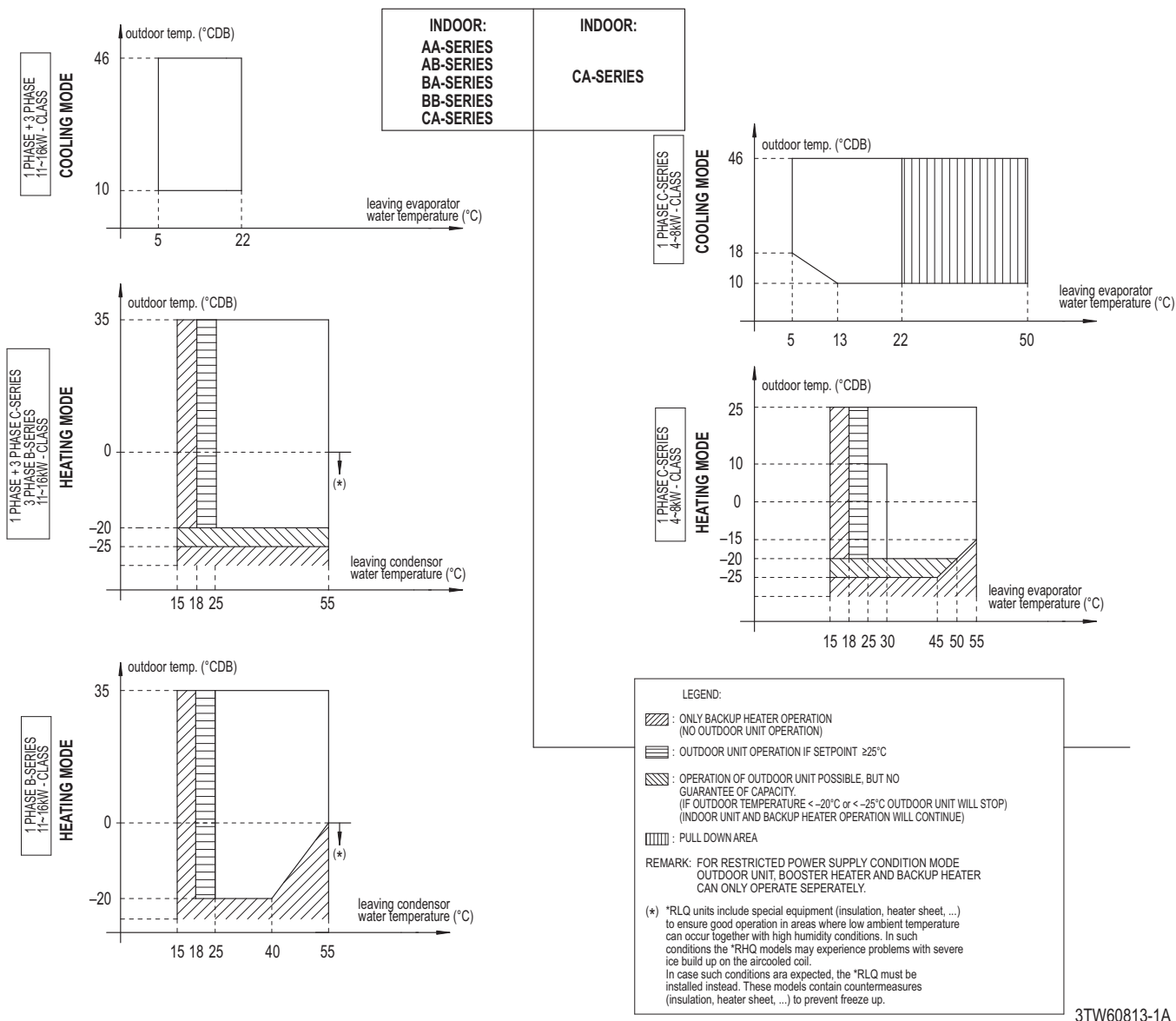
Note (11) - Backup heater (9W) - min. time delay between stages



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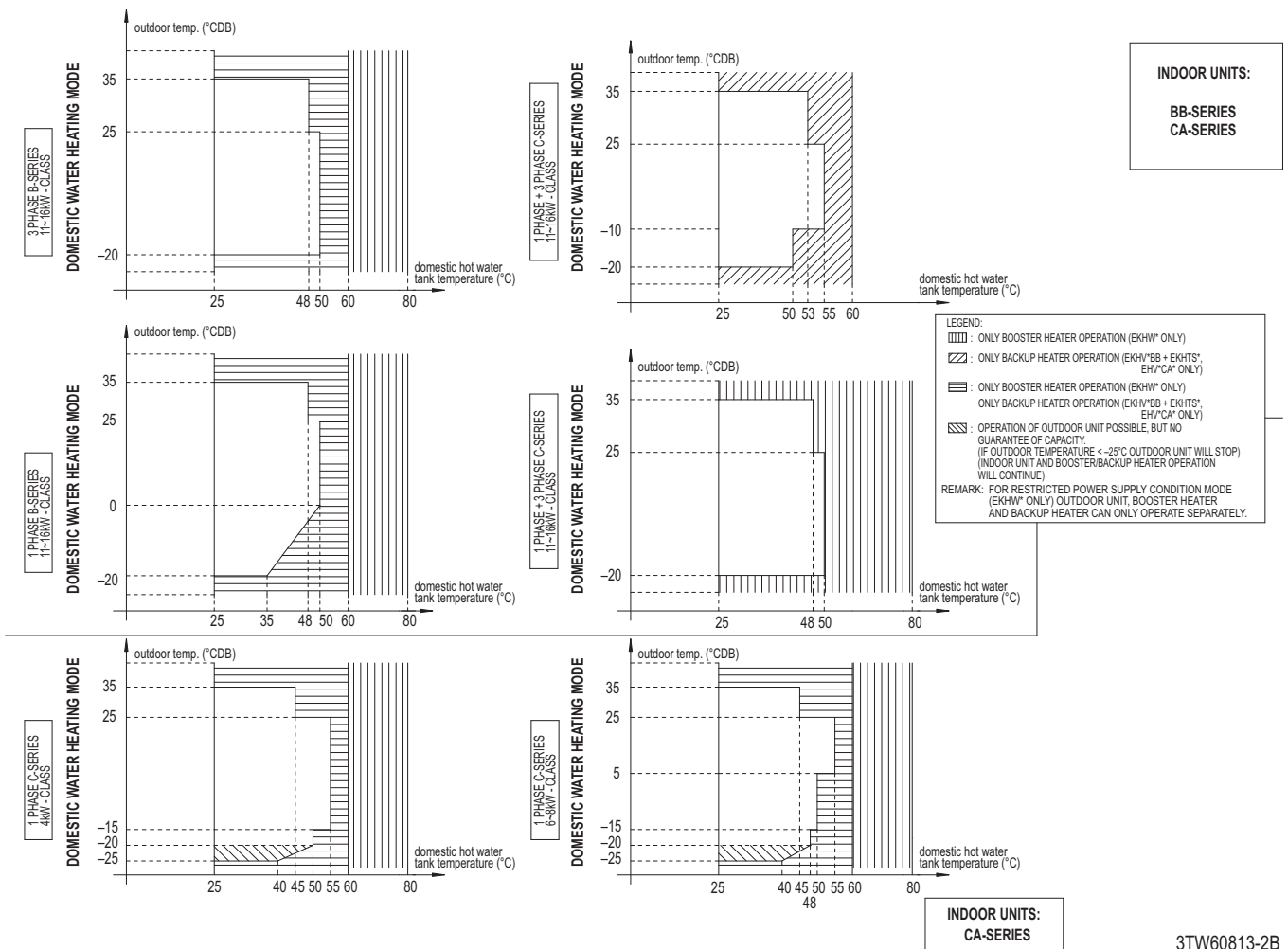
14.7 Operation range

14.7.1 Operation range: Heating and cooling



3TW60813-1A

14.7.2 Operation range: Domestic hot water

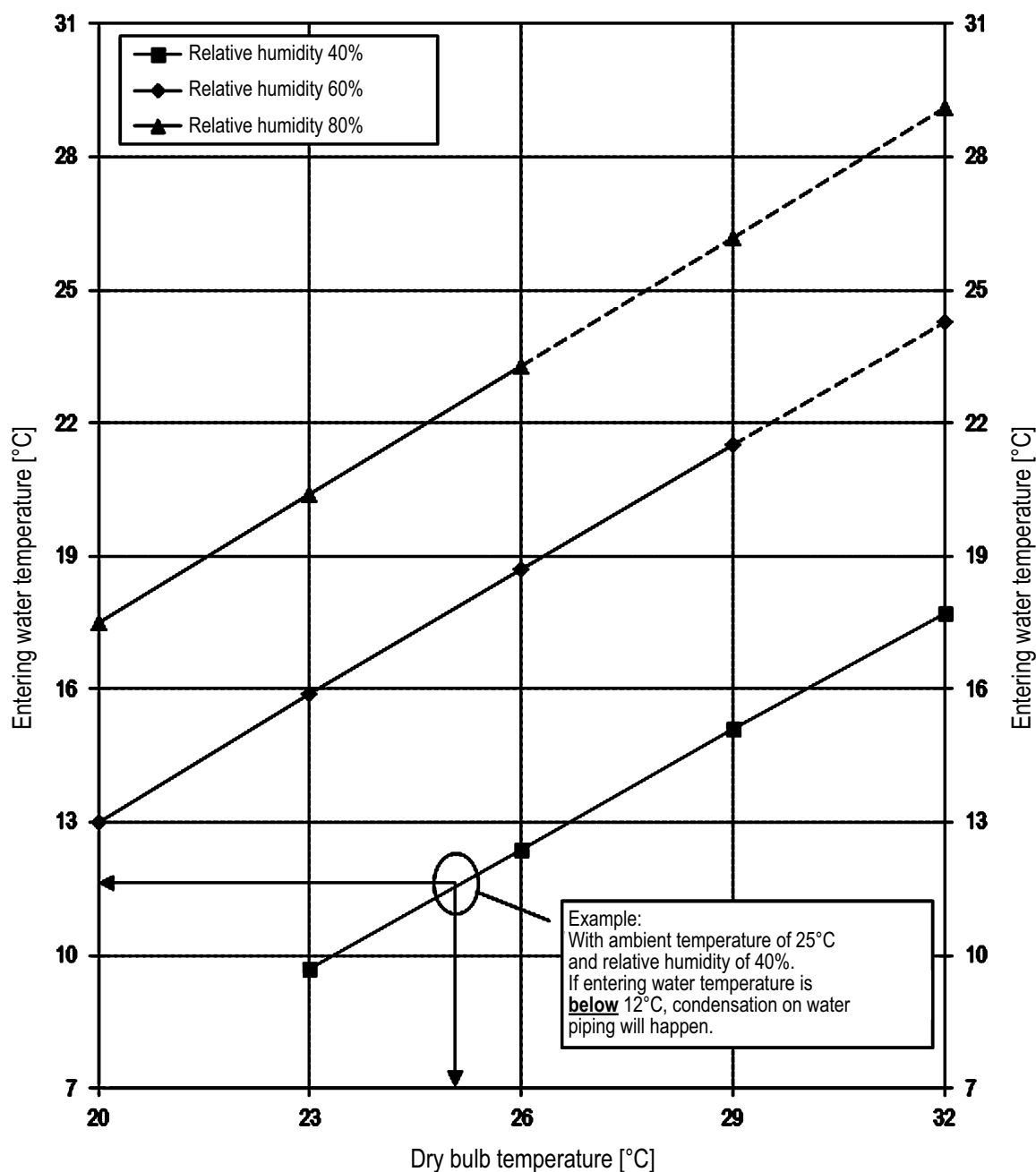


3TW60813-2B

14 Technical data

14.7.3 Drain pan necessity

Entering water temperature limit to prevent condensation



1. Refer to psychometric chart for more information.
2. If condensation is expected, installation of EKHBPCA2 - drainpan kit must be considered.

4D078990

14.8 Sound spectrum

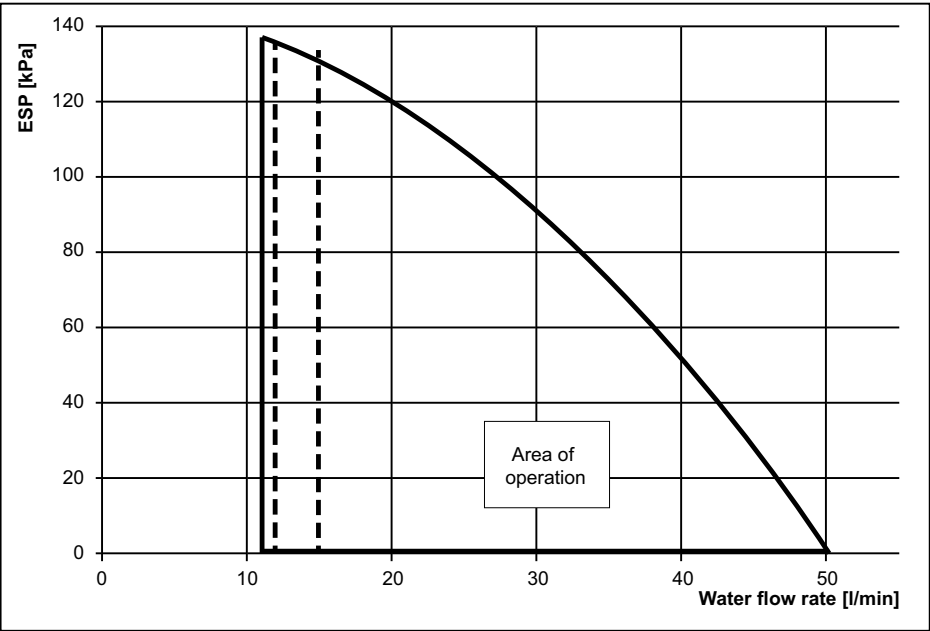
14.8.1 Sound spectrum: Outdoor unit

Not applicable.

14 Technical data

14.9 ESP curve

14.9.1 ESP curve: Indoor unit



Minimum flow required during backup heater operation
See dashed lines

| Unit | Flow |
|-----------------|------|
| EHV(H/X)16*CA3V | 12 |
| EHV(H/X)16*CA9W | 15 |

ESP: External Static Pressure Available
at space heating-cooling circuit

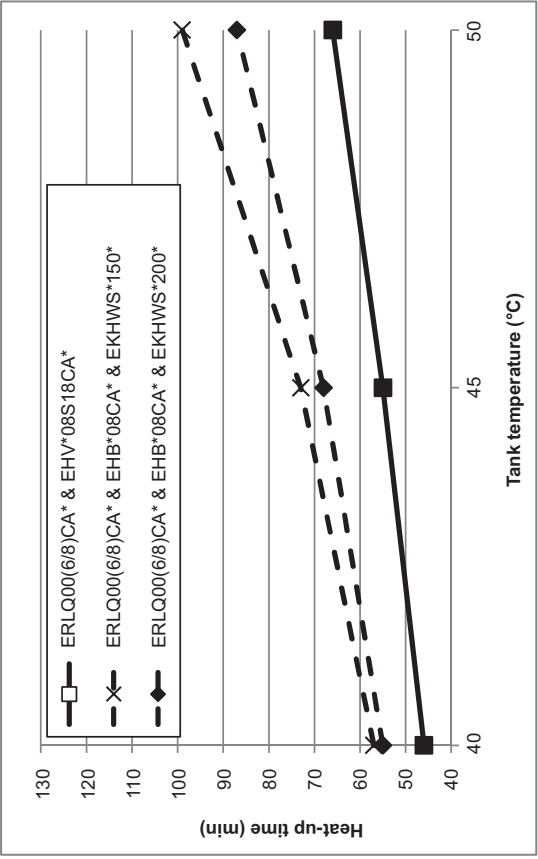
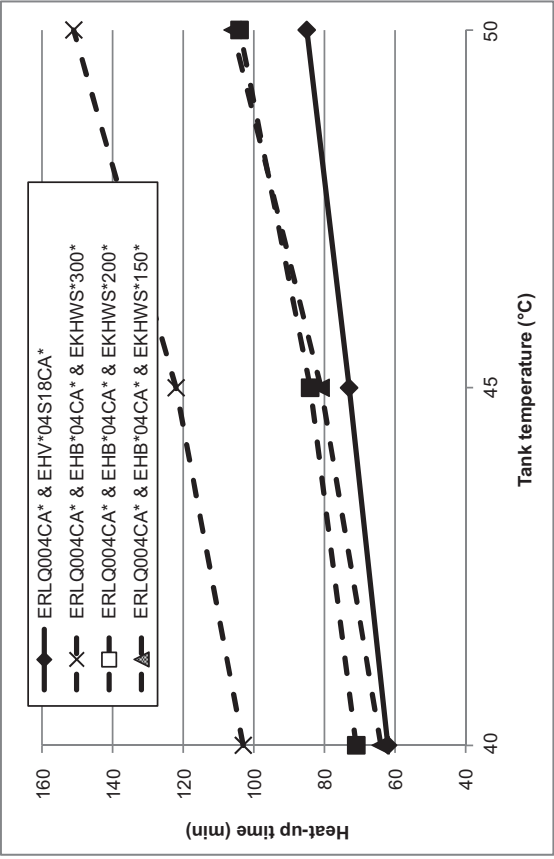
Water flow rate: Waterflow through
space heating - cooling circuit

- Notes:
- 1) Selecting a flow outside the area of operation can cause damage or malfunctioning of the unit.
See also minimum and maximum allowed waterflow range in the technical specifications.
 - 2) Water quality must be according to EN directive EC 98/83 EC.

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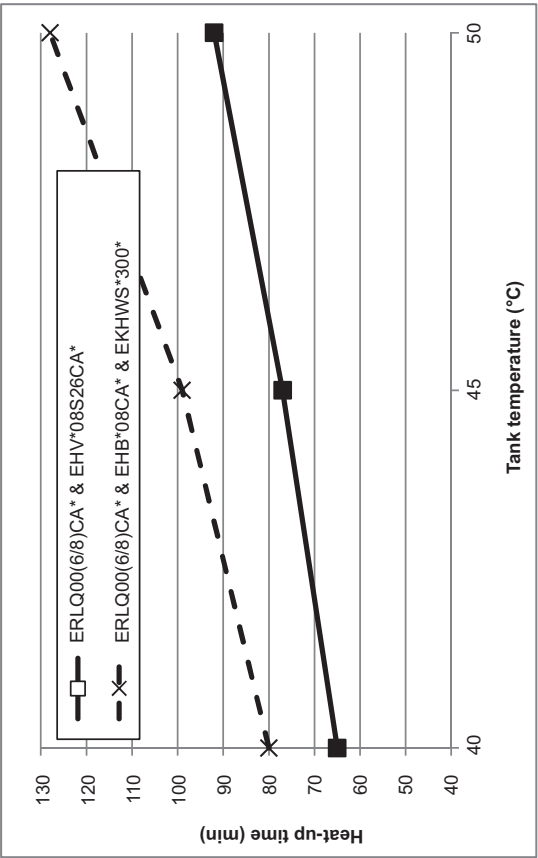
14.10 Performance

Heat up times GBS (1) :

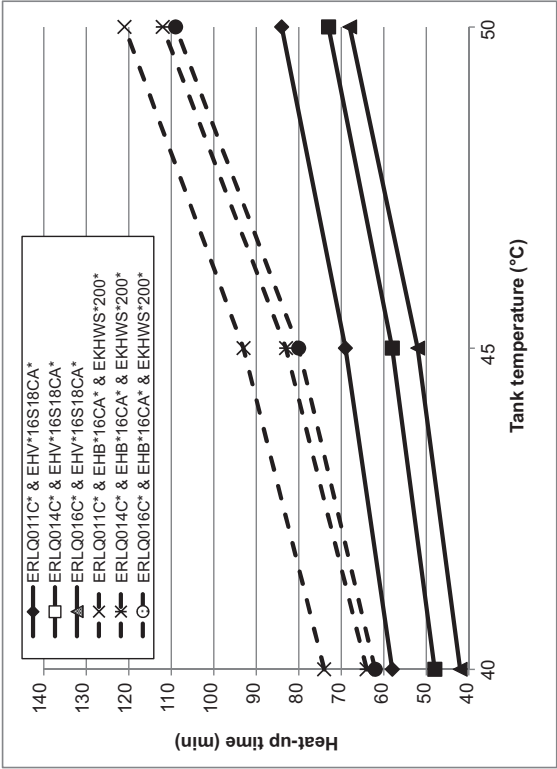
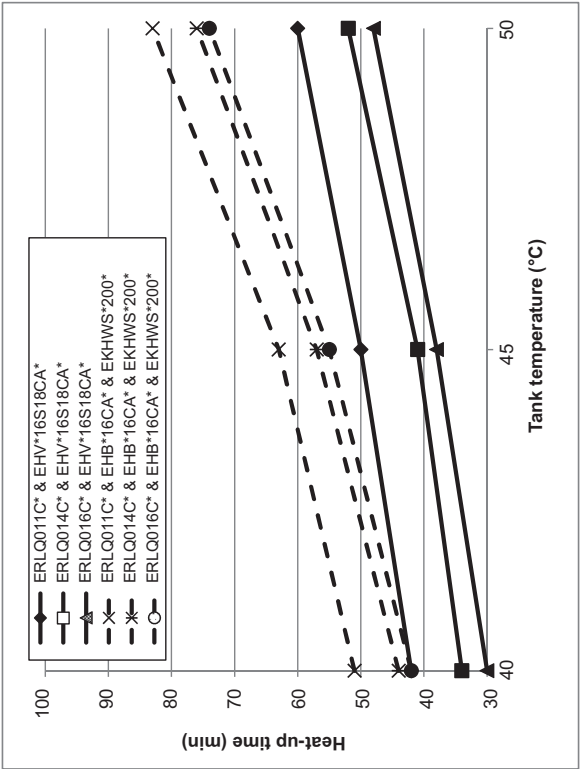
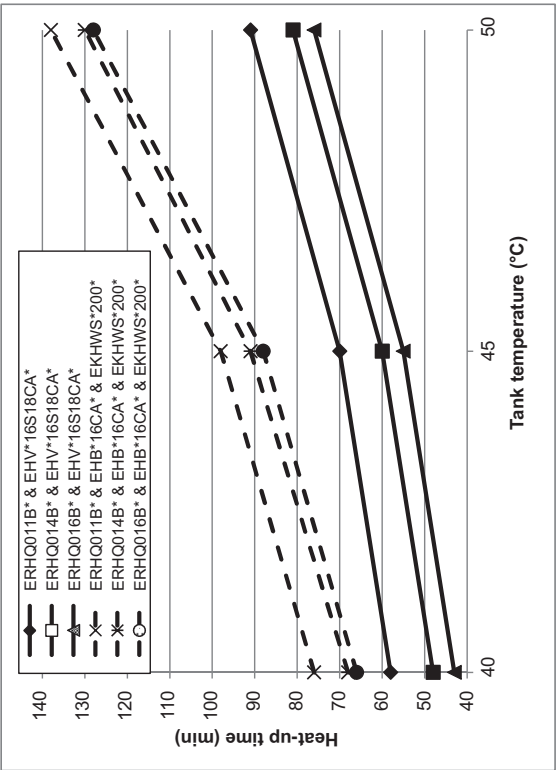
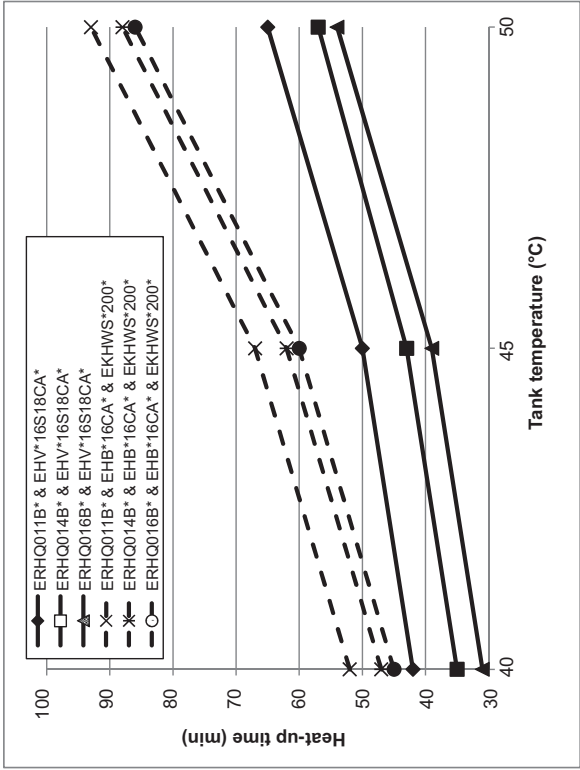


Notes:
(1) Time required to heat up the tank starting from a temp of 10°C up to the indicated temp with the **heatpump only**.
Refer to operation range for maximum tank temperature with heatpump only.

| Heat-up time tank until 45°C | | | |
|------------------------------|--|------------------------|----------------------------|
| | | ERLQ004CA* | ERLQ00(6/8)CA* |
| EHV*04S18CA | | 73 | N/A |
| EHV*08S18CA | | N/A | 55 |
| EHV*08S26CA | | N/A | 77 |
| | | ERLQ004CA* & EHB*04CA* | ERLQ00(6/8)CA* & EHB*08CA* |
| EKHWS*150* | | 81 | 73 |
| EKHWS*200* | | 84 | 68 |
| EKHWS*300* | | 122 | 99 |



Heat up times GQI (1) :

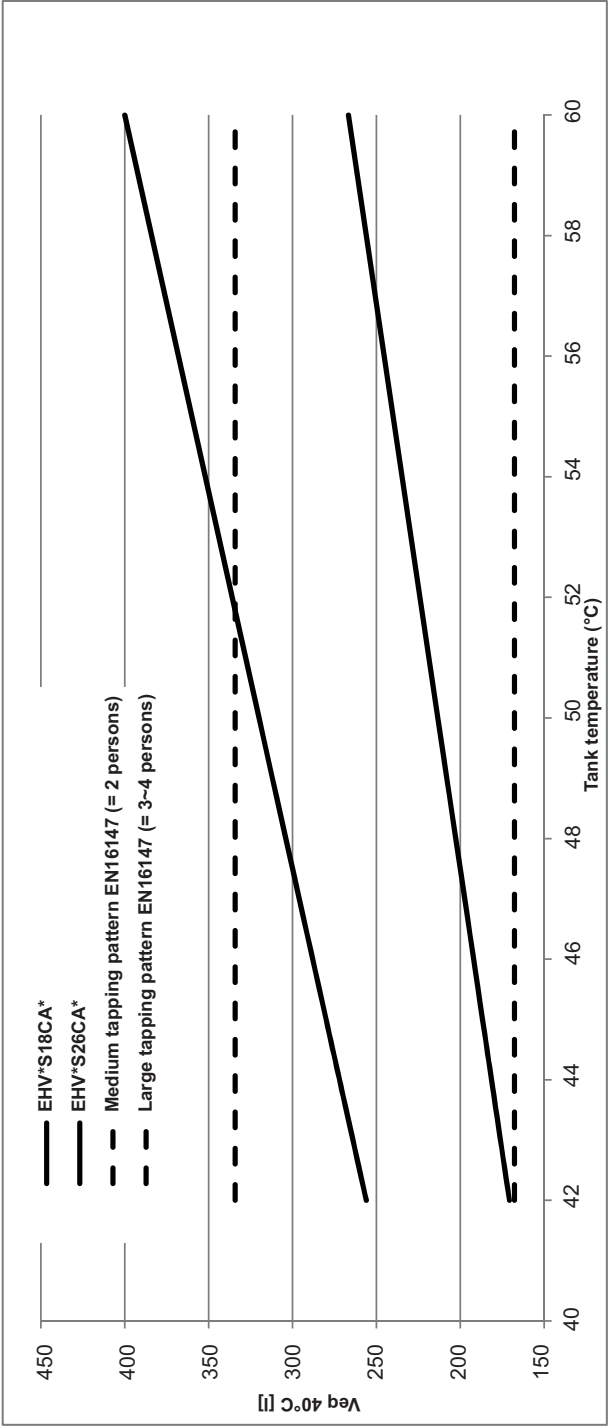


| | |
|------------------------------|----|
| Heat-up time tank until 45°C | |
| EHV*16S18CA | 38 |
| EHV*16S26CA | 52 |
| ERLQ016C* & EHB*16CA* | |
| EKHWS*150* | 69 |
| EKHWS*200* | 55 |
| EKHWS*300* | 80 |

Notes:
(1) Time required to heat up the tank starting from a temp of 10°C up to the indicated temp with the **heatpump only**.
Refer to operation range for maximum tank temperature with heatpump only.

Selection guidance of domestic hot water tank volume (3)

Ve_q 40°C = amount of water that can be tapped with a temperature of 40°C when the hot water tank is heated till a certain temperature with a cold water inlet temperature of 10°C. The 40°C is considered as a comfortable domestic hot water temperature.



If a higher daily Ve_q 40°C is required then additional heat up cycles are required within 24 hours. Refer to the operation manual for more information.

Heat loss of domestic hot water tank (4)

| Tank | Heat loss [kWh/24h] |
|------|---------------------|
| EHV* | 1,38 |
| 260l | 1,91 |

| Tank | Heat loss [kWh/24h] |
|--------|---------------------|
| EKHWS* | 1,55 |
| 200l | 1,77 |
| 300l | 2,19 |

Notes:

- (2) Time required to heat up the tank starting from a temp of 10°C up to the indicated temp with the heatpump only.
- (3) According to EN16147
- (4) According to EN12897

14.11 Combination table

Factory mounted optional equipment for *HV(H/X)04S#CA## and *HV(H/X)16S#CA##

| Description | # - ## | |
|------------------------------|---------|------------|
| | 18 - 3V | 26 - 9W(9) |
| Heating only model *HVH* | | |
| Reversible model *HVX* | | 26 - 9W(9) |
| Back up heater 3kW 1N~230 V | 0 | 0 |
| Back up heater 6kW 1N~230 V | - | 0 |
| Back up heater 6kW 3N~400 V | - | 0 |
| Back up heater 6kW 3~230 V | - | 0 |
| Back up heater 9kW 3N~400 V | - | 0 |
| Domestic hot water tank 180L | 0 | - |
| Domestic hot water tank 260L | - | 0 |

Factory mounted optional equipment for *HV(H/X)04S#CA##

| Description | # - ## | |
|------------------------------|---------|---------|
| | 18 - 3V | 26 - 9W |
| Heating only model *HVH* | | |
| Reversible model *HVX* | | 26 - 9W |
| Back up heater 3kW 1N~230 V | 0 | 0 |
| Back up heater 6kW 1N~230 V | - | 0 |
| Back up heater 6kW 3N~400 V | - | 0 |
| Back up heater 6kW 3~230 V | - | 0 |
| Back up heater 9kW 3N~400 V | - | 0 |
| Domestic hot water tank 180L | 0 | - |
| Domestic hot water tank 260L | - | 0 |

Outdoor combination table for *HV(H/X)04(08)S(18/26)CA* and *HB(H/X)16S(18/26)CA*

| Description | # - ## | |
|------------------------------|---------|------------|
| | 18 - 3V | 26 - 9W(9) |
| Heating only model *HVH* | | |
| Reversible model *HVX* | | 26 - 9W(9) |
| Back up heater 3kW 1N~230 V | 0 | 0 |
| Back up heater 6kW 1N~230 V | - | 0 |
| Back up heater 6kW 3N~400 V | - | 0 |
| Back up heater 6kW 3~230 V | - | 0 |
| Back up heater 9kW 3N~400 V | - | 0 |
| Domestic hot water tank 180L | 0 | - |
| Domestic hot water tank 260L | - | 0 |

Kit availability for outdoor units

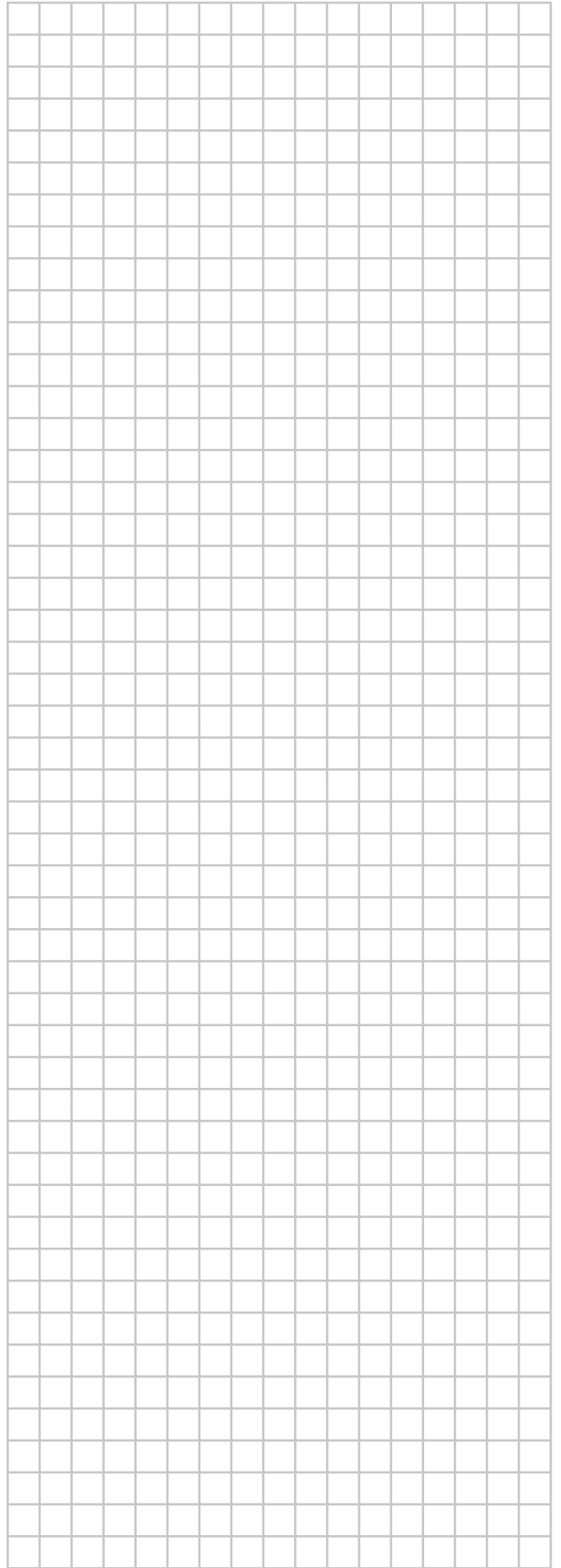
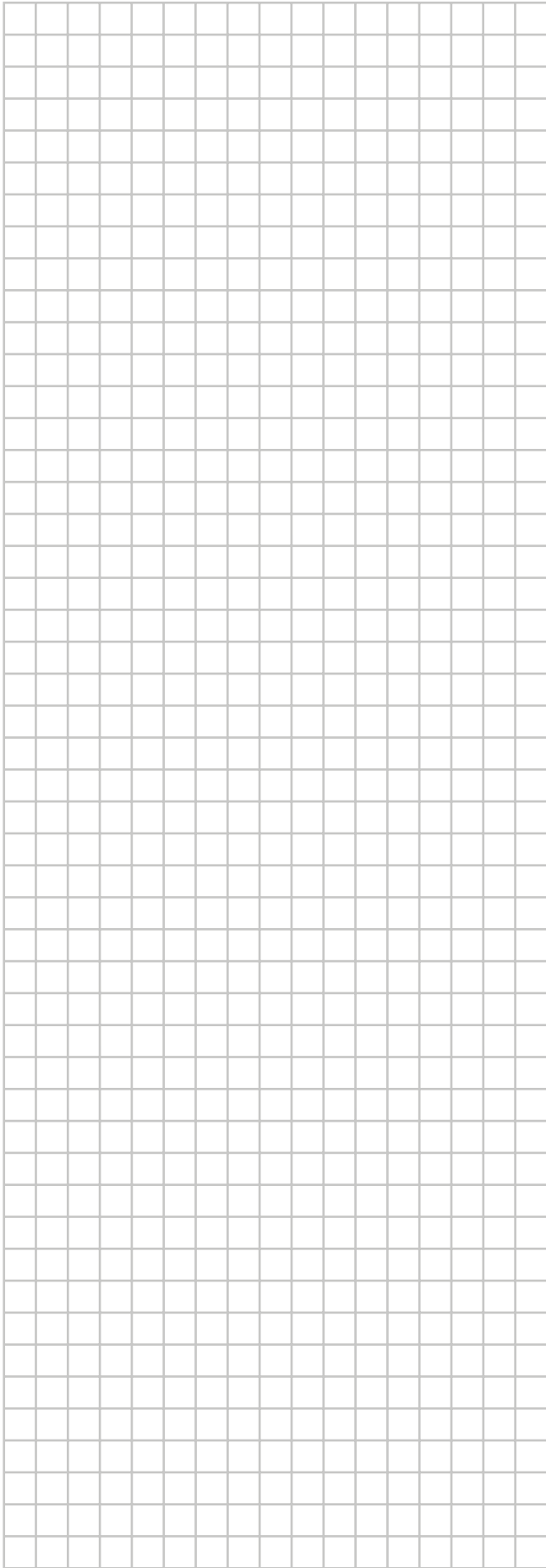
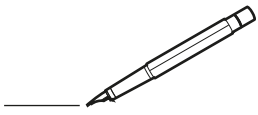
| Reference | Description | # - ## | |
|------------|------------------------------------------------------|---------|---------|
| | | 18 - 3V | 26 - 9W |
| *KRSCA1 | Remote sensor for outdoor (11) | 0 | 0 |
| *KRCS01-1 | Remote sensor for indoor (11) | 0 | 0 |
| *KRUCAL1 | User interface language group 1 | 0 | 0 |
| *KRUCAL2 | User interface language group 2 | 0 | 0 |
| *KRP1HBAA | Digital I/O PCB (2) | 0 | 0 |
| *KRP1AHTA | Demand PCB (6) | 0 | 0 |
| *KRTTWA | Wired room thermostat option kit | 0 | 0 |
| *KRTT1 | Wireless room thermostat option kit (incl. receiver) | 0 | 0 |
| *KRTETS | external temperature sensor option kit (4) | 0 | 0 |
| FWXV15AVEB | Heat pump convector | 0 | 0 |
| FWXV20AVEB | Heat pump convector | 0 | 0 |
| *KVKHPC | Valve kit heat pump convector (5) | 0 | 0 |
| *KPCAB1 | PC cable kit (12) | 0 | 0 |

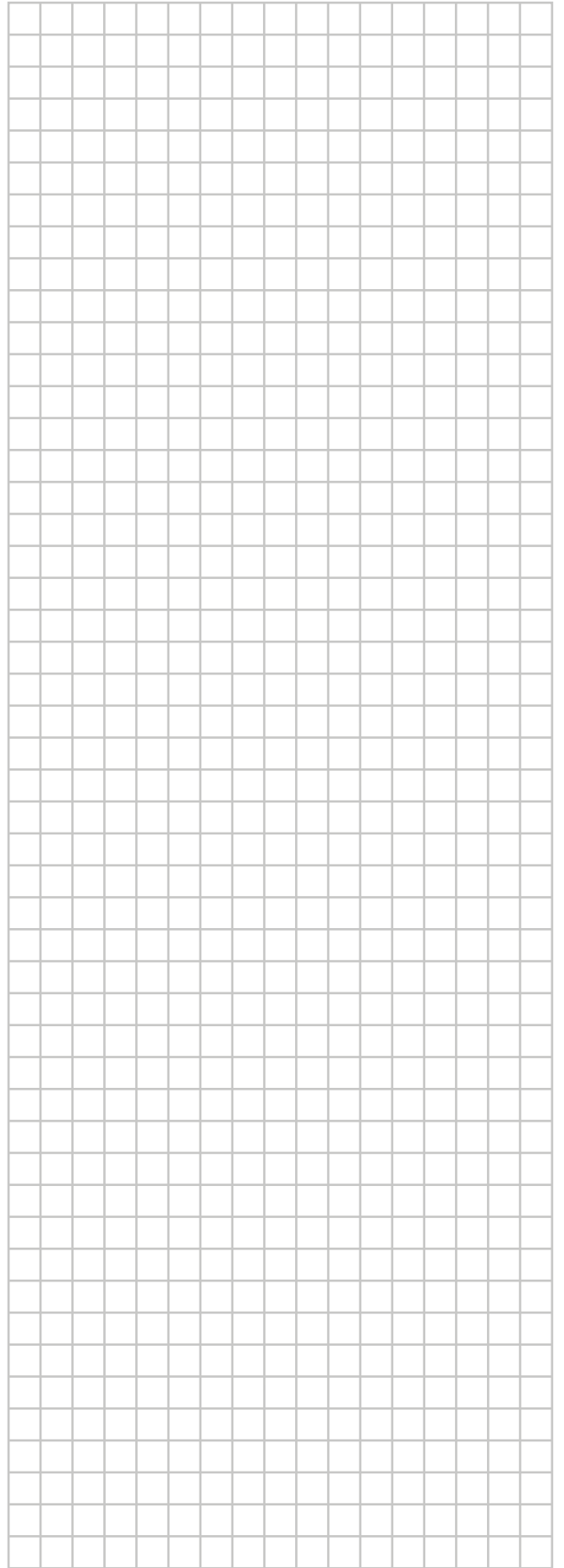
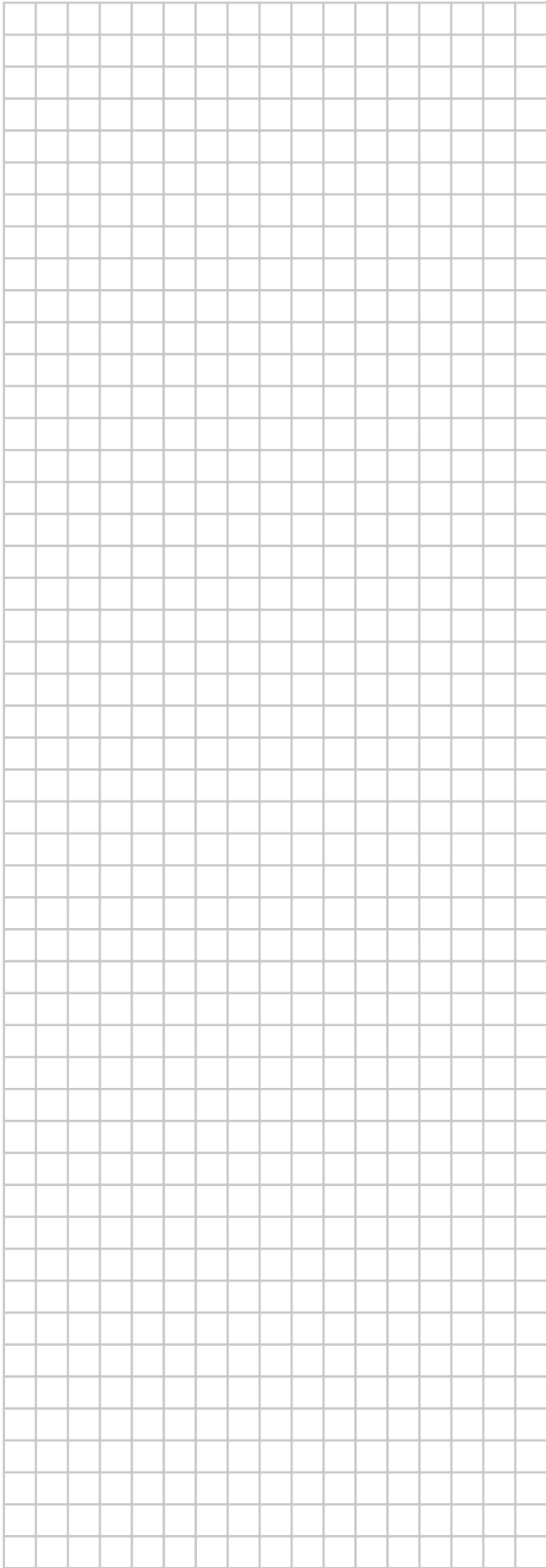
Kit availability

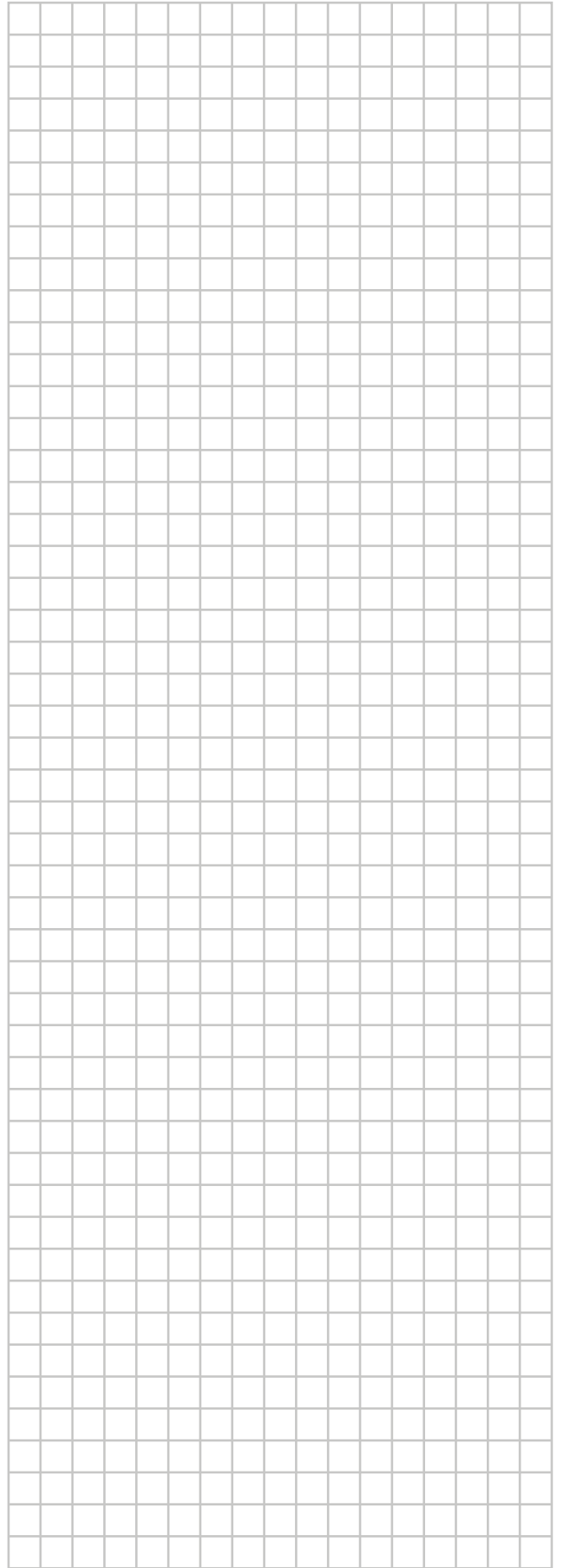
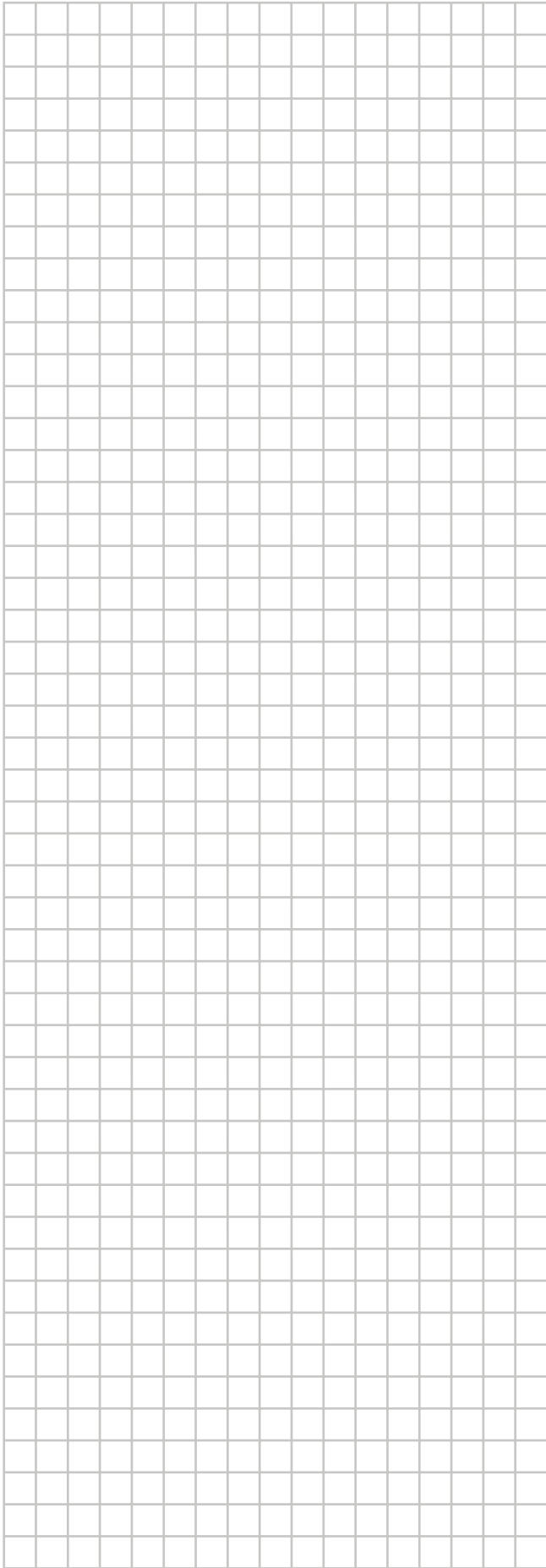
| Reference | Description | # - ## | |
|------------|------------------------------------------------------|---------|---------|
| | | 18 - 3V | 26 - 9W |
| *KRSCA1 | Remote sensor for outdoor (11) | 0 | 0 |
| *KRCS01-1 | Remote sensor for indoor (11) | 0 | 0 |
| *KRUCAL1 | User interface language group 1 | 0 | 0 |
| *KRUCAL2 | User interface language group 2 | 0 | 0 |
| *KRP1HBAA | Digital I/O PCB (2) | 0 | 0 |
| *KRP1AHTA | Demand PCB (6) | 0 | 0 |
| *KRTTWA | Wired room thermostat option kit | 0 | 0 |
| *KRTT1 | Wireless room thermostat option kit (incl. receiver) | 0 | 0 |
| *KRTETS | external temperature sensor option kit (4) | 0 | 0 |
| FWXV15AVEB | Heat pump convector | 0 | 0 |
| FWXV20AVEB | Heat pump convector | 0 | 0 |
| *KVKHPC | Valve kit heat pump convector (5) | 0 | 0 |
| *KPCAB1 | PC cable kit (12) | 0 | 0 |

Remark: Other combinations than mentioned in this combination table are prohibited

- (1) Heater tape that can be fixed on the bottom plate to prevent excessive ice formation.
- (2) PCB that provides additional output connections:
 - (a) Control external heat source (bivalent operation)
 - (b) Output remote ON/OFF signal Space heating/cooling
 - (c) Remote alarm output
- (3) It is not allowed to combine bottom plate heater and drain plug/stop kit
- (4) *KRTETS can only be used in combination with *KRTT1
- (5) Valve kit mandatory if heat pump convector is installed on reversible model (not mandatory for heating only model)
- (6) PCB to receive up to 4 digital inputs for power limitation, only for *HB(H/X)04/08CA
- (8) Bottom plate heater is factory mounted and controlled by outdoor unit
- (9) Unified model, the actual BUH capacity depends on the actual internal upwiring
- (10) Requires digital I/O PCB *KRP1HBAA
- (11) Only 1 remote sensor can be connected : indoor OR outdoor sensor
- (12) Data cable for connection with PC







DAIKIN EUROPE N.V.

Zandvoordestraat 300, B-8400 Oostende, Belgium

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